Trade, Food, Diet and Health

Perspectives and Policy Options

Corinna **Hawkes**
Chantal **Blouin**
Spencer **Henson**
Nick **Drager**
Laurette **Dubé**

WILEY-BLACKWELL

Trade, Food, Diet and Health

Perspectives and Policy Options

Disclaimer

The views expressed in this document are those of the authors and editors and do not necessarily represent those of the organisations to which they are affiliated.

Trade, Food, Diet and Health

Perspectives and Policy Options

Edited by

Corinna Hawkes, Chantal Blouin, Spencer Henson, Nick Drager and Laurette Dubé

WILEY-BLACKWELL

A John Wiley & Sons, Ltd., Publication

This edition first published 2010

Blackwell Publishing was acquired by John Wiley & Sons in February 2007. Blackwell's publishing programme has been merged with Wiley's global Scientific, Technical, and Medical business to form Wiley-Blackwell.

Registered office
John Wiley & Sons Ltd, The Atrium, Southern Gate, Chichester, West Sussex, PO19 8SQ, United Kingdom

Editorial offices
9600 Garsington Road, Oxford, OX4 2DQ, United Kingdom
2121 State Avenue, Ames, Iowa 50014-8300, USA

For details of our global editorial offices, for customer services and for information about how to apply for permission to reuse the copyright material in this book please see our website at www.wiley.com/wiley-blackwell.

Library of Congress Cataloging-in-Publication Data

Trade, food, diet, and health : perspectives and policy options / edited by Corinna Hawkes . . . [et al.].
p. ; cm.
Includes bibliographical references and index.
ISBN 978-1-4051-9986-5 (hardback : alk. paper) 1. Nutrition policy. 2. Food industry and trade. 3. Food supply. I. Hawkes, Corinna.
[DNLM: 1. Food Supply. 2. Commerce. 3. Diet. 4. International Cooperation. 5. Nutrition Policy. 6. World Health. WA 695 T763 2010]
TX359.T73 2010
363.8′2–dc22

2009033615

A catalogue record for this book is available from the British Library.

Set in 10/12.5 pt Sabon by Aptara® Inc., New Delhi, India
Printed in Singapore

1 2010

Contents

List of Editors and Contributing Authors

EDITORS

Corinna Hawkes is an independent consultant specialising in identifying and analysing food policies to address the global shift towards unhealthy diets, obesity and diet-related chronic diseases. Her clients around the world include international organisations, national governments, foundations and non-governmental organisations. She received her PhD in Geography from King's College, University of London, in 1998, and began her work on food policy at Sustain: The Alliance for Better Food and Farming, a London-based non-governmental organisation. She later worked in the United States on community food policy issues, and at a global level on projects for the World Health Organization (WHO) as part of the development of their Global Strategy on Diet, Physical Activity and Health. Between 2004 and 2008, Corinna led the research programme on food policy and global dietary change at the International Food Policy Research Institute (IFPRI), Washington, DC. Corinna was Chair of the WHO Expert Group on Food Marketing to Children and a member of the Globalisation Knowledge Network of the WHO's Commission on Social Determinants of Health. In 2009–2010, she was a fellow at the School of Public Health at the University of São Paulo, Brazil. She is also a visiting research fellow at the Centre for Food Policy, City University, London.

Chantal Blouin completed her PhD in Political Science at the University of Toronto. She held a Congressional fellowship from the American Political Science Association (APSA) and the Norman Robertson Research Fellowship at the Department of Foreign Affairs and International Trade (DFAIT) in 1998–1999. She worked as a senior researcher in Trade and Development at the North-South Institute in Ottawa until 2007. She is now Associate Director at the Centre for Trade Policy and Law (CTPL) at Carleton University and one of the Canadian International Council's Inaugural Senior Fellowship recipients. In addition, Dr Blouin is a member of the World Health Organization's Scientific Resource Group on Globalisation, Trade and Health as well as a board member of Equiterre.

Spencer Henson (PhD) is a professor in the Department of Food, Agricultural and Resource Economics at the University of Guelph, Canada. He is an agricultural economist who specialises in the economics of food safety and quality. His research interests include the economics of food-borne disease, trade effects of food safety and quality standards and consumer attitudes towards food safety and quality.

He has undertaken research in over 40 countries across North America, Europe, Asia, sub-Saharan Africa and Latin America, and funded by international agencies such the World Bank, Food and Agriculture Organization, World Health Organization, European Commission and Organization for Economic Co-operation Development. Recent research projects include investigations of consumer attitudes towards functional foods and organic production methods, economic incentives for the adoption of enhanced food safety controls, economic costs associated with food-borne illness and the impact of food safety requirements on international competitiveness.

Nick Drager (MD, PhD) – former Director of the Department of Ethics, Equity, Trade and Human Rights and Senior Adviser in the Strategy Unit, Office of the Director-General at the World Health Organization – is Honorary Professor, Global Health Policy at the London School of Hygiene & Tropical Medicine; Professor of Public Policy and Global Health Diplomacy at McGill University; and Senior Fellow, Global Health Programme at the Graduate Institute, Geneva. His work focuses on current and emerging public health issues related to globalisation and health, especially global health diplomacy/governance, foreign policy and international trade and health. The policy-related research and training activities of the work programmes he leads are designed to contribute to enabling policy-makers and public health practitioners to analyse and act on the broader determinants of health development, to better manage and shape the global and national policy environment for health and to place public health interests higher on the global development agenda to improve health outcomes.

He has extensive experience working with senior officials in developing countries worldwide and major multilateral and bilateral development agencies in health policy development, health sector analysis, strategic planning and resource mobilisation and allocation decisions and in providing advice on health development negotiations and in conflict resolution. He has deep experience in global health diplomacy and high level negotiations on international health development issues. He has represented WHO at international events and conferences, serves as chair, keynote speaker at numerous international conferences; he lectures at Universities in Europe, North America and Asia; and is the author of numerous papers, editorials and books in the area of global health and development. He has an MD from McGill University and a PhD in Economics from Hautes Etudes Internationales, University of Geneva.

Laurette Dubé (MBA, PhD) is a professor of Marketing and holds the James McGill Chair of Consumer and Lifestyle Psychology and Marketing at the Desautels Faculty of Management of McGill University. Her lifetime research interest has been the study of emotional and non-rational processes underlying consumption and lifestyle behaviour and how such knowledge can inspire more effective product and service design and management, and health and marketing communications. She examines these affective processes from their neurobiological manifestations to their conscious experience, to develop more effective communications and service

management strategies. She is the founding scientific director of the McGill World Platform for Health and Economic Convergence, created to foster partnerships among scientists, policy- and decision-makers from all sectors of society to encourage a more ambitious notion of effective health management.

CONTRIBUTING AUTHORS

Vincent J. Atkins holds a BSc in Economics from the University of the West Indies, an MSc in Agricultural Economics from the University of Florida and an LLB from the University of London. Formerly, a senior project officer in Agricultural Development at the Caribbean Community Secretariat (CARICOM), he is currently the trade policy and technical adviser to the less developed countries (LDCs) of CARICOM at the CARICOM Office of Trade Negotiations, formerly called the Caribbean Regional Negotiating Machinery (CRNM), where he has responsibility for analysing the implications of external trade agreements for CARICOM's LDCs. He has made several presentations on the nexus between international agricultural trade policy and health.

Michelle Christian is a doctoral candidate in the Department of Sociology at Duke University, United States. Her research interests include the social, cultural, health and economic impact of the processes of globalisation on racial and ethnic groups. Most recently she has focused on connecting a global value chains framework to understand changing food production systems in developing countries that can potentially shape health outcomes.

Adam Drewnowski received his degrees from Balliol College, Oxford, and the Rockefeller University in New York. He is the Director of the Center for Obesity Research and of the Center for Public Health Nutrition at the University of Washington, United States. He is also Professor of Epidemiology, Adjunct Professor of Medicine and the Director of the Nutritional Sciences programme at the University of Washington. His research addresses the impact of taste, cost and convenience on food preferences and eating habits and the current disparities in health status. Dr Drewnowski has also developed a nutrient profiling method to classify foods and beverages by their nutrient content that has implications for the regulation of nutrition and health claims. He is the author of over 120 research papers and reviews and a frequent presence at national and international meetings.

David P. Fidler is the James Louis Calamaras Professor of Law and Director of the Center on American and Global Security at Indiana University, Bloomington. He is one of the world's leading experts on international law and global health. He has authored and co-authored dozens of articles in law reviews and public health journals on global health topics. He is also an internationally recognised expert on international law and weapons of mass destruction and on rule of law issues connected with counterinsurgency operations. He serves as an international legal

consultant to the World Health Organization (WHO), and is currently working with the WHO on the relationship between trade and health, the rise of health in foreign policy and global health diplomacy. He has also served as an international legal consultant to the US Centers for Disease Control and Prevention and to numerous non-governmental organisations interested in global health and arms control issues.

Gary Gereffi received his MA and PhD from Yale University and is professor of sociology and Director of the Center on Globalisation, Governance & Competitiveness at Duke University, where he teaches courses in economic sociology, globalisation and comparative development and international competitiveness. His research interests deal with the competitive strategies of global firms, the governance of global value chains, industrial upgrading in East Asia and Latin America, and the emerging global knowledge economy.

Ashok Gulati obtained his PhD from the Delhi School of Economics. He has been a member of the Economic Advisory Council of the Prime Minister of India, of the State Planning Board of Karnataka, of the Economic Advisory Council of the Chief Minister of Andhra Pradesh and of the Board of Directors of ICICI Banking Corporation. He was also the NABARD Chair Professor at the Institute of Economic Growth in Delhi and Chief Economist at the National Council of Applied Economic Research. From 2001 until 2006, he was Director of Markets, Trade and Institutions Division of the International Food Policy Institute (IFPRI) in Washington, DC. He is now the Director of Asia of IFPRI, based in New Delhi. His special areas of research include analysis and policy advice on issues related to agricultural markets and development of value chains; agriculture trade liberalisation and negotiations in the World Trade Organization (WTO) with a focus on the likely implications on developing country interests.

Andrew S. Hanks is a graduate student in the School of Economic Sciences at Washington State University. He received a BSc in Economics and a BA in History in 2006 from Brigham Young University (Provo, UT). His primary research interests include econometrics, public finance, charitable giving, and individual consumer decision-making under uncertainty.

Sophia Huang has a PhD in Agricultural Economics from the University of California, Davis, and an MS in Statistics from University of California, Berkeley. She is currently an agricultural economist with the Economic Research Service (ERS), US Department of Agriculture. Her major research is on international trade of fruits and vegetables and US agricultural markets in Asia, especially in Taiwan and China.

W. Philip T. James is President of the International Association for the Study of Obesity (IASO) which incorporates the International Obesity Force (IOTF), a non-governmental organisation that he established. IASO works with the World Health

Organization (WHO), the Commonwealth Secretariat and other organisations to develop strategies for the prevention and management of obesity and its associated diabetes, cardiovascular diseases and cancers. He is also Chairman of the Presidential Council of the Global Prevention Alliance, which advises governments throughout the world on how to tackle the epidemic of childhood obesity and its associated adult chronic diseases. He chaired and wrote the first European and Global WHO documents on diet and the prevention of disease, the United Nations Millennium analysis of global nutritional problems and the new WHO analysis of the impact of excess weight gain on the global burden of disease. He developed the current approach to assessing food needs for Food and Agriculture Organization (FAO) and was their chief nutritional adviser for 10 years.

Timothy Josling is a professor emeritus at the (former) Food Research Institute at Stanford; an FSI senior fellow by courtesy; and a faculty member at FSI's Forum on Contemporary Europe. His research focuses on agricultural policy and food policy in industrialised nations; international trade in agricultural and food products; and the process of economic integration. He is currently studying the reform of the agricultural trading system in the World Trade Organization (WTO), including the current round of negotiations; the use of geographical indications in agricultural trade; and the problems faced by producers of Mediterranean food products. He has also recently done research on the agricultural trade policies of countries in the Caribbean Basin; reform of the farm policy in the European Union; and the question of regional integration and its role in the multilateral system, in particular in the reform of agricultural trade.

Mary R. L'Abbé holds a PhD in Nutrition from McGill University and continues there as adjunct professor in the School of Dietetics and Human Nutrition. She was Co-chair of the Canadian Trans Fat Task Force, charged with providing the Minister of Health with concrete recommendations to eliminate or reduce processed *trans* fats in Canadian foods to the lowest level possible. She has served on or chaired numerous national and international nutrition committees for the US Department of Agriculture (USDA), the World Health Organization (WHO) as well as the Pan American Health Organization (PAHO) and currently sits on the PAHO/WHO Task Force, Trans Fat Free Americas. Currently, Director of Health Canada's Bureau of Nutritional Sciences, she is responsible for the leadership of Health Canada's nutrition research, surveillance and scientific evaluation and regulatory programmes aimed at the maintenance and improvement of the nutritional quality of the Canadian food supply such as nutrition labelling, food fortification and health claims. She is also the Canadian Head of Delegation to the Codex Alimentarius Committee on Nutrition and Foods for Special Dietary Uses and Canadian delegate to the Codex Committee on Food Labelling.

Janine Lewis is the principal nutritionist at Food Standards Australia New Zealand where she leads the nutrition risk assessment team. She also leads the Australian delegation to the Codex Committee on Nutrition and Foods for Special Dietary

Uses. She completed two 6-month secondments to the World Health Organization (WHO) in July 2008, where she worked with the Food and Agriculture Organization (FAO) in developing future arrangements for the provision of scientific advice on nutritional matters to Codex Alimentarius and Member States.

Tim Lobstein is Director of Programmes and Policy at the International Association for the Study of Obesity and is the European Coordinator of the International Association of Consumer Food Organisations. He is also a visiting fellow at the Science Policy Research Unit at the University of Sussex (United Kingdom), a visiting fellow at the Rudd Center, Yale University (United States) and is the author of several books on food and nutrition policy issues. He contributes as a food policy consultant to the work of several UK, European and international bodies, with clients including the World Health Organization, the European Commission and several consumer and health NGOs. His current interests include social inequalities in health, economic aspects of obesity and global trade effects on nutrition and physical activity.

Sophia Murphy obtained a BA in Politics, Philosophy and Economics from Oxford University and an MA from the London School of Economics in Social Policy and Planning in Developing Countries. She is a senior adviser to the Trade and Global Governance Program of the Institute for Agriculture and Trade Policy. Her work is focused on agricultural trade rules, US trade and agriculture policy and the interests of developing countries in the multilateral trade system. She is widely published on agricultural trade and development, including analysis of the effects of international trade rules on development and food security, the impact of corporate concentration in the global food system, trade and poverty-related issues in the global biofuels sector and a critique of US food aid programmes. She has worked with the United Nations in Geneva and as a policy officer with the Canadian Council for International Cooperation in Ottawa.

David Orden received his PhD in Economics from the University of Minnesota. He was a visiting fellow at the University of New South Wales in Australia, chairman of the International Agricultural Trade Research Consortium and visiting professor at Stanford University. He has carried out research and public policy education programmes on exchange rate effects on agriculture, macroeconomic dynamic econometrics, the economics and political economy of domestic support policies and international trade negotiations and technical barriers to trade. He is now a professor in the Institute for Society, Culture and Environment, Virginia Polytechnic Institute and State University, and senior research fellow, Markets, Trade and Institutions Division, International Food Policy Research Institute (IFPRI), Washington, DC. His work at IFPRI involves research on agricultural policy and international trade, including the impacts of industrialised country agricultural subsidies on developing countries.

Thomas Reardon is a professor in the Department of Agricultural, Food, and Resource Economics, Michigan State University (MSU). Since 2007, he has been Co-Director of the IFPRI/MSU Joint Program 'Markets in Asia' with Ashok Gulati of the International Food Policy Research Institute (IFPRI). Prior to his joining MSU in 1992, he was Research Fellow at IFPRI from 1986 through 1991, a Rockefeller Foundation Post-Doctoral Fellow in Burkina Faso at ICRISAT and the University of Ouagadougou. His professional interests are the links between the rapid rise of supermarkets and agricultural development in developing countries, the rise of private food safety and quality standards, the development of markets for fruit and vegetables and dairy products, and farms and the opportunities and challenges facing small farmers and agro-enterprises with rapid food industry change driven by globalisation.

Tashmai Rikshasuta, at present, is an associate professor of Chulalongkorn University, Thailand. She holds a Bachelor of Law from Chulalongkorn University (1983), a Master of Law in International Law from Chulalongkorn University (1992). Her research interests are economic law and international economic law, especially World Trade Organization (WTO) Agreements and FTA Agreements.

Donna Roberts is a senior economist at the Economic Research Service of the US Department of Agriculture. Her research interests and publications are in the areas of agricultural trade, trade policy and trade regulation. In 2002, she completed a 6-year assignment at the US Trade Representative's Permanent Mission in Geneva, where she served as a delegate to the World Trade Organization's (WTO's) Committee on the Application of Sanitary and Phytosanitary (SPS) Measures. From 2003 to 2005, she was the Director for the Program for Research on the Economics of Invasive Species Management (PREISM) for ERS' Market and Trade Economics Division. She has also served as the Vice-Chair for the International Agricultural Trade Research Consortium since 2005.

Nipa Rojroongwasinkul is the head of Biostatistics and Computer Services Division and former Deputy Director of Institute of Nutrition, Mahidol University, Thailand. She holds a Bachelor of Science in Statistics from Kasetsart University, a Master of Science in Biostatistics and a PhD in Demography from Mahidol University. She has 20 years of working experience in food and nutrition research regarding applied statistical analysis and epidemiology. She conducted the first national food consumption survey in Thailand (2004–2005). She is a participating member of the Thailand Global Alliance for the Prevention of Obesity and Related Chronic Disease. Her most recent activities include a project on health profile and nutritional status of selected Thai-Muslim population as well as Development of Food-Based Dietary Guideline for the Thais.

Josef Schmidhuber was educated at the Technical University of Münich, where he obtained an MSc in Agricultural Economics and a PhD in Economics. He began his career with the World Food Council and worked as a senior economist with the

Organization for Economic Co-operation and Development (OECD). He is now Head of the Global Perspective Studies Unit of Food and Agriculture Organization (FAO) and a member of the Fourth Assessment Report of the International Panel on Climate Change (IPCC) and of the International Taskforce on Commodity Risk Management. His main work areas include commodity market analysis and outlook, trade and trade liberalisation in agriculture, global food and nutrition issues, climate change and bioenergy.

Prakash Shetty obtained an MBBS degree and an MD from Madras University, in Vellore, India. He was awarded a PhD in Medicine from Cambridge University. He is a professor of Public Health Nutrition at the Institute of Human Nutrition, University of Southampton (United Kingdom) and Editor-in-Chief of the *European Journal of Clinical Nutrition*. Prior to moving to the United Kingdom, he was Professor and Chairman of the Department of Physiology at St John's Medical College in Bangalore and established a Nutrition Research Centre of which he was the Director with research interests in energy and protein metabolism. He was elected Fellow of the Faculty of Public Health (FFPH) and of the Royal College of Physicians of London (FRCP). In 1993, he was appointed to the Chair of Human Nutrition at London University and has also been the Head of the Public Health Nutrition Unit, at the Department of Epidemiology and Population Health at the London School. Until 2005, he served a Chief of Nutrition Planning at the Food and Agriculture Organisation's Assessment and Evaluation Service in the Food and Nutrition Division. He currently serves as a Governor of the British Nutrition Foundation and on the Scientific Council of the Nestle Foundation, Lausanne, Switzerland.

Trenton Smith received his PhD in Economics from the University of California, Santa Barbara, in 2002 and also holds degrees in Biological Sciences and Economics and Civil Engineering from Stanford University. Dr Smith has held appointments as a global fellow and visiting assistant professor at the University of California, Los Angeles International Institute and as a postdoctoral research fellow in the Department of Economics at the University of Bonn in Germany. He is currently an assistant professor in the School of Economic Sciences at Washington State University. His research on obesity and health-related behaviour examines the influence of and interactions between socioeconomic factors such as household income and the price of food, and environmental factors such as economic insecurity (i.e. risk of income loss) and exposure to food advertising.

Wendy Snowdon has recently completed her PhD thesis at the World Health Organization Collaborating Centre for Obesity Prevention at Deakin University. Her research focused on policy interventions which Pacific Island countries could use to reduce diet-related non-communicable diseases. This includes ways of increasing access to local foods and improving the food environment through various legislative and policy mechanisms. She is currently the Co-ordinator of the Pacific Centre for the Prevention of Obesity and Non-communicable Diseases (C-POND),

a research centre which has been developed as part of a collaboration between Fiji School of Medicine and Deakin University. She has a Masters in Health Promotion from the University of London as well as a Masters in International Public Health from Sydney University. She worked as a community nutrition adviser in the United Kingdom for 5 years, before taking a post as a nutrition adviser in Chuuk, Micronesia. Following 2 years there, she became a nutrition adviser at the Secretariat of the Pacific Community, a regional technical advisory agency supporting 22 member countries. The 6 years she spent there gave her a unique insight into the nutrition and food supply problems facing the region.

Anne Marie Thow, a nutritionist and currently a PhD candidate at the University of Sydney, obtained a Masters in Public Policy at the Australian National University. In 2006, she completed an internship with the International Food Policy Research Institute in Washington, DC, investigating the implications of the Central American Free Trade Agreement for nutrition. Prior to beginning her PhD in 2007, she worked at the Australian Institute of Health and Welfare and at the Fiji National Food and Nutrition Centre, where she evaluated progress of the National Plan of Action on Nutrition. Her PhD project analysis the use of trade and tax policy to improve nutrition, using case studies in the Pacific. Her main interest is in the relationship and interaction between economic policy and public health nutrition.

Emorn Wasantwisut received her PhD from the Department of Nutrition and Food Science at the Massachusetts Institute of Technology. Currently, she is a senior adviser of the Institute of Nutrition, Mahidol University, and serves as the steering committee of the Micronutrient Forum as well as the International Zinc Nutrition Consultative Group (IZiNCG).

Christina Zehaluk is a nutritionist and is currently the Head of Special Purpose Foods in the Bureau of Nutritional Sciences, Food Directorate, Health Canada. She has been a member of a number of national and international working groups including those resonsible for the development of Canada's national action plan for nutrition and for food security. She was recently a member of the Canadian Trans Fat Task Force which was charged with providing the Minister of Health with recommendations to eliminate or reduce processed *trans* fats in Canadian foods. Ms. Zehaluk was for several years the Canadian Head of Delegation to the Codex Alimentarius Committee on Nutrition and Foods for Special Dietary Uses as well as a Canadian delegate to the Codex Committee on Food Labelling, and chaired and co-chaired working groups for both committees.

Acknowledgements

This book began when four of the editors, Laurette Dubé, Nick Drager, Spencer Henson and Chantal Blouin, began planning a Forum on Trade and Healthy Food and Diets. We felt that the issue of trade and health was becoming increasingly critical – and yet the issue of food and healthy eating had not been sufficiently discussed in this context. The Forum was held in November 2007 at McGill University, Montreal, Canada, in partnership with the Department of Ethics, Equity, Trade and Human Rights of the World Health Organization. We would like to thank the funders that made the Forum possible, particularly the Public Health Agency of Canada and Health Canada.

This book contains versions of many of the background papers prepared for that Forum, supplemented with some additional chapters. Based on her contribution to the Forum, Corinna Hawkes was asked to edit the book, and her work was supported financially by partners of the McGill World Platform for Health and Economic Convergence, and Health Canada. We thank these funders for the essential support that made the preparation of the book possible.

We also thank all the authors for their contributions, as well as their dedication and hard work in transforming original drafts into these chapters. Thanks also go to all participants of the workshop for their insights.

A very special thanks to Marie-Claire Laflamme-Sanders for her excellent and invaluable support in both hosting the workshop and editing the book.

The Editors

Part 1
Introduction and Overview

1 Trade, Health and Dietary Change

Chantal Blouin, Corinna Hawkes, Spencer Henson, Nick Drager and Laurette Dubé

1.1 How trade became a health issue

In 2001, trade ministers of the 148 member countries of the World Trade Organization (WTO) met in Doha, Qatar, to launch a new round of multilateral trade negotiations. At the meeting, the ministers agreed to an unprecedented declaration on public health which clearly stated that the WTO trade rules on intellectual property (the Agreement on Trade-Related Aspects of Intellectual Property Rights, or TRIPS) should not prevent members from taking measures to protect public health. This joint declaration came after the unparalleled mobilisation of global civil society against the negative impacts of patents on access to essential drugs. It was this high-profile controversy that first placed trade policy onto the global health agenda (Smith *et al*. 2009; Stiglitz 2009).

The TRIPS agreement, which was agreed to by WTO member countries in 1994, drew strong criticisms as it was perceived as a legal obstacle to the production of affordable generic drugs, i.e. it placed limitations on the capacity of national government to adopt measures to override patent protection. The HIV/AIDS epidemic in sub-Saharan Africa highlighted the risks associated with the TRIPS agreement. For instance, TRIPS stipulates that the production of generic drugs under compulsory licences should focus only on domestic needs, making it difficult for countries producing generic drugs to export them to the sub-Saharan African countries with no manufacturing capacity to produce their own drugs.[1]

There were also concerns about the impact of high patent protection on the price of pharmaceutical drugs, and access to health-related products like vaccines and medical supplies and equipment. While there is indeed strong evidence that patent protection leads to higher drug prices (Commission on Intellectual Property Rights 2002), proponents of strong patent regulations argue that without sufficient patent protection, the incentive to innovate, develop and manufacture new drugs is significantly reduced.

The issue of patent protection is still the subject of much political activism on both sides of the debate. Much of this concerns the attempts by the United States

[1] The public debates around the TRIPS agreement and the capacity to provide affordable drugs for HIV/AIDS patients in Africa and around the world led to changes to the WTO agreement, with a waiver allowing all countries to produce generic drugs to export to countries without manufacturing capacity.

Box 1.1 Core linkages between trade and health.

- Trade in health-related products (pharmaceutical products, vaccines and medical equipment)
- Trade in health services
- Trade in harmful products
- Trade and social determinants of health
- Trade in food

to strengthen patent protection beyond what is provided in the multilateral trade rules of the TRIPS in their bilateral trade negotiations (Correa 2006).

Access to drugs was the first, but not the only health issue bringing trade onto the health agenda (and vice versa). As shown in Box 1.1, four further concerns have raised the profile of trade as a health issue: trade in health services, trade in harmful products, trade and the social determinants of health and trade in food.

Trade in health services is associated with three public health concerns. The first is 'health tourism' which takes place when a patient travels abroad to receive health care. Health tourism has increased significantly since the 1990s, especially to Asia (Anon 2008). It includes American patients without health insurance travelling to India to receive care they cannot afford at home, Japanese patients travelling to Thailand for annual health examinations and high-income patients coming from low-income countries where sophisticated health services are not available. The patterns of such trade are still evolving, but some policy implications have emerged. For instance, in Thailand, health tourism has drawn health professionals away from rural and public establishments towards large private urban hospitals which cater to foreign patients. To deal with the problem, the Thai government adopted mitigating measures to limit the negative impacts of such an internal 'brain drain' (Pachanee & Wibulpolprasert 2006). The second type of trade in health services is the temporary movement of health professionals abroad to provide care. This phenomenon is distinct from the permanent migration of health professionals, but nevertheless raises the concern that greater temporary mobility of health professionals could worsen the existing 'brain drain' of physicians and nurses from developing countries (especially sub-Saharan Africa) to developed nations. A third type of trade in health services is when a foreign investor establishes a commercial establishment, such as a clinic or a hospital, to offer health services or health insurance services. The policy implications of foreign investment in health care services are similar to some of the concerns associated with private financing and delivery of health services (such as increased inequity in access to services). For instance, research on foreign investment in health establishments in China highlights how the coastal regions, already better served in terms of availability of facilities and services, have received all of the foreign investment in the establishment of specialised clinics (Shi 2003).

The third issue linking trade to the health agenda is the trade of products that damage health, particularly tobacco, alcohol, small arms or toxic waste. This first became a concern as the reduction of tariffs on tobacco products led to price

reductions and increased consumption. The negative impact of trade liberalisation on tobacco use is well documented (Taylor *et al*. 2001). The negotiations of the Framework Convention on Tobacco Control (FCTC) did not directly address this potential tension between international trade law and health, but contains provisions that have implications for trade rules. An earlier draft of the FCTC included text that gave supremacy to trade rules over the implementation of such provisions, but this was excluded from the final draft (Smith & Onzivu, 2009).

The fourth area is the effect of trade liberalisation on social determinants of health, such as poverty, economic insecurity and inequality (Blouin *et al*. 2009). This issue has long been a concern of civil society groups and was in fact an original stimulus for the founding of the People's Health Movement (2000). Although increasingly documented in research-based texts (e.g. Labonté *et al*. 2009) and, most recently, by the World Health Organization (WHO) Commission on the social determinants of health (WHO 2008), this issue remains relatively absent from mainstream trade and health circles, partly due to the prevailing belief that trade has a positive impact on health (e.g. Dollar 2001; Feachem 2001).

The fifth issue that brought trade onto the health agenda was food. In the last few decades, there has been a significant increase in cross-border flows of foodstuffs and investment in the agri-food industry. This phenomenon has raised three main policy concerns from a public health perspective: food security, food safety and diet-related health risks.

1.2 Trade and food-related health

1.2.1 Food security

As global food trade has grown (as described in Chapter 2), external markets have become an increasingly important source of national food supplies. It is debated whether this change has resulted in higher or lower levels of national and/or household food security. In theory, removing trade barriers has the effect of reducing food prices, thus increasing access to food by the poor. However, lower-priced imports can undermine the domestic market for food produced by domestic farmers, many of whom are poor, thus worsening their food security (e.g. Madely 2000). In an attempt to resolve the debate about the impact of agricultural trade liberalisation on food security, a report from the Food and Agriculture Organization of the United Nations (FAO) concluded that 'even where food prices do fall [as a result of trade liberalisation] this is not necessarily a straightforward advantage. The outcome depends on the location and employment of the food insecure, i.e. of the poorest strata of society. If many of the poorest households are dependent directly or indirectly on agricultural production for their main income, the overall effect on food security may be negative' (FAO 2003a: Chapter 1, Section 6). A second major empirical study by the FAO also concluded that 'trade reform can be damaging to food security in the short to medium term if it is introduced without a policy package designed to offset the negative effects of liberalisation' (FAO 2006: 75). Although the debate continues, the need to consider food security in trade

policy has become a more mainstream concern. As put by Watkins and von Braun (2003: 2), 'At risk of understatement, the crucial links between agricultural trade, poverty, and food security do not figure prominently on the WTO agenda. All of this is bad news for global poverty reduction efforts'.

A related debate concerns whether WTO agreements limit the capacity of national governments to adopt measures that ensure food security. Some have argued that the existing multilateral Agreement on Agriculture (AoA) reduces the ability of national governments to adopt policies that promote food security (see Murphy 2003). They point to the WTO restrictions on government intervention in agriculture, such as the prohibition on the introduction of new non-tariff border measures and export subsidies, and the obligation to convert existing non-tariff measures into tariffs and to reduce most tariffs. Conversely, other analysts have questioned the extent to which current WTO rules on agriculture really limit the policy space available for food-insecure states to pursue food security policies (FAO 2003b). For example, FAO (2003b: 63) conclude that the AoA 'does not in general, at this stage, limit the policy space to implement food security programmes and that the main constraints are lack of funding and institutional capability and, to some extent, political will'. There is nevertheless concern that new trade negotiations may limit the policy space available to promote food security. As a result, the FAO has proposed specific criteria defining situations in which developing countries could have greater flexibility in applying WTO rules (FAO 2005). Notably, too, the Doha round of trade talks at the WTO has discussed how to integrate food security in the trade agreements, such as creating exceptions to existing rules and obligations which could be used by national governments to adopt public policies which promotes food security.

More recent events have again brought trade and food security into the spotlight. Rising food prices in 2006–2008 were blamed in part on international trade in biofuels diverting crops from food uses (UN 2008). These high prices are now considered a core risk for rising food insecurity. In 2008, the FAO identified 34 countries at serious risk of food insecurity partly because of higher food and fuel commodity prices (FAO 2008). The crisis has also given rise to debates about whether more food trade can help resolve the food insecurity (e.g. World Bank 2008), or whether reducing trade and promoting domestic self-sufficiency is the key (e.g. La Via Campesina 2008).

1.2.2 Food safety

A second food issue that brought trade further onto the health agenda is food safety. There are two main concerns here. The first is that the increasing trade in foodstuffs augments the risk of transmission of food-borne diseases. Since foods produced in a single location are now traded to multiple locations all around the world, it is feared that trade increases the potential for the spread of new food safety hazards, the revival of previously controlled risks and more widespread contamination. Complex trade patterns also raise concerns that tracing the source

of the food safety risk is more difficult, making it more difficult to resolve the problem.

The era of greater food trade has certainly been accompanied by a rise of reported food-borne diseases. In the United States, for example, the average annual number of food-borne illnesses associated with fresh produce more than doubled between 1973–1987 and 1988–1991 (from 4 to 10 outbreaks per year), a trend that continued into the late 1990s (Calvin 2003). Yet beyond isolated and usually highly publicised cases, it is not possible to attribute this increase to imports. There is, in fact, little evidence to confirm whether food safety risks are increasing, remaining stable or decreasing with more food trade (Buzby & Unnevehr 2004).

The second concern is that national regulations on food safety present a barrier to trade. Such concerns were the reason for the adoption of the WTO's Agreement on Sanitary and Phytosanitary Measures (SPS Agreement), which aims to discipline national measures on food safety. The agreement specifies that food safety standards should be based on scientific evidence and international standards, but should not be overly trade restrictive. Despite resulting concerns that the SPS Agreement undermines stronger national standards and thus increases food safety risks (Silverglade 2000), there nevertheless remains a wide variety of different food safety regulations around the world (Josling *et al*. 2004).

The third issue that has brought food onto the trade and health agenda is the rise of obesity and diet-related chronic diseases worldwide. This much more recent issue has received far less attention in trade circles and is the principal focus of this book.

1.3 Trade, diet and diet-related chronic diseases

As with many phenomena, it was the perceived visibility of the effects of trade, and of globalisation more generally, that led researchers, civil society and the media to begin to highlight the link between trade and poor dietary patterns. As Coca-Cola spread rapidly around the world in the 1980s, followed by McDonald's in the 1990s, researchers coined the terms 'Coca-Colonisation' and 'McDonaldisation' to describe the westernisation of the global diet. This perception was soon backed by evidence that people all over the world were consuming fewer traditional staples (cereals and complex carbohydrates) and far more energy-dense foods high in fats, sweeteners and highly refined carbohydrates (though the research did not necessarily identify soft drinks and burgers as the cause). The term 'nutrition transition' was coined to describe the shift towards these unhealthy diets (Popkin 1998).

Diets higher in animal foods, sugar, fruits, vegetables, oils and fats became more prevalent in most developed countries in the late nineteenth century (e.g. Grigg 1995). For example, in England, it is estimated that the per person consumption of fat and refined carbohydrates increased 5- to10-fold over the past two centuries, while the consumption of fibre-rich grains declined substantially (Uusitalo *et al*. 2002). This same shift is now taking place in middle- and low-income countries, but with a significant difference: the rate of change is far faster (Popkin 2002). The shift typically begins with major increases in domestic production and imports

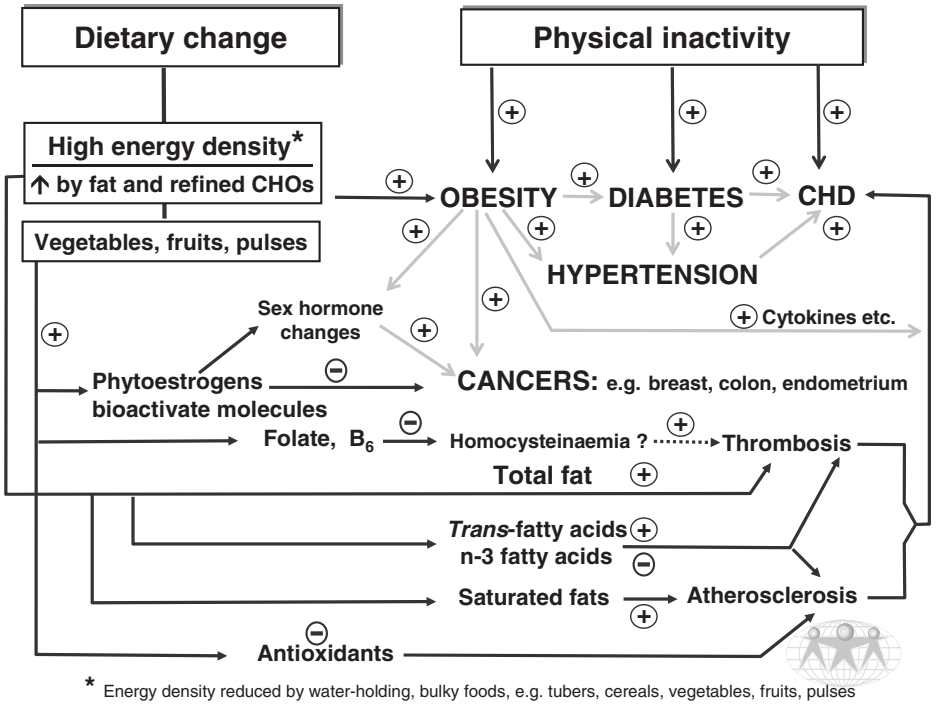

Figure 1.1 The dietary inter-relationships with chronic diseases. CHD, coronary heart disease. *Source*: James and Rigby (2007). By permission of Oxford University Press.

of oilseeds and vegetable oils (Drewnowski & Popkin 1997). Consumption of foods from animal sources (such as meat and milk) and processed foods (such as snacks, soft drinks, breakfast cereals and processed dairy products) then increases. The transition is also characterised by increased consumption of foods away from home, such as street foods and fast foods, and an inadequate consumption of fruits and vegetables.

Scientific evidence shows that these dietary patterns – specifically, diets high in fats (especially saturated fats and *trans*-fatty acids), free sugars, and salt and low in fruits, vegetables, pulses (legumes), whole grains, and nuts – pose significant risks for chronic diseases (WHO/FAO 2003). Along with declining levels of physical activity, diets have thus been implicated in the emergence of chronic diseases as a leading cause of mortality and morbidity in the world today. As shown in Figure 1.1, dietary change has direct and indirect impacts on obesity, diabetes, hypertension, heart disease and cancers.

According to the WHO, such chronic (often termed 'non-communicable') diseases are the largest cause of death in the world, led by cardiovascular disease (17 million deaths in 2002, mainly from ischemic heart disease and stroke) and followed by cancer (7 million deaths), chronic lung diseases (4 million) and diabetes mellitus (almost 1 million) (Yach *et al*. 2004). In 2008, more than 31 million people are thought to have died from the four leading chronic diseases: heart disease,

cancer, respiratory disease and diabetes (Stuckler 2008). Close to half of these deaths are estimated to be premature (WHO 2005). Although chronic diseases have been the leading cause of death in developed countries for decades, 80% of deaths from chronic diseases now occur in developing countries and cardiovascular disease is the leading cause of mortality in these countries (WHO 2005). Analysis of mortality data shows that almost half the disease burden in low- and middle-income countries was from chronic diseases in 2001 (Lopez *et al*. 2006). The most recent projections by the WHO indicate that, until 2030, there will be a dramatic shift in the distribution of deaths from younger to older ages, and from communicable, maternal, perinatal and nutritional causes to chronic disease causes (Mathers & Loncar 2006). Specifically, the proportion of deaths due to chronic disease is projected to rise from 59% in 2002 to 69% in 2030.

This shift is also characterised by the increasing prevalence of intermediate risk factors for these diseases such as overweight, obesity, high cholesterol and hypertension. According to the WHO, in 2005, approximately 1.6 billion adults (age 15+) worldwide were overweight, 400 million of whom were obese (WHO 2006a). In addition, at least 20 million children under the age of five were overweight. The WHO further projects that, by 2015, approximately 2.3 billion adults will be overweight and more than 700 million will be obese. A review of available data in 2006 found that childhood overweight has increased over past years in almost all countries for which data are available (Wang & Lobstein 2006).

Many factors have been blamed for the nutrition transition and associated increases in obesity and diet-related chronic diseases, including changes in people's income, employment pattern, and what are often termed 'lifestyles', and more distal, global causes related to economics, culture and technology. At the macro-level, the 'globalisation' of the food system is often talked of in a general way as a culprit. As put by Kennedy *et al*. (2004: 1), 'globalisation is having a major impact on food systems around the world ... [which] affect availability and access to food through changes to food production, procurement and distribution ... in turn bringing about a gradual shift in food culture, with consequent changes in dietary consumption patterns and nutritional status that vary with the socio-economic strata'. This is where trade – as a key component of globalisation – comes in. But while the links between trade and the way food is produced and moved around the world are well established, the links with changing food consumption patterns are not.

As for the other health- and food-related issues on the trade agenda, there are many differing perspectives on the role of trade in diet-related changes. Basically put, some perceive trade as a main driver of the westernisation of diets (see, for example, the essays in WHO 2002 and FAO 2004). Others, in contrast, view trade as a positive purveyor of greater dietary diversity and consumer choice (e.g. Regmi *et al*. 2004). On the policy side, some perceive a need to intervene directly in trade to stop the rising tide of diet-related disease; others view policies targeting consumers much more appropriate and not at all inconsistent with open trade. These different perspectives have not been well explored in the research and policy literature. To address this gap, this book brings together a range of studies on trade, food, diet and health, presenting different perspectives on a debated issue.

1.4 Book overview

Conflicting views about the role trade could or should play in the global economic order have given rise to what is often highly polarised debate about trade. Indeed, the history and functioning of food trade described in Chapter 2 shows that much of the advance of food trade has been the result of specific policy decisions influenced by particular political–economic beliefs. But rather than taking a single view, this book presents a range of diverging perspectives. It is an approach that reflects the diversity of the contributors, who come from a range of disciplines, including economics, law, public health, nutrition and sociology, and sectors that include academia, national governments, non-governmental organisations, trade organisations and international organisations. Given the different languages used by different disciplines and sectors, and the often very technical nature of trade policy, the book includes a **glossary** of the trade terms used in the chapters.

The book is divided into two parts: the linkages between trade and diet (Part 1) and the policy options available to address these linkages (Part 2). Chapters 2 traces the history of food trade, addressing the question 'why trade food?' It provides an overview of trade and investment in food and agriculture, and the resultant impacts on imports, exports and the whole food supply chain, not least the growth of transnational corporations that produce, process and sell food. Chapters 3 and 4 look at links between trade and the consumption of specific foods. Focusing on vegetable oils, meat and highly processed foods, Chapter 3 suggests that trade liberalisation has been a facilitator of the nutrition transition by changing food availability, prices and marketing, thereby encouraging consumers to consume certain foods over others. Chapter 4, looking at fruits and vegetables, comes from the opposite perspective, indicating that it is changes in consumption patterns and increasing demand for new types of fruits and vegetables at affordable prices that have driven increased global trade flows of fruits and vegetable, not the other way around. Chapter 5 looks at the issue of prices and costs in greater depth, arguing that international trade lowers the relative costs of energy-dense foods and diets, thus facilitating the growth of obesity in the developing world. Chapter 6 argues that trade affects what people eat primarily through indirect rather than direct channels. Using a global value chains approach, it examines how processes beyond the simple export and import of finished food products, such as the trade in ingredients, are more important, and that an in-depth understanding of how the global food industry operates is a key to understanding the linkages involved. Transnational supermarkets, increasingly a key player in the global food industry, is the subject of Chapter 7. This chapter likewise shows that it is a trade-related process beyond food imports and exports – the foreign investment that has fuelled rapid supermarket growth in developing countries – that is the key. It finds that, because supermarkets market and procure food differently from traditional retailers, they likely have an effect on food prices and diets.

The following three chapters present studies of the linkages between trade and food in specific geographical zones. Delving into Europe first, Chapter 8 examines

whether a vast instrument of agricultural trade policy – the European Union's Common Agricultural Policy (CAP) – has been a factor in changing dietary patterns in Europe since the 1970s. While it finds no evidence of a link, it does suggest that the CAP may have affected food consumption elsewhere in the world. In contrast, the trade policies of the Pacific Islands do appear, as reviewed in Chapter 9, to have had a direct impact on the diets and health of Pacific Islanders; the relatively small size and bounded nature of the Pacific Island countries provides unique insights into the pathways between trade and diet. Moving into Asia, Chapter 10 examines the case of Thailand, asking whether food imports have played a role in driving dietary change. It finds that the nutrition transition in Thailand has not been driven by food imports so much as domestic changes and the more diffuse influences of globalisation. It nevertheless suggests that the policy options needed to address dietary changes need to take a global perspective given the global nature of the influences, and makes the case for the adoption of nutrition profiling for this purpose.

The policy options are taken up in more detail in Part 2. From an advocacy perspective, Chapter 11 starts by outlining evidence that trade liberalisation has strongly negative dietary implications for a particularly vulnerable group: children. It then outlines the policies needed to address the outcomes of trade liberalisation on childhood obesity at the global, national and local levels. The next two chapters look at existing trade-related mechanisms available to promote healthy diets: the WTO's SPS Agreement (Chapter 12) and the Codex Alimentarius (Chapter 13). Chapter 12 provides a comprehensive review of the effects of the SPS Agreement on the transparency and harmonisation of national food safety regulations and highlights the lessons it provides for interventions to promote healthy diets. Chapter 13 examines how the Codex Alimentarius could be used to advance the recommendations in one of the key global policy documents in this area: the WHO's Global Strategy on Diet, Physical Activity and Health. It also provides an example of how one national experiences of implementing this Global Strategy – from Canada – can be used to help the Codex in doing so.

The next two chapters examine the policy space available to governments to implement policies given their international obligations under trade agreements. Chapter 14 asks whether developing countries have scope within the WTO's AoA to implement agricultural policies that have a health-promoting effect. Chapter 15 makes a detailed analysis of whether policies commonly recommended to address obesity, specifically those set out in the European Charter for Counteracting Obesity, would be permitted within the disciplines imposed by trade agreements. These analyses find that these policies are indeed possible within the disciplines imposed, although interventions like banning imports of energy-dense foods would not be permitted.

1.5 Key messages and conclusions

As already indicated, the book contains a variety of perspectives. Nevertheless, several key messages emerge strongly from the different chapters. First, the trade

processes linked with changing consumption patterns involve a lot more than just the imports and exports. While the movement of foodstuffs across borders have been the traditional concerns for food security and food safety, dietary matters involve other trade-related drivers, such as foreign investment, the growth of transnational corporations and supermarket growth, as well as urbanisation and income growth. And while due attention is often paid to the effect of WTO agreements on food and agriculture relative to other trade policies, bilateral and regional agreements, investment agreements and unilateral decisions made by governments, are also critical, if not, in some cases, more so. Second, the links between trade and diet are often more indirect than direct. While specific changes in trade policy can be linked directly with consumption trends in some cases, it is the totality of these more amorphous effects of trade operating on many different facets of the food industry and people's lives that matter. Third, there is a tension between conceptualising increased food trade as being driven by changing consumer eating habits, and conceptualising increased food trade as being driven by changing eating habits. This is likely a false binary, with both forces operating in both directions. Fourth, then, the picture emerges that, while the links are at times indirect or amorphous, trade and trade policy has implications for the food we eat, particularly the process of trade and financial liberalisation.

So how to address such a complex picture? The first step is to diagnose whether trade is in anyway the cause of the problem – as has been attempted by many of the chapters in this book. Trade processes that may intuitively appear to have important implications for diet and health may not, and vice versa. Thus, diagnosing the risks and benefits associated with specific trade policy and agreements is a first key step. A case-by-case approach is needed to assess whether trade and trade policy are fostering changes that are coherent with policies on diet and nutrition at the national level. This approach has been expressed in the WHO Resolution on International Trade and Health adopted by the World Health Assembly in 2006 (WHA 59.26) which also urged members 'to adopt, where necessary, policies, laws and regulations that deal with issues identified in that dialogue and take advantage of the potential opportunities, and address the potential challenges that trade and trade agreements may have for health, considering, where appropriate, using the flexibilities inherent in them' (WHO 2006b). The WHO has sponsored such a diagnostic tool on trade and health, to be used for national policy makers for developing national strategies on trade and health, including trade in foodstuffs (Blouin *et al*. 2009).

With regard to the policy options, emerging from the chapters are two possible approaches: intervening in the trade process itself and/or intervening in the outcomes of the trade process. The former involves intervening in trade and related agreements, or intervening in the actions of transnational food companies, while the latter approach involves developing policies that affect food availability, influence prices or regulate different aspects of food marketing. While the analysis indicates that banning import or exports on diet-related health grounds would likely contravene international trade law, policy approaches that address some of the outcomes of trade liberalisation are not at all inconsistent with rules and

regulations laid out in trade agreements. Both approaches have their advocates and opponents.

This book wishes to inform this debate and contribute to improving policymaking in this area by providing more information and evidence on the linkages between trade, food, diet and health.

References

Anon (2008). Globalization and health: importing competition. *The Economist*, 16 August.

Blouin, C., Chopra, M. & Van Der Hoeven, R. (2009). Trade and social determinants of health. *The Lancet* **373**(9662), 502–7.

Blouin, C., Drager, N. & Smith, R. (eds) (2009). *Toward Building a National Strategy on Trade and Health: A Diagnostic Tool for Policymakers*. Unpublished manuscript prepared for the World Health Organization.

Buzby, J.C. & Unnevehr, L. (2004). Food safety and international trade. In: *Food Safety and International Trade – Research Briefs: Agriculture Information Bulletin No. AIB789*. USDA, Washington, DC. Retrieved from http://www.ers.usda.gov/Publications/aib789/.

Calvin, L. (2003). Produce, food trade, and international trade. In: Buzby, J. (ed.). *International Trade and Food safety: Economic Theory and Case Studies*. USDA, Washington, DC, pp. 74–96.

Commission on Intellectual Property Rights (2002). *Integrating Intellectual Property Rights and Development Policy*. Commission on Intellectual Property Rights, London.

Correa, C. (2006). Implications of bilateral trade agreements on access to medicines. *WHO Bulletin* **84**(5), 399–404.

Dollar, D. (2001). Is globalization good for your health? *WHO Bulletin* **79**(9), 827–33.

Drewnowski, A. & Popkin, B.M. (1997). The nutrition transition: new trends in the global diet. *Nutrition Reviews* **55**(2), 31–43.

FAO (2003a). *Trade Reforms and Food Security: Conceptualizing the Linkages*. FAO, Rome.

FAO (2003b). Bangladesh. In: *WTO Agreement on Agriculture. The Implementation Experience. Developing Country Case Studies*. FAO, Commodities and Trade Division, Rome.

FAO (2004). Globalisation of food systems in developing countries: impact on food security and nutrition. *FAO Food and Nutrition Paper* **83**, 1–24.

FAO (2005). Special and differential treatment in agriculture. In: *FAO Trade Policy Briefs on Issues Related to the WTO Negotiations on Agriculture*, Vol. 10. FAO, Rome.

FAO (2006). *Trade Reforms and Food Security: Country Case Studies and Synthesis*. FAO, Rome.

FAO (2008). *Crop Prospects and Food Situation*. Retrieved from http://www.fao.org/docrep/010/ai470e/ai470e02.htm.

Feachem, R.G. (2001). Globalisation is good for your health, mostly. *British Medical Journal* **323**, 504–6.

Grigg, D. (1995). The nutritional transition in Western Europe. *Journal of Historical Geography* **21**, 247–61.

James, W.P.T. & Rigby, N. (2007). The challenge of the chronic diseases epidemic for science and society. In: Mann, J.I. & Truswell, A.S. (eds). Essentials in Human Nutrition, 3rd edn. Oxford University Press, Oxford, pp. 249–59.

Josling, T., Roberts, D. & Orden, D. (2004). *Food Regulation and Trade*. Institute for International Economics, Washington, DC.

Kennedy, G., Nantel, G. & Shetty, P. (2004). Globalization of food systems in developing countries: a synthesis of country case studies. In: *FAO Food and Nutrition Paper*, Vol. **83**. FAO, Rome, pp. 1–24.

Labonté, R., Schrecker, T., Runnels, V. & Packer, C. (eds). (2009). *Globalization and Health Pathways, Evidence and Policy*. Routledge, New York.

La Via Campesina (2008). *An Answer to the Global Food Crisis: Peasants and small farmers can feed the world*! Retrieved from http://www.viacampesina.org/main_en/index.php?option=com_content&task=view&id=525&Itemid=1.

Lopez, A.D., Mathers, C.D., Ezzati, M., Jamison, D.T. & Murray, C.J. (2006). Global and regional burden of disease and risk factors, 2001: systematic analysis of population health data. *The Lancet* **367**(9524), 1747–57.

Madely, J. (2000). *Hungry for Trade: How the Poor Pay for Free Trade*. Zed Books, London.

Mathers, C.D. & Loncar, D. (2006). Projections of global mortality and burden of disease from 2002 to 2030. *PLoS Medicine* **3**(11), e512. Retrieved from http://medicine.plosjournals.org/perlserv/?request=get-document&doi=10.1371%2Fjournal.pmed.0030442&ct=1.

Murphy, S. (2003). *Introduction to the Development Box: Finding Space for Development Concerns in the WTO's Agricultural Negotiations*. IISD, Geneva.

Pachanee, C. & Wibulpolprasert, S. (2006). Incoherent policies on universal coverage of health insurance and promotion of international trade in health services in Thailand. *Health Policy and Planning* **21**(4), 310–18.

People's Health Movement (2000). People's Health Charter. Retrieved from http://www.phmovement.org/files/phm-pch-english.pdf.

Popkin, B.M. (1998). The nutrition transition and its health implications in lower-income countries. *Public Health Nutrition* **1**(1), 5–21.

Popkin, B.M. (2002). The shift in stages of the nutrition transition in the developing world differs from past experiences! *Public Health Nutrition* **5**, 205–14.

Regmi, A., Ballenger, N. & Putnam, J. (2004). Globalisation and income growth promote the Mediterranean diet. *Public Health Nutrition* **7**(7), 977–83.

Shi, G. (2003). *Trade in Health Services and the GATS in China: Preliminary Observations and Analysis*. Paper presented at the WHO Workshop on Trade in Health Services, Ottawa, July 2003.

Silverglade, B.A. (2000). The WTO agreement on sanitary and phytosanitary measures: weakening food safety regulations to facilitate trade? *Food Drug Law Journal* **55**(4), 517–24.

Smith, R. & Onzivu, W. (2009). Trade in harmful and hazardous products. In: Blouin, C., Drager, N. & Smith, R. (eds). *Toward Building a National Strategy on Trade and Health: A Diagnostic Tool for Policymakers*. Unpublished manuscript prepared for the World Health Organization.

Smith, R., Correa, C. & Oh, C. (2009). Trade, TRIPS and pharmaceuticals. *The Lancet* **373**(9664), 684–91.

Stiglitz, J.E. (2009). Trade agreements and health in developing countries. *The Lancet* **373**(9661), 363–5.

Stuckler, D. (2008). Population causes and consequences of leading chronic diseases: a comparative analysis of prevailing explanations. *Milbank Quarterly* **86**(2), 273–326.

Taylor, A., Chaloupka, F.J., Guindon, E. & Corbett, M. (2001). The impact of trade liberalisation on tobacco consumption. In: Jha, P. & Chaploupka, F. (eds). *Tobacco Control in Developing Countries*. Oxford University Press, Oxford, pp. 343–63.

UN High-Level Taskforce on the Food Security Crisis (2008). *Comprehensive Framework for Action*. UN, New York.

Uusitalo, U., Pietinen, P. & Puska, P. (2002). Dietary transition in developing countries: challenges for chronic disease prevention. In: *WHO: Globalization, Diets, and Noncommunicable Diseases*. WHO, Geneva.

Wang, Y. & Lobstein, T. (2006). Worldwide trends in childhood overweight and obesity. *International Journal of Pediatric Obesity* **1**(1), 11–25.

Watkins, K. & von Braun, J. (2003). Time to stop dumping on the world's poor. In: *Essay from IFPRI's 2002–2003 Annual Report*. International Food Policy Research Institute, Washington, DC.

WHO (2002). *WHO: Globalization, Diets, and Noncommunicable Diseases*. WHO, Geneva. Retrieved from http://whqlibdoc.who.int/publications/9241590416.pdf.

WHO (2005). *Preventing Chronic Diseases a Vital Investment*. WHO, Geneva.

WHO (2006a). Obesity and Overweight: WHO Fact Sheet. Retrieved from http://www.who.int/mediacentre/factsheets/fs311/en/index.html.

WHO (2006b). International trade and health. In: *59th World Health Assembly Resolution WHA59.26*, Agenda item 11.10 27. WHO, Geneva.

WHO (2008). *Closing the Gap in a Generation: Health Equity through Action on the Social Determinants of Health*. WHO, Geneva.

World Bank (2008). *Double Jeopardy: Responding to High Food and Fuel Prices*. World Bank, Washington, DC. Retrieved from http://web.worldbank.org/WBSITE/EXTERNAL/NEWS/0,,xcontentMDK:21827681~pagePK:64257043~piPK:437376~theSitePK:4607,00.html.

World Health Organization/Food and Agriculture Organization (2003). *Diet, Nutrition and the Prevention of Chronic Diseases*. WHO Technical Report Series 916. World Health Organization, Geneva, Switzerland.

Yach, D., Hawkes, C., Gould, C.L. & Hofman, K.J. (2004). The global burden of chronic diseases: overcoming impediments to prevention and control. *Journal of the American Medical Association* **291**, 2616–22.

2 An Overview of Global Food Trade

Corinna Hawkes and Sophia Murphy

2.1 Why trade food?

Food has been traded for thousands of years. Basic to everyone's survival, food was also one of the first items that some people were able to produce in surplus, enabling them to sell it on for other goods. There is a compelling logic for trade in food: political borders do not coincide with the land required to support each given national population. Some countries do not produce enough food to meet their needs and depend on imported food to maintain food security. Other countries produce more than they need and look to export because the domestic market is not sufficient to absorb the supply. Countries might also forgo domestic production to import food that is produced more cheaply abroad, or sell abroad rather than in domestic markets because foreigners will pay more for the production.

Trading food also makes sense because food production is precarious, dependent on the weather and slow to adjust to changes, whether in growing conditions or prevailing prices. Agricultural output depends on arable land, sufficient freshwater, the right number of frost-free days and sunlight, as well as on demand, price, storage, roads, credit and technical know-how. No matter how rich and savvy, Americans, for example, can only grow domestic bananas in Hawaii. It makes economic and environmental sense to import instead from next-door Mexico, Central America and the Caribbean.

There is a long history, too, of food traded against people's will, under the duress of an absentee landlord or even an armed occupation. From the time Europeans set sail for Africa, the Americas and Asia (and later, Australasia), a period began that was initially about trading different kinds of goods but which in most cases, sooner or later, became forced occupations with colonial settlers. The history of food and agriculture in many parts of the developing world during the nineteenth and well into the twentieth century was shaped by colonial agriculture: subsistence food crops grown on the margin of plantations that produced rubber, sugar, tea, coffee, cocoa and tropical fruits, such as bananas and pineapples, for export back to the colonial power. After achieving independence, many of the former colonies were encouraged to continue producing the same commodities for export. For a period, some countries experimented with greater national control of this production although almost all continued to serve export markets.

In the first part of the twentieth century, leading economies took an interventionist stance and imposed strong state controls on trade. In the United States,

for example, the New Deal economic policies raised tariffs on agricultural goods (1930 Smoot-Hawley Act) and created floor prices to guarantee a minimum return to farmers (1933 Agricultural Adjustment Act), while other countries established national commodity boards, such as the Wheat Boards in Canada and Australia, and the Central Milk Council in New Zealand. Post-war, policy makers in many countries, both industrialised and industrialising (such as Japan and South Korea), implemented a variety of complicated programmes to protect domestic agricultural production and prices.

This situation changed as the era of 'globalisation' arrived. From the 1980s onwards, 'free trade', not state intervention, became the dominant policy paradigm. 'Trade liberalisation' became one of the most important economic policies of the era, viewed as a core means of promoting national and global economic growth. The free trade model holds that market barriers, such as tariffs, and state support to trade, such as export subsidies, are impediments to the free flow of goods – and thus as impediments to the maximisation of global welfare. Trade liberalisation thus aims to completely or partially eliminate government policies that curtail trade, notably tariffs, which act like a tax on imported goods so making them more expensive, as well as any type of non-tariff barriers that limit competition from imports or act to restrict imports by volume.

Much of the writing and thinking that influenced this economic model was rooted in neo-classical economic theory originally introduced by Adam Smith and David Ricardo (the original classical economic theorists) some 200 years ago. Neo-classical economists present international free trade as a tool that can ensure the most efficient distribution of goods, allowing the lowest cost (as a proxy for most efficient) producer to set the terms of trade (see Jackson 2000). Central to the model is the theory of 'comparative advantage', first advanced by Ricardo in 1817. The theory states that trading food across borders enables countries to specialise in producing foods consistent with their resource endowment (such as arable land, the availability of labour, access to capital and other inputs). Surplus production of such foods is then exported to countries that want the crop in question and can afford to buy it. In turn, the importing countries pay for the food by producing something else (which could be other foods and/or completely different goods or services) which they can sell in exchange. In theory, this leads to a globally efficient food system characterised by low production costs, reliable supply, and low food prices for consumers. Following this logic, in the modern era, food is traded because it is perceived to promote economic growth and stabilise markets.

The logic of globalisation ushered in over the 1980s and continuing today links trade intimately with investment. The result is not just increased food trade but a model of food and agriculture that is premised on a single, global market in which capital, services and goods move unhindered around the globe.

2.2 Trade agreements and food

Trade liberalisation is realised in two ways. One way is through domestic reforms that unilaterally open markets to more imports or that encourage exports, such as

by eliminating export tariffs. Unilateral liberalisation either involves governments choosing to open their markets to increased imports, or opening their markets under duress, as was the case under most of the structural adjustment programmes negotiated by debt-ridden developing countries with the World Bank and International Monetary Fund (IMF) during the 1980s and into the 1990s. More common today, however, is the second mechanism: trade agreements with other countries that oblige all parties to reduce their trade barriers together. The agreements can be multilateral, regional or bilateral (see Glossary).

Until the 1990s, food was commonly excluded from multilateral trade agreements. Although envisaged as part of the first General Agreement on Tariffs and Trade (GATT) in 1947, neither the United States nor the nascent European Union (EU) wanted to include agriculture in the quest for greater trade openness. As a result, agriculture was effectively kept off the multilateral trade agenda and excluded from basic trade rules (including rules governing the use of subsidies and import quotas to restrict trade and protect domestic producers) until the Uruguay Round Agreement on Agriculture (AoA) came into effect in 1995.

This is not to suggest that agriculture was not part of the multilateral agenda before the Uruguay Round talks. Far from it, commodity agreements in particular were the subject of intense negotiations among producer and consumer countries. The UN Conference on Trade and Development (UNCTAD), founded in 1964, also provided an important forum for certain kinds of trade agreement that affected agriculture directly, including the generalised system of preferences or GSPs, under which developed countries granted developing countries market access – including for a number of food commodities – at zero or low tariff rates. These deals, however, tended to complement the developed countries' production: no tariffs on raw coffee beans, but, in what is known as 'tariff escalation', high tariffs on roasted beans; no tariffs on cocoa butter, but high tariffs on chocolate; no tariffs on tea, but exorbitant tariffs on cotton and sugar (where producers were directly in competition in developed country markets).

The Uruguay Round marked a new era in food trade. A blueprint was established that opened agriculture much more widely to the pressures of neo-classical economics and the imperative to trade internationally. The completion of the Uruguay Round also marked a complete overhaul of the global trading system with the founding of the World Trade Organization (WTO) in 1995. The establishment of the WTO was the culmination of several decades of trade negotiations that had taken place under the auspices of a multilateral agreement: the GATT, first signed in 1947 and periodically revised thereafter. It was also a mark of how strongly the notion of free trade had captured the imaginations of governments in both developed and developing countries.

The WTO was founded to create a permanent negotiating forum for multilateral trade. The GATT had operated somewhat oddly, without a formal secretariat, even though it had an office and a small staff employed to administer GATT and related agreements. The WTO gave the multilateral trade agreements a home and created an enforcement mechanism (under the Dispute Settlement Understanding), which catapulted trade to the top of the multilateral agreement heap. Few other agreements had dispute settlement or enforcement mechanisms; for the most part,

Box 2.1 Multilateral trade agreements relevant to the trade of food and agricultural products (implemented 1995).

Uruguay Round Agreement on Agriculture: pledges signatory countries to reduce tariffs (market access provisions), export subsidies (export competition provisions) and domestic agricultural support (domestic support provisions)

Agreement on the Application of Sanitary and Phytosanitary Measures (SPS): sets out rules for national measures that aim to reduce hazards to animal, plant and human health, including food safety regulations

Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS): imposes obligations on countries to provide minimum protection to a range of intellectual property rights, including on food products (e.g. patents on seeds, geographical indications of commercial identify)

Technical Barriers to Trade Agreement (TBT): establishes obligations to ensure that national mandatory regulations, voluntary standards and conformity assessment procedures – including those affecting food – do not create unnecessary obstacles to trade

Dispute Settlement Understanding: the World Trade Organization's procedure for resolving trade disputes

General Agreement on Trade in Services (GATS): contains measures designed to liberalise the trade in services

Agreement on Trade-Related Investment Measures (TRIMs): prohibits trade-related investment measures, such as local content requirements, that are inconsistent with basic WTO agreement provisions

the multilateral system had limped along with admonishments and attempts to shame governments into meeting their commitments. The threat of trade sanctions, on the other hand, is a more powerful weapon, especially for smaller developing countries, which generally have only one or two major trading partners.

Seven core Uruguay Round/WTO trade agreements affect agriculture and food directly and/or indirectly (Box 2.1). The AoA is the only agreement that explicitly concerns agriculture. Three further agreements have direct implications for agricultural and food products. The Agreement on the Application of Sanitary and Phytosanitary Measures (SPS) relates in particular to standard setting in the areas of human, animal and plant health, including food safety. The Trade-Related Intellectual Property Rights Agreement (known as TRIPS) includes provisions to require patenting of life forms, including seeds. The Technical Barriers to Trade Agreement (TBT) aims to harmonise standards and certification procedures to facilitate trade, including those for foodstuffs. The creation of the Dispute Settlement Body also had significant effects on global food trade. Under the AoA, for example, the United States and EU both have had to change their domestic and trade laws to conform to the findings of dispute hearings that have gone against them. Finally, the General Agreement on Trade in Services (GATS) and the Agreement

on Trade-Related Investment Measures (TRIMs) affect food indirectly by including provisions that improve the business environment for transnational food companies (Suppan 2003).

Non-tariff barriers in food trade are also affected by the Codex Alimentarius, a set of international standards, guidelines and related texts for food products developed by the Codex Alimentarius Commission of the Joint FAO/WHO Food Standards Programme (founded in 1963). The aim of the Codex Alimentarius is to protect consumer health and facilitate trade by encouraging nations to harmonise regulations that may otherwise pose non-tariff barriers, such as laws on food safety, composition and labelling. Although the implementation of the Codex Alimentarius is voluntary, the WTO recognises it as a reference in international trade disputes. The SPS Agreement, for example, recognises the Codex Alimentarius as the benchmark food safety standards for countries to follow. Standards that are more stringent than those agreed at Codex have to be backed by strong scientific evidence to justify the additional restriction on trade they create.

In 2001, the fourth 'round' of WTO multilateral trade talks began in Doha (the 'Doha Round'). Since that time, progress has stalled, in large part because of disagreements around agriculture. Major proposals being considered for agricultural reform have been tabled and discussed without agreement, although some consensus has been achieved on several proposals (as further discussed by Atkins in Chapter 14).

Failure to make progress on food and agricultural trade at the WTO has shifted the focus onto regional and bilateral agreements as a means of liberalising food trade. Regional trade agreements affecting food trade actually predate the multilateral agreements. Regional trade agreements first arose between geographically contiguous countries with already well-established trading patterns (Crawford & Fiorentino 2005). An early example of such a regional agreement was the European Economic Community (EEC, the predecessor to the EU), which created a customs union in 1957 (i.e. a free trade area with a common external tariff). The Common Agricultural Policy (CAP), which harmonised state intervention in agriculture among the members of the EEC, was established in 1962. Other relatively early examples are the Caribbean Community (CARICOM), which came into effect in 1973 to promote trade and economic integration between the Caribbean countries, and the Gulf Cooperation Council, a trade bloc involving the six Arab states of the Persian Gulf founded in 1981.

During the 1990s, regional trade agreements started to become more common, with some 15 new agreements agreed per year (FAO 2004). Notable examples include the Southern Common Market (MERCOSUR), established by Argentina, Brazil, Paraguay and Uruguay in 1991, the ASEAN Free Trade Area (AFTA) between several southeast Asian countries in 1992, the North American Free Trade Agreement (NAFTA) between Canada, Mexico and the United States in 1994, and, more recently, the Dominican Republic-Central American Free Trade Agreement (DR-CAFTA) between the United States and five central American countries and the Dominican Republic in 2006–2007. Bilateral agreements (between two countries) also proliferated – sometimes geographically close, sometimes not.

On the whole, the AoA has set the standard for how agriculture is dealt within these regional and bilateral agreements. Before the AoA, agriculture was rarely included in regional deals, unless deeper integration was envisaged, as with the European Community. Since the AoA, agriculture became more likely to be included, although it also brought some negotiations on regional deals to a halt. Negotiations on a free trade area of the Americas, for example, have been more or less suspended since a stand-off on agriculture several years ago. The United States and the EU both continue to protect sensitive agricultural sectors in negotiating regional and bilateral trade deals, as do some of their partners (Canada, Australia and some developing countries).

In the mid-2000s, as uncertainty about the progress of the Doha Round of WTO trade talks took hold, the number of regional trade agreements signed reached unprecedented levels. Between January 2004 and February 2005 alone, 43 regional trade agreements had been notified to the WTO, making this the most prolific period for regional agreements in recorded history (Crawford & Fiorentino 2005). As of December 2008, 421 regional and bilateral trade agreements had been notified to the GATT/WTO and 230 agreements were in force (WTO 2009a).

Measures in multilateral, regional and bilateral trade agreements affect food trade by:

(i) reducing tariff and non-tariff barriers to imports and exports;
(ii) removing restrictions on foreign direct investment (FDI) in the food supply chain (including foreigners' rights to lease or own agricultural land);
(iii) opening up the market for services that affect the food supply chain;
(iv) tightening laws to protect intellectual property rights; and
(v) creating external systems to oversee implementation of agreements, using dispute settlement mechanisms to adjudicate disagreements between or among trading partners.

Measures to reduce tariff and non-tariff barriers to food imports and exports have the most direct implications for food trade. As listed in Table 2.1, they include tariffication, mandatory adherence to foods standards and standard-setting processes, and the elimination of state food marketing boards export licencing. Trade agreements also often include measures that aim to protect domestic agriculture, such as exemptions for special and sensitive products.

Although direct reductions of tariff and non-tariff barriers are the most obvious and most talked about provisions in trade agreements, they are certainly not the only measures that affect food trade. Other measures act to create a more commerce-friendly environment for private sector food and agricultural firms, such as the protection of intellectual property. One other key measure is the removal of restrictions on FDI. The WTO itself only regulates FDI in two ways: under rules governing trade in services through commercial presence (GATS), and the TRIMs. Thus arises one of the significant aspects of the development of regional and bilateral agreements vis-à-vis WTO agreements: these agreements often include investment provisions. Other important instruments that liberalise investment are

Table 2.1 Definition of policy measures in trade agreements directly affecting food trade.*

Tariff barriers	
Tariffs	A tariff is a tax (often called a 'customs duty') on an import paid for by the exporter (the cost is expected to be passed on in the final retail price, making the import relatively more expensive than it would otherwise be). A tariff may be either a fixed charge per unit of product imported (specific tariff) or a fixed percentage of value (ad valorem tariff). A bound tariff rate is the maximum tariff a country is permitted to set under WTO agreements; applied tariffs are the tariffs actually implemented (they cannot be higher than the bound level but are often lower).
Non-tariff barriers	
Tariffication	The process of converting non-tariff trade barriers to tariffs. This increases the transparency of existing agricultural trade barriers and is intended to facilitate their eventual reduction.
TRQs	A tariff-rate quota is a quota on an imported good, above which a higher tariff rate is applied. A lower tariff rate applies to any imports below the quota amount. Thus, increasing the tariff-rate quota increases the amount of the good that can be imported at the lower tariff rate, thereby facilitating trade.
Sanitary and phytosanitary and other food standards	SPS are intended to reduce hazards to animal, plant and human health. They include food safety regulations. International SPS facilitate trade by harmonising standards between trade partners. The jointly managed WHO–FAO Codex Alimentarius establishes international standards on food composition and labelling.
STEs	STEs are usually monopoly buyers or sellers of one or more goods, often found in agriculture. Once common, there are few STEs left after the recent period of trade deregulation and liberalisation.
Import licencing	Import licences are controls imposed by the state on importers. Requiring a licence limits participation in import markets. Minimising the incidence and complexity of import and export formalities and decreasing and simplifying import and export documentation requirements reduces trade barriers.
Export subsidies	Export subsidies are special incentives, such as cash payments, extended by governments to encourage increased foreign sales; usually used when a nation's domestic price for a good is higher than prevailing world market prices. Reducing export subsidies liberalises trade by reducing market distortions.
Measures implemented to protect domestic agriculture	
Sensitive and special products	Sensitive and special products are two categories exempted from the full disciplines called for in the Doha proposals for reform of the AoA. Sensitive products are proposed by developed countries for products they do not wish to open to full liberalisation. Special products are proposed by developing countries (for their use only) to protect products deemed essential for food security and rural livelihoods.
Agricultural safeguards	Safeguards are provisions permitted under WTO regulations by which imports beyond the safeguard level can be temporarily restricted if the affected industry can show that it will suffer serious injury from the higher level of imports.

WTO, World Trade Organization; TRQs, tariff-rate quotas; SPS, Sanitary and Phytosanitary Standards; WHO–FAO, World Health Organization–Food and Agriculture Organization; STEs, state trading enterprises; AoA, Agreement on Agriculture.
Source: USDA ERS (1996); USDA FAS (2005); WTO (2009b).
*Also see the Glossary.

bilateral investment treaties (BITs) signed by two states, and regional investment treaties signed by groups of states within a region. The three types of investment agreement can be collectively termed 'International Investment Treaties'. In 2008, there were over 2,500 such agreements (Mann 2008). This marks a huge increase since the 1980s. The number of BITs rose from 181 to 2,495 between 1980 and 2005 (UNCTAD 2000, 2006).

2.3 Foreign investment in the food supply chain

This proliferation of investment treaties has stimulated and facilitated foreign investment throughout the food supply chain. Much of the investment has taken the form of FDI, a long-term investment made by an individual, a government or an enterprise in one country into an enterprise in another.

Three core components of the food supply chain have been profoundly affected by FDI: agricultural production, food processing and food retailing. In agriculture, investments have been made in all stages of production, from seeds, fertilisers and pesticides, to grain silos, milling equipment, refrigeration and packaging plants, to shipping containers and runways to move product to global markets. The first major phase of FDI into agriculture occurred post-World War II in the 1960s and 1970s. It involved agribusinesses investing in the production of raw and lightly processed commodities for export. The big grain traders (based primarily in the United States and Europe) expanded into different processing activities, foods and geographical regions.

Over the 1990s, FDI became an increasingly important driver for agricultural development, especially once it started to dwarf bilateral development assistance. The technological developments in transportation and communications that significantly increased the possibilities for trade in fresh, perishable foods coincided both with the liberalisation of capital flows and trade, and with the dismantling of many state-run interventions in agricultural markets (from marketing boards, to state purchasing for food ration programmes, to national agricultural banks). The removal of the state opened a number of opportunities for the private sector to increase their role. In the 1990s, FDI into developing countries also proved a key driver behind the growth of high-value agricultural exports, such as fruits, vegetables and fish (Gulati *et al.* 2007). FDI in the export sector essentially enabled farmers in developing countries to link with high-value export markets around the globe.

Today, however, the proportion of FDI in the food supply chain going directly to agriculture is relatively low (see Table 2.2). There is relatively more investment elsewhere into the food supply chain, reflecting the subsequent phases of FDI into food processing (i.e. the manufacture of processed, packaged foods and drinks) and retailing (supermarkets, convenience stores, other modern formats for food retail and service, including fast food).

In the 1960s and 1970s, a few Western food processing companies, such as Nestlé and Coca-Cola, were already investing in developing countries, importing their products for sale in local markets and investing in factories to produce their products locally as well. But it was not until the 1980s that FDI into food processing soared, and it became the largest recipient of FDI relative to other parts of the food

Table 2.2 FDI into food and agriculture, developed and developing countries, 1990 and 2004.

		FDI (US$ million)	
FDI flow		**1990**	**2004**
FDI into food, drink and tobacco manufacturing	Outward stock from developed countries	72,952	248,398
	Outward stock from developing countries	2,452	2,188
	Inward stock into developed countries	64,427	238,066
	Inward stock into developing countries	9,612	33,337
Agriculture, hunting, forestry and fisheries	Outward stock from developed countries	5,061	5,287
	Outward stock from developing countries	408	1,106
	Inward stock into developed countries	3,193	7,739
	Inward stock into developing countries	4,063	14,339

FDI, foreign direct investment.
Source: UNCTAD (2006).

supply chain (Hawkes 2005). Outward FDI from food manufacturers in developed countries into developing countries more than tripled between 1990 and 2004 (Table 2.1, includes tobacco). FDI from the United States alone into food processing companies grew from US$9 billion in 1980 to US$36 billion in 2000, with sales increasing from US$39.2 billion to US$150 billion (Bolling & Somwaru 2001). The scale of the increase continued: between 2000 and 2006 US FDI into food processing almost doubled to US$67 billion; a huge 53% of this was into beverages (USDA ERS 2009). As FDI rose, the proportion into the manufacture of highly processed foods for sale in the host market increased relative to products produced by primary processing and intended for export to the home market. By 1998, 74% of the sales of affiliates of US food companies remained in the host market. Most FDI into food processing goes from one developed country to another. But flows to developing country regions, notably Latin America, are growing (Bolling & Gehlhar 2005), and an increasing amount of FDI in food processing now also flows between developing countries (UNCTAD 2006).

The third main recipient of FDI is food retail, a trend that started in earnest at the end of the 1990s (see also Chapter 7). FDI from US-based supermarket chains alone increased from US$400 million in 1999 to US$13.1 billion in 2002 (Harris *et al.* 2002). By 2006, the figure had grown to US$16.4 billion (USDA ERS 2009). In 2004, 50% of French-based Carrefour's sales came from foreign markets, as did 80% of Dutch-based Ahold's sales. FDI has also risen in the food service sector, as reflected by the increasing number of fast food restaurants worldwide. Between 1991 and 2001, the number of McDonald's outlets increased from 12,369 to 29,008, while the proportion of these outlets outside the United States increased from 29.5 to 54.9% (Hawkes 2002).

Most of the FDI into food processing and retailing comes in the form of acquisition of firms and the creation of foreign affiliates – and it continues apace. In 2007, the aggregate value of global food industry mergers and acquisitions (including food processors, distributors and retailers) was roughly $200 billion, compared to half that amount in 2005 (ETC Group 2008). In the packaged food industry, there were a reported 413 industry mergers and acquisitions in 2007 (ETC Group 2008).

While FDI has been marked by phases in which one or other sector predominates, all sectors – inputs into agricultural production, commodity production and processing, packaged foods, retailing and services – continue to receive FDI flows. For example, there is now a resurgence of interest in FDI into agricultural commodities, particularly into sugarcane and palm oil for the purpose of biofuel production (Rama & Wilkinson 2008). Perhaps even more 'traditional', there has also been a wave of agreements in which foreign firms seek to lease land directly from developing country governments to grow food for use in the home country (GRAIN 2008).

2.4 Food trade and the rise of transnational food companies

Food trade has a long history of large corporations. Sometimes state-owned or -sponsored, sometimes private, they generally operate with such large sums of capital and run such large risks that the barriers to entry are very high and competition is kept in check. All but one of the biggest global grain traders today (five companies: Cargill, Continental, Bunge, Louis Dreyfuss and Archer Daniels Midland (ADM)) has been in operation since the mid- to late-1800s. They are all privately-owned family businesses, with one exception: the newcomer, ADM. Cargill, perhaps the largest of them all with US$120 billion in sales and other revenues, and net earnings of US$3.95 billion in fiscal year 2008, is owned by some three dozen family members. Bunge has recently allowed some limited public offerings of its stock. For the most part, the companies are remarkable for their longevity and their continuity as privately-held companies.

Trade and financial liberalisation in the 1980s and 1990s furthered the expansion of large food firms – often termed transnational corporations (TNCs) (Box 2.2). FDI is the means through which transnationals form and grow. Lower barriers to trade facilitate the availability of cheaper inputs and ingredients. Most critically, perhaps, trade and financial liberalisation create the kind of stability that provide transnationals with the confidence they need to make investments and develop their businesses in other countries and regions. It is for this reason that the multinational agri-food industry has been so supportive of trade agreements that further liberalise trade and investment in the food supply.

As a result, there are now huge transnationals in all areas of the food supply chain, from seeds and agrochemicals to food processing, retailing, and the advertising and media companies that create and purvey the marketing of these foods. These companies often have tremendous market power. Monsanto, for example, is a chemical company that moved into genetic engineering and now owns an estimated 70–90% of the genetically engineered seed in commercial distribution. The top ten seed companies control 67% of the global proprietary seed market (82% of the world's commercial seed sales are proprietary). The top ten companies control 89% of the global agrochemical market (ETC Group 2008).

Box 2.2 Why trade and financial liberalisation encourage the growth of transnational corporations (TNCs) concerned with food.

- FDI into the food industry is the key process by which TNCs form and grow. Much of the increase in food trade is trade within global firms, created by the output from FDI.
- The commercialisation and privatisation of state trading enterprises in developing and transitional economies opened up opportunities for investment by the private sector. Typically, a flurry of private sector activity resulted, rapidly replaced by one or two dominant firms (usually TNCs) either working with a few local private firms and/or with some continuing competition among local firms in the margin.
- FDI into the service sector, the streamlining of dispute settlement mechanisms, as well as stronger and broader intellectual property rights, created a better business climate and increased access to capital and technology, which further encouraged investment by TNCs.
- Increased cross-border trade and FDI facilitates 'global vertical integration', i.e. the process of TNCs buying and contracting companies and services involved in all aspects of the production, processing, distribution and sale of a particular food, thereby bringing the entire food supply chain under its control.
- Greater cross-border trade also facilitates 'global sourcing', i.e. when a company searches for inputs, production sites and outputs where costs are lower and regulatory, political and social regimes more favourable. Both vertical integration and global sourcing enable TNCs to cut costs and create safeguards against the uncertainty of commodity production and product sales – thus stimulating further growth of TNCs.

There is rather less concentration in packaged, processed foods and drinks, but even here, the top ten companies listed in Table 2.3 control 26% of the global market for packaged food products – a 14% increase since 2004 (ETC Group 2008). Supermarkets are the most recent sector to undergo rapid consolidation. Wal-Mart did not sell food until 1990 and today has over 6% of grocery sales worldwide (more than twice the sales of its nearest rival, Carrefour). Table 2.3 shows the scale of the supermarket giants. Wal-Mart has become a global powerhouse: operating in 13 countries, with revenues of $379 billion and over 2 million employees. It is the largest company in the global Fortune top 500 index (ETC Group 2008) and the world's largest private sector employer.

This market structure gives food commodity chains an hour-glass shape, in which millions of producers sell to billions of consumers through a very narrow join made up quite often of only four to eight dominant firms (Vorley 2003). As discussed further by Vorley (2003) and Murphy (2002), this has tremendous implications for food producers, food consumers and for developing countries.

Table 2.3 Global top ten food and beverage companies and retailers.

		Home-base	2007 food and beverage sales (US$ million)	2007 total sales (US$ million)	Food and beverages as percentage of total sales (%)
	Food/beverage company				
1.	Nestlé	Switzerland	83,600	89,700	93
2.	PepsiCo, Inc.	United States	39,474	39,474	100
3.	Kraft Foods	United States	37,241	37,241	100
4.	The Coca-Cola Company	United States	28,857	28,857	100
5.	Unilever	Netherlands	26,985	50,235	54
6.	Tyson Foods	United States	26,900	26,900	100
7.	Cargill	United States	26,500	88,266	30
8.	Mars	United States	25,000	25,000	100
9.	Archer Daniels Midland Company	United States	24,219	44,018	55
10.	Danone	France	19,975	19,975	100
		Total top ten	338,751	449,666	
	Food retailer	**Home-base**	**2007 food sales (US$ million)**	**2007 total sales (US$ million)**	**Grocery as a per cent of total sales (%)**
1.	Wal-Mart	United States	180,621	391,135	46
2.	Carrefour	France	104,151	141,087	74
3.	Tesco	United Kingdom	72,970	100,200	73
4.	Schwarz Group	Germany	58,753	70,943	83
5.	Aldi	Germany	55,966	65,251	86
6.	Kroger	United States	52,082	73,053	71
7.	Ahold	Netherlands	50,556	62,614	81
8.	Rewe Group	Germany	49,651	56,324	88
9.	Metro Group	Germany	49,483	73,538	71
10.	Edeka	Germany	45,397	51,272	89
		Total top ten	719,630	1085,417	

Source: ETC Group (2008), based on data from Leatherhead Food International (food and beverage companies) and Planet Retail (food retailers).

It is notable that the degree of transnationalisation of TNCs concerned with food is high relative to other TNCs. 'Transnationality' can be measured by estimating a Transnationality Index (TI) of the ratio of foreign to total assets, sales and/or employment. According to UNCTAD, in 1993, food transnationals had the second highest TI of all TNCs (TI = 53%, compared with 61% for chemical TNCs); by 2004, the TI had increased to 80.3%, and TNCs concerned with food were ranked first (second highest was metal products TNCs at 63.7%) (UNCTAD 1995, 2006).

A separate analysis suggests that in 2004, food transnationals were second only to media companies in their degree of transnationality (Senaur & Venturini, cited in Rama & Wilkinson 2008).

Underlying the numbers on 'transnationality' is the fact that, while trade officials tend to talk about trade volumes between countries, it is companies that in fact trade. While Brazil, the United States and Argentina dominate the production of soya beans for export, it is Cargill, Bunge and ADM that overwhelmingly handle the export (and processing) of the beans for all three countries. It is those three firms that are active in Asia and Europe on the import side as well. Some of the trade is between firms, but as much as a third is estimated to be within firms: Cargill sells seed and fertiliser, buys grain and makes feed, owns feedlots and provides supermarkets with 'case-ready' (already butchered and packaged) meat. The operations are international and necessitate considerable international movements of commodities and food.

Another way to understand what is happening in food trade is to compare the largest agribusinesses and food companies to national level of gross domestic product (GDP) levels. In 2007, the food processor Nestlé posted a profit of US$9.7 billion, greater than the 2007 GDP of the 65 poorest countries by the World Bank's measure. Wal-Mart posted profits of $13.3 billion over the fiscal year ending 31 January 2009. That is more than the 2007 GDP of almost half the countries in the world (88 in total) in profits alone (sales revenue was in the hundreds of thousands of millions of dollars).

2.5 Food imports and exports

Greater trade and financial liberalisation has meant more imports and exports of food. During the first 20 years of the main liberalising period 1980–1981 to 2000–2001, the total value of world agricultural trade increased from US$243 billion into US$467 billion, representing an annual rate of increase of 4.9% in the 1980s and 3.4% in the 1990s (relative to 5.7 and 6.7%, respectively, for manufactured goods) (Ataman Aksoy 2005). Growth has continued. As shown in Figure 2.1, the value of world agricultural exports increased steadily between 2003 and 2007, rising to a total of almost US$1128 billion in 2007. Food made up 80% of these exports, the rest being non-food products like cotton, rubber, tobacco and wood.

Seen from the perspective of imports, between 1970 and 2001, gross world food imports, measured in terms of calorie equivalents, rose by almost 60% (FAO 2004). In developing countries, food import bills as share of GDP more than doubled between 1974 and 2004 (FAO 2004), and between 1971 and 2003, the share of agricultural production exported increased from 19 to 40% (calculated from FAOSTAT).

Two aspects of this food trade are critical: what it consists of and where it is going. Whereas cereals once dominated international food trade, they now comprise less than 50% of the total value of agricultural imports in developing countries (FAO

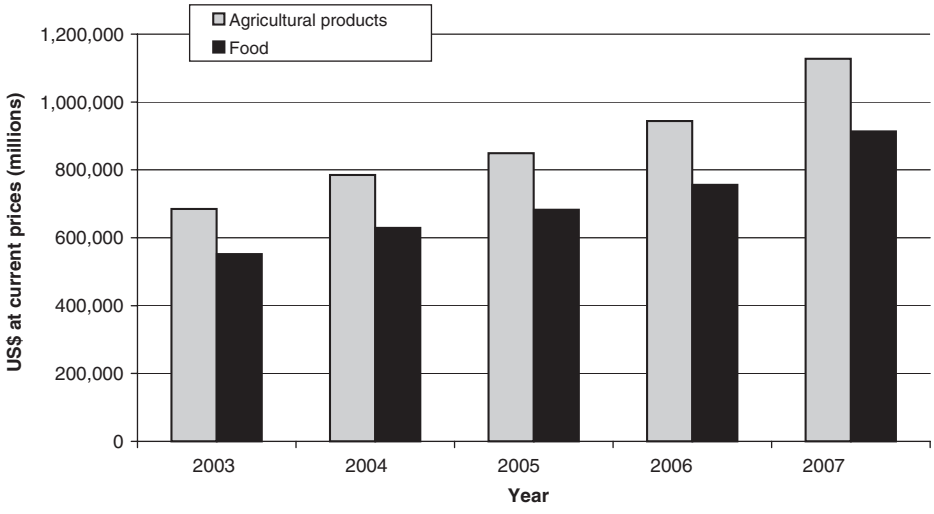

Figure 2.1 World exports of agricultural products, 2003–2007. *Source*: WTO (2009c).

2004). This represents a decline in the trade in cereals relative to higher value products, such as seafood and fruits and vegetables (Table 2.4).

The amount of trade in processed foodstuffs also increased far more rapidly than raw agricultural commodities. In 1995, the total value of global processed foods exports was 2.5 times higher than in 1985, compared with 1.5 times higher for unprocessed agricultural commodities (Rae & Josling 2003). As shown in Table 2.4, the fastest rate of imports of any foodstuffs during the 1990s was 'other processed foods' and the processed products of vegetable oils and drinks experienced relatively rapid rates of growth.

There have also been key changes in where foods are going and coming from. The amount going to developing countries has increased significantly. Whereas gross food imports into developed countries grew by 45% between 1970 and 2001, they grew by 115% into developing countries (FAO 2004). At the same time, there has been a significant increase of exports of high-value foods from developing into

Table 2.4 Annual import growth rates for different foodstuffs, 1990–1991 to 2000–2001.

Food stuff	Developing countries (%)	Industrialised countries (%)
Vegetable oil and oil seeds	6.8	1.0
Seafood, fresh and processed	7.7	3.3
Fruits and vegetables, fresh and processed	6.4	1.9
Beverages, alcoholic and non-alcoholic	6.6	4.6
Other processed foods	11.9	4.9
Cereal grains	1.6	1.8
Total	4.3	2.0

Source: Ataman Aksoy (2005) and The World Bank. © The World Bank.

developed countries, a reflection of the increased investment into this sector in developing countries.

2.6 Conclusion

Over the past 20–30 years, trade liberalisation has led to a more liberal, commerce-friendly global marketplace for food products, although it cannot yet be described as 'open' since high levels of protection still exist in various forms. This stems partly from the fact that, while every market has its peculiarities, agriculture fits less well than most sectors into the assumptions of free trade economics. This is because agriculture is characterised by inelastic demand and slow supply responses, a tendency for oligopolistic power between producers and consumers, and the immovability of key factors of production, including arable land and access to freshwater. The economics are also shaped by the politics of food: food is essential to life, and access to sufficient and affordable food for at least most of the people most of the time is essential to political stability. Governments are loath to become completely dependent on external markets for their food security because world prices are unstable and once the country is dependent, food imports are not optional. Whether the world price for rice is at US$24 or $12 per cwt (it was both at different times during 2008), import-dependent countries have to buy.

Yet, countries continue to negotiate bilateral and regional trade and investment agreements to further liberalise food trade and investment. The leaders of the Group of 20 finance ministers and central bank governors continue to pledge their support for a speedy conclusion to the Doha trade talks. At the time of writing (February 2009), however, the world of finance and trade is in turmoil. The collapse of a number of major banks and insurance firms since September 2008, together with the bailouts governments have proposed in response, have put enormous demands on the global financial system. Like all sectors, food and agriculture are affected: trade credit is scarce, uncertainty compounds volatility, and governments show increasing reluctance to trust the 'invisible hand' of the market alone. Deregulated markets have proved severely lacking. Among other indications of the changing times, the US Congress began to debate new legislation in 2009 to tighten (anew) the regulations governing speculation on commodity exchanges – which includes speculation on agricultural commodities. Also, indicative is a proposal by the Argentine government to create a state-controlled entity to influence grain prices, and discussions between Thailand and Vietnam on how to create a floor under the price of rice in world markets.

These events were subsequent to the 'food price crisis' of 2008, when dramatic price spikes in many food commodities drew international attention. Everywhere, consumers were affected (though in industrialised economies, food inflation was more closely linked to energy prices than to agricultural commodity prices). As a result of the crisis, the World Bank estimated that a further 100 million people joined the ranks of those unable to afford enough food for a minimally healthy and productive life, bring the total close to 1 billion (thousand million) people worldwide.

It was not just agricultural commodities that faced an extraordinary year in 2008. In November, trade volumes began to fall for the first time in 25 years. The IMF is now predicting that world trade volumes will contract by 2.8% in 2009 (IMF 2009). The picture for agricultural commodities is more mixed: the FAO predicts a sharp drop in coarse grains trade by almost 13% but also a 6% increase in wheat trade. Rice is expected to remain flat. Overall, FAO expects the global cereal trade to fall by 3.6%, to 263 million tonnes in 2008–2009 (Partos 2009).

The food crisis prompted a number of food commodity exporters to increase export tariffs or even impose export bans on certain products. The effect was to raise high prices still higher, feeding something of a panic among net importers. The lasting political effect of these decisions is likely to be felt in food importing governments' increasing reluctance to model agricultural trade rules on the AoA, which presumes that greater food security will be achieved through increased volumes of trade in agricultural goods.

The food price crisis, coupled with the wider financial crisis that is still unfolding around the globe, has started a profound shift in the assumptions that drive trade and investment in food and agriculture. Notwithstanding, the trade and financial liberalisation that transformed food systems around the globe over the past 30 years will continue to have a profound and lasting impact on food consumers, food producers and the food system as a whole in the years to come.

References

Ataman Aksoy, M. (2005). The evolution of agricultural trade flows. In: Ataman Aksoy, M. & Beghin, J.C. (eds). *Global Agricultural Trade and Developing Countries*. World Bank, Washington, DC, pp. 17–35.

Bolling, C. & Gehlhar, M. (2005). Global food manufacturing reorients to meet new demands. In: Regmi, A. & Gehlhar, M. (eds). *New Directions in Global Food Markets*. Agriculture Information Bulletin Number 794. USDA, Washington, DC, pp. 62–73.

Bolling, C. & Somwaru, A. (2001). US food companies access foreign markets though direct investment. *Food Review* **4**(3), 23–8.

Crawford, J.A. & Fiorentino, R.V. (2005). *The Changing Landscape of Regional Trade Agreements*. Discussion Paper Number 8. World Trade Organization, Geneva.

ETC Group (2008). *Who Owns Nature? Corporate Power and the Final Frontier in the Commodification of Life*. ETC Group, Ottawa.

FAO (2004). *The State of Agricultural Commodity Markets 2004*. FAO, Rome.

GRAIN (2008). *Seized: The 2008 Land Grab for Food and Financial Security*. GRAIN, Barcelona.

Gulati, A., Minot, N., Delgado, C. & Bora, S. (2007). Growth in high-value agriculture in Asia and the emergence of vertical links with farmers. In: Swinnen, J.F.M. & Leuven, K.U. (eds). *Global Supply Chains, Standards and the Poor: How the Globalization of Food Systems and Standards Affects Rural Development and Poverty*. CABI, Wallingford, UK.

Harris, J.M., Kaufman, P.R., Martinez, S.W. & Price, C. (2002). *The US Food Marketing System, 2002*. USDA, Washington, DC.

Hawkes, C. (2002). Marketing activities of global soft drink and fast food companies in emerging markets: a review. In: *Globalization, Diets and Noncommunicable Diseases*. WHO, Geneva.

Hawkes, C. (2005). The role of foreign direct investment in the nutrition transition. *Public Health Nutrition* **8**(4), 357–65.

International Monetary Fund (28 January 2009). Global recession triggers slump in world trade volumes. *IMF Survey Online*. Retrieved from http://www.imf.org/external/pubs/ft/survey/so/2009/num012809 a.htm.

Jackson, J.H. (2000). *The World Trading System: Law and Policy of International Relations*, 2nd edn. MIT Press, Cambridge, MA.
Mann, H. (2008). *International Investment Agreements, Business and Human Rights: Key Issues and Opportunities*. International Institute for Sustainable Development, Winnipeg.
Murphy, S. (2002). *Managing the Invisible Hand. Institute for Agriculture and Trade Policy*. Institute for Agricultural and Trade Policy, Minneapolis.
Partos, L. (16 February 2009). Costs for cereals to fall, predicts FAO. *Industry Online Newsletter*. Retrieved from www.BakeryAndSnacks.com.
Rae, A. & Josling, T. (2003). Processed food trade and developing countries: protection and trade liberalization. *Food Policy* **28**, 147–66.
Rama, R. & Wilkinson, J. (2008). Foreign direct investment and agri-food chains in developing countries: a review of the main issues. In: *FAO: Commodity Market Review 2007–2008*. FAO, Rome, pp. 51–66.
Suppan, S. (2003). *The WTO Services Agreement: Possible Impacts on Agriculture*. Institute for Agricultural and Trade Policy, Minneapolis.
UNCTAD (1995). *World Investment Report 1995*. UNCTAD, Geneva.
UNCTAD (2000). *World Investment Report 2000*. UNCTAD, Geneva.
UNCTAD (2006). *World Investment Report 2006*. UNCTAD, Geneva.
United States Department of Agriculture Economic Research Service (USDA ERS) (December 1996). A glossary of trade terms. *Agricultural Outlook* **AO-236**, 24–5.
United States Department of Agriculture Economic Research Service (USDA ERS). (2009). *Global Food Markets: Foreign Direct Investment*. Retrieved 12 March 2009 from http://www.ers.usda.gov/Briefing/GlobalFoodMarkets/Investment.htm.
United States Department of Agriculture, Foreign Agricultural Service (USDA FAS). (2005). *Glossary of Agricultural and WTO Terms*. Retrieved from http://www.fas.usda.gov/ITP/WTO/mini-ministerial2008/glossary.pdf.
Vorley, B. (2003). *Food Inc. Corporate Concentration from Farm to Consumer*. UK Food Group, London.
World Trade Organization (WTO) (2009a). Regional Trade Agreements. Retrieved 4 March 2009 from http://www.wto.org/english/tratop_e/region_e/region_e.htm.
World Trade Organization (WTO) (2009b). Glossary. Retrieved 12 March 2009 from http://www.wto.org/english/thewto_e/glossary_e/glossary_e.htm.
World Trade Organization (WTO) (2009c). Statistics Database. Retrieved 12 March 2009 from http://stat.wto.org/Home/WSDBHome.aspx?Language.

Part 2
Links Between Trade and Diet

3 The Influence of Trade Liberalisation and Global Dietary Change: The Case of Vegetable Oils, Meat and Highly Processed Foods

Corinna Hawkes

3.1 Introduction

The 'nutrition transition' towards diets high in energy-dense processed foods, meat, fats and sugars is happening throughout the developing world (see Chapter 1). It is often suggested that trade has played a key role in this transition (e.g. Chopra 2002; FAO 2004; Hawkes 2006a; Hawkes & Thow 2008; Lang 1997; McMichael 2001; Pingali & Khwaja 2004; Rayner *et al.* 2007; Thow 2009; Thow & Hawkes 2009). Yet, there is little evidence of how particular trade policies and processes have advanced this shift for specific foods in a global context. This chapter attempts to address this gap by providing evidence of how trade liberalisation has facilitated the consumption of three food categories – vegetable oils, meat and highly processed foods.

The three food groups were selected because of their fundamental role in the nutrition transition. Vegetable oil consumption is a key to the early phase. As noted by Drewnowski and Popkin (1997: 34), 'the Westernization of the global diet continues to be associated with increased consumption of animal fats. Yet the nutrition transition in developing nations typically begins with major increases in the domestic production and imports of oilseeds and vegetable oils rather than increased imports of meat or milk'.

Meat is nevertheless a critical component of dietary change in the developing world. In what has been termed a 'livestock revolution', consumption of meat in developing countries increased by 70 million metric tons between the early 1970s and the mid-1990s, almost triple the increase in developed countries (Delgado 2003). In China, for example, consumption of meat and dairy more than tripled between 1952 and 1992 (11 kg/capita to 38 kg/capita), and reached 65.3 kg/capita in urban areas in 1999 (Popkin & Du 2003).

In the popular imagination, it is the highly processed foods – notably fast foods and soft drinks – that are most associated with the 'McDonaldisation' and 'Coca-Colonisation' of developing countries.[1] Household data reporting increased

[1] Highly processed foods have undergone secondary processing into a readily vegetable form, such as baked goods, dairy-based desserts, salty snacks and prepared meals, making them distinct from primary processed food products like vegetable oils and sugar.

consumption of processed foods is sparse in the developing world owing to survey methodologies, but sales data indicate there has been huge growth in the market for these products.

This chapter examines if and how trade liberalisation has affected the consumption of vegetable oils, meat (particularly chicken) and highly processed foods. Specifically, it examines how trade liberalisation has affected, as indicators of consumption, the availability, prices and marketing of these foods. Following a defined conceptual framework, the chapter examines the flow of effects from changes in trade policy to changes in consumption of each product, mapping out:

(i) the policies implemented to liberalise trade for each food product;
(ii) the resultant impact on the food supply chain;
(iii) the impact of the availability, price and marketing of the product; and
(iv) the consumption trends.

3.2 Conceptual framework

The conceptual framework defines trade liberalisation as reduced barriers to imports and exports, foreign direct investment and trade in services, other measures facilitating business activity, and the process of harmonising national regulations. Central to the framework is the concept that trade liberalisation influences diets not just by facilitating food imports and exports, but by affecting the entire food supply chain (Figure 3.1). As discussed in Chapter 2, trade liberalisation affects the whole food supply chain by influencing the incentives farmers and agribusinesses have to produce different foods, food imports and exports (very directly), and food processing, retailing, and advertising, which have all been profoundly affected by the growth of global food companies.

Another key concept in the framework is that diets are affected by the environment in which consumers make food choices, conceptualised here as food availability (in this case, the amount of food available nationally), price (the food retail price – the cost of food as purchased by the consumer)[2] and marketing of food (for example, how it is sold through retail channels, promoted, packaged and labelled). That consumer food choices are affected by the broader food environment is well established (Story *et al.* 2008; Swinburn *et al.* 1999). The food available to consumers is a key component of the physical environment and critical to food access and accessibility (Swinburn *et al.* 1999). In the economic environment, the cost of food has been identified as a key factor affecting food decisions (Story *et al.* 2008). As a factor in the macroenvironment, food marketing has been identified as a 'potent force' in eating behaviours. The conceptual framework thus posits that alongside biological, social, cultural and behavioural factors, these environmental

[2] This is distinct from the farmgate price (i.e. the price paid to agricultural producers for their products). The two types of price are linked, but do not necessarily follow the same trends because of the nature of price transmission (i.e. the degree to which 'upstream prices' affect 'downstream prices'). Thus, changes in food retail prices do not always reflect changes in farmgate prices.

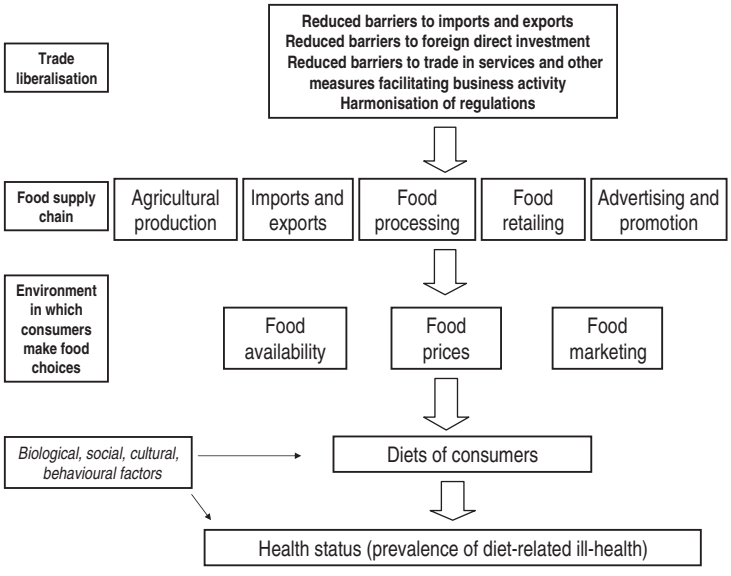

Figure 3.1 A conceptual framework for the link between trade liberalisation and diet.

factors affect the choices consumers make everyday about what they eat. This in turn affects their health.

3.3 Vegetable oils

3.3.1 Policies implemented to liberalise trade in vegetable oils

Trade in oilcrops and vegetable oils has increased considerably in the last 30 years. Although the United States has been a major producer and exporter for decades, greater trade has been driven by increases in production and trading of two oils – soya bean oil and palm oil – by key developing countries. Argentina and Brazil have emerged as lead exporters of soya bean oil, Indonesia and Malaysia of palm oil, while China and India have become leading importers of both, along with a handful of nations, such as Mexico and Pakistan (Bruinsma 2003).

The emergence of these new vegetable oil powerhouses was the direct result of policy choices (Box 3.1). In the early 1990s, Argentina and Brazil implemented policies with the explicit intention of increasing soya bean and/or soya bean oil exports, including policies to encourage foreign investment in oilcrop processing. Likewise, Indonesia and Malaysia implemented policies to shift the palm oil sector from domestic to export orientation, while also using export taxes to maintain lower domestic prices. China, a key importing country, reduced its barriers to soya bean imports in the mid-1990s, with the objective of increasing supply of the raw commodity for domestic processing into oil. Import barriers continued to decline into the early 2000s as a result of the country's accession into the World Trade Organization (WTO). India also took a significant step to reduce restrictions

Box 3.1 Policies implemented to liberalise oilseed and vegetable oil trade by leading importers and exporters.

Brazil (1990s)
Restructured farm income taxes (to encourage greater investment in soya bean production).

Lowered import tariffs on fertilisers and pesticides (to facilitate higher soya bean production).

Eliminated soya bean export tax (to promote greater exports).

Reduced restrictions on foreign investment (to encourage the entry of more foreign capital into the soya bean processing market).

Argentina
Eliminated export tax on processed oilseed products (to promote greater exports) (1991).

Reduced barriers on agricultural input imports (to encourage greater soya bean production) (1991).

Implemented privatisation programmes (to attract foreign investment) (1991).
Introduced a more favourable taxation system (to lower costs of exporting soya bean oil) (1995–1996).

Indonesia
Deregulated palm oil exports, though with continued use of export taxes (to promote exports while keeping domestic prices low) (1991) (exports were restricted during the 1998 financial crisis through the use of an export tax because weak local currency was encouraging exports; the reductions immediately prior to and after the crisis reflected a reduction from higher tax levels in place up until 1997).

Reduced export tax (1997) and, following hikes during the 1998 financial crisis, again from 40 to 10% (1999) and then to 3% (2001).

Lifted limit on plantation size (in place since 2002) (2004) (to increase production and promote exports).

Malaysia
Passed the Promotion of Investment Act which provided export incentives for palm oil (1986).

Granted tax-free export quotas and reduced export taxes (late 1990s/early 2000s).

China
Reduced soya bean tariffs to 3% in anticipation of WTO accession (to encourage greater soya bean imports) (mid-1990s).

Replaced state-controlled trading, import quotas and licencing by a system of steadily increasing tariff-rate quotas on soya bean, palm and rapeseed oil which

could be filled by non-state traders. Tariff-rate quotas on soya bean, palm and rapeseed oil increased from 5.8 million tons in 2002 to an unlimited amount in 2006 (to liberalise vegetable oil imports) (2002).

Reduced over-quota tariff on vegetable oils to 9% (was 48% in 2002) (2005).

India
Eliminated state monopoly on vegetable oil imports in 1994–1995, as part of unilateral efforts to liberalise trade and the need to follow international rules negotiated under the General Agreement on Tariffs and Trade (GATT) (to encourage vegetable imports) (1994–1995).

Still retains high tariffs on oilcrops (to protect domestic producers).

Source: Agri-Food Trade Service (2002); Ahmad and Tawang (1999); Anon (2003); Casson (1999); Dohlman *et al.* (2003); FAO (2001, 2005); Persaud and Landes (2006); Schnepf *et al.* (2001); Tuan *et al.* (2004).

to vegetable oils imports in 1994–1995, removing the state marketing board but retaining high tariffs to protect its oilseed producers.

3.3.2 Impact on the food supply chain

Effects on imports and exports

Oilseed products are the most internationally traded agricultural product when total exports are compared with total production (Regmi *et al.* 2005). Between 1990 and 2005, exports of soya bean oil from Brazil increased threefold, from Argentina fivefold, and from Indonesia and Malaysia ninefold and twofold respectively (Figure 3.2). In 1997–1999, the top ten importing developing countries together had net imports of 13 million tons (oil equivalent), a 12-fold increase since the mid-1970s (Bruinsma 2003). In developing countries as a whole, imports of oil and oil seeds between 1990–1991 and 2000–2001 grew by 6.8% annually, relative to 1.0% in developed countries. By 2003, imports comprised 43.9% of domestic vegetable oil supplies in developing countries (Table 3.1).

Changes in exports and imports from year to year reflect specific changes in trade policy. Exports of palm oil from Indonesia and Malaysia took a particularly sharp upward turn in the late 1990s reflecting export tax reductions (Box 3.1, Figure 3.2), while the introduction of a tariff-rate quota in China in 2002 resulted in a 116% increase of soya bean oil imports in 2003 (Tuan *et al.* 2004). Vegetable oil imports into India jumped significantly immediately after the state marketing board was eliminated in 1994–1995 and, by 1999, the country had shifted from a relatively small importer of vegetable oils to the world's leading importer, a position re-taken by China in 2000 (FAO 2007d).

Table 3.1 Domestic supply and import quantity of vegetable oils, 1980 and 2003.

	Region	1980	2003	% change (1980–2003)
Domestic supply (million tons)	Developed countries	20.6	37.9	84.0
	Developing countries	20.8	65.1	213.0
Import quantity (million tons)	Developed countries	7.1	21.2	198.6
	Developing countries	6.0	28.6	376.7
Calories available (/capita/day)	Developed countries	310.9	421.7	35.6
	Developing countries	132.6	239.1	80.3
Imports as proportion of domestic supply (%)	Developed countries	34.5	55.9	62.3
	Developing countries	28.8	43.9	52.3

Source: FAOSTAT archived Food Balance Sheets (FAO 2007b).

Impact on oilcrop processing

Trade liberalisation of the vegetable oils market also facilitated the growth of soya bean processing capacity (crushing and conversion into oil). With a more favourable investment environment, leading transnational corporations (TNCs) such as Bunge, Cargill and Archer Daniels Midland (ADM) expanded their processing capacities through acquisitions and expansion in Argentina, Brazil, China and India. In Argentina, the trade reforms of the 1990s were followed by extensive private investments in more efficient crushing technology. National crushing capacity (per 24 hours) for oilseeds rose from about 58,000 tons in 1994 to an estimated 94,268 metric tons in 2000 (Schnepf *et al.* 2001). In Brazil, by the end of the 1990s, the five largest companies owned about 60% of total crushing capacity (Schnepf *et al.* 2001). In China, the majority of soya beans are now processed in facilities subject to foreign investment, and ADM is (through a joint venture with a state-owned company) the largest oilseeds processor in China. India is also emerging as a centre for refining crude vegetable oils as a result of investment by Cargill, Bunge and Wilmar. During the 1990s–2000s, investment was also made in building capacity for the hydrogenation of soya bean oil for sale as *trans* fats to the processed foods industry.

3.3.3 Impact on availability, price and marketing

The increase in imports and exports, processing capacity and involvement of TNCs had the effect of increasing the availability, lowering the price and changing the way vegetable oils are marketed. *Availability* of vegetable oils in developing countries increased by 213% between 1980 and 2003, compared to 84% in developed countries (Table 3.1). As availability increased, vegetable oil *prices* fell, driven by lower costs of production in key exporting countries combined with lower import tariffs (FAO 2004; World Bank 2007). The most traded oils (palm oil and soya bean oil) are also the cheapest, produced in major exporting countries at lower prices than importing countries; it was reported in 2004 that China now imports soya bean oil from Argentina and Brazil at lower prices than it itself produces, while the prices of vegetable oils in India are now more affected by soya bean output

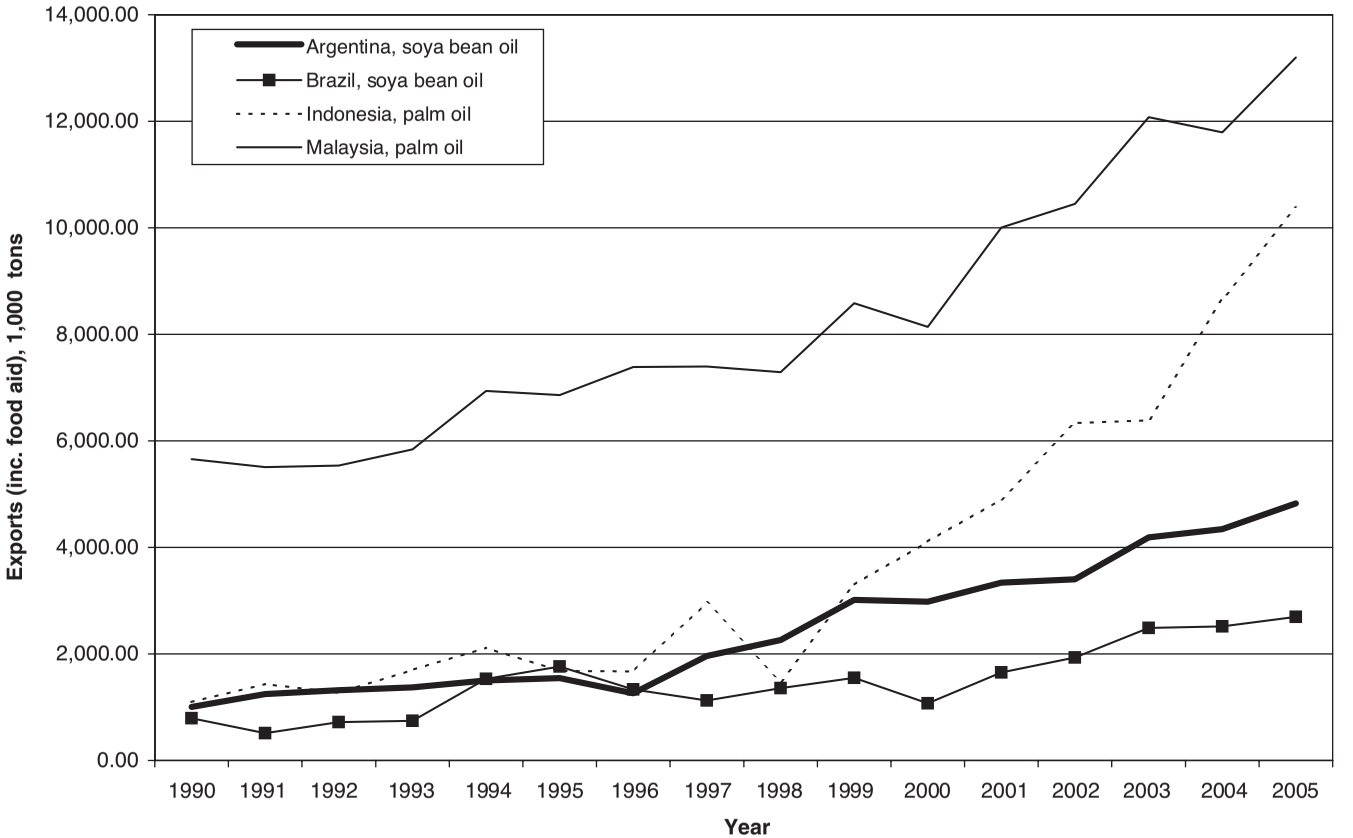

Figure 3.2 Exports of soya bean and palm oil from four leading exporting countries, 1990–2005. *Source*: FAOSAT detailed trade data (FAO 2007a).

in Brazil, Argentina and the United States than by domestic production (Tuan *et al.* 2004). Overall, the real prices of soya beans and palm oil fell steadily from the 1980s up until the global surge in food prices in the mid- to late 2000s (Bruinsma 2003).

By increasing availability and lowering prices, trade liberalisation has created a more competitive consumer environment for vegetable oils, which has altered the way they are *marketed*. To increase sales and consumption, TNCs have developed a dual marketing strategy, as exemplified by the case of soya bean oil (Beckman 2005):

(i) *Achieving a low-cost leadership position to increase sales volumes.* Affordability has been the key in increasing sales among lower income consumers. In China, for example, prices are the most important factor for most customers when choosing a type of oil (Euromonitor 2007b). In Beijing, in 2006, soya bean oil was selling at 34.90 Yuan for 5 L, compared with 79.10 Yuan for peanut oil and 64.10 Yuan for sunflower oil.[3] In Brazil, the leading manufacturer, Bunge, launched a new soya bean oil, *Ville*, in 2005 at a lower price than its leading brand, *Soya*, specifically to expand market share among lower income consumers (Bunge 2005b; Euromonitor 2006a).

(ii) *Adding value to products to increase sales margins.* The second key strategy has been to develop new oil brands and food brands made with soya bean oil. In China and India, most consumers still purchase unbranded oils on the basis of price, but more are switching to packaged brands as prices have lowered – a shift that is attributed to rising sales (Euromonitor 2007b, 2007c). Where markets are more developed, such as in Brazil, market leaders have developed higher-value branded food lines comprising oils, mayonnaise and spreads. Bunge, for example, launched a new form of soya bean oil (*Primor Frituras*) in 2005 as a 'frying' oil to create added value through differentiation (Bunge 2005a). Another key strategy is the use of nutrient claims. Bunge's *Primor Frituras* and *Soya* cooking oil and mayonnaise come with claims such as 'rich in vitamin E', 'light', 'free of *trans* fats' and 'contributes for the maintenance of the healthful levels of its cholesterol' (Bunge 2007).

3.3.4 Consumption trends

As availability and marketing have increased and prices gone down, consumption of vegetable oils has increased worldwide. Between 1980 and 2003, the number of calories available from vegetable oils per capita increased by 80.3% in developing countries, compared to 35.6% in developed countries (Table 3.1). As of 2005, total per capita availability from vegetable oils in developing countries stood at around 298 kcal – 11% of all calories available in developing countries, compared with 8% (213 kcal) in 1990 (FAO 2007e). Between 1982–1984 and 2000–2002,

[3] Data are not an average but collected by the author at a Beijing supermarket in December 2006.

vegetable oils contributed more than any other food group to the increase of calorie availability worldwide (by 70 kcal/capita/day) (Hawkes 2006a). The bulk of increased consumption comes from China, India and a handful of other countries: between 1994 and 2004, vegetable oil consumption doubled in China and increased by one-half in India, relative to just one-quarter in the United States and Western Europe. This trend is predicted to continue: according to the Food and Agriculture Organization of the United Nations (FAO), 44 out of every 100 additional calories consumed to 2030 will come from vegetable oils (Bruinsma 2003). *Trans* fat consumption has also increased as a result of increased consumption of processed foods.

That the increase in consumption comes largely from the oils that are the most widely traded indicates a link between trade liberalisation and consumption. In both China and India, soya bean oil and palm oil are now consumed in proportionately greater amounts relative to before the new import regimes. In India, for example, palm oil accounted for 28% of consumption and soya bean oil for 21% at the end of the 1990s, compared with less than 4% in the early 1970s, when 53% of consumption was peanut oil, 25% rapeseed oil and 9% cottonseed oil (all of which were domestically produced) (Dohlman *et al.* 2003).

3.4 Meat

3.4.1 Policies implemented to liberalise global meat trade

The international meat market has been particularly affected by two sets of trade policies: those on imports and exports of livestock and meat; and those on imports and exports of animal feed (feed grains and oilseed meal).[4]

Declining tariffs barriers in the context of the General Agreement on Tariffs and Trade (GATT) have reduced barriers to meat imports and exports (Steinfeld *et al.* 2006). Meat trade has also been liberalised through regional and bilateral trade agreements and unilateral efforts. As a result, in some countries, import tariffs have been lowered, tariff-rate quotas increased, import licencing requirements removed, and animal health and food safety standards harmonised. For example, under the North American Free Trade Agreement (NAFTA), signed by Mexico, the United States and Canada in 1994, tariffs on poultry were reduced and import licencing converted into a system of gradually expanding tariff-rate quotas (Zahniser 2007).

Yet the international market for meat is still characterised by the presence of trade barriers. In 2001, average tariffs on meat were the third highest of all agricultural products (the highest two being tobacco and dairy), ranging from over 80% for frozen beef, pork and poultry to 70% for prepared meats (Gibson *et al.* 2001). Other measures implemented by countries to protect domestic markets include agricultural safeguards, anti-dumping measures and use of special treatment

[4] Trade liberalisation has also affected foreign investment in meat processing and animal feed production, but this is not dealt with here.

provisions. A recent study of 14 developing countries found that poultry meat is the product most likely to be designated a 'special product' in trade agreements, i.e. retain a higher than average level of protection (FAO/ICTSD 2007). Probably even more important are restrictions on trade arising from food safety and animal health regulations. As noted by the FAO in 2005, animal disease outbreaks, such as food and mouth disease, BSE and avian flu in the 2000s, 'led countries to increasingly impose bans, tighten sanitary border control measures tighten sanitary border control measures, and strengthen domestic regulations' (FAO 2005).

At the multilateral level, the WTO Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement) aims to facilitate trade by encouraging transparency, compliance and complaints in national SPS regulations, including those that affect meat (as described in Chapter 12) (Henson 2003). Yet there is little analysis that actually shows if the SPS Agreement has had the effect of liberalising meat trade. Evidence from the number of notifications to the WTO of new national regulations on food safety and animal health, and the number of complaints in response to those new regulations, suggests that countries are continuing to implement contentious regulations concerning animal health and meat safety (Josling *et al.* 2004).

A key component of producing meat is animal feed. The trade in animal feed has been a crucial factor in changing the nature of meat production. As put by Steinfeld *et al.* (2006: 12): 'Traditionally, livestock production was based on locally available feed resources such as crop wastes and browse that had no value as food. However, as livestock production grows, it depends less and less on locally available feed resources, and increasingly on feed concentrates that are traded domestically and internationally'. Leading grains that are made into feed concentrates (i.e. grains mixed with high-protein oil meals or other by-products, minerals and vitamins) are yellow corn (white corn tends to be used for human consumption), soya bean meal and sorghum. These grains and oilseed products are widely traded goods. Trade in soya beans is relatively unrestricted by tariffs and other border measures, and trade deals have generally led to liberalisation of corn and sorghum, though varying degrees of barriers still do exist. Individual countries also implemented significant reforms of their trade regimes for animal feed imports. The United States dominates world trade in animal feed, being responsible for 51% of world corn exports, 40% of world soya bean exports and 80% of world sorghum exports (FAO 2007c).

3.4.2 Impact on the food supply chain

Impact on imports and exports

As shown by Figure 3.3, total world meat exports have grown significantly since 1990. This is largely a result of the phenomenal growth of chicken exports, and to some extent, of pork, while beef trade has not changed significantly. It is noteworthy that the growth of chicken trade comes largely from a handful of countries. In 2005, 76% of all chicken exports entered six countries (Russia, China, Saudi Arabia, Japan, Mexico and South Africa) plus the European Union-27 (FAO 2007c).

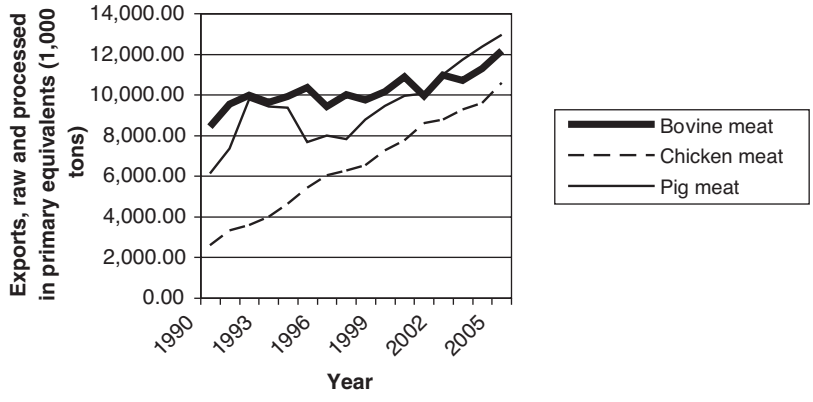

Figure 3.3 World exports of bovine, chicken and pig meat, 1990–2005. *Source*: FAOSTAT Core Trade Data (FAO 2007d).

Exports have grown as a result of strong incentives in leading exporting countries. Chicken exports from the world's second largest exporter, the United States, 'skyrocketed' in the 2000s (Bruinsma 2003). In 2006, 54% of these exports were of leg quarters (US Department of Commerce 2007). Haley (2001: 46) explains the increasing exports from the United States in the 1990s thus:

The popularity of skinless, boneless chicken breast meat in the United States gave rise to enormous quantities of poultry parts less desirable to U.S. consumers – dark meat, primarily leg-quarters. Large supplies of low-cost, dark U.S. chicken meat coincided however, with the relaxation of selected policy constraints to international meat trade, and, to growing incomes in a part of the world where consumers prefer dark poultry meat: Asia and Russia.

Exporting even more than the United States is Brazil, which spent the 1990s developing a highly successful industrial chicken industry. Growth was stimulated by a combination of technology adoption, industrial organisation, internal and external market liberalisation, and the growth of the feed grain industry (de Camargo Barros *et al.* 2003).

Despite this huge growth of chicken trade between certain markets, it is notable, that there has been no overall shift of meat exports towards developing countries: the percentage of chicken exports entering developing countries relative to developed countries actually declined from 48 to 47% between 1990 and 2005 (FAO 2007c). Moreover, the relative proportion of imports in total meat consumption has remained quite stable. Percentage of pork supplies in developing countries made up by imports decreased from 5.0 to 4.4% between 1990 and 2005 (FAO 2007e). At 18.6%, the amount of beef consumed from imports is much higher, but this increased from just 17.9% in 1990. There was an increase for chicken, from 7.2 to 9.9% between 1990 and 2005 (FAO 2007e).

Thus, while meat trade has grown, growth has been restricted mainly to one meat – chicken – and to specific countries, rather than reflecting a significant shift of meat imports into the developing world overall. This likely reflects a combination of continuing trade barriers in the international meat market, huge technological changes in the chicken industry (resulting from technology transfers from developed to developing countries), and the role of regional and bilateral agreements in facilitating meat trade between specific countries. The specifics of trade agreements are important here. Mexico, for example, became a significant poultry importer from the United States after the liberalisation of poultry trade under NAFTA. But the agreement set a restrictive tariff-rate quota for chicken leg quarters in order to protect the domestic Mexican market. Thus, in 2005, around 70% of imports were of products with little competition in the Mexican market: turkey meat and mechanically deboned meat (Zahniser 2007). The tariff-rate quota for chicken was, however, eliminated in 2008, a move that is expected to boost imports of chicken leg quarters. And despite the low tariff-rate quota prior to 2008, 25% of all poultry imports were chicken leg quarters in the mid-2000s, reportedly because the restriction was circumvented to some extent by legal injunctions obtained by individual firms, and the under-invoicing of product (Zahniser 2007).

Another factor that subdues the role of imports is that many developing countries are producing more chicken themselves, so reducing the proportional effect of higher imports. Perhaps counter-intuitively, it is this trend where trade liberalisation has likely had its most discernible impact on chicken supplies in developing countries.

Impact on chicken production

Between 1990 and 2005, the share of chicken in world meat[5] production increased from 23 to 30%, while pork remained stable at 43% and beef declined from 34 to 27% (Figure 3.4). During the same time period, share of chicken production increased in developing countries from 44 to 58% (FAO 2007f). But whereas imports of meat have not trended towards developing countries, imports of animal feed grains have. In 1990–1992, share of world exports of corn, soya beans and sorghum entering developing countries was 44%; by 2003–2005, the amount had risen to 62% (FAO 2007c).[6]

Lower feed prices have played a key role here. Up until the surge of food prices in the mid- to late 2000s, increasing production efficiencies had led to declining animal feed prices since the 1950s (Steinfeld *et al.* 2006). The availability of cheap feed increases the incentive to produce chicken, especially in high-volume operations (Vocke 1991). The use of feed concentrates favour chicken over beef production because poultry has a greater feed efficiency ratio, and chicken feed concentrate

[5] 'World meat' here is actually represented by total bovine, pig and chicken meat; the proportion of other meats in total supply is very small.

[6] This includes exports for food use, but about two-thirds of global feed grain supplies are used as animal feed (Hoffman et al. 2007).

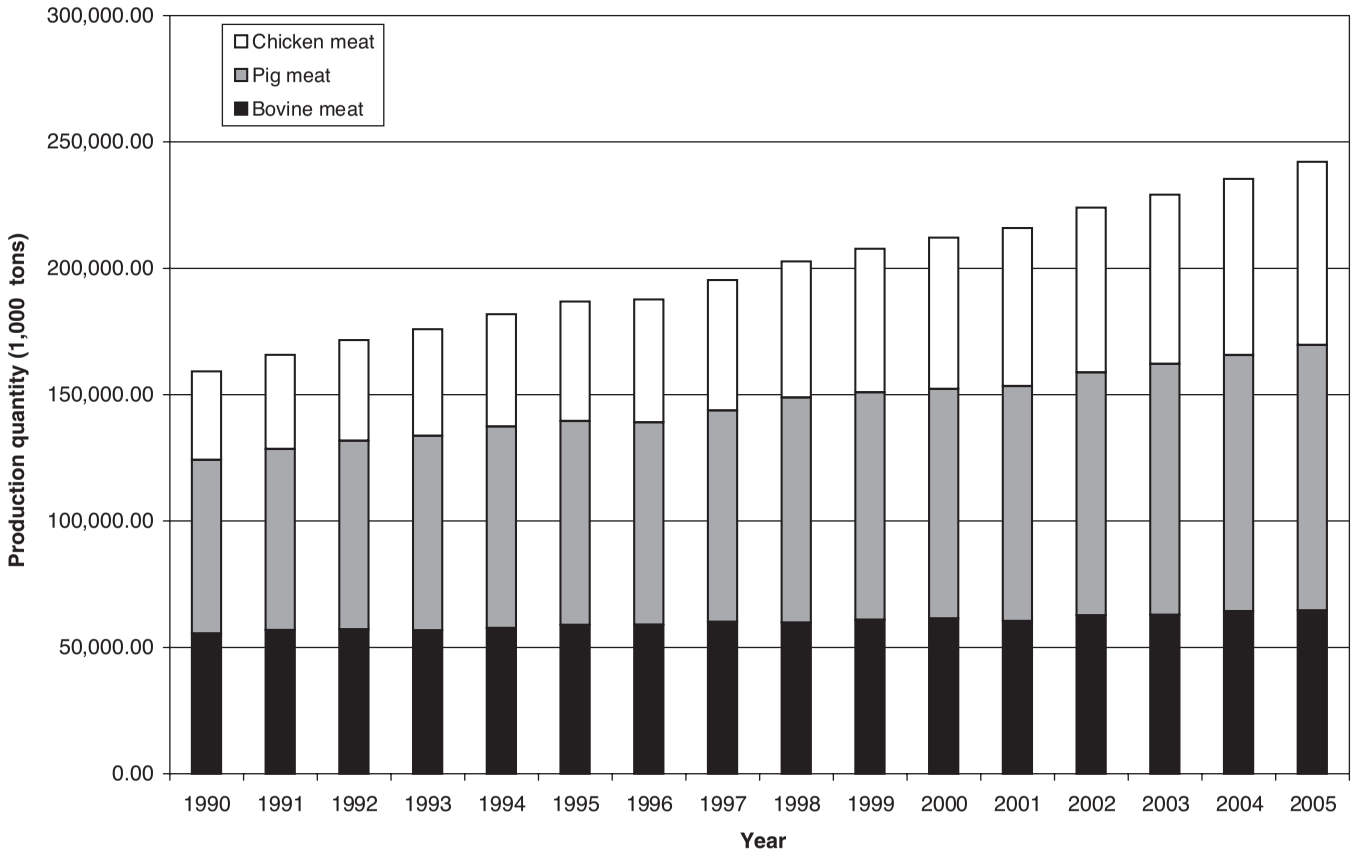

Figure 3.4 World production of beef, pork and chicken, 1990–2005. *Source*: FAOSTAT Core Production Data (FAO 2007b).

Table 3.2 Chicken and bovine meat (beef) production and consumption in three Latin American countries, 1990–1992 and 2002–2004 (3-year average)*.

	Meat production (1,000 tons)		Calories from meat/capita/day (kcal)	
Chicken	*1990/92*	*2002/04*	*1990/92*	*2002/04*
Brazil	2,622	7,826	65	134
Colombia	364	679	35	56
Mexico	836	2,139	41	90
Bovine meat	*1991/92*	*2002/04*	*1991/92*	*2002/04*
Brazil	4,447	7,381	114	141
Colombia	681	696	109	90
Mexico	1,183	1,505	50	64

*The difference between production and calories available for consumption reflects imports and exports.
Source: FAOSTAT data compiled in Hawkes (2006b).

prices are lower than any other meat (Steinfeld *et al.* 2006). Take the case of three rapidly growing chicken producers. Colombia implemented a market liberalisation programme in the early 1990s, which, among other measures, relaxed imports on feed ingredients and reduced import duties (Fajardo 2004). This resulted in a surge of imports of corn for animal feed from the United States from almost zero in the late 1980s/early 1990s to 2,023 tons in 2002–2004 (Hawkes 2006b). The influx of much cheaper feed had the effect of sharply lowering production costs and promoting growth in chicken output (Table 3.2) (USDA FAS 1998).

In Mexico, the market for animal feed opened up through NAFTA, which replaced import licencing of corn with a tariff-rate quota (with no over-quota tariff applied) and eliminated tariffs on soya bean meal (as of 2003) (Zahniser & Link 2002). This facilitated 'a noteworthy expansion in the Mexican feed industry' (Zahniser & Link 2002). Overall, US exports to Mexico of feed grains, oilseeds and related products more than doubled during the NAFTA period, approaching 17.5 million metric tons in 2005 (Zahniser 2007). Imports now account for about half of the feedstuffs used in the Mexican poultry industry. According to an analysis by the United States Department of Agriculture (USDA), the availability of US feedstuffs has enabled Mexican livestock producers to 'expand output, lower their costs of production, and compete more effectively with meat imports from the United States, Canada, and other countries' (Zahniser 2007).

In the Philippines, an emerging centre of poultry production, tariffs on yellow corn were lowered as part of WTO commitments in the 1990s (Costales *et al.* 2003). Total corn imports increased from 4.11,000 tons in 1991–1993 to 93.61,000 tons in 2003–2005, a shift which favoured the development of large-scale feed mills and chicken integrators, as well as organised large-scale commercial chicken firms (Costales *et al.* 2003). Chicken production in the Philippines has almost tripled since 1990 (FAO 2007b).

3.4.3 Impact on availability, price and marketing

Trade liberalisation has facilitated increased *availability* of chicken at lower *prices*. Feed prices are a major determinant of meat prices; it has been estimated that feed accounts for 70–80% of the total cost of chicken production (Vocke 1991). In consequence, in many countries, chicken production costs have declined and chicken retail prices fallen, especially when compared with beef. In Brazil, for example, real producer prices for chicken decreased by 50.6% between 1990 and 2001 (de Camargo Barros *et al.* 2003). In Colombia, chicken is now sold at half the price of either beef or pork, thus providing strong incentives for increased consumption (Cabal 2000; USDA 2001).

Trade liberalisation has also affected the way chicken is *marketed*. Due to developments in processing and retailing, chicken is now more likely to be processed rather than sold as whole live birds. In Colombia, it was impossible to buy processed frozen chicken prior to 1995, but it is now fairly common (Euromonitor 2006c). Processing is used to 'add value' to the product. In Mexico, for example, imported mechanically deboned meat is used a key ingredient in sausages and cold cuts (Zahniser 2007). Chicken has also been an important ingredient in the growth of the fast foods industry. In Colombia, between 2000 and 2005, the number of fast food outlets dedicated to chicken grew from 725 to 1,083 (Hawkes 2006b).

3.4.4 Consumption trends

Consumption of chicken, pork and beef has risen in developing countries since 1990 (Table 3.3). But chicken consumption has grown most rapidly, doubling between 1990–1992 and 2003–2005, whereas pork consumption increased 1.5-fold and beef 1.2-fold. The most remarkable increase in chicken consumption has occurred in countries that traditionally consume beef, notably in Latin America (Bruinsma 2003). As shown by Table 3.2, calories available from chicken

Table 3.3 Meat consumption (kcal/capita/day) in developed and developing countries, 1990–2005.

		1990/92*	1996/98*	2003/05*
Developed countries	Beef	124	102	99
	Pork	193	178	189
	Chicken	68	76	94
	Total	385	357	382
Developing countries	Beef	29	32	34
	Pork	71	89	105
	Chicken	15	23	30
	Total	115	144	169

*Three-year average.
Source: FAO (2007a).

increased by around 200% in Brazil, Colombia and Mexico between 1990–1992 and 2000–2004, whereas calories available from beef increased by half as much.

3.5 Highly processed foods

3.5.1 Policies implemented to liberalise trade for highly processed foods

International trade agreements have had a profound impact on the market for highly processed foods since the 1980s. Most significant have been the agreements on investment and other rules designed to facilitate cross-border commerce (e.g. intellectual property, dispute settlement etc.). As discussed in Chapter 2, these agreements have facilitated FDI and increased the incentives for investments by TNCs. Liberalisation of foreign direct investment rules has been a particularly strong driver of growth. As noted by Bolling and colleagues, 'investment [in the processed foods industry] that was not legally possible a decade ago became possible in the 1990s' (Bolling *et al.* 1998: 6).

The multilateral Agreement on Agriculture, SPS Agreement, TBT Agreement, Dispute Settlement Understanding and TRIPS (see Chapter 2) have all affected the processed foods industry (Barr 2000). These agreements, as well as regional and bilateral agreements, have reduced tariff and non-tariff barriers to trade in processed foods. In some cases, tariff reductions have been greater for processed foods than primary products (Barr 2000), but tariffs on processed foods still remain a barrier to processed food trade. Owing to 'tariff escalation' (i.e. when tariffs become higher with the degree of processing), developed and developing countries tend to impose higher tariffs on fully processed foods relative to semi-processed, primary, or horticultural commodities[7] (Regmi *et al.* 2005). The bound mean tariff rate for fully processed foods in developing countries was 53% in 2003 relative to 45% for primary products; the applied mean tariff was 21% relative to 11% respectively (Regmi *et al.* 2005).

3.5.2 Impact on the food supply chain

Impact on imports and exports

Over the past 25 years, the amount of trade in processed foods has increased proportionately faster than unprocessed products. Trade in highly processed foods has grown faster than primary processed foods: the share of highly processed foods in world trade grew from less than 20% in 1980 to over 30% in 1998, whereas the share of primary processed products did not increase significantly (Regmi *et al.*

[7] Fully processed refers to highly processed foods and plus meat, fish, dairy, eggs and processed fruits and vegetables; primary commodities are cereals; semi-processed are meat and cereal products which have been processed but are not in vegetable form, e.g. pig fat; horticultural products are fruits, vegetables and spices.

2005). Much of the fastest growth took place in branded foods manufactured by leading TNCs. The value of trade in 'prepared foods' for example, increased from US$1.7 billion in 1980 to US$9.2 billion in 1998.

Still, exports of highly processed foods from the world's leading exporter, the United States, have actually stagnated since the mid-1990s (Regmi *et al.* 2005). Although this likely reflects the presence of tariffs, probably more important is that transnational food processors favour FDI over exports as a market growth strategy.

Impact on food processing

FDI into the manufacture of processed foods has been the main source of growth of the processed food market worldwide, especially since the 1990s (also see Chapters 2 and 11). FDI enables TNCs to overcome obstacles posed by exports, such as high tariffs, high transportation costs and customs procedures, while lowering production costs (Hawkes 2005). By enabling the purchase of foreign affiliates, FDI brings TNCs closer to their customer base and allows them to capitalise on intangible assets such as brand, knowledge of local markets and reputation (Henderson *et al.* 1996). TNCs have successfully worked to dominate markets in certain brands, rather than capture the entire processed foods market (Bolling & Gehlhar 2005). On a global scale, this trend has led to the dominance of foreign investors in the highly processed food sector. In China, for example, there are numerous nationally and locally based food companies, some of which have successfully out-competed foreign companies. However, in highly processed foods, such as soft drinks, snacks, sweet biscuits and fast foods, foreign investors dominate (Wei & Cacho 2001).

As a result, FDI is now responsible for more sales of processed foods around the world than trade: sales of processed foods exported by US-based companies was US$30 billion in 2000 compared with the US$150 billion of sales generated by FDI (Bolling & Somwaru 2001). FDI is often, however, complementary to trade (Rama & Wilkinson 2008). This is partly because trade liberalisation removes barriers to sourcing ingredients from the lowest cost producers – and thus foreign affiliates of TNCs have more incentive to trade. For example, rather than importing potato chips, foreign affiliates can lower production costs by importing ingredients for manufacturing potato chips, such as potato flour, flakes and starch, from the lowest cost exporter (as discussed further by Gereffi and Christian in Chapter 6).

Impact on food retailing

The growth of transnational supermarkets has had two core effects on the processed food market in developing countries. First, the growth of transnational retailers has provided a major incentive for increased imports of highly processed foods. Prior to the development of large-scale food retail in developing countries, exporters faced a highly fragmented retail market which made it both difficult to export in large volumes, and to build the relationships needed for sustainable growth. Large supermarkets, in contrast, have a centralised, high-volume distribution system with fewer distribution layers to navigate, giving foreign food suppliers a better chance to compete (Gale & Reardon 2006).

Second, the growth of supermarkets has introduced incentives for consumers to try highly processed foods. A major growth strategy of TNCs concerned with processed foods is to develop new products targeting different market niches to activate and reactivate demand in a changing consumption environment (Wilkinson 2002). Supermarkets are ideally placed to deliver the adaptive tendencies of this market dynamic. Through their size and capital base, supermarkets are able to make available a far wider range of processed foods than small stores and to take the risks inherent in introducing new foods. Due to economies of scale in storage and distribution and technological advancements in supply logistics, they are also able to sell processed foods at lower prices, while still maintaining profits (Reardon *et al.* 2003). Supermarkets are better equipped to use sales promotions as a means of increasing sales, and have more incentive to use sales promotions; given that individual products tend to have low margins, selling large volumes is essential to supermarket profits (Hawkes 2008). Consequently, supermarkets frequently update their stock to create and adapt to demand, thereby delivering (and encouraging) the market segmentation strategy of the processed foods industry. As put by market research organisation Euromonitor, the growth of large-scale supermarkets 'facilitated the deepening penetration of emerging regions by packaged food manufacturers, which stimulated growing scales through food retailers with their new product launches and intensive marketing campaigns' (Euromonitor 2005).

FDI in food service outlets has also made highly processed foods more available, notably of fast foods. The increase in the number of McDonald's outlets is indicative of the increase in general (see Chapters 2 and 11).

Impact on advertising and promotion

Greater FDI and trade in services have facilitated an increase in the advertising and promotion of highly processed foods. TNCs and domestic food companies use a wide range of techniques to market highly processed foods, including to children and young people (as outlined by Lobstein in Chapter 11). Supermarkets also play a role through their extensive use of sales promotions. While evidence from developing countries is limited, a recent systematic review shows that there is a great deal of food promotion to children in countries for which data is available, particularly in the form of television advertising of highly processed, energy-dense foods (Hastings *et al.* 2007). In Brazil, for example, close to 60% of all food advertisements in 2002 were for foods high in fats and sweeteners (Sawaya *et al.* 2004). In Asia, food makes up a significant proportion of advertising targeted at children, ranging from 25% in South Korea, to 40–50% in India, 50–75% in Pakistan and the Philippines and 70% in Malaysia (Escalante de Cruz *et al.* 2004). The evidence shows that this food advertising has a significant influence on children's food choices (Hastings *et al.* 2003, 2007; McGinnis *et al.* 2006).

Advertising and promotion are important because they enable food companies to attract attention to new products, thus increasing the incentive to invest in the development of new products. Product promotion also enables companies to create perceived differences between similar products, add value and desirability to products and 'educate' consumers about their brands. Moreover, since only brands

are promoted, advertising is a means of shifting consumers away from unbranded towards branded foods.

3.5.3 Impact on availability, price and marketing

These changes in the food supply chain have affected the *availability*, *price* and *marketing* of highly processed foods. With regard to availability, TNCs have played a direct role by producing and selling these foods; they have also played an indirect role by stimulating competition with domestic food companies and thus market growth overall. Importantly, they have pioneered two key changes in the availability of highly processed foods in developing countries:

(i) *The spread of branded foods over unbranded foods*. Products that were previously weighed and sold in bulk are now more readily available in branded packages. This has been facilitated by the growth of supermarkets which specialise in branded foods, the use of promotions to educate consumers about brands, and the increased ability to protect brands through agreements on intellectual property rights and dispute settlement.

(ii) *The introduction of 'new' foods*. 'Traditional' foods are being replaced with 'Western' foods. In China, for example, chocolate bars are becoming increasing popular with middle class consumers in place of traditional snacks such as (unbranded) nuts (Euromonitor 2007a). The market for breakfast cereals is another good example, as companies encourage consumers to replace traditional breakfast foods with cereals. The process is again facilitated by the increasing presence of supermarkets that invest in product promotions, and the use of advertising and promotion. The production of new products is critical to industry success: a recent report by an investment bank found that there a strong correlation between new product development innovation and global market share – which in turn, commands higher profit margins and cash returns (Goldman Sachs Group Inc. 2007).

Critical here are changes in the way that highly processed foods are *marketed*: more through supermarket channels, more brands, more promotions, more labels. Importantly, successful industry actors are pursuing a segmented marketing strategy: identifying growth opportunities in different consumer niches and marketing different foods to these niches (Euromonitor 2006c). The increasing use of nutrient and health claims is an example of this strategy, as foods with 'functionality' are marketed to the wealthier, health-aware consumer. The increasing targeting of products at children is another example, as products like fast foods, snacks and breakfast cereals are specifically formulated, packaged and formulated to appeal to this market.

The effect of trade liberalisation on the *prices* of highly processed foods is a little more complex. Brands sold by leading TNCs are often more expensive than brands produced by domestic companies and unbranded equivalents. The snack foods market presents a good example; locally produced unbranded snacks tend to be much cheaper than, say, Frito-Lay's latest flavour. 'Premium' higher income

consumers are willing to pay for these brands, especially given the 'value' added to them through advertising and promotion. However, the presence of well-known brands and increased concentration in the retail market places downward pressures on prices of all processed foods. As a result, processed foods are becoming more affordable to more people.

Another important dynamic here is the niche marketing strategy pursued by the processed foods industry: the same company develops a range of products, some of which are targeted at lower income consumers, others, at higher income consumers, a strategy already described for vegetable oils. This has the effect of increasing volume sales while also increasing sales of high-margin products. Prices also change over time as the market develops. Whereas 'health and wellness' products now command premium prices, for example, it is likely that prices will decrease over time as the market grows and competitive forces increase.

3.5.4 Consumption trends

Consumption of packaged, processed foods is increasing on a global scale. Between 2000 and 2005, value sales of packaged foods increased from US$1,095 billion to US$1,455 billion. Fastest growth was of snack bars (68% value growth 2000–2005), followed by ready meals (45%) and chilled processed food (41%) (Euromonitor 2006b).

These global figures are strongly affected by sales in developed countries, where consumers spend about half their food budget on processed, packaged foods. Consumers in developing countries spend less on processed foods – less than one quarter of their food budget – but it is here where annual sales growth is highest (Table 3.4). Between 1996 and 2002, sales growth of all processed foods was around 29% in low- to middle-income countries, compared with 7% in upper- to middle-income countries. Products such as breakfast cereals registered double- and triple-digit growth in many developing countries, and sales growth of ready meals was dramatic in Eastern Europe and Latin America. Soft drinks and fast food sales grew rapidly in Eastern Europe, Asia and Latin America (Hawkes 2002). Although branded, highly processed foods like snacks and fast foods remains a small

Table 3.4 Annual average growth in retail sales of packaged foods, 1996–2002.

Country group	Per capita retail sales of packaged foods, 2002 ($)	Total retail growth of packaged foods 1996–2002 (%)	Per capita growth of packaged foods (%)
High income	979	3.2	2.5
Upper-middle income	298	8.1	6.7
Lower-middle income	143	28.8	28.1
Low income	63	12.9	11.9

Source: Gehlhar and Regmi (2005).

proportion of overall dietary intake in most developing countries, their contribution to the diet is increasing (Adair & Popkin 2005).

Another important trend has been increased sales of 'healthy' highly processed foods, a trend facilitated by the use of nutrient and health claims, and other way of 'marketing health'. According to data analysed by the global financial services company, J.P. Morgan, 18 of the fastest growing food categories worldwide are those perceived to be healthier, a trend that is forecast to continue (Langlois *et al*. 2006).

3.6 Conclusion: trade liberalisation as a facilitator of dietary change

Trade liberalisation and associated trade agreements have influenced the trend towards increased consumption of three foods intimately associated with the nutrition transition in developing countries: vegetable oils (including *trans* fats), meats and highly processed foods. Importantly, it has influenced consumption within food groups. Foods that have been more affected by trade liberalisation are now more widely consumed, e.g. soya bean and palm oil relative to sunflower or peanut oil, chicken relative to beef, branded, non-traditional and widely promoted highly processed foods relative non-branded, traditional, little promoted foods. It is likely that similar dynamics are at work for other food groups.

The evidence presented here suggests that three dynamics have been critical to this process:

(i) *Market growth:* Trade liberalisation has facilitated food market growth in developing countries, as a result of the shift of food production, exports and investments towards the developing world. Developing countries have become a primary growth engine for TNCs concerned with food.

(ii) *Competition:* Trade liberalisation has introduced competitive forces into the consumer food market in developing countries. Although it is often suggested that the growth of TNCs has made markets less competitive (by increasing market power) (Murphy 2006; Vorley 2003), trade liberalisation has nevertheless introduced new competitive forces by (i) integrating new global competitors into national markets, such as TNCs; (ii) placing downward pressure on prices, such as by opening up markets to lower cost exports and facilitating the concentration of supermarket power; and (iii) creating incentives for more promotional activities.

(iii) *Synergistic actions throughout the food supply chain:* Trade liberalisation has enabled positive synergies throughout the food supply chain, such as speeding up the rate of market growth and intensifying competition. For example, the vegetable oils market grew not just through greater imports and exports, but greater investment in processing capacity. Competition increased in the international chicken market not just because more was being imported and exported, but because more was being produced. The market for processed foods grew not just because of greater investment in processing, but because of complementary growth of the retail and advertising industries.

It cannot be said, however, that trade liberalisation has been *the cause* of diet change. Rather, trade liberalisation has *facilitated* shifts and *increased the rate of change*, where other conditions were favourable, both on the side of supply and demand. On the supply side, for example, technology transfer was already favouring increased chicken production; trade simply facilitated this process by providing the low-cost feed necessary for the economic profitability of high-volume operations. On the demand side, conditions were already favourable to diet change as a result of changes in income, urbanisation, demographics and employment. It is notable, for example, that there is a direct relationship between national income and the consumption of packaged foods (Goldman Sachs Group Inc. 2007). Without these changes in demand, these dietary shifts would not have taken place. Thus, it is a question not of *if* consumers would change their diets, but *how* – and trade liberalisation has played a role by shaping *how* consumers have responded in their food choices. It is perhaps inevitable that consumers will begin to eat more vegetable oils; but it is not inevitable that they will consume more soya bean oil relative to other oils. Likewise, it is inevitable that they will eat more meat – but it is not written that they will eat more chicken. As demand for 'convenience' grows, it is inevitable that they will consume more readily processed foods, but it is not inevitable that these have to be branded – nor high in calories and low in micronutrients.

Trade liberalisation has thus been a driver of the nutrition transition not because it 'tells' people what to eat, but because it makes choices already attractive to consumers even more so, thus speeding up the rate of change.

References

Anon (2003). CPO industry still open for new investment. *Indonesian Commercial Newsletter* **29**, 7–21.

Adair, L.S. & Popkin, B.M. (2005). Are child eating patterns being transformed globally? *Obesity Research* **13**, 1281–99.

Agri-Food Trade Service (2002). *China's Vegetable Oil Industry*. Agri-Food Canada, Ottawa.

Ahmad, T.M.A.T. & Tawang, A. (1999). *Effects of Trade Liberalization on Agriculture in Malaysia*. Working Paper 46. Bangkok: Regional Co-ordination Centre for Research and Development of Coarse Grains, Pulses, Roots and Tuber Crops in the Humid Tropics of Asia and the Pacific (CGPRT Centre).

Barr, G. (2000). Effects of trade agreements on the food and beverage processing industry. In: *OECD, The Agro-Food Processing Sector in China*. OECD, Paris, pp. 89–94.

Beckman, C. (2005). Vegetable oils: competition in a global market. *Bi-Weekly Bulletin* **18**, No. 11.

Bolling, C. & Gehlhar, M. (2005). Global food manufacturing reorients to meet new demands. In: Regmi, A. & Gehlhar, M. (eds). *New Directions in Global Food Markets*. Agriculture Information Bulletin Number 794. USDA, Washington, DC, pp. 62–73.

Bolling, C., Neff, S. & Handy, C. (1998). *U.S. Foreign Direct Investment in the Western Hemisphere Processed Food Industry*. USDA ERS, Washington, DC.

Bolling, C. & Somwaru, A. (2001). US food companies access foreign markets though direct investment. *Food Review* **24**, 23–8.

Bruinsma, J. (2003). *World Agriculture: Towards 2015/2030. An FAO Perspective*. Earthscan Publications Ltd., London.

Bunge (2005a). *Noticias: Óleo de Soja Especial para frituras é nova opção para consumidor*. Retrieved 30 September 2007 from http://www.bunge.com.br/noticias/noticia.asp?id=71.

Bunge (2005b). *Noticias: Bunge Alimentos apresenta novidades na Expoabras 2005*. Retrieved 30 September 2007 from http://www.bunge.com.br/noticias/noticia.asp?id=2.
Bunge (2007). *Familia de Produtos Soya*. Retrieved 30 September 2007 from http://www.soya.com.br/site/content/produtos/default.aspx.
Cabal, M.P. (2002). Private sector initiatives in food safety: the case of the Colombian poultry industry. In: Hanak, E., Boutrif, P., Fabre, M. & Pineiro, M. (eds). *Food Safety Management in Developing Countries*. Proceedings of the International Workshop, CIRAD-FAO, Montpellier, France, December 2000, pp. 11–13.
Casson, A. (1999). *The Hesitant Boom: Indonesia's Oil Palm Sub-Sector in an Era of Economic Crisis and Political Change*. CIFOR, Bogor, Indonesia.
Chopra, M. (2002). Globalization and food: implications for the promotion of "healthy" diets. In: *World Health Organization, Globalization, Diets and Noncommunicable Diseases*. World Health Organization, Geneva.
Costales, A.C., Delgado, C.L., Catelo, M.A.O., Tiongco, M., Chatterjee, A. & delos Reyes, A. (2003). Annex I: livestock industrialization project: phase II – policy, technical, and environmental determinants and implications of the scaling-up of broiler and swine production in the Philippines. In: *Project on Livestock Industrialization, Trade and Social-Health-Environment Impacts in Developing Countries*. FAO, Rome.
de Camargo Barros, G.S., de Zen, S., Piedade Bacchi, M.R., Galvao de Miranda, S.H., Narrod, C.A. & Tiongco, M. M. (2003). Annex V: livestock industrialization project: phase II – policy, technical, and environmental determinants and implications of the scaling-up of swine, broiler, layer and milk production in Brazil. In: *Project on Livestock Industrialization, Trade and Social-Health-Environment Impacts in Developing Countries*. FAO, Rome.
Delgado, C.L. (2003). Rising consumption of meat and milk in developing countries has created a new food revolution. *Journal of Nutrition* **133**, 3907S–10S.
Dohlman, E., Persaud, S. & Landes, R. (2003). *India's Vegetable Oil Sector: Imports Fill Rising Demand*. USDA, Washington, DC.
Drewnowski, A. & Popkin, B.M. (1997). The nutrition transition: new trends in the global diet. *Nutrition Reviews* **55** (2), 31–43.
Escalante de Cruz, A., Phillips, S., Visch, M. & Bulan Saunders, D. (2004). *The Junk Food Generation: A Multi-Country Survey of the Influence of Television Advertisements on Children*. Consumers International, Asia Pacific Office, Kuala Lumpur, Malaysia.
Euromonitor (2005). *The World Market for Retailing*. Euromonitor, London.
Euromonitor (2006a). *Oils and Fats – Brazil*. Euromonitor, London.
Euromonitor (2006b). *Packaged Food – World*. Euromonitor, London.
Euromonitor (2006c). *Retailing in Colombia*. Euromonitor, London.
Euromonitor (2007a). *Impulse Foods – World*. Euromonitor, London.
Euromonitor (2007b). *Oils and Fats – China*. Euromonitor, London.
Euromonitor (2007c). *Oils and Fats – India*. Euromonitor, London.
Fajardo, L.F. (2004). Impact of globalization on food consumption, health and nutrition in urban areas of Colombia. In: *Globalization of Food Systems in Developing Countries: Impact on Food Security and Nutrition*. FAO Food and Nutrition Paper 83. FAO, Rome, pp. 285–300.
FAO (2001). *Review of Basic Food Policies*. FAO, Rome.
FAO (2004). *The State of Agricultural Commodity Markets 2004*. FAO, Rome.
FAO (2005). *Policies for Basic Food Commodities 2003–2004*. FAO, Rome.
FAO (16 September 2007a). *FAOSTAT Core Consumption Data*.
FAO (16 September 2007b). *FAOSTAT Core Production Data*.
FAO (30 September 2007c). *FAOSTAT Core Trade Data*.
FAO (16 September 2007d). *FAOSTAT Detailed Trade Data*
FAO (2 September 2007e). *FAOSTAT Food Balance Sheets*.
FAO (1 October 2007f). *FAOSTAT SUA Data*.
FAO/ICTSD (2007). *Indicators for the Selection of Agricultural Special Products: Some Empirical Evidence*. Information Note No 1. FAO/ICTSD, Rome.
Gale, F. & Reardon, F. (2006). China's modernizing supermarket sector presents major opportunities for U.S. agriculture exporters. *AgExporter* **XVI**(11), 204–208.

Gehlhar, M. & Regmi, A. (2005). Factors shaping global food markets. In: Regmi, A. & Gehlhar, M. (eds). *New Directions in Global Food Markets*. Agriculture Information Bulletin Number 794. United States Department of Agriculture, Washington, DC.

Gibson P., Wainio, J., Whitley, D. & Bohman, M. (2001). *Profiles of Tariffs in Global Agricultural Markets*. Agricultural Economic Report No. 796. USDA ERS, Washington, DC.

Goldman Sachs Group Inc. (2007). *Global: Food and Beverages*. Global Investment Research, London.

Haley, M.M. (2001). Changing consumer demand for meat: the U.S. example, 1970–2000. In: Regmi, A. (ed.). *Changing Structure of Global Food* Consumption and Trade. U.S. Department of Agriculture, Washington, DC, pp. 41–8. Agriculture and Trade Report WRS011. Retrieved from http://www.ers.usda.gov/Publications/WRS011/.

Hastings, G., McDermott, L., Angus, K., Stead, M. & Thomson, S. (2007). *The Extent, Nature and Effects of Food Promotion to Children: A Review of the Evidence*. World Health Organization, Geneva.

Hastings, G., Stead, M., McDermott, L., Forsyth, A., MacKintosh, A.M., Rayner, M. *et al.* (2003). *Review of Research on the Effects of Food Promotion to Children*. Food Standards Agency, London.

Hawkes, C. (2002). Marketing activities of global soft drink and fast food companies in emerging markets: a review. In: *World Health Organization, Globalization, Diets and Noncommunicable Diseases*. World Health Organization, Geneva.

Hawkes, C. (2005). The role of foreign direct investment in the nutrition transition. *Public Health Nutrition* **8**, 357–65.

Hawkes, C. (2006a). Uneven dietary development: linking the policies and processes of globalization with the nutrition transition, obesity and diet-related chronic diseases. *Globalization and Health* **2**(4). Retrieved 29 August 2006 from http://www.globalizationandhealth.com/content/2/1/4.

Hawkes, C. (2006b). Agricultural and food policy for cardiovascular health in Latin America. *Prevention and Control* **2**, 137–47.

Hawkes, C. (2008). Dietary implications of supermarket development: a global perspective. *Development Policy Review* **26**(6), 657–92.

Hawkes, C. & Thow, A.M. (2008). The implications of the Central American free trade agreement (CAFTA) for the nutrition transition in Central America. *Pan American Journal of Public Health* **24**(5), 345–60.

Henderson, D.R., Handy, C.R. & Neff, S.A. (1996). *Globalization of the Processed Foods Market*. USDA ERS, Washington, DC.

Henson, S. (2003). Food safety issues in international trade. In: Unnevehr, L. (ed.). *Food Safety in Food Security and Food Trade*. 2020 Vision Focus 10. IFPRI, Washington, DC.

Hoffman, L., Baker, A., Foreman, L. & Young, C.E. (2007). *Feed Grains Backgrounder*. Electronic Outlook Report FDS-07c-01. USDA ERS, Washington, DC.

Josling, T., Roberts, D. & Orden, D. (2004). *Food Regulation and Trade*. Institute for International Economics, Washington, DC.

Lang, T. (1997). The public health impact of globalisation of food trade. In: Shetty, P.S. & McPherson, K. (eds). *Diet, Nutrition and Chronic Disease: Lessons from Contrasting Worlds*. John Wiley & Sons, London.

Langlois, A., Zuanic, P.E., Faucher, J., Pannuti, C. & Shannon, J. (2006). Obesity: Re-Shaping the Food Industry. JP Morgan Global Equity Research, London.

McGinnis, J.M., Gootman, J.A. & Kraak, V.I. (2006). *Food Marketing to Children and Youth: Threat or Opportunity?* National Academies Press, Washington, DC.

McMichael, P. (2001). The impact of globalisation, free trade and technology on food and nutrition in the new millennium. *Proceedings of the Nutrition Society* **60**, 215–20.

Murphy, S. (2006). *Concentrated Market Power and Agricultural Trade*. ECOFAIR Trade Dialogue. Retrieved from http://www.tradeobservatory.org/library.cfm?refid=89014.

Persaud, S. & Landes, R. (2006). *The Role of Policy and Industry Structure in India's Oilseed Markets*. United States Department of Agriculture, Washington, DC.

Pingali, P. & Khwaja, Y. (2004). *Globalization of Indian Diets and the Transformation of Food Supply Systems*. ESA Working Paper No. 04-05. Agricultural and Development Economics Division, Food and Agriculture Organization of the United Nations, Rome.

Popkin, B.M. & Du, S. (2003). Dynamics of the nutrition transition toward the animal foods sector in china and its implications: a worried perspective. *Journal of Nutrition* **133**, 3898S–906S.
Rama, R. & Wilkinson, J. (2008). Foreign direct investment and agri-food chains in developing countries: a review of the main issues. In: *FAO: Commodity Market Review 2007–2008*. FAO, Rome, pp. 51–66.
Rayner, G., Hawkes, C., Lang, T. & Bello, W. (2007). Trade liberalization and the diet transition: a public health response. *Health Promotion International* **21**, 67–74.
Reardon, T., Timmer, C.P., Barrett, C.B. & Berdegue, J. (2003). The rise of supermarkets in Africa, Asia and Latin America. *American Journal of Agricultural Economics* **85**, 1140–46.
Regmi, A., Gehlhar, M., Wainio, J., Vollrath, T., Johnston, P. & Kathuria, N. (2005). *Market Access for High-Value Foods*. USDA, Washington, DC.
Sawaya, A.L., Martins, P.A. & Martins, V.J.B. (2004). Impact of globalization on food consumption, health and nutrition in urban areas: a case study of Brazil. In: *Globalization of Food Systems in Developing Countries: Impact on Food Security and Nutrition*. FAO Food and Nutrition Paper 83. FAO, Rome, pp. 253–74.
Schnepf, R.D., Dohlman, E. & Bolling, C. (2001). *Agriculture in Brazil and Argentina: Developments and Prospects for Major Field Crops*. USDA, Washington, DC.
Steinfeld, H., Gerber, P., Wassenaar, T., Castel, V., Rosales, M.L. & de Haan, C. (2006). *Livestock's Long Shadow: Environmental Issues and Options*. FAO, Rome.
Story, M., Kaphingst, K.M., Robinson-O'Brien, R. & Glanz, K. (2008). Creating healthy food and eating environments: policy and environmental approaches. *Annual Review of Public Health* **29**, 253–72.
Swinburn, B., Egger, G. & Raza, F. (1999). Dissecting obesogenic environments: the development and application of a framework for identifying and prioritizing environmental interventions for obesity. *Preventive Medicine* **29**, 563–70.
Thow, A.M. (2009). Trade liberalisation and the nutrition transition: mapping the pathways for public health nutritionists. *Public Health Nutrition* 12; 1–9. [Epub ahead of print]
Thow, A.-M. & Hawkes, C. (2009). The implications of trade liberalization for diet and health: a case study from Central America. *Globalization and Health*. Retrieved from http://www.globalization and health.com/content/5/1/5. doi:10.1186/1744-8603-5-5.
Tuan, F.C., Fang, C. & Cao, C. (2004). *China's Soybean Exports Expected to Grow Despite Short-Term Disruptions*. Electronic Outlook Report OCS-04J-01. United States Department of Agriculture Economic Research Service, Washington, DC.
United States Department of Agriculture Foreign Agricultural Service (USDA FAS) (1998). *Colombia Poultry Annual Report 1998: GAIN Report #CO8025*. Foreign Agricultural Service, United States Department of Agriculture, Washington, DC.
US Department of Commerce (16 September 2007). *U.S. Census Bureau, Foreign Trade Statistics*.
USDA (2001). *Colombia: Poultry and Products*. Foreign Agricultural Service GAIN Report. USDA, Washington, DC.
Vocke, G. (1991). Investments to transfer poultry production to developing countries. *American Journal of Agricultural Economics* **73**, 951–4.
Vorley, B. (2003). *Food, Inc. Corporate Concentration from Farm to Consumer*. IIED, London.
Wei, A. & Cacho, J. (2001). Competition among foreign and Chinese agro-food enterprises in the process of globalization. *International Food and Agribusiness Management Review* **2**, 437–51.
Wilkinson, J. (2002). The final foods industry and the changing face of the global agro-food system. *Sociologia Ruralis* **42**, 329–46.
World Bank (2007). *Commodity Forecasts (Real Prices)*. Retrieved 12 February 2007 from http://web.worldbank.org/WBSITE/EXTERNAL/EXTDEC/EXTDECPROSPECTS/EXTGBLPROSPECTS/0,,contentMDK:20675357~menuPK:627723~pagePK:64218950~piPK:64218883~theSitePK:612501,00.html.
Zahniser, S. (2007). *NAFTA at 13: Implementation Nears Completion*. Electronic Outlook Report WRS-07–01. United States Department of Agriculture Economic Research Service, Washington, DC.
Zahniser, S. & Link, J. (2002). *Effects of North American Free Trade Agreement on Agriculture and the Rural Economy*. Electronic Outlook Report WRS-02-1. United States Department of Agriculture Economic Research Service, Washington, DC.

4 Global Trade of Fruits and Vegetables and the Role of Consumer Demand*

Sophia Huang

4.1 Introduction

International trade in fruits and vegetables has expanded at a higher rate than trade in other agricultural commodities, particularly since the 1980s. Not only has world trade in fruits and vegetables gained prominence, but also the variety of commodities has expanded. Over the years, three regions – the European Union (EU), the North American Free Trade Agreement (NAFTA) area and Asia (East, Southeast and South) – have remained as both the major destinations and sources of supply. A substantial share of their trade is intraregional, particularly that of the EU. All the three regions, however, also depend on Southern Hemisphere countries for imports of juices and off-season fresh fruits, and the EU and NAFTA also depend on equatorial regions for bananas – the leading fresh fruit import. In addition, Asian trade – the smallest among the three – has become much more important since the 1980s as incomes and populations have grown and policies changed. This chapter describes these global trade patterns in fruits and vegetables focusing on the period 1980–2001. It analyses the forces behind these trends, including the role played by changing consumer diets.

4.2 Global expansion of fruit and vegetable trade

According to data from the Food and Agriculture Organization (FAO) of the United Nations (FAO 2003), fruits and vegetables claimed an increasing share of world agricultural trade, from a nominal value of $3.4 billion (10.6%) in 1961 to nearly $70 billion (16.9%) in 2001. During this period there had also been important changes in the categories of products traded. Fruit and vegetable juices more than doubled their share of total global export value for fruits and vegetables, from 3.6% in 1967–1971 to 8.7% in 1997–2001. Similarly, the share of vegetables and their products increased from 26.0 to 32.7%, while that of fruits and their products (excluding juices) declined from 48.5 to 39.1% (Table 4.1). In 1999–2001, the share of trade by fresh fruit nevertheless

*This chapter does not necessarily reflect the views of the Economic Research Service or the US Department of Agriculture.

Table 4.1 Composition and growth of world fruit and vegetable exports.

	Growth rate	Composition of export value (%)	
Product group*	**1989–2001**	**1967–1971**	**1997–2001**
Fruits and derived products	4.2	48.5	39.1
Vegetables and derived products	5.2	26.0	32.7
Nuts and derived products†	4.5	10.5	9.0
Fruit and vegetable juices	7.1	3.6	8.7
Pulses and derived products	3.6	4.7	3.9
Roots, tubers, and derived products	2.6	5.0	6.0
Others	−1.4	1.7	0.6
Total fruit and vegetable exports	—	100	100

—Not available.
*The product groups in the table are according to the classification of the Food and Agriculture Organization (FAO). FAO's definition of fruits and vegetables includes more than 160 items, representing a broad range of products.
†This category also includes four oil-bearing crops and their products – coconuts and dessicated coconuts, olives (fresh and preserved) and prepared peanuts.
Source: Calculated based on data from the Food and Agriculture Organization of the United Nations (FAO 2003).

remained dominant at 30.6%, followed by fresh vegetables (20.3%), processed fruit and vegetables (30.3%), fruit and vegetable juices (9.0%), tree nuts (6.1%) and pulses (3.6%).

The variety of traded fruits and vegetables has also changed. Many 'non-traditional' commodities – mangoes, frozen potatoes, single-strength orange and apple juices, fresh mushrooms, garlic, sweet corn (prepared or preserved) and avocado – achieved, or were close to, a double-digit growth rate in their exports during 1989–2001. In comparison, the export growth rate for many traditional products during the same period was relatively low. Typical examples were oranges (1.1% export growth rate), canned pineapples (0.4%) and canned mushrooms (0.6%). Even the popular concentrated orange juice (2.6%) and apple juice (4.5%) had growth rates lagging far behind their double-digit growth competitors, single-strength juices. Bananas, apples, oranges and tomatoes accounted for over 30% of the total fruit and vegetable trade in the 1960s and 1970s, but by the end of the 1990s they accounted for less than 20%. Fresh grapes, fresh vegetables, frozen potatoes, tree nuts and other fruit and vegetable products are entering world trade channels in increasing quantities. But bananas remain the most important traded horticultural commodity by value, followed by tomatoes, grapes and apples.

The top fruit and vegetable exports, with an individual average value share larger than or equal to 1% during 1999–2001, are listed in Table 4.2, along with their individual growth rates during 1989–2001. The table also includes sweet corn

Table 4.2 Growth rate and market share for world fruit and vegetable exports.

	Export value share (%) 1999–2001	Export volume growth (%) 1989–2001
Bananas	6.3	4.5
Tomatoes	4.3	5.3
Grapes	3.5	5.2
Apples	3.5	3.6
Potatoes, frozen	2.8	11.2
Oranges	2.6	1.1
Chillis and peppers, green	2.3	7.1
Orange juice, single-strength	2.3	13.9
Potatoes	2.2	0.7
Tangerines, mandarins, clementines and satsuma	2.0	5.4
Orange juice, concentrated	1.9	2.6
Beans, dry	1.7	4.1
Tomato paste	1.6	4.9
Pears	1.4	5.8
Lettuce	1.3	4.9
Peaches and nectarines	1.2	3.3
Cashew nuts, shelled	1.2	3.9
Cucumbers and gherkins	1.2	3.7
Almonds, shelled	1.1	4.7
Strawberries	1.1	5.7
Lemons and limes	1.0	4.2
Mushrooms, fresh	1.0	11.1
Onions, dry	1.0	4.4
Cantaloupes and other melons	1.0	7.8
Sweet corn, prepared or preserved	0.6	9.3
Mangoes	0.6	12.6
Others*	49.5	—
Total	100	—

—Not available.
*Others include nearly 140 minor fruits and vegetables.
Source: Calculated based on data from the Food and Agriculture Organization of the United Nations (FAO 2003).

(prepared and preserved) and mangoes, although their value share was less than 1%, because of their high export growth rate during the period.

4.3 Regional dominance of trade flows

4.3.1 Overview

Although about 320 countries (roughly divided between importers and exporters) participate in global trade in fruits and vegetables, trade is not evenly distributed. Overall, 30 countries – basically with high income – account for 92–95% of global trade of fruits and vegetables. Among these 30 countries, three regions dominate

world commerce in fruits and vegetables[1]: the EU,[2] the NAFTA area and Asia. In addition, two special regions – here termed Southern Hemisphere countries and banana-exporting countries – are important in this trade. The Southern Hemisphere countries consist of Argentina, Australia, Brazil, Chile, New Zealand, Peru and South Africa, while the banana-exporting countries include Colombia, Costa Rica, Côte d'Ivoire, Ecuador, Guatemala, Honduras and Panama.[3]

The largest importers of fruits and vegetables are the EU, the United States and Japan. In general, high-income regions are also among the largest exporters, led by the EU and the United States. Some developing countries are large exporters, however, including Mexico and China. While the United States is the foremost exporter of fruits and vegetables in the world if intra-EU trade is excluded from the data, it is not the largest producer. That position belongs to China, although China plays a much smaller role in world trade than the United States because of internal consumption of its fruits and vegetables. Recently, China has also become a more important trader.

As shown in Table 4.3, the EU, NAFTA and Asia are major destinations and sources of supply in the global trade of fruits and vegetables, while the banana-exporting countries and the Southern Hemisphere countries are important suppliers of fresh fruits. The group of Southern Hemisphere countries is also a major supplier for juices.

4.3.2 Banana-exporting countries

The trade flows for the banana-exporting countries are relatively straightforward. The world's top 30 fresh fruit importers purchased one-fifth of the value of their total fresh fruit imports during 1999–2001 from the group of the banana-exporting countries (Table 4.3). With 86% of their fresh fruit exports consisting of bananas, the banana-exporting countries accounted for nearly 60% of the market value in global banana exports.

4.3.3 Southern Hemisphere countries

In contrast to the banana-exporting countries, the relatively recent emergence of the Southern Hemisphere countries in the global trade is dynamic and involves several products. Their core role in trade is the provision of off-season fruit. With a crop production cycle opposite to that of the Northern Hemisphere, the Southern

[1] This analysis is based on data from the Global Agricultural Trade System (GATS), prepared by USDA's Foreign Agricultural Service; GATS, in turn, uses data from the UN Trade Statistical Office (USDA 2003). It focuses on four key fruit and vegetable categories: fresh fruit, fresh vegetables, processed fruit and vegetables and fruit and vegetable juices.

[2] This analysis includes the EU only as it was in 1999–2001, i.e. 15 countries, not the 27 countries it comprised in 2009.

[3] Although the Philippines is also an important banana exporter, with neighbouring Asian countries as the dominant markets, the Philippines is included here in the Asian group.

Table 4.3 Destination of exports and origin of imports by top 30 trading countries.

	Fresh fruits	Fresh vegetables	Processed fruits and vegetables	Fruit and vegetable juice
			$ *million*	
Export value†	19,469	13,165	19,017	5,697
Destination of exports			*Per cent*	
EU	57.0	56.1	51.3	63.5
NAFTA	18.8	26.4	16.5	19.0
Asia	10.8	7.7	17.5	9.4
South America	2.0	0.8	2.5	0.9
Middle East	1.6	1.6	2.1	1.2
Non-EU Western Europe	1.8	1.9	1.6	0.9
Others	8.1	5.4	8.5	4.9
Total	100	100	100	100
			$ *million*	
Import value†	23,243	13,620	19,722	5,993
Origin of imports			*Per cent*	
EU	31.4	55.2	40.9	35.1
NAFTA	13.1	23.4	17.0	14.1
Asia	6.1	7.4	22.5	6.1
Southern Hemisphere*	19.1	4.1	5.2	32.2
Middle East	3.2	2.6	5.2	3.2
Banana-exporting countries‡	20.3	0.4	1.7	1.5
Others	6.8	7.0	7.5	7.7
Total	100	100	100	100

†Includes intraregional trade.
*Southern Hemisphere countries include Argentina, Australia, Brazil, Chile, New Zealand, South Africa and Peru.
‡Banana-exporting countries include Colombia, Costa Rica, Côte d'Ivoire, Ecuador, Guatemala, Honduras and Panama.
EU, European Union; NAFTA, North American Free Trade Agreement.
Source: Calculated based on data from the Foreign Agricultural Service of U.S. Department of Agriculture (USDA 2003).

Hemisphere exporters, whose summers come during Northern Hemisphere winters, play a vital role in making the year-round supply of fresh fruits possible. These countries have taken advantage of the seasonal differences to expand their exports, particularly for many temperate-climate fruits. The market for off-season fruit imports in the Northern Hemisphere continued growing in the 1990s, after a fast expansion in the 1980s, as several Southern Hemisphere countries boosted their fruit production.

During 1999–2001, Southern Hemisphere fresh fruit shipments accounted for 19% of the value purchased by the world's top 30 fresh fruit importers (Table 4.3). Two major destinations for these fresh fruit exports were the EU (43%) and NAFTA (24%, mainly to the United States). Other important destinations included Asia (16%, mainly to East Asia) and South America (8%).

Thus far, no country in the region has succeeded in topping Chile as the region's leading exporter; Chile accounted for nearly 35% of the value of fresh fruits exported by the Southern Hemisphere countries in 1999–2001. Next to Chile is South Africa, chiefly targeting the EU and accounting for nearly one-fifth of the market share of the region's fresh fruit exports. Other important fresh fruit suppliers from the region included New Zealand and Argentina, together accounting for nearly another third of the market share.

The United States and the EU are Chile's predominant destinations for its fresh fruit exports, accounting for 42 and 21%, respectively, of the country's fresh fruit exports during 1999–2001. Although nearly 60% of these exports to the United States were grapes, which constituted close to 70% of US imported grapes during 1999–2001, Chile also accounted for virtually all US imports of fresh plums, peaches and cherries. In comparison, three-fourths of Chile's fresh fruit exports to the EU were grapes, apples and pears.

During 1999–2001, more than half of the fresh fruits exported by the Southern Hemisphere countries were temperate-climate fruits such as grapes, apples and, to a much lesser degree, pears. About two-thirds of apples exported by the Southern Hemisphere countries came from Chile and New Zealand, while Chile and Argentina were the dominant suppliers for grapes and pears. Geographic proximity is particularly important for those Southern Hemisphere countries that export fresh fruits to Asia and South America. For example, the Asian market is important to exporters in Australia and New Zealand, who shipped almost no horticultural products to South America, while South America is a more important market than Asia for Argentina, Brazil and Chile.

In addition to fresh fruits, the group of Southern Hemisphere countries is a major supplier for fruit juices, accounting for nearly one-third of the import value for juices purchased by the world's top 30 importers during 1999–2001 (Table 4.3). Orange juice (mainly frozen) accounted for more than 70% of the region's juice exports, with apple juice (11%) a distant second. Led by Brazil (exporting mainly frozen orange juice), the region shipped more than half of its juice exports to the EU. NAFTA (to which it shipped 28%, mainly to the United States) and Asia (to which it shipped 13%, mainly to Japan) were the second and third destinations. Brazil accounted for nearly three-fourths of the region's juice exports, while Argentina (shipping mainly apple and grape juices) was the second largest exporter in the region (11% of the exports). Other countries had a share of less than 6% each.

4.3.4 European Union-15

The EU is the leading destination as well as source of supply in the global fruit and vegetable trade. During 1999–2001, the 15 member countries of the EU accounted for 51–64% of exports and 31–55% of imports by the world's top 30 countries trading in fruits and vegetables (Table 4.3). While nearly all its members are among the major importers of fruits and vegetables, not all are major suppliers. Major exporters include Spain, the Netherlands, Italy, Belgium, France and Germany.

The core characteristic of EU trade of fruits and vegetables is that it consists mainly of intra-EU trade among its member countries. Intraregional trade accounted for 78–88% of exports and 50–85% of imports, depending on product groups, during 1999–2001. The EU, however, also relied on extraregional suppliers for many horticultural products, particularly fresh fruits and juices. In addition, while varying considerably among products and partners, a substantial share of extra-EU fruit and vegetable imports is from countries benefiting from preferential treatment for some portion of that trade. Other trade flows with limited or no preferences, however, are also inevitable because adequate alternative supplies are not available.

For juice imports, slightly more than half were from extra-EU trade; in particular, the EU trade group depended for 28% of its juice imports on the Southern Hemisphere countries, mainly frozen orange juice from Brazil. EU juice imports from other regions were relatively insignificant – less than 6% from NAFTA and 3% from Asia.

For fresh fruits, the EU trade group purchased nearly half of its imports from its members, but also purchased nearly one-third of its fresh fruit imports from the banana-exporting and Southern Hemisphere countries, importing a nearly equal share from each region. Bananas accounted for more than 80% of the fresh fruits imported by the EU from the banana-exporting countries, with Costa Rica, Ecuador, Colombia and Panama the major suppliers. Apples, grapes and pears represented more than half of the fresh fruits imported by the EU from the Southern Hemisphere countries, with South Africa, Chile, New Zealand and Argentina the major suppliers. Among them, South Africa was the leading supplier, accounting for a 35% share of the fresh fruits imported by the EU from the Southern Hemisphere countries during 1999–2001. Historical and political closeness as a member of the British Commonwealth led South Africa to target its fresh fruit exports to the EU, even during the decade of world sanctions against the country's apartheid policy. In contrast, the North American market only opened fully for South African business in the mid-1990s.

4.3.5 NAFTA area

NAFTA is also an important destination and source in the global trade of fruits and vegetables. The world's top 30 trading countries of fruits and vegetables shipped 13–24% of their exports to NAFTA and imported 17–26% from NAFTA during 1999–2001 (Table 4.3). Among the three NAFTA members, the United States is the leading importer, with Canada lagging far behind and Mexico relatively insignificant. The United States is also the leading supplier among the three for all commodity groups except fresh vegetables, for which Mexico is the leading exporter.

Intraregional trade in NAFTA is also important for the fruit and vegetable trade, particularly for fresh vegetables. More than 90% of NAFTA fresh vegetable exports and 86% of NAFTA fresh vegetable imports derived from intra-NAFTA trade

during 1999–2001. For other commodity groups, in contrast to the EU, extraregional trade was, in general, more significant than intraregional trade for NAFTA.

Fresh fruits

While intra-NAFTA trade accounted for slightly more than one-third of its fresh fruit imports, the NAFTA trade group depended more than any other trade group on Southern Hemisphere countries and banana-exporting countries as its major sources of supply. Together, these two regions supplied nearly 60% of fresh fruit imported by NAFTA during 1999–2001. During this period, 80% of fresh fruit imports by NAFTA from the banana-exporting countries were bananas, while about 45% of fresh fruit imports from Southern Hemisphere countries were grapes. In addition to shipping 55% of NAFTA exports within the region, NAFTA exporters shipped nearly one-third of their fresh fruit exports to Asia during 1999–2001, mainly to affluent markets in East Asia, particularly Japan. Oranges, apples, grapefruit, grapes and cherries accounted for nearly 80% of these exports. In comparison, NAFTA shipped only 7% of its fresh fruit exports to the EU because of high seasonal tariffs and preferential agreements, with grapefruit accounting for nearly 30% of these exports.

Juices

NAFTA depended on the Southern Hemisphere countries for more than 40% of its juice imports during 1999–2001, while intra-NAFTA trade accounted for about 30%. Frozen orange juice, almost totally from Brazil, made up 43% of juice imports from the Southern Hemisphere countries, followed by apple juice (28%) and grape juice (12%). In addition to the Southern Hemisphere countries, the EU (mainly for apple juice and, to a much lesser degree, grape juice) and Asia (mainly for pineapple juice and, to a much lesser degree, apple juice) had shares of 8 and 11%, respectively, in the NAFTA market.

In addition to the juice exports going to intra-NAFTA countries – nearly half the juice exports – Asia (particularly Japan) and the EU were major destinations. About 60% of NAFTA's juice exports to the EU was orange juice (mainly frozen). Another 19% was grapefruit juice; for which the EU was the leading destination. In comparison, NAFTA's juice exports to Asia were relatively diversified, with frozen orange juice, grape juice, grapefruit juice and apple juice accounting for nearly 60% of the exports.

Processed fruits and vegetables

Extraregional trade is also important for processed fruits and vegetables exported by NAFTA, accounting for slightly more than half its processed fruit and vegetable trade during 1999–2001. Asia, and to a much lesser degree the EU, were two major destinations for this extra-NAFTA trade. One-third of processed fruits and vegetables exported from NAFTA to the EU consisted of dried prunes and raisins.

In comparison, nearly a third of processed fruits and vegetables exported to Asia were frozen potatoes, while other processed potatoes, sweet corn, raisins and dried prunes accounted for another 30%. Japan was the leading destination, with a share of nearly one-fifth of the processed fruits and vegetables exported globally by NAFTA, while the United States supplied over 60% of these exports.

Of processed fruits and vegetables imported by NAFTA, Asia supplied 22%, the EU 15% and intra-NAFTA trade about 46%. Olives (prepared or preserved) were the leading processed fruit and vegetable import from the EU, accounting for 35%. Prepared or preserved pineapples (almost all from tropical Southeast Asian countries) made up 30% of the imports from Asia, and mushrooms and truffles (dried, prepared, or preserved) another 14%. China supplied slightly more than one-fifth of NAFTA's mushroom imports.

4.3.6 Asia

Except in the processed category, Asia accounted for 6–7% of exports and 8–11% of imports by the world's top 30 trading countries of fruits and vegetables during 1999–2001. Asia is a relatively important trader in the processed category, accounting for 18% of imports and 23% of exports (Table 4.3). Because Asia is a vast, diverse continent in land, labour, climate and economic development, it tends to have a different set of participants as major importers or exporters. For example, China, and to a lesser degree tropical Southeast Asian countries such as Thailand and the Philippines, are its main exporters. In contrast, though China and Southeast Asian countries have shown market potential, affluent Asian markets that are land-scarce and have high labour costs, like Japan and South Korea, are the main Asian destinations for global exports of fruits and vegetables.

Intra-Asia trade played a substantial role for the Asia trade group, particularly for exports. A distinguishing characteristic of fruit and vegetable exports by this group is China's dominant role, particularly in the intraregional Asian market. China is a top exporter for all the commodity groups. Except for juices, most of its exports were shipped to neighbouring Asian markets, ranging from nearly 70% for processed fruits and vegetables to nearly 80% for fresh vegetables during 1999–2001. At the same time, except for fresh fruits, Japan alone accounted for 60–80% of China's fruit and vegetable exports to Asia. As a result, China is a dominant competitor in the Asian fruit and vegetable markets, particularly for the United States in the Japanese market.

The Asia trade group, however, also depends strongly on extraregional sources for horticultural imports, particularly for juices and fresh fruits. For juice imports, intra-Asia trade accounted for only about 12% during 1999–2001. The Southern Hemisphere countries, NAFTA and, to a much lesser degree, the EU, supplied most of the juices imported by the Asia trade group – a market share of 9% of global juice imports. For fresh fruit imports, extraregional trade accounted for slightly more than 60%, with NAFTA – and to a lesser degree the Southern Hemisphere countries – the dominant suppliers. However, unlike the EU and NAFTA countries that depend on the banana-exporting countries for banana imports, the Asian banana imports come mainly from intraregional trade, principally with the Philippines.

For imports in other commodity groups, extraregional trade is still substantial, although intraregional trade is slightly more important. For example, extraregional imports accounted for 42% of processed fruit and vegetable imports, with NAFTA the dominant supplier. Thirty-nine per cent of the fresh vegetable imports were also from outside the Asian region, mainly from NAFTA and, to a lesser degree, the Southern Hemisphere countries (primarily Australia and New Zealand). A unique characteristic of the Asia trade group is its strong dependence on the NAFTA countries (mainly the United States) for imports, ranging from 20% of its fresh vegetables to 34% of its fresh fruits and juices during 1999–2001.

4.4 Consumer preferences as a driver of global trade in fruits and vegetables

Consumer demand is allied to rising incomes, urbanisation and the associated increases in levels of information and education. In the United States, education campaigns conducted through the 1990s to encourage greater consumption of fruits and vegetables (e.g. '5-a-day') appear to have increasingly spurred greater consumption and trade; although levels significantly fall short of recommended levels, Americans are eating more fruits and vegetables than before. By farm-weight basis, the average American consumed (as approximated by per capita disappearance) 217.9 pounds of fresh vegetables and melons in 2001, up 33% since 1980. Similarly, per capita consumption of fresh fruit totalled 98.0 pounds in 2001, up 11% over the same period. It is expected that per capita expenditure on fruits and vegetables will increase more than for any other product group from 2000 to 2020 (Blisard *et al.* 2002).

Demand for variety and convenience has increased along with consumption. The typical grocery store carried 345 produce items in 1998, compared with 173 in 1987 (Calvin *et al.* 2001). The new items are both exotic imports, such as clementines and passion fruit, and variations on standard products such as an increasing number of tomato varieties, many of which are also imported. By 2000, however, the introduction of new produce items was down to 192, compared with a high of 545 in 1996 (Harris 2002).

Changing consumer preferences are also evident in the year-round availability of items once thought seasonal, with consumers willing to pay the higher price for imported out-of-season fresh products. Year-round consumer demand for high-quality fresh fruits and vegetables is a critical influence in global changes in the fruit and vegetable trade. Without trade in fresh fruits and vegetables, consumers in temperate climates would face long winters with very limited supplies of fresh produce. While some fresh crops can be stored for a few months, such as apples and potatoes, more perishable products like strawberries and tomatoes would be available in much smaller quantities, if at all. Variety is also important. Without trade, temperate countries would not have tropical fruit such as bananas and tropical countries would not have deciduous fruit like apples.

For example, table grapes are now available all year. California supplies of summer and fall grapes are augmented with grapes from Chile and Mexico during the winter and spring, with minor amounts from several other countries. Table grapes

are now considered a staple, and consumption has increased for the California product as well as imports. US per capita consumption of grapes grew from 4 pounds in the 1980 season to 7.4 pounds in 2001, while the import share of consumption for grape increased from 14 to 49%. Year-round availability undoubtedly accounts for some of the increase in consumer demand. In most cases, US imports have grown to satisfy increasing consumption, rather than to replace domestic production.

Growing consumer demand in other countries is also fuelling trade. Real per capita income grew on average by almost 100% among all countries in the last four decades (World Bank 2001). The large gains in per capita income levels have resulted in significant changes in global food consumption patterns, especially in middle-income developing countries. Studies show that fruit and vegetable consumption is positively correlated with income growth. Wealthier middle-income countries are most likely to upgrade their diets to include more fruits and vegetables as income levels increase (Regmi *et al.* 2001). In addition, research suggests that besides income and price, other demographic variables also determine the rate and composition of changes in food consumption (Regmi & Dyck 2001). For example, unpublished 1998 ERS data indicate that urban consumers in China consume 38 kg more fruit and vegetables per capita per year than rural consumers. Similarly, FAO data from the 1980s indicate fruit and vegetable consumption to be generally greater in urban areas across all developing countries (FAO 1993, 1994). Given their rapid rate of urbanisation and income growth, middle-income countries appear to be promising future markets for fruits and vegetables.

Another important demand-side factor is the rising importance of supermarkets as purveyors of fruits and vegetables (discussed further in Chapter 7). Consolidation in the retail sector, both in the United States and in many countries around the world, also has an impact on the supplier/buyer relationship. Large retailers desire large volumes of consistent products to provide uniformity across all their stores, which may be more easily supplied by larger shippers. Recent research has shown that retailers buying a select group of produce items acquired 91% of the volume from their top four suppliers (Calvin *et al.* 2001).

Retailers are also increasing their demand for differentiated products. For example, an apple can be marketed in many different ways to appeal to a wide customer base. A retailer may want an apple for which a specific firm provides third-party certification for compliance with good agricultural practices or a particular type of packaging, an unusual variety, a special kind of storage, or a particular production system, such as organic. Product differentiation has an important impact on international trade because it requires increased coordination between shipper and buyer as shippers provide more specialised products for particular buyers.

4.5 Supply-side factors driving increased trade

Consumer demand is not the only factor driving increased trade. Supply-side factors have also played a key role, the most important being climate, proximity to markets, seasonality and price and technology and, last but not least, trade agreements.

4.5.1 Production tied to climate

Horticultural crops have quite diverse production and storage attributes. Some can be grown in a variety of climates and locations, while others can be grown in only a few places. Some, such as apples or potatoes, can be stored but many must be consumed or processed soon after harvesting. This makes geographical distance important in determining trade patterns of fruits and vegetables, compared with patterns for the major field crops.

The EU, North America and Japan account for over 80% of the world's demand for imported fresh fruits and vegetables. Although some high-income countries, such as the United States and the EU nations, have suitable climates for producing many kinds of fruits and vegetables, none has the ability to meet all its domestic needs. International trade has expanded consumer access to a variety of fruits and vegetables during seasons when they are not domestically produced.

4.5.2 Trade tied to proximity of markets

Distance is another factor that determines trading partners. Although transportation costs have declined significantly over the last 20 years, they are still an important barrier for exporters. Most of US fresh produce imports come from its neighbours – Canada and Mexico.

Regional trade agreements also significantly affect patterns of trade because of lower tariffs. For example, NAFTA and the formation of the EU reinforce the tendency of the large tomato producers in North America and Europe to export mainly to neighbouring countries. Where transportation costs claim a smaller share of a product's final value, there tends to be a larger geographical spread for importers. Processed tomato products, for example, are storable with little spoilage. Lower spoilage and less handling reduces transportation costs as a proportion of total costs and provides processed tomatoes with a wider geographical market than fresh tomatoes.

These observations for tomatoes apply to fruits and vegetables overall: for fresh fruits and vegetables, where transportation costs are large, countries tend to import from the closest producers. Imports of processed goods are more geographically dispersed because transportation costs are lower as a portion of total costs.

4.5.3 Seasonality and price

Seasonality is an important feature of the global trade in fruits and vegetables. Countries in the Southern Hemisphere can produce during the Northern Hemisphere's winter season. In addition, in the Northern Hemisphere, the southernmost countries can produce some fruits and vegetables earlier in the spring or later in the fall than countries farther north. The growing volume of seasonal trade has had a price-smoothing effect on fruits and vegetables throughout the year for importing countries, in part because of marketing agreements with wholesalers that supply retailers with products year-round. The seasonal pattern, however, has changed over

the last 20 years. Improvements in production methods, as well as the development of more varieties of fruits and vegetables, have allowed growers in the Northern Hemisphere to expand their production seasons.

US grape trade provides a good example of seasonality. According to data from the Foreign Agricultural Service of the U.S. Department of Agriculture (USDA 2002), the United States receives nearly 90% of its fresh grape imports, mainly from Chile – and to a much smaller degree from Mexico – January through April. Meanwhile, the United States ships 85% of its grape exports, mainly to its NAFTA neighbours and East Asian countries, during August through November (Figure 4.1).

Another example is US imports of tender warm-season fresh vegetables, such as tomatoes, peppers and cucumbers, during the winter and early spring. Southern Florida is virtually the only domestic outdoor growing area that can reliably produce these warm-season vegetables in commercial volume throughout the winter. But even in Florida, hard freezes remain an annual threat to winter crops. As a result, winter imports of vegetables help to stabilise the US market against production shortfalls due to freezes, heavy rain and the impact of hurricanes on developing winter crops.

4.5.4 Technology aids trade in fresh produce

Technology has been at the forefront of changes making fresh fruits and vegetables available to consumers globally, at an affordable price. Advances in transportation, in combination with other technological developments that have complemented the progress in transportation, have helped reduce delivery time, maintain product quality and cut shipping costs. In recent decades, it has become easier for shippers to deliver horticultural products to purchasers thousands of miles away, with no substantial loss in freshness. The feasibility of long-distance trade in perishable products will likely increase further as shipping technologies continue to improve.

In particular, advances in controlled atmosphere (CA) technologies have extended the shelf life of perishable products and continue to improve product quality and variety on a worldwide basis. With CA, products hold up better during transportation. CA technologies allow operators to lower the respiration rate of produce by monitoring and adjusting oxygen, carbon dioxide and nitrogen levels within a refrigerated container. In this way, CA can slow ripening, retard discolouration and maintain freshness of perishables like lettuce, asparagus, peaches, mangoes and avocados that would not remain fresh during ordinary refrigerated ocean transport. Some sophisticated CA systems are combined with systems that maintain relative humidity – a crucial factor for some produce such as grapes, fruit with pits and broccoli – and that control levels of ethylene, a naturally occurring gas that accelerates the ripening of fresh fruits and vegetables (Coyle *et al.* 2001).

In addition, satellite technologies – particularly global positioning systems, which are becoming increasingly available and less expensive – enable shippers to track their cargo around the world electronically. Other electronic technologies enable

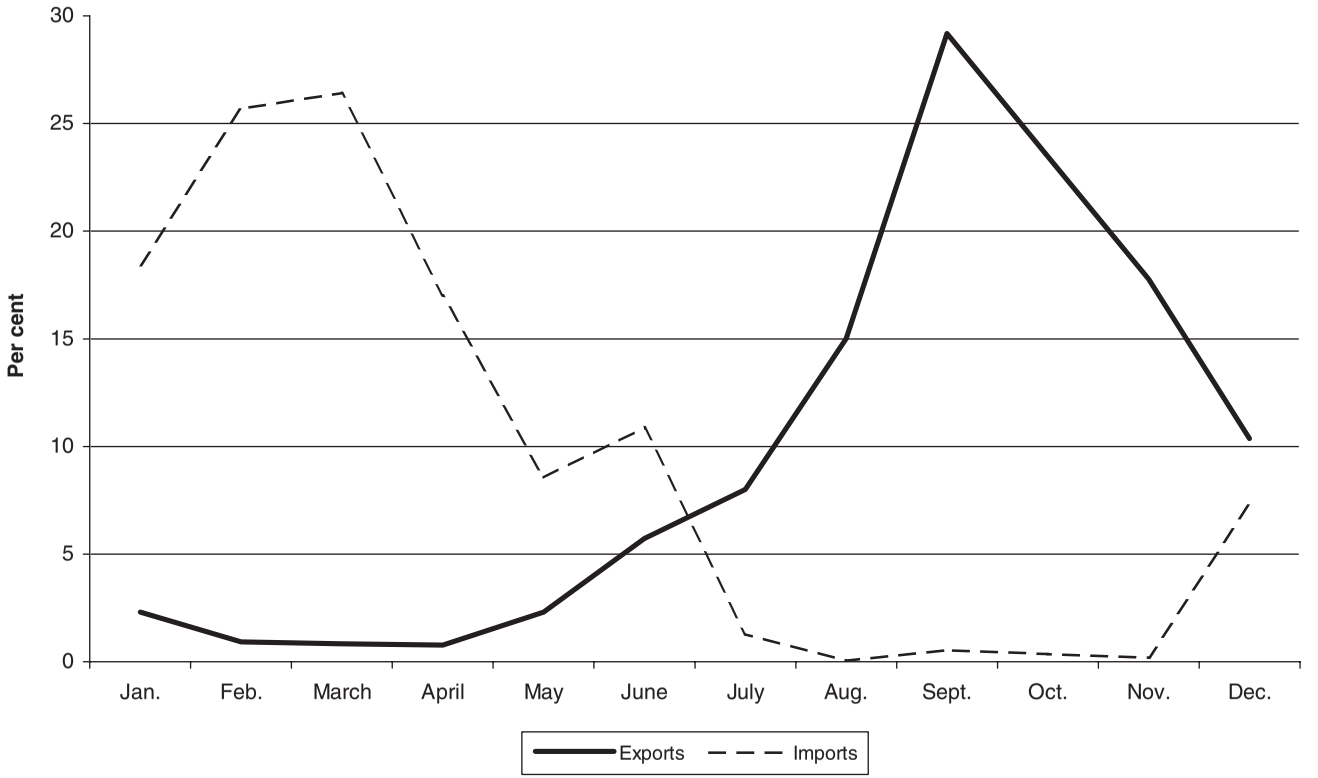

Figure 4.1 Monthly distribution of US grape trade, average 1989–2001. *Source*: Calculated based on data from the Foreign Agricultural Service, U.S. Department of Agriculture (USDA 2002).

shippers and carriers to monitor quality, reduce risk (and costs) of liability claims and shorten cargo delivery time. Information technology has also resulted in the development of remote monitoring systems for refrigerated containers, which transmit and collect performance information electronically so that physical checks are not required while the container is stacked in the hold or on the dock. The remote system may also activate an alarm, helping minimise losses when problems arise (Coyle *et al.* 2001).

4.5.5 Trade agreements

Declining trade barriers, including bilateral and multilateral trade agreements, harmonisation of sanitary and phytosanitary regulations, and dispute settlements under the auspices of the World Trade Organization, have also fostered more trade. The fast export growth of US produce to Asia between the mid-1980s and mid-1990s is a good example. During that period, the high trade barriers for horticultural imports in Asia were lowered substantially through bilateral and multilateral negotiations. For example, after completing liberalisation of lemons and grapefruit and the partial liberalisation of oranges in 1977, Japan eventually dismantled its quota system for fresh oranges on 1 April 1991. Another example is that US trade agreements, such as the Caribbean Basin Initiative and the Andean Trade Preference Act, have eliminated most agricultural tariffs on imports from those countries. Peru is now one of the largest producers and exporters of asparagus in the world. Thanks to its open access to the US market, Peru supplied 47% of US asparagus imports in 2001, compared with 10% in 1990.

Despite greater liberalisation in the overall trade environment for fruits and vegetables, there are still high tariffs and other non-tariff barriers to trade. One of the most common non-tariff barriers is composed of the various anti-dumping rules that countries can and do invoke to avoid the influx of imports. Anti-dumping practices affect the patterns of trade in fruits and vegetables and remain a threat to the trade of some commodities in some countries.

4.6 Conclusions

Trade in fruits and vegetables has become steadily more important over the last decades. The composition, volume and direction of this trade have changed as incomes and insistence on quality have grown on the demand side, while technology and trade agreements have influenced the supply side. Lower prices and greater availability of produce year-round, in tandem with increasing incomes have enhanced the array of fruits and vegetables in the global consumer's basket of goods. Other factors, such as concern for a healthy diet and improved handling and transportation, have furthered the globalisation of fruit and vegetable trade.

Globalisation of markets is likely to continue as the basic factors of supply combine with innovations in technology and lower trade barriers, enabling suppliers to meet the preferences of a more affluent clientele. Developed countries will continue

to dominate global trade in fruits and vegetables, but new varieties will find their way into the diets of the relatively affluent everywhere.

This evolving global trade pattern undoubtedly has helped to increase fruit and vegetable consumption. To date, however, the average American still does not consume the amount of fruit and vegetables currently recommended by the US Government's *Dietary Guidelines for Americans 2005*. In fact, research by the Economic Research Service of the US Department of Agriculture shows that US consumers would need to substantially increase their intake of fruits and vegetables – more than double for fruits and more than one-fourth for vegetables – to meet the recommendations in the guidelines. This is a significant dietary challenge for Americans – whose diets are high in wheat flour products, sweeteners, dairy products and meat, leaving consumers less capacity to consume fruits and vegetables.

With increasing national concern about diet and obesity, however, public and private sector nutritionists have emphasised the need for Americans to increase fruit and vegetable consumption. Future gains in fruit and vegetable consumption are expected from the continued efforts of this campaign, together with individual industry promotional efforts, additional Federal dietary emphasis, an aging and health-conscious population, and positive news reports on the benefits of eating fruit and vegetables. In addition, global trade in fruits and vegetables is expected to satisfy an increasing share of this evolving demand. Imports make year-round supply of fruits and vegetables possible, expand consumers' choices and can smooth domestic price fluctuations. They are likely to continue to contribute to increased consumption and thus help narrow the dietary gap.

Acknowledgement

This chapter is drawn from *Global Trade Patterns in Fruits and Vegetables*, by Sophia Wu Huang (ed.), Agriculture and Trade Report number WRS-04-06, US Department of Agriculture/Economic Research Service, Washington, DC, June 2004, available at http://www.ers.usda.gov/publications/WRS0406/.

References

Blisard, N., Lin, B.H., Cormartie, J. & Ballenger, N. (2002). America's changing appetite: food consumption and spending to 2020. *Food Review* **25**(1), 2–9.

Calvin, L., Cook, R., Denbaly, M., Dimitri, D., Glaser, L., Handy, C. *et al.* (2001). *U.S. Fresh Fruit and Vegetable Marketing: Emerging Trade Practices, Trends, and Issues*. USDA, Washington, DC.

Coyle, W., Hall, W. & Ballenger, N. (2001). Transportation Technology and the Rising Share of U.S. Perishable Food Trade. In: Regmi, A. (ed.). *Changing Structure of Global Food Consumption and Trade*. USDA, Washington, DC, pp. 31–40.

Harris, J.M. (2002). Food Product Introductions Continue to Decline in 2000. *Food Review* **25**(1), 24–7.

Regmi, A., Deepak, M.S., Seale, J.L. & Bernstein, J. (2001). Cross-country analysis of food consumption patterns. In: Regmi, A. (ed.). *Changing Structure of Global Food Consumption*

and Trade. Agriculture and Trade Report number WRS-01-1. US Department of Agricultural Economic Research Service, Washington, DC, May 2001.

Regmi, A. & Dyck, J. (2001). Effects of urbanization on global food demand. In: Regmi, A. (ed.). *Changing Structure of Global Food Consumption and Trade*. Agriculture and Trade Report number WRS-01-1. US Department of Agricultural Economic Research Service, Washington, DC, May 2001.

U.S. Department of Agriculture (USDA), Foreign Agricultural Service (2002). *FASOnline*, *U.S. Trade Internet System*. Retrieved March 2002 for the monthly volumes of U.S. imports and exports from http://www.fas.usda.gov/ustrade/USTImFatus.asp?QI= and http://www.fas.usda.gov/ustrade/USTExFatus.asp?QI=.

U.S. Department of Agriculture (USDA), Foreign Agricultural Service (2003). *Global Agricultural Trade System*, unpublished database. Accessed February 2003.

United Nations, Food and Agriculture Organization (FAO) (1993). *Compendium of Food Consumption Statistics from Household Surveys in Developing Countries. Vol. 1: Asia*. FAO Economic and Social Development Paper 116/1, FAO, Rome.

United Nations, Food and Agriculture Organization (FAO) (1994). *Compendium of Food Consumption Statistics from Household Surveys in Developing Countries. Vol. 2: Africa, Latin America and Oceania*. FAO Economic and Social Development Paper 116/2. FAO, Rome.

United Nations, Food and Agriculture Organization (FAO) (2003) *FAOSTAT* database. Retrived April 2003 from http://faostat.fao.org/site/535/DesktopDefault.aspx?PageID=535.

World Bank (2001). *World Development Indicators*, CD-ROM data, 2001.

5 International Trade, Food and Diet Costs, and the Global Obesity Epidemic

Adam Drewnowski, Andrew S. Hanks and Trenton G. Smith

5.1 Introduction

In the United States, obesity rates have risen as the American diet has become increasingly energy-rich but nutrient-poor (Drewnowski & Specter 2004). Energy-dense diets, rich in added sugars and fats, are far more affordable (per unit of energy) than diets composed of whole grains, lean meats, fish, low-fat dairy products, and fresh vegetables and fruit (Drewnowski & Darmon 2005a). Energy-dense diets also taste good and are readily available and convenient. Inexpensive starches, fats and sweets may represent the only viable food option for low-income consumers. As a result, more people consume energy-dense diets, especially in lower income groups (Drewnowski & Darmon 2005b). The low energy cost of the diet ($/1,000 kcal) rather than the consumption of fast foods, sweets or desserts per se, may thus be the most powerful predictor of weight gain (Drewnowski 2007).

Population groups with low education and income, some racial and ethnic minorities, and high-poverty areas suffer from higher rates of obesity and its metabolic complications (Drewnowski & Specter 2004). Overlapping maps of poverty and obesity by geographic location clearly demonstrate that obesity in America is, for the most part, an economic issue (Drewnowski 2007). Historically, obesity in developing countries has also followed a socioeconomic gradient, but with greater obesity among wealthier groups (Nguyen *et al.* 2007; Sobal & Stunkard 1989). It was initially described as a 'disease of affluence', with the highest prevalence observed among the better-educated urban dwellers (Monteiro *et al.* 2004). In recent years, as gross national product (GNP) has increased, the distribution of obesity in developing countries has shifted towards lower socioeconomic groups, particularly in those characterised by large agglomerates of urban poor (Drewnowski & Popkin 1997). The shift towards obesity in lower income women has typically occurred at earlier stages of economic development than it did for men. In a number of developing countries, obesity is rapidly becoming the problem of women and the urban poor (Aguirre 2000; Monteiro *et al.* 1995, 2004).

These rising obesity rates in the developing world have been linked to the 'nutrition transition', the replacement of traditional plant-based diets with more sugars and vegetable and animal fats (see Chapters 1 and 3) (Drewnowski & Popkin 1997; Popkin 1994). It seems likely that this wave of cheap fats and sugars has propelled the growth of obesity in developing countries by lowering the cost of energy-dense

diets (Monteiro *et al.* 2004). International trade has likely contributed to this process by lowering the economic costs of food and diets. As a result, a diet high in energy and low in nutrition becomes more affordable and/or attractive relative to a diet that is more nutritious.

This chapter sets out a series of propositions that link economic theory with current public health findings regarding increasing obesity rates. The first proposition is that international trade lowers food and diet costs; second, that energy-dense foods and diets cost less relative to nutrient-rich foods and diets; third, that consumption of energy-dense foods and diets increases as income declines and, therefore, low-cost, energy-dense diets may contribute to overeating by the poor; and finally, that the recent significant increases in global food prices may increase the likelihood that poor consumers will purchase energy-dense diets, thus further contributing to the growth of obesity in the developing world.

5.2 Proposition 1: World trade has reduced the relative cost of dietary energy

World trade has influenced the cost of energy dense foods. While trade is rightly credited with allowing the more efficient production of goods and services, it has also affected changes in economic organisation that have reliably driven consumers towards the purchase of energy-dense processed foods. This phenomenon is perhaps best viewed from the perspective of the economist's conception of consumer choice. When a consumer chooses foods, he or she is constrained by the scarcity of money (needed to purchase food), of time (to obtain, prepare and eat meals), and of information (about cooking, availability of food products and the various effects of particular foods on health outcomes such as obesity) (Box 5.1). These

Box 5.1 Constraints on dietary choice.

Material

- Food prices (energy-dense versus nutrient-rich)
- Availability
- Household income

Time

- Paid labour
- Shopping
- Food preparation

Information

- Cultural knowledge of foods and food preparation
- Nutrition education
- Local price and availability

constraints are inextricably linked in a market economy, since time spent on cooking or obtaining knowledge is necessarily time that cannot be devoted to earning a wage (hence the economist's phrase 'opportunity cost of time') or other necessary or desirable activities. Any change in the relative cost (or price) of one of these items might, therefore, be expected to induce changes in (i.e. substitution either towards or away from) consumption of the others.

Trade-driven factors have reduced the relative cost of dietary energy in the developing world. Four particularly critical factors have been: (i) the dramatic expansion of trade in the inputs to processed energy-dense foods (refined grains, sugar cane and corn sweeteners, and vegetable oils), (ii) urbanisation, (iii) foreign direct investment and (iv) rising household incomes (factors that are also discussed in Chapters 3, 4, 6, 9 and 11).

The most direct effect of international trade on food and diet is probably via the stimulation of technological innovation and production of vegetable oils and sugars. Major economic and political initiatives led to the development of oil crops not only in Europe and the United States, but also in Southeast Asia (palm oils) and in Brazil and Argentina (soya bean oils) (as also discussed in Chapter 3). The production and export of inexpensive vegetable oils were promoted through direct subsidies, credit guarantees, food aid and market development programmes. As shown in Figure 5.1, global availability of corn, palm, palm kernel, rapeseed, soya bean and sunflower oil surpassed 100 million tons by 2005, more than twice the amount produced in 1991 and more than 13 times world production in 1961.

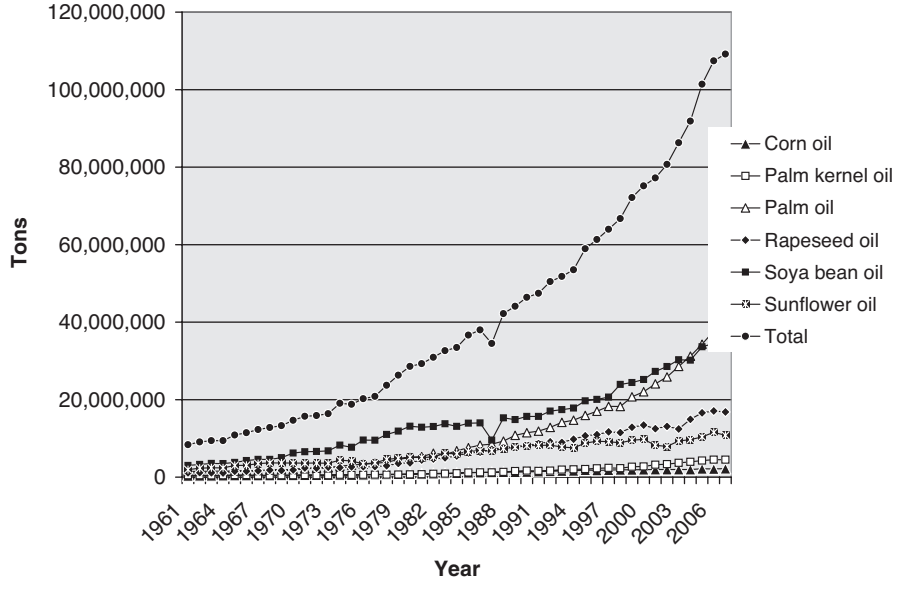

Figure 5.1 World production of vegetable oils, 1971–2007. *Source*: Data from FAOSTATS (Retrieved 10 March 2009 from http://faostat.fao.org/site/636/DesktopDefault.aspx?PageID=636#ancor).

While much of the growth before 1990 was attributable to soya bean oil, in recent years, palm oil production – driven in part by the health-motivated move away from hydrogenated oils – has risen dramatically and now exceeds that of soya bean (Figure 5.1).

Technological advances in oilcrop yields and refining practices have greatly reduced the price of vegetable oils relative to meat or fresh produce. Technological breakthroughs in the development of high-yield oilseeds and in the refinement of high-quality vegetable oils have further helped reduce the cost of baking and frying fats, margarine, spreads, and salad and cooking oils. As a result, vegetable oils have altered the global food supply, becoming widely available to countries in the early stages of economic development (Drewnowski & Popkin 1997).

Global production of caloric sweeteners and their export (primarily by Brazil) has also increased over the past several decades. Sugars, derived from cane, corn and sugar beet, account for a progressively higher percentage of energy in the global diet. Until recently, the world price of raw and refined sugar had shown a steady decline and, according to some analyses of food balance data, sweetener consumption by lower income nations has increased the most (Popkin 1994). As a result of these changes, even the lowest income countries now have access to additional caloric sweeteners and vegetable fats.

Trade in vegetable oils and sugar has also increased dramatically in recent years, mainly due to the increase in imports of palm oil (for more detail, see Chapter 3). Figure 5.2 shows world trade in oilseeds; and while reliable trade data for caloric sweeteners is not readily available, Brazil's recent experience is informative: between 1990 and 2005, exports of refined sugar increased tenfold (FAOSTAT 2009). Increased trade in the agricultural commodities that serve as feedstocks for energy-dense processed foods does not necessarily speak to the key issues of price and availability, but it does underscore the magnitude of the profound changes taking place in food systems around the world.

A second trade-related factor that reduces the cost of energy-dense diets is urbanisation. At the most fundamental level, trade between countries is advantageous because it allows for specialisation in productive activity. In practice, this typically means the employment of unskilled labour increasingly moves from agriculture to manufacturing – which in turn implies migration of workers from rural to urban areas. Urban growth now dominates most low-income countries, leading to vast urban conglomerates. These cities of 5–27 million are growing much faster in the less developed than more developed regions of the world. The most explosive growth of mega-cities has been in Asia.

Physical access to healthy foods is limited in poor urban areas. The relation between urbanisation and dietary quality should not be surprising. New immigrants to urban areas are not only physically removed from their rural culture and food traditions (exposed, instead, to advertisements for brand-name foods), but they are also likely to be faced with dramatically different relative food prices. Compared to prepackaged processed foods, delivering fresh produce to urban populations will always be at a significant cost disadvantage on at least three counts: production is necessarily more dispersed, which implies higher transportation costs; it is subject

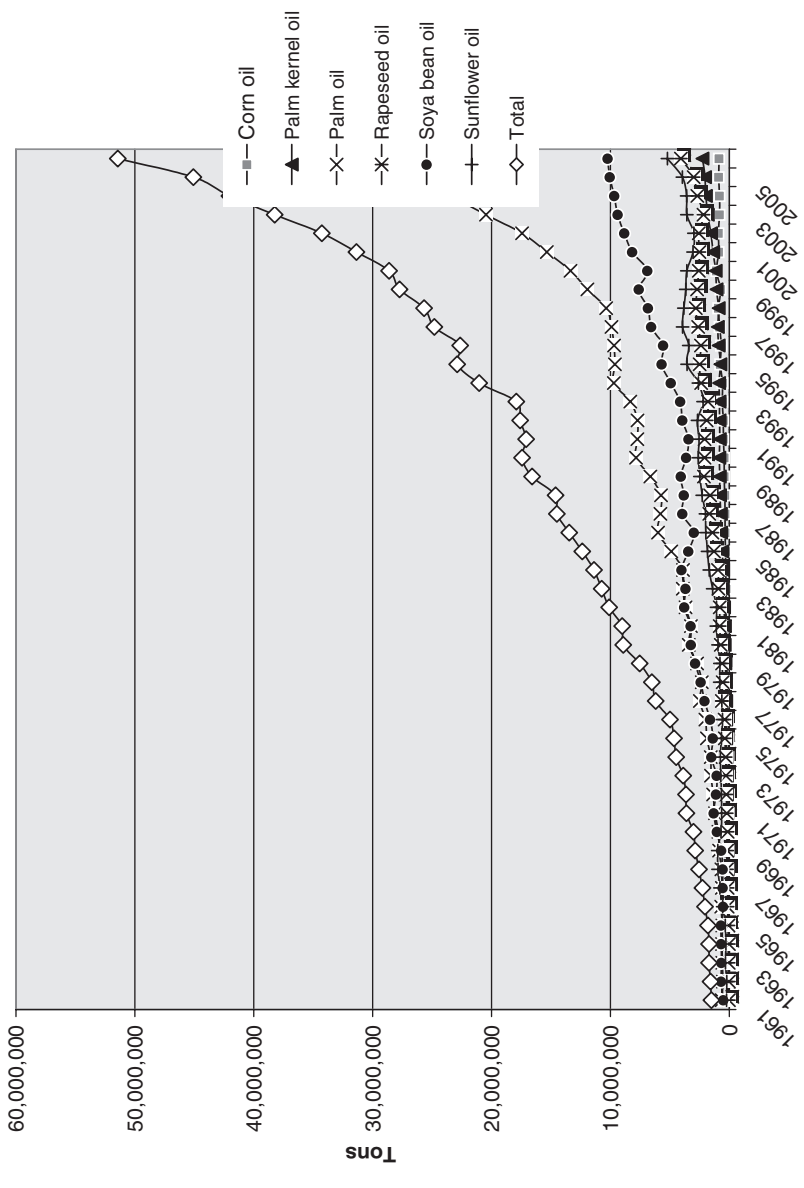

Figure 5.2 World trade in vegetable oils, 1961–2006 (imports). *Source*: Data from FAOSTATS (Retrieved 10 March 2009 from http://faostat.fao.org/site/535/DesktopDefault.aspx?PageID=535#ancor).

to spoilage (and may require refrigeration en route); and it weighs as much as ten times more per calorie.

Urbanisation has a profound effect on diet composition. Analyses of Food and Agriculture Organization (FAO) food balance sheets and World Bank economic indicators data for 1990 simulated the impact of urbanisation on the proportion of sugars energy in the diet (Drewnowski & Popkin 1997). The simulation predicted a significant increase in sugars consumption, especially in low-income countries. Since then, other studies have explored the consumption of caloric sweeteners by the urban poor, with particularly persuasive data obtained from Brazil (Monteiro *et al.* 1995). As predicted in 1997 by Drewnowski and Popkin, increased urbanisation of lower income nations is accelerating the shift towards increased consumption of sweeteners and fats.

A third key trade-related factor is foreign direct investment (FDI) inflows. It has been suggested that FDI into food processing increases the availability and lowers the cost of highly processed foods (Hawkes, 2005; also discussed in Chapter 3). A simple data analysis of FDI and a processed food index suggests that FDI promotes processed food consumption. Using consumption data from the UN's FAO, the index is composed of the ratio of consumption of the three primary feedstocks of processed foods: corn, soya beans and sugar crops (fraction of total calories in the diet) to consumption of fruits and vegetables (again, as a fraction of calories in the diet) for 1990–2005. The index can thus be conceptualised as:

$$\text{PFI} = \frac{\%\ \text{corn} + \%\ \text{soybeans} + \%\ \text{sugar crops}}{\%\ \text{fruits and vegetables}}$$

A simple bivariate linear regression indicates a positive association between changes in this processed food index (PFI) and changes in FDI inflows (Figure 5.3). Although the FDI data are not specific to the food processing or food production industries, the association is consistent with trade-induced changes in local food production systems.

Fourth, trade liberalisation has stimulated economic growth in developing countries, leading to rising incomes. It is an unfortunate irony that success in this regard has been accompanied by the displacement of traditional food cultures in favour

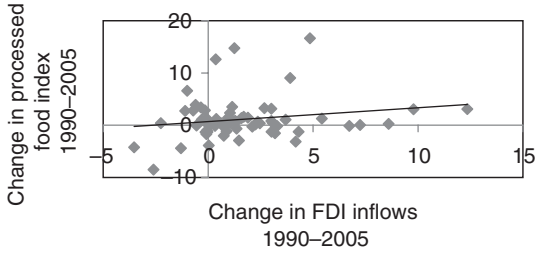

Figure 5.3 Relationship between foreign direct investment into low-, middle-income countries (1990–2005) and index of processed food consumption. Source: Data from FAOSTATS (Retrieved 13 September 2007 from http://faostat.fao.org/site/609/default.aspx#ancor) and from World Bank (2007).

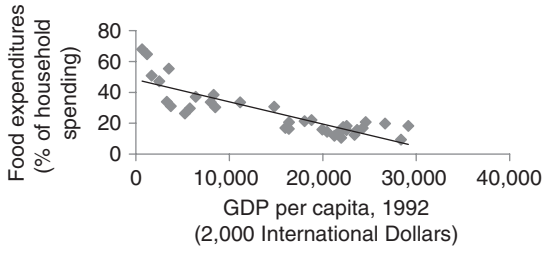

Figure 5.4 Relation between per capita GDP and percent income spent on food, 1992–2005. *Source*: Meade and Rosen (1996) and Euromonitor International (1992–2005).

of energy-dense processed foods. Indeed, one of the most reliable trends over the past several decades has been the sustained realisation of what is known as 'Engel's law', the principle that the share of income spent on food decreases as incomes rise. Figure 5.4 shows that as per capita real GDP increases among various countries (36 countries in 1992 and 60 in 2005, to be exact) between 1992 and 2005, the percentage of disposable income spent on food declines. Again, as incomes have risen, the relative cost of food has fallen – although it is important to note that, in 2005, many households in the poorest countries still spent more than 40% of income on food.

5.3 Proposition 2: Energy-dense foods and diets cost less; nutrient-dense foods and diets cost more

Studies on the relative cost of dietary energy have a long and distinguished history (Atwater 1894; Boyd Orr 1937). Studies conducted by W.O. Atwater, the founder of nutrition research at the United States Department of Agriculture (USDA), examined the relative cost of protein from different food sources. A contemporary re-analysis (Drewnowski 2004) showed that wheat flour, dried beans, white bread and cheese were more energy-dense and cost less per megajoule (MJ) of dietary energy than did either seafood (oysters) or fresh fruit (oranges). Even based on 1887 food prices, there was a negative relation between energy density (energy per unit weight) and energy cost (retail cost per unit energy).

The relation between energy density (MJ/kg) and energy cost ($/MJ) is by now well established. Figure 5.5 shows the relation between foods' energy density and energy cost ($/MJ) based on 2006 prices in Seattle supermarkets (Monsivais & Drewnowski 2007). Fats and oils, sugar, refined grains, potatoes and beans provided lowest-cost dietary energy. Energy cost of vegetable oils and sugars was less than $1/MJ, whereas the cost of fresh produce was ten times as much. The energy cost of sweetened beverages was much lower that the cost of fruit juices or fresh fruit. The differential in energy costs between lard and lettuce was several thousand per cent. The same results have been obtained using 2000 food prices in France (Drewnowski & Darmon 2005a, 2005b). Again, refined grains, added sugars and

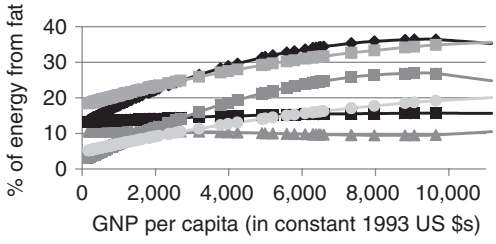

Figure 5.5 Relationship between energy density (kcal/100 g) and energy costs. *Source*: Based on data from the city of Seattle, Washington, United States (Monsivais & Drewnowski 2007).

fats were the lowest cost sources of dietary energy, whereas the more nutrient dense foods were associated with higher energy costs per MJ.

If healthier foods cost more per unit energy, then so must healthier diets. Observational studies relating dietary energy density to energy costs have come to two principal conclusions. First, lower energy density is associated with higher energy costs. This was first shown in a study of French adults, with diet costs estimated using mean national food prices for 57 index foods provided by the French National Institute of Statistics (INSEE) (Darmon *et al.* 2004). Dietary energy density (MJ/kg) was obtained by dividing energy intakes by the estimated edible weight of all foods and caloric beverages consumed. Participants were split by quintiles of energy intake (MJ/day) and the relationship between dietary energy density and diet costs was assessed separately for each quintile. Figure 5.6 shows that, at each quintile of energy intake, energy-dense diets cost less (€/day) than low energy density diets. Selecting an energy-dense diet was, in other words, an effective strategy to save money.

Higher nutrient density (an index of diet quality) is also associated with higher energy costs. Among UK women, diet quality, as measured by an index of fruit and vegetable intakes, has been associated with higher diet costs (Cade *et al.* 1999). A study of French adults showed that higher fruit and vegetables intakes were associated with higher diet costs, after adjusting for energy (Drewnowski *et al.* 2004). Another study of French adults showed that energy density and nutrient

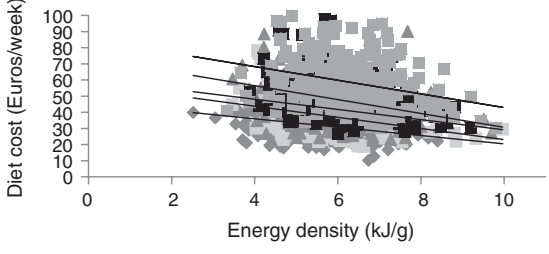

Figure 5.6 At each intake quintile, higher energy density–lower cost (€/week). *Source*: INCA Data (Darmon & Drewnowski 2008).

density each had independent effects of diet cost. The nutrient content of the diet (i.e. dietary quality) contributed substantially to diet costs. As a result, the lowest cost diets were energy dense but nutrient poor. They were also associated with the highest energy intakes overall.

5.4 Proposition 3: Consumption of energy-dense foods and energy-dense diets increases as incomes decline

As shown in Figure 5.4, the share of income spent on food decreases as incomes rise. The drop in food spending is disproportionately greater than the drop in spending on other goods. In the United States, the average American spends approximately 7% of disposable income on food consumed at home and another 4% on foods consumed away from home, the lowest such percentage in the world (Drewnowski 2004). Mean per capita expenditure on foods and beverages (including alcohol) has been estimated at under $8/day, with some families spending no more than $4/day. However, the proportion of disposable income devoted to food can reach 25–30% for lowest income families (Drewnowski 2004).

In United States, evidence is accumulating that lower income families preferentially select lower cost but more energy-dense diets. Added sugars and fats now account for close to 40% of daily energy intakes (Drewnowski & Darmon 2005b). Time trend analyses suggest that average diet composition has moved – presumably driven by changes in production technology, income distribution and relative prices – towards more lower cost foods. Data show that there has been a 300-kcal increase in daily energy intakes between 1985 and 2000 in the United States (Drewnowski 2004). This increase was largely due to refined grains, added sugars and added fats. Second, the consumption of fruits and vegetables has not kept pace, with trends pointing to the lower cost options. In 2000, half of total fruit servings in the United States were accounted for by low-cost orange juice, bananas, apple juice, fresh apples, fresh grapes and watermelon. Low-cost potatoes (fresh, frozen and potato chips), canned tomatoes and iceberg lettuce accounted for 48% of total vegetable servings. The consumption of more nutrient-rich (and more costly) leafy green vegetables was of only 0.2 servings per day, with deep yellow vegetables adding another 0.2 servings (Drewnowski 2004).

Lower income families economise by buying low-cost vegetables and fruit, cheaper cuts of meat and more cereals, added sugars and added fats. They also buy more meals at fast-food restaurants. Meals away from home tend to have a higher content of added fats, sugars and sodium than meals at home. The American diet has thus become more energy-dense and there are growing concerns that it is also becoming nutrient-poor. A recent review of the literature linked diet quality with incomes and social class (Darmon & Drewnowski 2008). Based on data largely collected outside the United States, the review concluded that certain foods acted as social class indicators. Thus, the consumption of whole grains, lean meats, fish, and fresh vegetables and fruit was associated with income.

The present theory suggests that low-income families struggling to buy food in the face of severe budgetary constraints would be driven towards more energy-dense foods. This suggests that energy-dense foods meet the economist's definition of *inferior* goods. A consumption good is inferior when its use decreases with increasing income. As discussed below, this observation could exacerbate the public health problems stemming from consumption of energy-dense diets.

5.5 Proposition 4: Low-cost, energy-dense diets contribute to obesity among the poor

The observed links between eating habits and rising obesity rates appear to be mediated by low-cost energy-dense diets and the economics of food choice. Economic studies have linked rising obesity rates in the United States to the lower cost of all foods and the increasing cost of physical activity relative to other goods (Chou *et al.* 2004; Cutler & Shapiro 2003). These analyses, however, have not examined the related problem of disparities by socioeconomic strata. Obesity rates are not equally distributed across all segments of American society; not all foods have dropped in price by the same amount; and diet quality and diet cost may show sharp variations by social class (Darmon & Drewnowski 2008).

In reality, the burden of obesity falls disproportionately on population subgroups with the most limited economic means. Paradoxically, following Engel's law, groups at most risk for obesity spend the *largest* proportion of disposable income on food. Whereas the affluent lean may spend no more than 7% of income on food, the obese poor spend in excess of 25%, this according to data from the Bureau of Labour Statistics. For the poor, the only way to meet daily caloric needs might be through the purchase of nutrient-poor, energy-dense processed foods (Darmon *et al.* 2002).

The preferential consumption of energy-dense foods and energy-dense diets may have metabolic consequences. Experimental and clinical studies have shown that energy density of foods, coupled with larger portion sizes, can cause overeating. The energy-dense diets were high in fats and sweets, whereas the low-energy density diets contained more low-fat dairy products, vegetables and fruit. In other words, there may be physiological and economic reasons why low-cost, energy-dense diets are associated with overeating and weight gain.

Numerous studies have linked the rising rates of obesity in the United States to growing consumption of fast foods, snacks, caloric beverages, sweets and desserts. These observations are consistent with a single parsimonious explanation: obesity is caused by the consumption of low-cost energy-dense processed foods (Drewnowski 2007). Paradoxically, reducing food expenditures may raise energy intakes (perhaps via differential effects on satiety) as consumers spend less and eat more (Drewnowski & Specter 2004). In today's America, the poor are obese and the rich are thin (Aguirre 2000) and there is good reason to believe that as the developing world becomes more and more linked (by trade) to the world economy and traditional food systems are displaced by manufactured energy-dense foods, that the rest of the world will soon suffer the same fate.

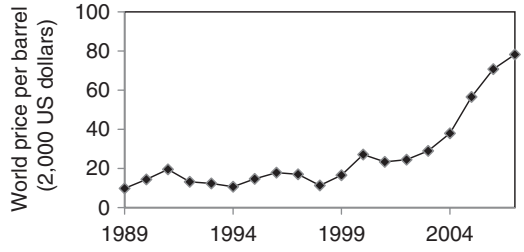

Figure 5.7 The rising price of crude oil, 1989–2007. *Source*: Data from U.S. Energy Information Administration (2007).

5.6 Proposition 5: Rising global food prices could paradoxically lead to increasing global obesity rates

Refined grains, vegetable oils and sugars (both cane and corn) have experienced unprecedented price volatility over the past few years. The rising price of crude oil depicted in Figure 5.7 has had a profound impact on food prices. The real prices for most agricultural commodities have risen dramatically since 2006, as shown in Figure 5.8 for vegetable oils in the United States.

One view (Severson 2008) is that such price increases represent good news for public health since global obesity rates are likely to decline. That view is not only profoundly elitist (implying that semi-starvation is somehow better than obesity) but is also likely to be incorrect. Rather, economic theory suggests that faced with scarcity and rising costs, people might well consume *more* energy-dense foods and diets. The reason for this is as follows.

First, commodities such as soya bean oil and refined sugar are primary feedstocks for the production of processed foods and energy (especially liquid petroleum-based fuel) is an important input to the production and shipment of processed foods. As such, it could be assumed that the prices of processed foods would *rise* as a result of the recent developments. Yet, when the price of a particular good rises, economic theory holds that two distinct effects follow. First, consumers of the good will tend to shift away from the more expensive product and towards less expensive substitutes (the *substitution* effect). Such a consumer also finds himself or herself (from the perspective of his or her pre-price-increase consumption bundle) with

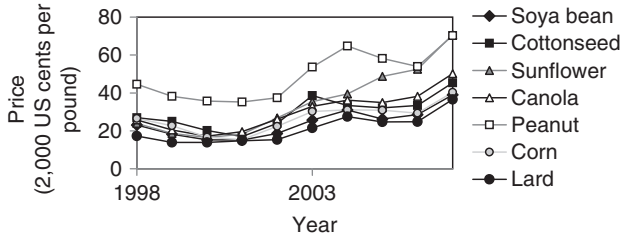

Figure 5.8 US prices of vegetable oils, 1998–2007. *Source*: U.S. Department of Agriculture (2007).

less money to spend. He or she therefore must re-allocate all expenditures, just as he or she would if his or her income had fallen. This re-allocation (known as the *income* effect) might include either an increase or a decrease in consumption of the good whose price had risen. If the latter holds (i.e. consumption rises with rising income), then the income and substitution effects work in the same direction, and a price increase unambiguously results in decreased consumption. If consumption falls with rising income (in which case the good in question is known as an *inferior* good), it is possible that an increase in price could (as long as the income effect dominates) result in *increased* consumption (assuming, of course, that only the price of the good in question changes). Goods for which demand rises in response to increases in price are known in economic theory as 'Giffen goods'.

Instances of such 'upward-sloping demand' (i.e. Giffen goods) are exceedingly rare in the modern world, because the conditions necessary to meet them are extreme: a low-quality (inferior) good, for which high-quality substitutes are also consumed and which must constitute a large fraction of household expenditures. There is one real-world situation, however, in which Giffen behaviour seems likely: the purchase of energy-dense foods by poor families in the developing world. As put in the original text explaining the economic theory: 'As Mr. Giffen has pointed out, a rise in the price of bread makes so large a drain on the resources of the poorer labouring families and raises so much the marginal utility of money to them, that they are forced to curtail their consumption of meat and the more expensive farinaceous foods: and, bread being still the cheapest food which they can get and will take, they consume more, and not less of it' (Marshall 1895: 208).

As noted above, there is ample evidence that energy-dense foods are inferior goods for the low-income household. For poor families, such foods constitute large proportions of household income. Deaton and Subramanian (1996), for instance, find that the poorest households in Maharashtra, India, spend an average of 20% of their income on (and get 53% of daily calories from) sorghum; Jensen and Miller (2007) find similar patterns in China for rice in the Hunan province and for wheat in the Gansu province, and even present experimental evidence of Giffen behaviour for these goods.

If this conjecture about the dominance of income effects is correct, the rising world prices of grains, sugars and fats may paradoxically serve to *aggravate* the global obesity epidemic, as well as contributing to political instability and social unrest.

5.7 Conclusions

International trade lowers the relative costs of energy-dense foods and diets. Consuming these diets leads to obesity and groups of lower socioeconomic status are more likely to consume them. Thus, the rising prevalence of obesity among lower income people in developing countries can be partly explained by the decreasing costs of energy-dense diets. This evidence-based proposition adds to the argument that international trade has a profound influence on diet quality and, therefore, global health.

Dietary shifts that occur as a function of economic growth and development have been characterised previously as the nutrition transition (Popkin 1994). Developing nations undergoing the nutrition transition replace their traditional plant-based diets with more animal protein, sugar and animal fat. The optimistic view was that the next stage of the nutrition transition would lead to diets with more whole grains, lean meats, vegetables and fruit, and to more leisure time and increased physical activity (Popkin 1994).

However, the world economic situation is less ideal than previously hoped, and those projections of future global health and happiness may have been overly optimistic. Instead, globalisation and world trade have made societies dependent on low-cost, energy-dense foods – and none more so than the urban poor. Added sugars and vegetable fats reduce energy cost ($/MJ) of the global diet, while increasing its energy density (MJ/kg). Whereas the nutrition transition used to be based on the dietary shift from plant to animal foods, the new 'post-industrial' version of the nutrition transition is based around low cost refined grains, added sugars and fats. Foreign direct investment and world trade may have also opened the door to diets of low cost processed foods, largely based on commodity crops: soya bean, corn and sugar crops.

The increase in fuel and food prices means that these nations will be in a difficult situation. One view (Severson 2008) is that obesity rates will decline. The conclusion arrived at here is far more pessimistic. Energy-dense foods seem to meet all the criteria for Giffen goods for low-income households. In the face of global scarcity of foods, low-income household consumption of energy-dense foods will likely increase even as prices rise. By that time, as their prices rise, meat, fruits and vegetables will be out of reach.

The question of the effects of recent market developments on dietary quality should be considered an urgent research question. The current geopolitical and economic trends are already disturbing the world food supply. One undesirable potential consequence has been a rise in staple food prices attended by political and economic unrest. Another may well be even more obesity in the developing world.

References

Aguirre, P. (2000). Socioanthropological aspects of obesity in poverty. In: *Obesity and Poverty: A New Public Health Challenge*. World Health Organization, Geneva.

Atwater, W.O. (1894). *Foods, Nutritive Value and Cost*. U.S. Department of Agriculture. Farmers' Bulletin No. 23. Government Printing Office, Washington, DC.

Boyd Orr, J. (1937). *Food, Health and Income*. Macmillan, London.

Cade, J., Upmeier, H., Calvert, C. & Greenwood, D. (1999). Costs of a healthy diet: analysis from the UK Women's Cohort Study. *Public Health Nutrition* **2**, 505–12.

Chou, S.Y., Grossman, M. & Saffer, H. (2004). An economic analysis of adult obesity: results from the behavioral risk factor surveillance system. *Journal of Health Economics* **23**(3), 565–87.

Cutler, D. & Shapiro, J.G. (2003). Why have Americans becomes more obese? *Journal of Economic Perspectives* **17**(3), 93–118.

Darmon, N., Briend, A. & Drewnowski, A. (2004). Energy-dense diets are associated with lower diet costs: a community study of French adults. *Public Health Nutrition* **7**(1), 21–7.

Darmon, N. & Drewnowski, A. (2008). Does social class predict diet quality? *American Journal of Clinical Nutrition* **87**(5), 1107–17.
Darmon, N., Ferguson, E.L. & Briend, A. (2002). A cost constraint alone has adverse effects on food selection and nutrient density: an analysis of human diets by linear programming. *Journal of Nutrition* **132**, 3764–71.
Deaton, A. & Subramanian, S. (1996). The demand for food and calories. *Journal of Political Economy* **104**(1), 133–62.
Drewnowski, A. (2004). Obesity and the food environment: dietary energy density and diet costs. *American Journal of Preventive Medicine* **27**(Suppl 3), 154–62.
Drewnowski, A. (2007). The real contribution of added dietary sugars and fats to obesity. *Epidemiologic Reviews* **29**(1), 160–71.
Drewnowski, A. & Darmon, N. (2005a). Food choices and diet costs: an economic analysis. *Journal of Nutrition* **135**, 900–904.
Drewnowski, A. & Darmon, N. (2005b). The economics of obesity: dietary energy density and energy cost. *American Journal of Clinical Nutrition* **82**(Supp 1), 265S–73S.
Drewnowski, A., Darmon, N. & Briend, A. (2004). Replacing fats and sweets with vegetables and fruit – a question of cost. *American Journal of Public Health* **94**, 1555–59.
Drewnowski, A. & Popkin, B.M. (1997). Dietary fats and the nutrition transition: new trends in the global diet. *Nutrition Reviews* **55**, 31–45.
Drewnowski, A. & Specter, S.E. (2004). Poverty and obesity: the role of energy density and energy costs. *American Journal of Clinical Nutrition* **79**, 6–16.
Euromonitor International (1992–2005). *World Development Indicators Database*. Retrieved 18 October 2008 from http://web.worldbank.org/.
FAOSTAT (2009). Retrieved 10 March 2009 from http://faostat.fao.org/site/535/DesktopDefault.aspx?PageID=535#ancor.
Hawkes, C. (2005). The role of foreign direct investment in the nutrition transition. *Public Health Nutrition* **8**, 357–65.
Jensen, R.T. & Miller, N.H. (July 2007). *Giffen Behavior: Theory and Evidence*. NBER Working Paper 13243.
Marshall, A. (1895). *Principles of Economics*. Macmillan, London.
Meade, B. & Rosen, S. (1996). Income and diet differences greatly affect food spending around the world. In: *International Market Trends*. Retrieved from http://www.ers.usda.gov/Publications/FoodReview/Sep1996/Sept96h.pdf.
Monsivais, P. & Drewnowski, A. (2007). The rising cost of low energy density foods. *Journal of the American Dietetic Association* **107**(12), 2071–6.
Monteiro, C.A., Mondini, L., de Souza, A.L.M. & Popkin, B.M. (1995). The nutrition transition in Brazil. *European Journal of Clinical Nutrition* **49**, 105–13.
Monteiro, C.A., Moura, E.C., Conde, W.L. & Popkin, B.M. (2004). Socioeconomic status and obesity in adult populations of developing countries: a review. *WHO Bulletin* **82**(12), 940–46.
Nguyen, M.D., Beresford, S. & Drewnowski, A. (2007). Trends in overweight by socio-economic status in Vietnam: 1992–2002. *Public Health Nutrition* **10**, 115–21.
Popkin, B.M. (1994). The nutrition transition in low-income countries: an emerging crisis. *Nutrition Reviews* **52**, 285–98.
Severson, K. (2 April 2008). Some good news on food prices. *New York Times*, F1.
Sobal, J. & Stunkard, A.J. (1989). Socioeconomic status and obesity: a review of the literature. *Psychology Bulletin* **105**(2), 260–75.
U.S. Department of Agriculture (2007). *Monthly Feedstuff Prices and Peanut Report*. Agricultural Marketing Service. Retrieved 15 October 2007 from http://www.fas.usda.gov/.
U.S. Energy Information Administration (2007). Retrieved 31 October 2007 from http://tonto.eia.doe.gov.
World Bank, World Development Indicators, ESDS International, University of Manchester (2007). Retrieved 13 September 2007 from http://web.worldbank.org/.

6 Trade, Transnational Corporations and Food Consumption: A Global Value Chain Approach

Gary Gereffi and Michelle Christian

6.1 Introduction

The spread of obesity, particularly in developing countries, has been linked to economic globalisation, notably the interrelated expansion of trade, foreign direct investment and transnational corporations (TNCs). Many studies have placed local increases of obesity, and associated changes in food consumption patterns, in this global context, stressing how the availability and diversity of internationally traded food products have transformed local agriculture and food systems and, thereby, food prices and availability (see, for example, Kennedy *et al.* 2004; Lang 2003; Popkin & Gordon-Larsen 2004).

What has been lacking from this literature thus far is a detailed theoretical framework that situates why, how and what global economic processes are transmitted to the local level. This chapter attempts to fill this void by developing a global value chain (GVC) framework for the study of global economic processes, food consumption patterns and obesity. A methodology already widely used in the social sciences to understand global industry structure, GVC analysis focuses on the role of lead firms in global industries (in this case global agri-food companies, like Cargill, Kraft, PepsiCo and McDonald's), and how they interact with local-level companies. This is particularly pertinent given the attention received by TNCs as purveyors of fast foods, snacks and other highly processed foods.

The chapter first defines and describes the main concepts and methods of GVC analysis, and outlines how this approach can be used to analyse changes in food consumption patterns. It then applies the GVC framework to examine the linkages between trade, foreign direct investment and food consumption in three illustrative country case studies (China, Mexico and Trinidad and Tobago), and highlights the role of TNCs as drivers of food consumption through two company case studies (McDonald's and PepsiCo).

6.2 Concepts and methods of GVC analysis

GVC analysis examines the actors and mechanisms that shape and transform global economic processes and various types of inter-firm relationships (see the Center

on Globalisation, Governance, & Competiveness global value chains web site, http://www.globalvaluechains.org/concepts.html). It seeks to identify why and how an industry is globally organised, how local economic processes are conditioned by global arrangements, and where change is most likely to happen (Gereffi & Kaplinsky 2001). GVC analysis incorporates the full range of activities of lead firms and their suppliers to bring a product from its initial conception to the consumer; these activities are spread far and wide across geographic space and yet have profound consequences at the local level. Such activities impact jobs, technologies, standards, regulations, products, processes and markets in specific industries and places (Gereffi 2005; Sturgeon 2009).

GVC research has its foundation in world-system theory, which posits that countries are located in the core, periphery and semi-periphery of the global economy, with their position reflecting their development capabilities (Bair 2009; Gereffi 2005). World-system theory focuses on nation-states (i.e. countries), its fundamental principle being that power and hierarchy are embodied in the relations between nation-states and their position in the global economy. GVC analysis embodies this core principle but shifts the focus to the powerful role of TNCs, which operate fluidly across borders. The first incarnation of GVC analysis was the global commodity chains framework (Gereffi & Korzeniewicz 1994). The concept of 'value' was incorporated into the framework when researchers started to use the analysis to show where value is captured in a particular industry, which firms have that value and where they are located, and how firms (and the countries they are based in) can move to higher value positions in their industries (Gereffi & Kaplinsky 2001; Gibbon & Ponte 2005). Traditionally, GVC analysis was applied to manufacturing industries such as apparel (Gereffi 1999), electronics (Sturgeon 2002) and automobiles (Humphrey & Memodovic 2003), but its application can be much broader.

The GVC framework has proven particularly useful when applied to understanding practical, real-world problems. Because the integrative conceptual scheme of GVC analysis connects the global and local levels of analysis, anyone interested in reform – researchers, firms, policy makers, or non-governmental organisation (NGO) activists – can search for leverage points whereby specific business practices and development conditions can be championed or criticised, and pathways for change can be sought (Gereffi *et al.* 2009; Oxfam International 2004). For example, countries that wish to upgrade into higher value segments of an industry, or to switch to an entirely different one, can use the framework to understand their competitive strengths, along with the challenges they must overcome to improve their position (Dolan & Humphrey 2004; Gibbon & Ponte 2005). Labour unions or activists can use the framework to identify why firms move offshore and where to exert pressure on firms to provide better labour rights and protection at home or abroad (Raworth & Kidder 2009). GVC analysis can also be applied by environmental and health groups to show how global economic processes interact in local contexts to environmentally degrade land, water and air quality, or to change the types of food available in schools and communities.

The GVC model employs specific methodological tools organised into a series of discrete research steps. First, the stages and actors in the value chain are identified by tracing the entire input–output process that brings a product or service from initial conception into the consumer's hands. The main segments in the value chain follow a typical sequence: research and development → design → production → distribution → marketing → sales. The analysis then identifies the actors in each segment, their relative size and importance, and how their roles may be changing. These actors include the lead firms of each industry and their suppliers. Companies are described as 'lead firms' if they have the market power or control over key technological or information assets that allow them to establish the parameters that other major actors in the industry must comply with. In addition to their purchasing power (Sturgeon 2009), the strength of lead firms also comes from whether they have direct and/or indirect control of key stages in the supply chain, product or process standards, brand recognition and technological innovation (Gereffi *et al.* 2009). Typically, lead firm status derives from having multiple or overlapping sources of power.

The second step is to determine the geography of the chain. The relative ease with which companies are able to relocate their production facilities in order to gain access to raw materials, new markets and lower labour costs reflects major advances in global communication and transportation technologies. Developing countries are under constant pressure to devise strategies to maintain their position in extant production networks or to upgrade to higher value-added segments of GVCs.

Third, after identifying the input–output structure and the geographical spread of a value chain, the ties between firms in the industry are analysed. These relationships are described as 'governance' structures that dictate how the chain operates and who controls the diffusion of technology, standards and brands within the chain. Traditionally, value chains were characterised as either 'producer driven' or 'buyer driven' (Gereffi 1994). A producer-driven chain tends to be vertically integrated and connects firms through ownership or tightly knit production alliances. A buyer-driven chain is characterised by lead firms (retailers, marketers and 'manufacturers without factories' that retain brands but have outsourced their production capabilities) that utilise a wide array of independent suppliers, which in turn are linked to one another through complex global sourcing networks and intermediary firms (Gereffi 1999).

In recognition of the variety of inter-firm relationships in the global economy, a more comprehensive typology of GVC governance structures has been put forward, with five distinct kinds of relationships: markets, hierarchies (vertical integration through ownership) and three types of networks – modular, relational and captive (Gereffi *et al.* 2005). This typology recognises that there are new network forms of organisation within GVCs that involve some explicit coordination beyond simple market transactions, but which fall short of vertical integration ('hierarchies'). Researchers have also addressed the increased complexity of GVCs by showing how an industry can have multiple governance structures that vary over time or

across distinct segments of the chain (Dolan & Humphrey 2004; Gereffi *et al.* 2005; Sturgeon 2009).

Lastly, the coordination, power and linkages of GVCs would not be complete without an analysis of the institutions – that is, governments, unions, trade associations, NGOs, multilateral agencies and regulatory bodies – that influence the activities of the chain. GVCs are embedded in multiple ways in these institutional arrangements. Frequently, the lead firms or drivers of GVCs exhibit more power in influencing an industry than government laws and regulations. The latter are typically hindered by enforcement difficulties, whereas if suppliers do not comply with lead firm standards, they face harsh penalties or can be dropped from the chain.

6.3 A GVC framework for analysing the linkages between global economic processes and food consumption

The GVC approach highlighted here is industry and firm-centric, but GVCs do not operate in a vacuum. The role of government policies, social context and external factors all matter in the operation of the chain. The strength of the GVC framework is that all actors can try to take advantage of their position in the chain to influence business practices or government policies in a manner consistent with their goals and interests. This is where a public health agenda can come into play, particularly as it relates to food consumption and childhood obesity. Concretely, a GVC approach can evaluate why and how diets are changing through the global economic processes that shape or constrain the food options available to consumers. It can be used to identify how supply chains shape the availability of foods, the interaction between global and local chains, the role played by TNCs throughout the chain and the leverage points for change. Each of these GVC elements related to food consumption is now described.

6.3.1 GVC analysis shows how food supply chains shape the availability of food

GVC research identifies every segment of food production systems, following products from 'farm to fork'. The food supply chain can be broken down into three broad steps: (i) farm and harvest; (ii) processing and manufacturing; and (iii) retail. Taking the case of a French fry, the chain would begin with russet potato seeds and the companies that supply them, and then move on to examine the firms that grow the russet potato, followed by the manufacturers that process the potato into cut, frozen French fries, which then move to final sale. At the retail end, restaurants, supermarkets and institutions like governments and schools all buy large quantities of frozen French fries. Restaurants also purchase the fat needed to fry the potatoes before they are consumed.

At each segment of the chain, there are dominant firms that play key roles. The lead firm buyers of French fries (e.g. McDonald's, Wendy's or Wal-Mart) are

supplied by large manufacturers of French fries (e.g. McCain Foods, J.R. Simplot), which purchase russet potatoes from big growers/shippers (e.g. United Fresh Potato Growers of Idaho) that receive seeds, herbicides and pesticides from crop science firms (e.g. Bayer Crop Science). Understanding the French fry chain helps us explain the nutritional properties of French fries, how they are marketed to different sets of consumers, and at what price.

Relatively few firms in the chain have the status of lead firms. To be classified as lead firms, companies must have a critical marketing, technological or financial edge that permits them to set the standards or specifications for other companies they deal with. Without this advantage, even quite large companies may find themselves relegated to the role of suppliers of commoditised bulk products, with relatively thin profit margins and little capacity to influence the activities of other firms in the supply chain.

6.3.2 GVC analysis maps the interaction between global and local value chains

Each stage of the food production system connects countries on a global scale, and these connections are driven by the practices of lead firms in developed countries. Figure 6.1 depicts the interaction of global and local food value chains. Within the GVC (the top four boxes), there are the global agri-business companies, food manufacturers, fast-food franchises and retailers. These segments of the chain are linked to each other at the global and local levels. Agri-business conglomerates, like extremely large chicken, potato and lettuce suppliers, operate transnational

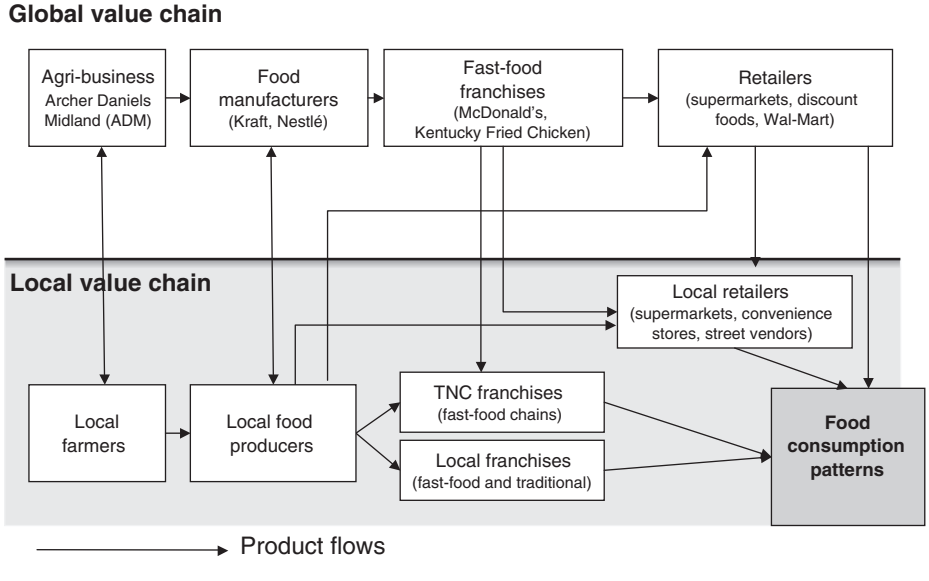

Figure 6.1 Interaction of global and local food value chains.

subsidiaries across the world or buy crops from small- and medium-sized farms in local economies. They then supply food manufacturers, which in turn sell their processed goods to fast-food chains and global retailers.

The interaction between the global and local categories may be direct, such as setting up large farming operations and producing for local markets in developing countries, but it often is captured through indirect effects. For example, continuing with French fries, in 2007, China was the world's leading potato producer, growing 72 million tons of potatoes, which is 23.3% of the world's supply of potatoes (FAO 2008). China's domestic potato growers run their own farms, but they also sell to developed-country food manufacturers that operate subsidiaries in developing economies. Interestingly, McCain Foods, the largest manufacturer of frozen French fries, is also the second largest manufacturer of ethnic Chinese foods. McCain initially brought their food technology expertise overseas to change the way food is produced and presented to consumers in Taiwan. In addition to their consumption of modern processed foods from the West, the developing world is also creating processed versions of traditional dishes, such as dumplings, steamed buns and rice rolls in China. Thus, the traditional diets of developing countries are being transformed because more meals are now available for consumers in the fast food, calorie-rich format of developed countries, while utilising the technological prowess of modern food processing to make these appealing, abundant and cheap.

6.3.3 GVC analysis identifies the role played by TNCs throughout the chain

At various stages of the food production value chain, lead firms dominate the outcomes and linkages within the chain. The power relationships they have with their competitors and suppliers determine the governance structure of the chain. For example, Kentucky Fried Chicken (KFC) is one of the world's largest buyers of chicken and therefore dictates what type of chickens farmers should raise, and the product and process standards these chickens must meet in order for KFC to purchase them. Because these standards call for a high level of technological sophistication and efficiency, only the largest chicken conglomerates, such as Tyson's and Pilgrim's Pride, can become a supplier for KFC.

Similarly, TNC manufacturers like McCain that buy russet potatoes for McDonald's French fries dictate product standards to the potato growers that supply them. McCain may choose to have more vertical control (i.e. direct ownership) over the processing, packaging and distribution stages of the supply chain for their French fries because these practices entail sophisticated production techniques that are best performed in-house. Alternatively, TNCs may peg their business practices to the demands of global retail buyers. In fact, retail giants, such as Wal-Mart, are likely to refuse to sell McCain's or J.R. Simplot's frozen French fries unless they meet specific pricing and packaging requirements.

Factors associated with childhood obesity can be linked to the behaviour of lead firms in global food production systems. Researchers have adopted the 'energy in'

and 'energy out' model of childhood obesity (Cutler *et al.* 2003; Glass & McAtee 2006). 'Energy in' refers to the reasons why children consume specific foods and 'energy out' refers to active/sedentary lifestyle behaviours. Factors highlighted by the 'energy in' literature, such as a corporate food culture targeted to youth and the availability of unhealthy snack foods, are reflected in the business practices of food TNCs. Their reach and power include the influence they have over children and parents in providing 'instant food' options that cater to a modern culture, busy lives and youth perceptions. TNCs are drivers of the global fast-food technology, processed foods and Western cultural norms that have become so prevalent in developing countries. The global–local interactions they spark accelerate the speed at which local food producers, manufacturers and retailers adopt transnational business strategies and tailor them to domestic needs.

6.3.4 GVC analysis identifies leverage points for change

The GVC framework allows us to identify the lead firms within the agribusiness, manufacturing, and retail segments, their influence upon the rest of the chain and avenues for change within the chain. For example, lead firms tend to define the standards for conduct and performance in an industry. Many food TNCs have already been compelled by government regulations or induced by consumer preferences to change certain practices along the food value chain, such as procuring healthy ingredients for their products and imposing stricter standards upon their suppliers. But GVC analysis can likewise be used to examine if these new business practices are only 'skin deep'. While firms may be promoting nutritional foods in their marketing campaigns, they also may be lobbying against government health regulations or moving to countries with lax regulatory environments.

A key form of change in GVC analysis is 'upgrading', that is how firms or countries are able to move to higher value-added activities or more profitable roles within the chain for a particular commodity or to enter into a new value chain (Gereffi 1999; Milberg 2004). It is necessary to analyse industrial policies, indigenous capabilities, corporate strategies and the governance structures of lead firms and institutions in GVCs in order to understand the dynamics of upgrading. The fact that domestic manufacturers and fast-food firms in developing countries have been able to position themselves within global food chains and establish their own brands demonstrates that developing countries can upgrade to higher value-added segments in the chain. Thus, individuals in developing countries are finding it easier to acquire Western diet options not only through Western brands but also through local imitators.

The instant noodle phenomenon is a revealing case. Instant noodle technology was first developed by Japan. However, Taiwan has been the leader in adopting advanced technology in instant noodles and bringing it to Asia, particularly China, the world's biggest market for instant noodles. Tingyi, a Taiwan-based firm with its Master Kong brand, has a 43% share of the market in China, beating the Japanese joint venture Nissin Hualong, which has 14% of China's instant noodle sales

(Dobson 2008). Taiwan has used the technology pioneered by developed countries to become the leading provider of instant foods for the Chinese market. They are also conforming to the business practices of consolidation and brand marketing. In addition to Tingyi, Taiwan is home to Uni-President Enterprises, the country's largest food conglomerate, which encompasses several stages of the food and agriculture value chain. The company procures commodities, such as soya beans and corn, and processes them into animal feed. They also manufacture processed foods, such as instant noodles, frozen foods, baked goods and soft drinks (Google Finance 2008).

6.4 From global to local: a GVC analysis of trade, foreign direct investment and food consumption

Trade is a global economic process that connects the global and local levels of GVCs. By focusing on the linkages between the global and the local (Figure 6.1), the GVC framework provides insights about the impact of trade on local food systems and food consumption that go beyond the global flows of foodstuffs per se. For example, it is often assumed that the direct trade (i.e. imports and exports) of processed foods is responsible for their diffusion into developing countries from the West, and this helps account for the growth of obesity. In fact, processed food is just a small portion of developing countries' imports: only 10% of the $3.2 trillion in global processed food sales in 2002 were traded products (Regmi & Gehlar 2005).

More importantly, a GVC analysis shows that most processed foods are created 'in-country' and connected to local supply chains and production facilities, and that the key role of imports and exports is to provide the ingredients that go into a wide array of food products. Global processes also play a key role through the transfer of Western-style food processing into local firms. This is illustrated by the cases of soya beans in China, corn in Mexico and the overall food supply in Trinidad and Tobago, which are reviewed below.

6.4.1 The dynamics of soya bean production, trade and consumption in China

Trade liberalisation and China's accession to the World Trade Organization have had a profound impact on China's agricultural system and domestic food supply. Soya beans are emblematic of the modern redefinition of Chinese agriculture. Soya beans, along with grains and sugar, are land- and labour-intensive crops grown in the western and northern regions of the country. Exports of these commodities have fallen while products of higher value, such as horticultural and animal products in the eastern and southern regions of China, have increased. While soya bean exports have decreased, China has imported large quantities of soya beans rather than use its domestic supply (as also discussed in Chapter 3). Before 2000, the soya bean tariff rate was as high as 114%, but it was lowered to 3% and then 1%. In 2007,

soya bean imports were estimated at 31 million tons and up to 50 million tons if one includes oil made from soya beans (Xinhua News 2008).

Imported soya beans have altered the food value chain in China. The sharp increase of imports spurred by liberalisation is a response to rising demand for soya bean-based oils and animal feed (Tuan *et al.* 2004). Imported soya beans are highly sought because they are cheaper and contain higher oil content, partly due to the bioscience techniques employed by foreign growers. Soya bean oil is replacing traditional rapeseed oil in China. The crushing of soya beans has become a profitable segment of the value chain. Crushing creates numerous fat products that are integral to many styles of cooking. Partially and fully hydrogenated soya bean oils are used in pan frying, deep frying and baking. Soya beans are also crushed into soya bean meal, which is fed to animals in China's booming livestock industry. Cooking techniques have changed with the use of soya bean oils, and soya bean meal has made livestock cheaper and more abundant.

There are soya bean processors in Heilongjiang, Shandong, Jiangsu, Guangdong and Sichuan provinces. Xinhua News (2008) estimates that 80% of soya bean processing facilities in China are subsidiaries or joint ventures of foreign firms. Archer Daniels Midland (ADM) is the largest soya bean processor in China. ADM Hong Kong/Shanghai is a wholly foreign-owned subsidiary that engages in import/export trade and wholesale distribution, while ADM Tianjin provides vegetable oil concentrate and ADM Dalian creates soya bean meal.

Soya beans as an input commodity have led to foreign direct investment in manufacturing and the adoption of foreign food-processing practices. The commodity has affected several food supply chains, especially livestock. Chinese firms are emulating foreign business practices. Following the path of developed countries, pig and poultry plants in China have become more concentrated, and large specialised household operations and commercial facilities are expanding (Tuan *et al.* 2004). China is reorienting its agricultural system to cultivate products they can export, such as horticultural goods, rather than meeting the domestic demand for food, thus sparking higher local prices for vegetables and potential grain shortages (Tuan *et al.* 2004). All of these factors affect the availability and price of healthy food options in Chinese cities and rural communities. According to Pingali (2007: 281), these globalisation trends in China will stimulate a new form of diet where wheat, lots of protein and energy-dense foods will characterise Chinese food choices.

6.4.2 Corn production, trade and consumption in Mexico

Corn is a traditional crop in Mexico that has great cultural, religious, political and economic significance for the indigenous groups in the country. Since the North American Free Trade Agreement (NAFTA), the rapid expansion of US corn exports has transformed the cultivation of corn in Mexico to mimic those types available in the United States. Between 2003 and 2004, US corn exports to Mexico increased by 240% (Zahniser & Coyle 2004). As of 1 January 2008, all tariffs on corn

were abolished after a decade-long phase out. This change is expected to further accelerate the segmentation of the corn market in the region, with real consequences for farmers, processors and the sustainable diversity of Mexican-based corn varieties.

Yellow corn, which is primarily used as an input for animal feed, is the dominant US corn export that supplements and competes with Mexican production. The increase in demand is attributed to the expanding livestock industry, particularly pig and poultry that use corn-based feed (as opposed to soya beans in China). It is projected that Mexico's livestock industry will become more consolidated, similar to the structure of US livestock producers. White corn, which goes into tortilla production, is still mostly based in Mexico, although US exports of white corn have risen since 2000.

Corn in Mexico is grown on small farms, where farmers typically have around 10 hectares of farmland and little access to tractors and irrigation. In comparison, corn in the United States is grown on farms with a typical size of over 270 hectares and its cultivation is highly mechanised. Corn in Mexico goes to one of the country's 10,000 corn millers and 45,000 tortilla producers. Due to government support for the tortilla industry, Mexican producers have an advantage in the market. Corn flour production in Mexico is very concentrated, with Mexican companies Gruma and Grupo Minsa controlling more than 90% of domestic corn flour production (Zahniser & Coyle 2004).

While Mexico has its own large companies in the tortilla and corn flour production segments of the market, the reduction in tariffs associated with NAFTA has brought a flood of cheap corn from the United States and stiff competition for local farmers. It is estimated that Mexico's corn imports may reach 14 million metric tons by 2013. The corn being imported is mostly a genetically modified US variety and Monsanto is hoping to bring their genetically modified seeds to Mexico for local farmers to use. These seed varieties will require pesticides and fertilisers manufactured by transnational chemical companies (Ross 2007).

The survival of many of the *ejidos* (community farms) in Mexico is in jeopardy because of the new tariff phase-out. According to Ross (2007), in the first 13 years of NAFTA, 6 million Mexican farmers abandoned their farms, potentially making 59 distinct Mexican corn varieties extinct. Overall, tariff changes, continuing urbanisation and a complex distribution system are driving further structural changes in Mexico's food system that could lead to future economic and social problems. For example, food consumption patterns may change at faster rates as campesino farmers and their families begin to eat more energy-dense high-caloric foods as they migrate to urban centres for work. This is because the flood of US corn may create cheaper commodity inputs (high fructose corn syrup) for processed food varieties. The prevalence of cheap imported corn from the United States has also undermined the viability of large swaths of Mexico's smallholder, corn-based rural economy, thereby fuelling the migration from rural to urban areas in Mexico, and onward to the United States, resulting in the depopulation of rural areas and swelling the ranks of the unemployed and underemployed informal workers in metropolitan centres.

6.4.3 Import dependence in Trinidad and Tobago's food supply

The Caribbean islands of Trinidad and Tobago show how an entire country's food supply system can be dependent upon imports (see also the example of the Pacific Islands by Thow and Snowdon in Chapter 9). Yet, Trinidad and Tobago's domestic manufacturers still play a key role in the foods available on the islands, further demonstrating the interaction between global and local food systems. Trinidad and Tobago is a net food importer. They have a high overall level of import dependence, reaching 100% for products like corn oil, infant food, wheat, potatoes, many fruits and vegetables, chocolate products, tea, black pepper, milk and cheese (Lovendal *et al.* 2007). The United States is the largest supplier for Trinidad and Tobago's imports of meat, dairy, fresh vegetables and fruit, cereals, fats and grains (Logan 2006). The imported products go directly to retail outlets or they are inputs for local manufacturing facilities.

The food-processing sector accounts for almost half of Trinidad and Tobago's manufacturing gross domestic product and it is a large contributor to non-oil exports (Lovendal *et al.* 2007). Most of their trade goes to other Caribbean Community countries, with Trinidad and Tobago being the lead exporter within the region. According to Logan (2006), the structure of the food-processing industry within the Eastern Caribbean region is categorised in five groupings: transnational firms, large-, medium-, small-scale domestic firms and micro-sized enterprises. Nestlé Trinidad and Tobago Ltd. is the largest food-processing company in the country, but the domestic market for food is dominated by big local firms such as Erin Farms Ltd., Hummingbird Rice Mills and Willie's Homemade Ice Cream. Yet, these local firms rely on imported ingredients: only 20% of inputs that go into local manufacturing facilities are procured domestically, while 80% come through imports.

Trinidad and Tobago illustrate that the food system in a small nation can be reliant on imports and western food-processing techniques, and still maintain a significant role for locally owned facilities. Because Trinidad and Tobago are so reliant on imported inputs, however, they cannot ensure the availability of many foods essential for a healthy diet, such as fruit and vegetables. Food consumption in the country is already dominated by cereals and sugar crops, and this reliance will only increase if the prices for processed-food inputs stay low, while fresh produce prices rise. Thus, the high prices of imported healthy foods make it hard for locals to consume these products, and domestically owned firms are not offering healthier alternatives.

The above examples from China, Mexico and Trinidad and Tobago show how the GVCs of food products connect developed and developing countries in direct and indirect ways. China has substantial amounts of foreign direct investment in its food manufacturing sector, but trade liberalisation has increased the availability of key agricultural commodities like soya beans, with significant impacts on its local agricultural and food systems. While Mexico and Trinidad and Tobago have strong local firms, these companies have adopted the food-processing practices of TNCs in developed countries. These practices have a ripple effect throughout the countries in changing the types of food available for consumption. The recent evolution of global food and agricultural value chains favours the adoption of Western supply

chain dynamics in developing countries. The story at the local level is one where global economic processes influence food consumption in ways that can be both positive and negative for healthy diets.

6.5 Drivers of food consumption: TNCs as drivers of food consumption

One of the most effective techniques used in GVC analysis is case-based comparisons of lead firms in GVCs. A look at specific companies facilitates the analysis of broad corporate strategies as well as inter-firm linkages in the value chains being studied. This is done here for five lead firms in the global food value chain: three from the food and beverage manufacturing category (Kraft, Nestlé and PepsiCo), and two from the fast-food category (McDonald's and Yum! Brands, the owners of KFC and other restaurant chains).

Table 6.1 provides brief company profiles of these firms (see the Annual Reports for Kraft, Nestlé, PepsiCo, McDonald's and Yum! Brands 2000–2007). Kraft, Nestlé, PepsiCo, McDonald's and Yum! Brands had combined global sales of about $320 billion in 2007. Because of the firms' different reporting methods, this estimate is based on total sales for some firms (Yum!, McDonald's, PepsiCo and Nestlé) and net revenues for others (Kraft). Moreover, McDonald's and Yum!'s figures combine company and franchise sales. These multibillion dollar corporations are engaged in global multi-branding strategies across the world, and together they employ more than 3 million workers. Yum! and McDonald's are located in over 100 countries, manufacturers Nestlé and PepsiCo are in more than 200 countries and Kraft in over 150. For all of the corporations, international sales play a key role in their overall profitability.

Table 6.1 Profiles of leading food transnationals, 2007.

Companies	Global sales	Employees	Main brands	Number of countries
Yum! (based on total company sales, franchise sales and employees)	$34 billion	1 million+	Kentucky Fried Chicken, Taco Bell, Pizza Hut, A&W	100+
McDonald's (based on total company sales, franchise sales and employees)	$47 billion	1.6 million	*Has owned*: Chipotle, Boston Market, Donatos Pizzeria	118
Kraft (based on net revenues)	$37 billion	104,000	Nabisco, Oscar Meyers, Post Cereal	155
Nestlé (based on total sales)	$90 billion	276,050	Nescafe, Hot Pockets, Crunch, Kit Kat	Almost worldwide
PepsiCo (based on total sales)	$98 billion	185,000	Pepsi, Frito-Lay, Gatorade, Tropicana	200

Source: Company Annual Reports and web sites.

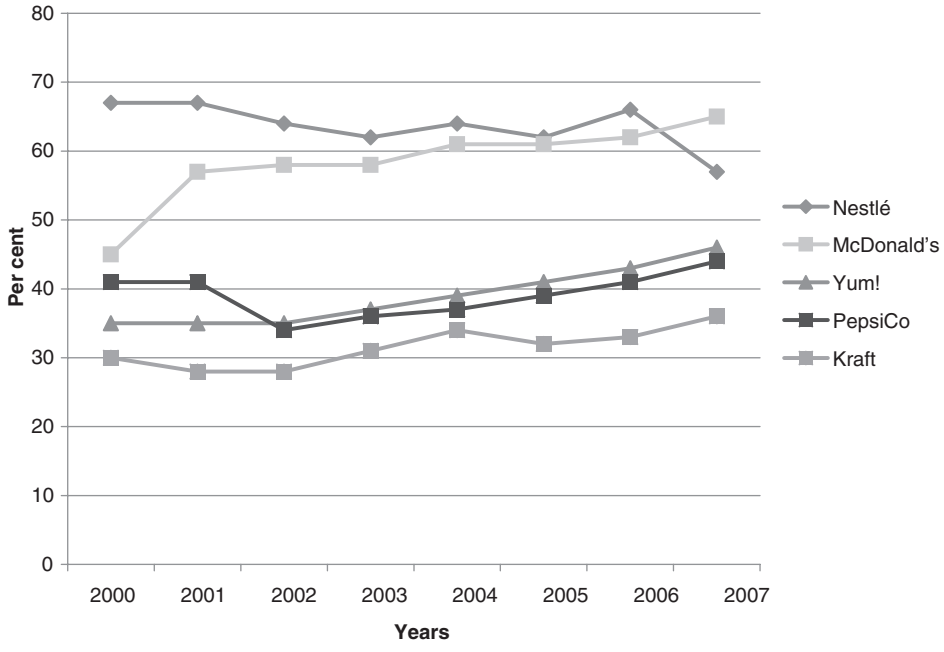

Figure 6.2 Global sales of food and beverage transnationals (as per cent of total sales), 2000–2007. *Source*: Company Annual Reports. *Note*: International is everything other than the United States except for Nestlé, which is everything other than Europe. For McDonald's, 'Corporate' and 'Other' sales are counted as United States. For Nestlé, 'Pharma' and 'Other Food & Beverages' are counted as International. Nestlé sales since 2002 only include food and beverages. McDonald's 2000 includes franchise sales and not solely franchise revenue.

Figure 6.2 shows the percentages of international sales compared to total sales since 2000. All of the corporations have a strong global presence, with international sales close to or over 40% of their totals for 2007. ('International' is defined as everything but the United States for all the companies except Nestlé, where it is everything but Europe.) Nestlé's international sales went down slightly due to the strength of their performance in Europe, but total sales have increased. McDonald's has consistently high figures since 2000. The global share for McDonald's would be even higher if the total sales of international franchise units were included, instead of just its corporate licencing revenues. Total sales for Kraft and PepsiCo would also be much higher than their net revenues.

A more detailed analysis of the global expansion and shifting food consumption strategies is provided below for two of the most recognised food companies in the world: McDonald's and PepsiCo. Both companies have sought to leverage their global brand with localisation efforts that also address growing international pressures for healthy diets.

6.5.1 McDonald's

Unlike their competitors, McDonald's has chosen to focus solely on a one-brand image, their McDonald's restaurant chain. Formerly, they owned Chipotle, Boston

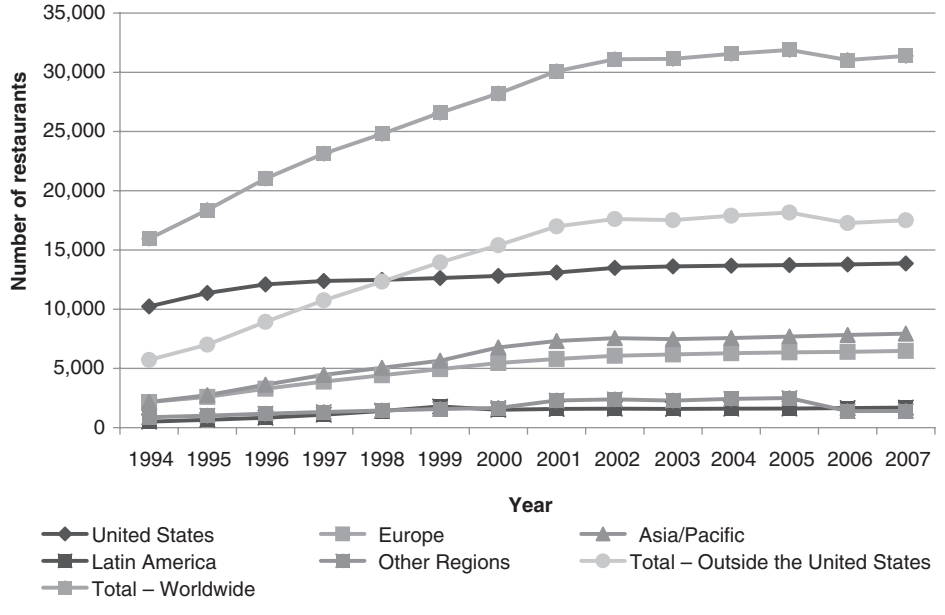

Figure 6.3 McDonald's global restaurants, 1994–2007, by region. *Source*: McDonald's Annual Reports (1998–2007).

Market and Donatos Pizzeria, but over the last 5 years they used their corporate strength solely for the McDonald's restaurant brand. Although they have maintained a one-brand strategy, they were one of the original fast-food multinationals to aggressively pursue overseas expansion.

Figure 6.3 shows the rapid escalation in the number of McDonald's restaurants outside the United States since 1994. Growth in the Asia-Pacific region is particularly strong. In 1994, the company had just over 2,000 restaurants in the region, but by 2000 that number had tripled. Europe has expanded as well, while Latin America has remained relatively steady. Overall, these figures show the strength of McDonald's operations. As of 2007, they had a total of 31,377 system unit restaurants with nearly 18,000 of those in international localities. In 2008, they expected to open 550 restaurants worldwide.

China is a key emerging market for McDonald's and its performance to date is positive, with strong new unit growth, including drive-thru locations as it looks to tap into rising levels of car ownership. McDonald's has more than 800 restaurants on the Mainland, and in 2008, they planned to open 125 more restaurants in China. McDonald's main competitor in China is KFC (a subsidiary of Yum! Brands), which benefited from its first-mover status and the fact that chicken is more widely consumed by the Chinese than beef. McDonald's is trying to cater towards a more chicken- and fish-friendly menu in order to tap into local consumer preferences.

McDonald's also promotes local sourcing. DaChan Food, the Dalian-based integrated chicken meat and feed producer in China, is the largest chicken supplier

of KFC and the major supplier of McDonald's, Dicos and other local outlets in China. The standards the chicken must meet, as required by Western firms like McDonald's, are being transmitted into the type of chicken provided by non-Western outlets too, as the example of Dicos, a Taiwan-based company, shows.

McDonald's has been a front-runner in providing more extensive nutritional information on their menu items and promulgating health-friendly, balanced-lifestyle campaigns. Starting in 2000, they introduced salads, low-fat desserts and a wider choice of chicken and fish burgers; they also included more regional menu variation and began experimenting with new formats, such as cafes and kiosks. In 2004, after much publicised consumer and government concerns regarding the obesity crisis, McDonald's discontinued its super-size option and began a new range of salads. They are addressing the claim that they are contributing to the obesity crisis directly through their corporate social responsibility strategies highlighted in their Worldwide Corporate Responsibility Report (McDonald's 2006).

McDonald's launched a number of programmes in keeping with their 'balanced lifestyles' platform that focuses on three areas: food choice, education and physical activity. One of the key components is 'Go Active!' which was tied with sponsorship of the Athens 2004 Olympic Games. In 2006, they began to print nutritional information directly on their packaging, the first major restaurant company to do so. The format is icon-based and can be understood independently of the consumer's language; the icons represent calories, protein, fat, carbohydrates and sodium. Finally, in 2006, McDonald's announced a collaboration with Scripps Research Institute (QSR 2006). McDonald's will financially support research that focuses on understanding solutions to childhood obesity and type 2 diabetes, with an initial contribution of $2 million. This amount remains tiny in comparison to McDonald's total profits or the magnitude of the health problem being addressed.

6.5.2 PepsiCo

PepsiCo merged with Frito-Lay in 1965 to create PepsiCo Inc. It is now the second largest soft drink company in the world behind Coca-Cola. PepsiCo's main brands are Pepsi Cola, Frito-Lay, Tropicana, Gatorade and Quaker. Its two core brands are Pepsi Cola in the soft drink market and Frito-Lay in the packaged-food industry. The United States and Mexico remain two of the top markets for PepsiCo soft drinks and snack food products. However, PepsiCo has more than doubled its net sales in non-North American countries from 2000 to 2007. Figure 6.4 shows a breakdown of PepsiCo's global net sales since 2000 for the United States, Mexico, the United Kingdom, Canada and all other countries. Net sales in the United States are still the strongest, but international markets are increasing (Euromonitor International 2007).

FDI Magazine (2002) reported that in 1982 PepsiCo was one of the first TNCs to set up operations in China following the open-door policy. The venture was not smooth: investing in China involves joint ventures with Chinese partners in order

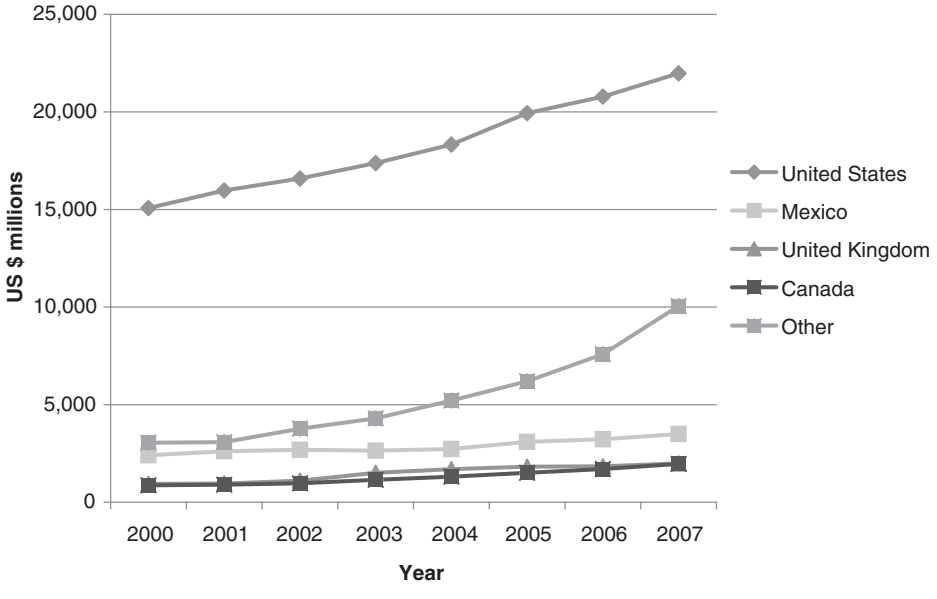

Figure 6.4 PepsiCo global sales (Net), 2000–2007 by geographic breakdown. *Source*: PepsiCo Annual Reports.

to enter the highly competitive market. In 2002, PepsiCo terminated a joint venture with a Chinese bottling firm after 8 years because the local Chinese partners wanted a larger share of profit margins and expansion outside of their contractual regions. The profit-sharing issues with Chinese partners were exacerbated by government protection of domestic beverage makers. Moreover, the Chinese government controls the location of foreign plants in order to spread competition across the country. PepsiCo claimed that it was pouring money into advertising and marketing, with investment liabilities still outweighing revenues after 20 years.

PepsiCo now has 40 joint and solely owned ventures in China, which is its second largest soft drink market outside the United States. PepsiCo owns 25 bottling plants and four packaged food factories, and their new strategy aims at doubling the Chinese workforce over the next 5 years in order to match growth potential in that market. Their aggressive marketing tactics in the past decade have included brand building using celebrity endorsements and sports sponsorships. In a survey by A.C. Neilsen in 2002, Pepsi had a 44% market share in major Chinese cities (FDI Magazine 2002).

An important strategy that has solidified Pepsi's global strength is their belief in localisation. A PepsiCo spokesperson stated to *Beverage Daily* that in order to succeed in the industry on a global scale, all business strategies, particularly marketing and product development, must reflect the preferences and desires of the countries they are operating in (Merret 2007). Investment in China alone totals over one billion dollars, and PepsiCo plans to expand its Chinese market by investing an additional $850 million between 2006 and 2009.

In order to penetrate emerging markets, PepsiCo adapts its products to local preferences (Brush 2006). The company has expanded using joint ventures and has hired local managers who have expertise in the market's preferences. Frito-Lay in Mexico sells chips with chili flavours, while Frito-Lay in China sells crab- or duck-flavoured chips. By utilising partnerships with local bottlers and local suppliers, PepsiCo appeals to consumers' nationalist sentiments while also impacting local food production systems. Sabritas in Mexico and Yazhou in China are both popular brands sold by PepsiCo with regional-sounding names. To increase their understanding of their target market, PepsiCo opened its first research and development site outside the United States in Shanghai in 2006.

PepsiCo was ranked number 1 globally in 2005 for sweet and savoury snacks, and 80% of the company's net sales is from packaged foods. In 2003, *trans* fat was removed from all chips as they switched to using corn oil. By 2006, Lay's and Ruffles chips were made using sunflower oil. PepsiCo also strove to reduce sugar and sodium in their snack foods and expanded their product range to include more nuts and healthy snacks. In the snack foods sector, the pressure to shift away from the sweet and high fat snacks market has led PepsiCo to explore two potential development paths. The company can pursue the 'impulse channel' (the convenient, on-the-go foods which dominate food markets today) or move towards acquiring more healthy and organic snack options.

PepsiCo launched its 'Smart Spot' marketing campaign in 2004, which includes labelling healthy products as well as exercise campaigns to promote smart lifestyle choices (PepsiCo 2007). All products labelled with a Smart Spot sign meet nutrition criteria set by the Food and Drug Administration and the National Academy of Science. By 2006, more than 40% of PepsiCo's annual revenues in the United States and Canada came from Smart Spot eligible products, which include Baked Cheetos, Baked Lays and Diet Pepsi. PepsiCo was also one of the first companies to voluntarily restrict advertising as part of the Children's Food and Beverage Advertising Initiative set up by the Council for Better Business Bureaus. They partnered with the Alliance for a Healthier Generation to limit direct advertising to children under 12 to only Smart Spot products.

Developing countries like India and China are seeing the emergence of a middle class that can now purchase inexpensive consumer products. Urban Chinese children are spending more on snacks and play items, and are influencing their parents' spending (McNeal & Yeh 1997). PepsiCo's sales figures and profit margins should continue to expand in developing markets because they have already established strong domestic partnerships and a solid infrastructure.

6.6 Conclusions

The severity of the global childhood obesity pandemic calls for innovative research agendas and theoretical approaches that address the macro factors and social contexts that affect this public health crisis. Applying a GVC framework to food production and consumption patterns around the world is one such approach that can be used to understand how the global context influences dietary and health

outcomes, including increasing rates of childhood obesity. The GVC perspective incorporates economic and political factors at the global, national and local levels that have been ignored in much of the previous medical and epidemiological literature on this topic (Glass & McAtee 2006).

This chapter has outlined a GVC framework that can be applied to food consumption and sketched out some of the preliminary insights provided by this analysis for understanding the linkages between trade, TNCs and food consumption. The GVC approach is well suited to linking the global and local levels of analysis, with a focus on both production and consumption. It shows, for example, that the impact of trade on food consumption in developing countries is primarily indirect rather than direct, and is captured at the national and local levels through the adoption of Western products and practices by domestic food systems. This helps us identify the key points through which trade processes could be leveraged to encourage healthier consumption points. Applying this analysis beyond these initial steps is needed to identify win–win scenarios in which healthier diets and lower childhood obesity rates become central in the business models of domestic enterprises and TNCs.

Acknowledgements

The authors gratefully acknowledge the valuable research assistance they received in preparing this paper from Joonkoo Lee, Kim Rogers, Yisel Valdes and Aileen Zhang.

References

Bair, J. (ed.). (2009). *Frontiers of Commodity Chain Research*. Stanford University Press, Stanford, CA.

Brush, M. (12 July 2006). Pepsi Pops with a Snack-Food Empire. *MSN Money*. Retrieved 28 September 2007 from http://articles.moneycentral.msn.com/Investing/CompanyFocus/PepsiPopsWithASnackFoodEmpire.aspx.

Center on Globalization, Governance, & Competitiveness (2008). *Concepts and Tools, Global Value Chains*. Duke University. Retrieved 14 April 2008 from http://www.globalvaluechains.org/concepts.html.

Cutler, D., Glaeser, E. & Shapiro, J. (2003). Why have Americans become more obese? *Journal of Economic Perspectives* **17**, 93–118.

Dobson, R. (24 February 2008). China's surging instant noodle business sets off scramble for market share. *International Herald Tribune*. Retrieved 4 April 2008 from http://www.iht.com/articles/2008/02/24/business/noodle.php.

Dolan, C. & Humphrey, J. (2004). Changing governance patterns in the trade in fresh vegetables between Africa and the United Kingdom. *Environment and Planning A* **36**(3), 491–509.

FDI Magazine (2002). *Pepsi Was One of the Earliest Multinational Companies*. Retrieved 28 September 2007 from http://www.fdimagizine.com/news/fullstory.php/aid/46/Pepsi_was_one_ofthe_earliest_multinational_companiesChina.html.

Food and Agriculture Organization (2008). *International Year of the Potato*. Retrieved 3 April 3 2008 from http://www.potato2008.org/en/world/index.html.

Gereffi, G. (1994). The organization of buyer-driven global commodity chains: how U.S. retailers shape overseas production networks. In: Gereffi, G. & Korzeniewicz, M. (eds). *Commodity Chains and Global Capitalism*. Greenwood Press, Westport, pp. 95–122.

Gereffi, G. (1999). International trade and industrial upgrading in the apparel commodity chain. *Journal of International Economics* **48**(1), 37–70.
Gereffi, G. (2005). The global economy: organization, governance, and development. In: Smelser, N. & Swedberg, R. (eds). *The Handbook of Economic Sociology*, 2nd edn. Princeton University Press, Princeton, NJ, pp. 160–82.
Gereffi, G., Humphrey, J. & Sturgeon, T. (2005). The governance of global value chains. *Review of International Political Economy* **12**(1), 78–104.
Gereffi, G. & Kaplinsky, R. (eds). (2001). The value of value chains: spreading the gains from globalisation. Special Issue of *IDS Bulletin* **32**(3).
Gereffi, G. & Korzeniewicz, M. (eds). (1994). *Commodity Chains and Global Capitalism*. Greenwood Press, Westport, CT.
Gereffi, G., Lee, J. & Christian, M. (2009). U.S.-based food and agricultural value chains and their relevance to healthy diets. *Journal of Hunger & Environmental Nutrition* **4**(3–4).
Gibbon, P. & Ponte, S. (2005). *Trading Down: Africa, Value Chains, and the Global Economy*. Temple University Press, Philadelphia, PA.
Glass, T. & McAtee, M. (2006). Behavioral science at the crossroads in public health. *Social Science and Medicine* **62**, 1650–71.
Google Finance (2008). Uni-President Enterprises Corporation. Retrieved 3 April 2008 from http://finance.google.com/finance?q=TPE:1216.
Humphrey, J. & Memodovic, O. (2003). *The Global Automotive Industry Value Chain: What Prospects for Upgrading by Developing Countries?* Sectoral Studies Series. United Nations Industrial Development Organization, Vienna.
Kennedy, G., Nantel, G. & Prakash, S. (2004). *Globalization of Food Systems in Developing Countries: Impact on Food Security and Nutrition*. Food and Agricultural Organization, Rome, Italy.
Kraft (2000–2007). *Annual Report* (various years).
Lang, T. (2003). Food Industrialization and food power: implications for food governance. *Development Policy Review* **21**(506), 555–68.
Logan, K. (2006). *Caribbean Basin Food Processing Ingredients Sector Eastern Caribbean*. GAIN Report. United States Department of Agriculture, Washington, DC.
Lovendal, C.R., Jakobsen, K.T. & Jacque, A. (2007). *Food Prices and Food Security in Trinidad and Tobago*. Working Paper No. 07-27, Agricultural Development Economics Division, Food and Agriculture Organization, Rome, Italy.
McDonald's (1998–2007). *Annual Report* (various years).
McDonald's (2006). *Worldwide Corporate Responsibility Report*. Retrieved 1 October 2007 from http://www.mcdonalds.com/corp/values/report.html.
McNeal, J. & Yeh, C.H. (1997). Development of consumer behavior patterns among Chinese children. *Journal of Consumer Marketing* **14**(1), 45–60.
Merret, N. (2007). *Pepsi Goes Local in Chinese Expansion*. Retrieved 28 September 2007 from http://www.beveragedaily.com/news/ng.asp?n=75487-pepsico-china-r-d-workforce.
Milberg, W. (2004). Globalized production: structural challenges for developing country workers. In: Milberg, W. (ed.). *Labor and the Globalization of Production: Causes and Consequences of Industrial Upgrading*. Palgrave Macmillan, New York.
Nestlé (2000–2007). *Annual Report* (various years).
Oxfam International (2004). *Trading Away Our Rights: Women Workers in Global Supply Chains*. Oxfam GB, Oxford.
PepsiCo (2007). Euromonitor International.
PepsiCo (2007). *PepsiCo's Health and Wellness Initiatives*. Retrieved 20 September 2007 from www.smartspot.com.
PepsiCo, Inc. (2000–2007). *Annual Report* (various years).
Pingali, P. (2007). Westernization of Asian diets and the transformation of food systems: implications for research and policy. *Food Policy* **32**, 281–98.
Popkin, B. & Gordon-Larsen, P. (2004). The nutrition transition: worldwide obesity dynamics and their determinants. *International Journal of Obesity* **28**(S1–S9), 52–9.
QSR (2006). *McDonald's Align to Fight Childhood Obesity and Type 2 Diabetes*. The Scripps Research Institute. Retrieved 14 September 2007 from http://www.qsrmagazine.com/articles/news/story.phtml?id=5115.

Raworth, K. & Kidder, T. (2009). Mimicking 'Lean' in global value chains: it's the workers who get leaned on. In: Bair, J. (ed.). *Frontiers of Commodity Chain Research*. Stanford University Press, Stanford, CA, pp. 165–189.

Regmi, A. & Gehlar, M. (2005). New directions in global food markets. *Agriculture Information Bulletin*, February (794).

Ross, J. (21 November 2007). NAFTA and biotech: twin horsemen of the Ag apocalypse: the last days of Mexican corn. *Counter Punch*. Retrieved 1 April 2008 from http://www.counterpunch.org/ross11212007.html.

Sturgeon, T. (2002). Modular production networks: a new American model for industrial organization. *Industrial and Corporate Change* **11**(3), 451–96.

Sturgeon, T. (2009). From commodity chains to value chains: interdisciplinary theory building in an age of globalization. In: Bair, J. (ed.). *Frontiers of Commodity Chain Research*. Stanford University Press, Stanford, CA, pp. 110–35.

Tuan, F., Fang, C. & Cao, Z. (2004). *China's Soybean Imports Expected to Grow Despite Short-Term Disruptions*. United States Department of Agriculture, Washington, DC.

Xinhua News (2008). *NPC, CPPCC Annual Sessions*. Retrieved 1 April 2008 from http://news.xinhuanet.com/english/2008–03/06/content_7732794.html.

Yum! (2000–2007). *Annual Report* (various years).

Zahniser, S. & Coyle, W. (2004). *U.S. Corn Trade During the NAFTA Era: New Twists to an Old Story*. United States Department of Agriculture, Washington, DC.

7 Links Between Supermarkets and Food Prices, Diet Diversity and Food Safety in Developing Countries

Thomas Reardon, Spencer Henson and Ashok Gulati

7.1 Introduction

'Traditional retail' has been undertaken historically in a similar way everywhere in the world – food was traditionally sold in small 'mom-and-pop shops', public markets such as produce 'wet markets', hawkers and street fairs, with consumers buying fresh products daily and non-perishables less frequently. Much is made about supposed differences in food purchasing traditions, but a walk around Montreal or Chicago in the 1920s would feel, as the written descriptions and photo essays can attest, basically the same as that found in the traditional food shops and markets of the cities of Delhi, Jakarta, Bangkok or Lima today.

Supermarkets were thus as 'non-traditional' in the United States, Canada or Western Europe in the 1920s and 1930s as they were in the 1990s in developing countries. They emerged in these nations in the 1920s and 1930s, and slowly built their food retail share to the 80% today. Compare that to the far faster spread of supermarkets in developing countries starting in the early 1990s – with about the same share as in the United States in the 1930s – to climb in one decade to about 50–60% of food retail in 'first-wave' developing countries, 30–50% in the 'second-wave' and 1–30% in 'third-wave' countries. This is 5–10 times faster than the retail transformation that occurred in the United States. This amazing 'full gallop' of consumers away from traditional shopping modes to supermarkets is occurring for reasons of, among others, cost, convenience, product diversity, feelings of safety and cleanliness, air conditioning and feelings of modernity. The rush to supermarkets occurred and is occurring while consumers have choices between traditional retailers and supermarkets – they were and are not pushed or legislated or mandated to make this vote with their feet and their yuan, pesos, rupiahs and baht.

This chapter examines the rise of supermarkets in developing countries and consumer expenditure at these supermarkets, to hypothesise how supermarket diffusion may be affecting consumers' diets and health. The paper proceeds as follows. Sections 7.2 and 7.3 discuss the trends in, and drivers of, the rapid spread of supermarkets in developing countries. Section 7.4 then lays out emerging evidence and hypotheses about how the supermarket revolution (relative to the traditional

retail system) affects consumer food prices, diet diversity, composition and food safety.

7.2 The rise of supermarkets in developing countries

Supermarkets have been around for a half-century in a number of developing countries, but mainly in big cities, catering to upper-middle and wealthy consumers. These supermarkets were generally owned and managed by domestic companies. This situation changed completely when a 'supermarket revolution' saw a huge influx of foreign-based supermarket chains into developing countries, with accompanying (or anticipatory) competitive investment by domestic modern retail.

7.2.1 Diffusion of modern retail over regions and countries

The spread of supermarkets has and is taking place in three established waves and a fourth emerging wave (Reardon & Timmer 2007; Reardon *et al.* 2003). The 'first-wave' countries experienced supermarket-sector 'take-off' in the early- to mid-1990s. These include much of South America and East Asia outside China (and Japan), Northern-Central Europe, the Baltics and South Africa. In these countries, the average share of supermarkets in food retail went from roughly only 10–20% circa 1990 to 50–60% on average by the early 2000s. A comparison with the roughly 75–80% share that supermarkets have in food retail by mid-late 2000s in the United States and Western Europe shows a clear process of convergence. These first-wave countries saw in a single decade the supermarket diffusion that took some five decades in the United States and the United Kingdom.

The second-wave countries include Mexico and much of Southeast Asia, Central America and Southern-Central Europe. In these areas, the share went from circa 5–10% in 1990 to 30–50% mid-late 2000s, with the take-off occurring in the mid- to late-1990s.

The third-wave countries include countries where the supermarket revolution take-off started only in the late 1990s or early 2000s, reaching by late 2000s about 5–20% of national food retail. These areas include parts of Eastern and Southern Africa, some countries in Central and South America, 'transition East Asia' (China and Vietnam), Russia and India.

7.2.2 Diffusion trends within a country – over space, socioeconomic strata and product markets

There were and are also waves of diffusion of supermarkets within countries. Supermarkets tend to start in large cities, then move into intermediate cities and towns and then to small towns in rural areas. This pattern stems from a clear business strategy: the richest and largest market initially yield the highest profit per capital invested; but then, competition and saturation of the initial base drives investment by the supermarket into wider markets. Although the gross return declines, there are cost savings due to economies of scale and procurement system change,

as discussed in Section 7.5.2. Often the multinational chain acquires or joint ventures with a large domestic chain and acquires smaller local chains operating in the various regions of a country. The competition from the larger chains in turn pushes intermediate, city-based chains to extend into the hinterland towns seeking refuge from the increasing competition in its base market. This process accelerates the diffusion of supermarkets over space.

Controlling for the pattern of spatial diffusion, there are similar waves of diffusion over socioeconomic groups cum consumer segments. Obeying the same business logic as in spatial diffusion, supermarkets focus first on upper income consumer segments (national and expatriate), and then move into the middle class and finally into the markets of the urban poor. Moreover, as modern retail spreads, there tends to be format diversification to facilitate the spatial and consumer segment differentiation. For example, to penetrate the markets of inner cities and small towns where space is limited and product assortment can be more narrow, chains use discount stores, convenience and neighbourhood stores and small supermarkets.

A third type of diffusion is over food categories, as took place decades earlier in the United States and Canada. The first wave of product penetration is in processed foods (canned, dry, and packaged items such as rice, noodles, and vegetable oils). This is due to the economies of scale in procurement as well as direct relations with processed food manufacturers. The second wave is in semi-processed foods (with extensive or minimal processing, such as dairy products) and minimal processing and packing (chicken, pork, beef and fruit), and the third wave is into the fruit and then the vegetable market (in particular, leafy vegetables and bulk vegetables). This third wave is by far the slowest and has only in the past half decade been important to supermarkets in the first- and second-wave countries, and is just beginning in the third wave. Three examples illustrate the waves of food category penetration:

(i) In China, a random sample of 1,200 consumers from the six largest cities show that modern retailers already have a retail market share of 94% in non-food, 79% in packaged and processed goods, 55% in baked goods, 46% in meat, 37% in fruit, 35% in poultry, 33% in fish and only 22% in vegetables (Goldman & Vanhonacker 2006).

(ii) In the more advanced case of Hong Kong, supermarkets have a 59% share in fruit retail, but still only a 55% share in vegetables, 52% in meat, 39% in poultry and 33% in fish (Coca-Cola Retailing Research Council Asia 2005). It has also been reported from Asia, in general, that younger consumers are 'forsaking wet markets' and becoming more supermarket-oriented instead (*Planet Retail* 2004).

(iii) In three cities in Indonesia (Jakarta, Bandung and Cirebon), a survey of 1,300 consumers found that penetration of supermarket retailing has occurred much more rapidly in processed, dry and packaged foods, household products and personal care, with much slower penetration of fresh food markets (ACNielsen 2007).

(iv) The penetration by supermarkets of fresh produce retail varies from 10% in Nicaragua to 25–30% in Mexico to 50% in Brazil, again reflecting that

supermarkets gradually move from being mainly retailers of processed foods to being retailers of processed and fresh foods as supermarket diffusion proceeds (Reardon & Berdegué 2007).

7.3 Determinants of diffusion of supermarkets in developing countries

7.3.1 Demand-side factors

Key demand-side factors driving the rise of supermarkets are rising incomes, a burgeoning middle class (Senauer & Goetz 2003) and urbanisation. The entry of women into the workforce outside the home has also played a key role by increasing their incentive to purchase convenience and processed foods to save labour time on food preparation (Pingali 2006). The increase in the ownership of refrigerators and growing access to cars and public transport in the 1980s and 1990s have supported this trend.

7.3.2 Liberalisation of FDI

Starting in the early 1990s and through the 2000s, policies that partially or completely liberalised foreign direct investment (FDI) between nations facilitated foreign investment by supermarket chains. These investment agreements were included to some degree in structural adjustment programmes, bilateral, regional, and to a more limited extent in multilateral trade agreements, and investment agreements (as further described in Chapter 2). This led to an avalanche of FDI in developing countries mainly by Western European and US multinational retailers such as Carrefour (France), Tesco (United Kingdom), Ahold (Netherlands), Metro (Germany) and others, as well regional multinationals (such as Dairy Farm, based in Hong Kong, into Asian markets). This was a crucial driver of the 'supermarket revolution' in developing countries in the 1990s and 2000s (Reardon *et al.* 2003; Traill 2006).

The core 'push' factor encouraging this investment was the low growth rates in home markets; the core 'pull' factor was the higher profit rates in developing countries. Such profits are highest where the competition among chains is least (after controlling for demand-side factors like income growth), making the rate of FDI and subsequent supermarket growth highest at the initial stages. For example, the supermarket sector in China is growing at around 40% a year, versus only 5–10% in the more mature, relatively saturated supermarket sectors in countries like Brazil and Taiwan.

The importance of FDI (as well as the domestic policies discussed below) explains the somewhat anomalous results that China and Russia are in the third wave, and thus 'late comers' given their demand side characteristics (income, absolute size of the middle class population, urbanisation rate, share of women in the workforce) are similar to many countries in the second wave. The main reason for the lag

was policy – in the form of severe constraints on retail FDI that were progressively relaxed in the 1990s'.

In many cases, such as in Mexico and Brazil, FDI was a crucial driver. In others, notably countries with rapid economic growth rates like Russia, India and China, the supermarket revolution has also been fuelled by massive investments by domestic chains.

An important impact of FDI and local investment has been the rapid consolidation and multinationalisation of the supermarket sectors over the past decade. For example, in Latin America, the top five chains per country have 65% of the supermarket sector. Taking the case of Mexico (Reardon *et al.* August 2007a), in the early 1990s, nearly all the supermarket sales (in a small supermarket sector occupying only some 5% of food retail) were by domestic chains. In 1994, the North American Free Trade Agreement liberalised FDI. By 2002 (in a modern retail sector occupying more than a third of total retail), 48% of the $24 billion in sales by the top seven chains were by foreign chains (primarily Wal-Mart). By 2006 (in a modern retail sector by now constituting about half of total retail), the sales of those chains had nearly doubled to $38 billion, and 53% are by foreign chains (again, primarily Wal-Mart, but also Costco and H-E-B (H.E. Butt Grocery Company)). This rise in the share of FDI-based retailers had as its concomitant large yearly FDI. For example, Wal-Mart/Mexico invested $1.1 billion in 2007, and spent $1.1 billion in 2006 and $0.73 billion in 2005. The leading domestic chains competitively invested to stay up; for example, Soriana, second-ranked, invested $0.47 billion in 2006.

7.3.3 Domestic retail regulations

Domestic regulations on the retail sector have also generally speaking promoted supermarkets, although this varies over time (as in Thailand) and over countries (with China, for example, providing much more free-market for foreign retail investment than India). A notable domestic policy that promotes supermarkets is the regulations on 'wet markets', such as Beijing's requirement that no new wet markets be constructed in the city limits.

7.3.4 Cost and quality advantages over traditional retailers from modernised procurement

As discussed in the next section, supermarket chains have gained cost and quality advantages over traditional retailers as they have modernised their procurement systems. This has allowed the chains to move from the upper-income consumer segments into the middle class, and then into the food markets of the poor.

7.4 Impacts of diffusion on traditional retail

As supermarkets have spread, traditional retail has declined. The fastest decline is small general stores selling broad lines and processed foods and dairy products,

while fresh produce shops and wet markets hold out longer. But in later stages (such as in Hong Kong in the 2000s), the produce shops and wet markets decline. Several examples are:

(i) In Indonesia, sales of supermarkets rise 15% per year, while those of traditional retail decline at 2% per year. Nearly all Indonesians (except a tiny pocket of rich consumers and expatriates) shopped only in small shops and wet markets in 1990; by 2005, 30% of overall food, and 10% of produce, was bought in supermarkets, (Natawidjaja *et al.* 2007).

(ii) In urban Chile, there was a disappearance of 15,777 small shops between 1991 and 1995, mainly in Santiago (a city of 4 million). There was a 21–22% decline of general food, meat and fish small shops, 25% of deli/meat shops and dairy product shops, but only a 17% decline in fruit/vegetable shops (Faiguenbaum *et al.* 2002).

(iii) In urban Argentina, in the most intense take-off period of supermarkets from 1984 to 1993, there was a decline of small food shops from 209,000 to 145,000 – roughly 64,000 went out of business (Gutman 1997). It is estimated that during the 1990s, 4 out of 10 neighbourhood shops turned into self-service stores, another 4 survived but with drastic drops in sales, and 2 closed. It is also reported from Argentina that while general-line small shops folded quickly, those in a specialised niche, in particular bakeries, fresh fish and meat, and fruit and vegetable shops, took longer to disappear (Rodríguez *et al.* 2002).

(iv) In Hong Kong, in the 1970s, supermarkets outcompeted (based on price, quality and variety) traditional outlets in the packaged- and processed-food markets. For example, supermarkets quickly displaced rice stores (after the 1974 deregulation of rice sales by supermarkets, which addressed public concern regarding traditional rice stores' profiteering; Ho 2005) and other general-line grocery stores. Between 1974 and 1985, the number of small grocery shops selling general provisions dropped by 30%. In 1986, the supermarkets' share of staple and dry foods (noodles, rice, oil and packaged goods) was 68, and by 1995 their share was 90% (Goldman *et al.* 1999; Ho 2005). By contrast, only 11 and 6% of vegetables and fruit, respectively, were bought in supermarkets in Hong Kong in 1995 (Goldman *et al.* 1999). Starting in 1996, the supermarket sector (then in a mature phase) began to challenge the wet markets. The sector saw a diversification into superstores with large fresh-food sections that mimicked wet markets, and so a 'supermarket-cum-wet market' format emerged (Ho 2005). In 2000, the government changed the zoning laws to favour supermarkets, allowing supermarkets, not just hypermarkets, to operate in-store wet markets and to locate in public rental or subsidised government estate buildings (for lower-income consumers). As a result, many supermarkets in the poorer areas were converted to superstores. By 2004, supermarkets in Hong Kong had a 59% share in fruit retail and a 55% share in vegetables (Coca-Cola Retailing Research Council Asia 2005; Reardon & Gulati February 2008).

7.5 Supermarkets' impact on consumer prices and diet diversity: emerging evidence and hypotheses

7.5.1 Pathways

As supermarkets have grown and traditional retail declined, they could have affected, and still be affecting, consumers' diets via three vectors: (i) reducing consumer prices (relative to those of traditional retailers), measured as product price plus shopping 'transaction costs' – and thus affecting (potentially) consumers' product choices and raising consumers' real incomes; (ii) increasing product diversity – based on the product inventory that supermarkets carry, which is typically far greater and more diverse than the 'mom-and-pop' store; and (iii) increasing product safety (relative to the traditional retail system).

The ability of the modern retail chain to do these three things depends on their ability to modernise their procurement systems (relative to the traditional procurement system of supermarket chains which consisted of depending on traditional wholesalers), as now discussed.

7.5.2 Supermarkets' modernisation of procurement systems as the 'foundation stone' of supermarkets' competitive positioning on price and diversity

As supermarkets have spread over the past decades, retail competition has risen sharply. In order to compete, supermarkets have reduced costs in order to penetrate the mass market, while raising quality to hold on to and deepen the market among middle-class clientele. Modernising procurement systems has been crucial to this process of reducing costs and raising quality: it enables efficiency gains, economies of scale and coordination cost reductions.

Modernisation has followed four clear trends. First, the *extension and integration of procurement catchment areas into national, regional and global networks*. As the number of stores in a given supermarket chain grows, there is a tendency to shift from a fragmented, per-store procurement system, to a distribution centre serving several stores in a given zone or district, and eventually the whole country. The 'catchment' area of a distribution centre or set of them usually starts as the zone of a country (such as 'northeast China') and then broadens to several distribution centres representing a centralised system for procurement over all zones in a country (a good example being Soriana's five distribution centres in Mexico).

Centralisation increases efficiency of procurement by reducing coordination and other transaction costs. China Resources Enterprise (2002), for example, notes that it is saving 40% in distribution costs by combining modern logistics with centralised distribution in its two large new distribution centres in southern China. It should be noted, though, that centralisation may increase transport costs due to the extra movement of the actual products.

The next, and economically logical, step is internationalisation at a regional level. In this step, a regional system of distribution centres is set up to allow coordinated procurement over a set of countries. Regional and global supermarkets operating in East/Southeast Asia, Latin America and Central and Eastern Europe are establishing such regional procurement networks, and increasingly integrating them with the chains' global procurement networks (Reardon *et al.* 2007b).

The second trend in retail procurement system change is the *shift from exclusive reliance on the traditional wholesale sector to the use of non-traditional, specialised/dedicated wholesalers and logistics firms*. The latter, non-traditional players are specialised in a product category and dedicated to the supermarket sector as a main or the main client. These specialised wholesalers cut transaction, coordination, and search costs, and enforce private standards and contracts with suppliers on behalf of the supermarkets. An example from Central America is Hortifruti (in the same holding company as the Costa Rica-based chain CSU (Corporacion de Supermercados Unidos), and since 2006, part of Wal-Mart), which undertakes contract farming and spot-market purchases to source produce for the CSU stores in Costa Rica, Nicaragua and Honduras, following the private standards of that chain (Berdegué *et al.* 2005).

The third trend is the *incipient shift from spot market to implicit contracts or preferred supplier lists*. There is mounting evidence of chains and/or their specialised wholesalers (acting as 'channel captains') entering into such preferred supplier relationships – de facto but informal contracts that are usually equivalent to a 'memo of understanding' (verbal or written) with processors and farmers. Chains and/or their specialised wholesalers tend to move from spot-markets to preferred supplier lists where there is greatest need for quality and consistency, and where farmers or processors are associated or are individually large (thus lowering transaction costs).

The fourth, but by no means least important, trend is the *rise of private standards and private enforcement of public standards* (Reardon *et al.* 1999). These standards pertain to the quality and safety of food products. In general, these standards function as coordination instruments of supply chains by standardising product requirements over suppliers, who may cover many regions or countries. Standards specify and harmonise the product and delivery attributes, thereby enhancing efficiency and lowering transaction costs. Private standards of a given chain may also be designed to ensure (at a minimum) that the public standards are met in all the markets in which the retail chain operates.

7.5.3 Evidence on food prices charged by supermarkets versus traditional retailers

A supermarket chain's procurement system determines, all else being equal, the cost of the products. Depending on the consumers' elasticities of demand with respect to prices,[1] supermarkets' charging lower prices for product x can sway a consumer to consume more of x. That supermarkets charge lower prices than traditional

[1] That is, the measure of responsiveness in the quantity demanded for a commodity as a result of change in price of the same commodity.

retailers in developing countries is observed in emerging evidence, albeit with lots of variation depending on the stage of supermarket development, inter alia.

The key point is that the modernisation of procurement systems can substantially reduce product and/or transaction costs.[2] If the chain passes these cost savings on to the consumer, then the consumer price decreases. In general, it appears that chains choose to pass on to consumers some of those cost savings (rather than retain them fully as profit) to compete with other supermarket chains and traditional retailers. This trend is in general correlated with the stage of diffusion of supermarkets, the type of product (supermarket prices of processed products are typically competitive much earlier than that of fresh foods), and the degree of modernisation of the chain's procurement system (whose costs modernisation drives down). Note that supermarkets tend to modernise procurement systems first for processed products such as rice and oil, then for semi-processed products such as dairy and meat and in a third stage for fresh produce. Controlling for the traditional retailer's price, there is usually a negative correlation between supermarket procurement modernisation and the price the supermarket charges the consumer.

A review of available survey-based evidence from ten developing countries plus primary data from Madagascar (Minten & Reardon, 2008) shows a stable and predictable pattern in supermarket pricing and quality offerings versus traditional markets. (i) Supermarkets early on out-compete traditional retailers by charging lower prices for staples and processed products – taking advantage of procurement systems that allow for economies of scale. Poor consumers take advantage of this to buy processed foods and semi-processed foods from supermarkets. (ii) Supermarkets early on sell vegetables more expensively than do traditional retailers. Only slowly do they reduce their prices and compete on fruit and eventually vegetable prices. (iii) Supermarkets in the early stages tend to focus on packaged and high-quality products. Typically, supermarkets then shift over time towards a variety of qualities and of packaging to add the mass-market to their marketing targets. (iv) Where the data permit, it is possible to see a clear differentiation of price by quality. Sometimes it is clear that supermarkets charge higher prices because they focus on the quality niche. However, sometimes (like for potatoes in Ecuador), it is clear that supermarkets provide both better quality and lower prices.

Examples of supermarkets charging lower prices include the following:

(i) A study in Chile, a 'first-wave' country (LatinPanel study for 2004, reported in Camara Nacional de Comercio 2005), shows that supermarkets, by charging lower prices for food compared to traditional retailers, reduced the cost of the food consumption basket of lower- and middle-income consumers in Chile.

(ii) D'Haese and van Huylenbroeck (2005) found that supermarket prices were well below the prices of small shops in South Africa (a second-wave country) in particular for the processed foods and staples that accounted for the top

[2] That is, a cost incurred in making an economic exchange.

ten consumer purchase items (of rural town/village areas) as well as bulk produce items, such as cabbage, and semi-processed items such as dairy.

(iii) Neven *et al*. (2006) showed in Nairobi, Kenya (a third- or perhaps fourth-wave country), that supermarket prices were lower than traditional shops for processed foods and non-food items, but not for fresh produce generally speaking, except for some mass commodity produce items, such as kale, that supermarkets used to 'draw' consumers.

(iv) Minten and Ghorpade (2007) found in Rajasthan, India, that supermarkets were charging less than traditional retailers for fresh produce. (This is relatively uncommon in the early stages of supermarket development. Usually supermarkets' produce prices are higher than traditional shops' because the former have not yet moved to modernised procurement of fresh produce and to generate the volumes and efficiency needed to drive down prices.)

(v) Farina *et al*. (2005) found that there was a 'symbiotic relationship' between large processors and supermarket chains in Brazil and Argentina, with supermarkets procuring in large volumes and reducing (through lower transaction costs) milk prices to consumers, and transaction costs to dairy processors. Dries and Reardon (February 2005) found similar results in Russia.

7.5.4 Evidence on product diversity in supermarkets versus traditional retailers

The 'straw man' position in popular debate is to depict supermarkets as purveyors of processed foods, and thus potential exacerbators of poor diet trends towards the overconsumption of processed food and abandonment of fresh foods. This image is easily debunked by an examination of the trends noted above regarding supermarkets penetration of product categories. In the earliest stages, in the United States or Canada as in developing countries, supermarkets indeed sell nearly only processed products – flour, rice, beverages, bread, vegetable oil, packaged foods and condiments. This was the case in an A&P supermarket in the 1940s in the United States, in Mexican or Brazilian supermarkets in the early 1990s, and remains the case today in supermarkets in middling size towns in Kenya. But in first and second wave, and many third wave countries, this stage has not been left behind, with huge growth in the meats and fish section, the dairy section, and in the past half-decade, the produce section. For example, in only 2000, in Mexican leading supermarket chains, fresh produce was only about 1–2% of food sales; today it is 10–12% (Reardon *et al.* August 2007a). The same variety available in Mexican supermarkets is now available in supermarkets or hypermarkets in Shanghai and Beijing and Jakarta today, and it is hard to tell what is different (in product offering) from a supermarket in Montreal.

Rather, the issue is the reverse – what can be found in supermarkets in Mexico City or Beijing or Delhi that cannot be found in small shops and wet markets? There is some 'hard' research on this; the rest is based on observation by the authors in the field and remains hypothetical.

(i) The basic brands of staple processed commodities tend to be the same in supermarkets and small shops – the flour mill brands, the vegetable oil brands, the rice lines etc. There would be more of the supermarket chains' 'private labels', perhaps more imported brands and more 'health' brands like organic pulses. Packaged snack foods would be similar to brands found in local small shops, with simply more volume.

(ii) The meat section would be similar between a supermarket and traditional markets, but with a greater share of packaged fresh meat in overall meat offerings. Again, there might be a greater variety of processed meats from imports.

(iii) The dairy section would be stunningly different in a supermarket or hypermarket compared with a traditional retailer. Supermarket chains have economies of scale thus high dairy product diversity (a supermarket might have 1,000 stock-keeping units[3] of dairy products versus 100–200 in a small shop), which allows for more choice and a greater range of value added to producers. Supermarkets have a far greater shelf space and better refrigeration facilities than small shops, and this is one of the key factors in the symbiotic relationship of large chains and big dairy processors like Nestlé. (For example, see Hu *et al.* 2004 for China; Farina *et al.* 2005 for Argentina and Brazil; and Dries & Reardon 2005 for Russia.)

(iv) The produce section would be more diverse (and larger) in a supermarket compared with a fruit/vegetable shop, but a supermarket would be similar in diversity (or less) compared to a single large wet market. However, there is a key time dimension to the diversity of the produce section. From observation, it appears that in traditional local markets (and sometimes in urban markets), there is high diversity on sale, with sharp seasonality. When supermarkets are in early takeover stages, they stock less diversity than these local markets because they select products based on low cost (transaction costs and product costs); at this stage, local 'diversity' products are cheap for gatherers and at road-side stands, but expensive for big retailers to obtain and stock. Products (even imported or from far off production sites) that are commodities are far cheaper and easier to stock (Reardon *et al.* 2007a provide an illustration of this for Mexico). But then, as supermarkets develop further, the produce section becomes a key 'battle arm' in competition (such as in Mexico, starting only circa 2002), and consumers start to search out more exotic and/or local heirlooms (i.e. back to old diversity products) in supermarkets rather than local markets.

Even adjusting for some margin of error on the above hypotheses and observations, the picture that emerges in developing countries (on average) is that a supermarket or hypermarket is not 'biased' towards one food category or other. A consumer frequenting supermarkets would have as much or more food choice

[3] Each stock-keeping unit (SKU) is a unique identifier for each distinct product and service that can be ordered from a supplier.

than one frequenting only traditional stores. This point becomes increasingly true as supermarkets develop.

7.5.5 Direct evidence of supermarkets' effects on diets

There are two approaches to evaluating the effects of the above-described changes on consumers' diets. The first is to determine, controlling for the country situation, which kinds of consumers go to supermarkets, and once there, what they buy. The tiny amount of extant evidence indicates that shopping at supermarkets is generally speaking correlated with a consumer's higher incomes and education, having a car and refrigerator, and being in a bigger city rather than a smaller one (such as in Argentina, Rodríguez *et al.* 2002). This does not imply that only these kinds of consumers shop at supermarkets, just that the frequency differs over groups. Furthermore, different types of consumers tend to buy different product categories at supermarkets. The essence of the few findings are that the better-off consumers tend to buy both processed and fresh products at the supermarkets, while poorer consumers who shop at supermarkets tend to buy just processed products and buy their fresh produce at wet markets and small shops. This would be expected in a situation where produce still costs more at supermarkets and where richer consumers value their time more than they weigh the produce cost difference. As produce prices come down, even poor consumers would be willing to buy. Therefore, these findings would differ over countries and over time.

The second approach to evaluate the effects of supermarket development on diets is to directly study (after carefully controlling for consumer characteristics) whether it actually makes a difference on consumption patterns if the consumer buys food in supermarkets or traditional stores. In theory, such a difference could arise due to: (i) the hedonic characteristics (i.e. pleasure-related) of the supermarket's differential offering (compared to traditional retailers), for instance, how the products were presented and advertised; (ii) the different variety of products (for example, whether the local small shop sells ice creams or only the supermarket sells them); (iii) controlling for (i) and (ii), a lower price in a supermarket (relative to traditional retailer) for a given item, controlling for the price-sensitivity of the consumer.

It is thus a tall order to isolate – and then decompose the reasons for – supermarkets' effects on consumers' purchases of food products. No study has done this fully. Cross-country regression studies, such as regressing the share of processed food in the diet against the share of supermarkets in overall retail (controlling for average incomes), would contain too much noise and imprecision to be of much use. The fact that supermarket diffusion is associated with income growth, and it is generally observed that increases in income lead to processed foods displacing staples ('Bennett's Law'), also means that the share of processed food in the diet would be expected to be positively correlated with share of supermarkets. Such a study would thus be tautological in nature, and not pinpoint what the role or effect of supermarkets is in the complex equation.

Micro-studies that control for socioeconomic characteristics of households and examine econometrically whether supermarkets per se affect consumption are extremely rare, in our observation. There are two extant studies, one showing a positive effect on diets, the other a negative effect. The first is Tessier *et al*. (2008), which examined the determinants of a consumer's buying from supermarkets in Tunis using urban consumer data. Controlling for socioeconomic characteristics, they examined the correlation of diet quality and regular supermarket use, and found that regular clients of supermarkets have a somewhat better quality diet. Asfaw (2008), using urban consumer data from Guatemala in 2000 (when produce, dairy and meat sections of Guatemalan supermarkets were in their early development stages), found that those buying at supermarkets tended to buy highly processed foods as compared to those shopping only at traditional stores. However, like Tessier *et al*. (2008), Asfaw (2008) did not have data on what consumers purchased at supermarkets versus traditional stores, and so could not isolate the effect of supermarkets on processed food purchase. But this is a good hypothesis to test in further studies. It would be important to examine whether the finding is due to processed-product price differences with local shops (which would establish that the supermarkets per se drove the differential consumption pattern via price elasticity of demand), or if it is due to idiosyncratic differences between supermarket and traditional retail shoppers, holding income constant.

It is likely, and thus could be a working hypothesis, that supermarkets are a 'megaphone' of consumer preferences at a given moment in a given group. Supermarkets are simply geared to deliver more, and more cheaply, whatever the consumers around them want to buy. (This can mean greater consumption of nutritious foods made more affordable by modern retail, as pointed out for example by Hawkes 2008.) If they want cheap and diverse processed foods, supermarkets work to provide that. If they want fresh produce, fair trade and organic products, supermarkets work to provide that. It is fair to say that supermarkets are biased towards making profits, but not biased towards any product category.

7.6 Evidence of supermarkets' effects on food safety for consumers

7.6.1 Fresh produce

The rise of private quality and safety standards implemented by supermarkets, as well as private enforcement of public standards, has become a dominant mechanism through which fresh produce supply chains are governed in developed country markets (Fulponi 2006; Henson & Reardon 2005). This is now also an emerging trend in developing countries.

In general, traditional produce retail in developing countries operates with little or only rough and approximate use of standards – either of quality or safety – and

even less of social or environmental standards. The most typical and traditional situation is that produce is bought ungraded or graded from local growers, then graded in a rough and approximate way for the wholesale market. For example, in Mexico, brokers grade guava into extra, first, second and thirds (by size) and add some colouring (for ripeness) grades. Other attributes (such as consistency of the flesh, skin damage etc.) may be added, but not consistently across buyers or markets. There are public national standards for fruit but, in general, these are not used (Berdegué *et al.* 2005). In Guatemala and Thailand, there are food safety regulations, but generally speaking, these do not translate into safety standards implemented for produce marketed in the traditional markets (Berdegué *et al.* 2005; Boselie 2002). That is, traditional informal markets at the field broker up to the wholesale markets have little incentive to apply uniform and rigorous standards; even if the incentive is there, there is little capacity given that typically the supply chains are long (for example, a tomato changes hands five times, from the field to the wholesale market in Mumbai, India), with many small intermediaries bulking product of various quality grades, origins and safety characteristics along the chain. Even if the product got to the wholesale market with tight grading of quality and safety standards, in the traditional system it would then be distributed via massive numbers of small retailers with no capacity to test the produce for bacteria or pesticide residuals, little capacity to preserve produce undamaged, and with little uniformity among them in quality standards presented to the consumer. Moreover, a government can specify quality and safety standards, but due to the informal and atomised nature of the market, usually finds it hard to impossible to enforce the standards (Reardon *et al.* 1999).

The conditions of underdeveloped and under-implemented quality and safety standards in the traditional market and supply chains are both a problem and an opportunity for supermarket chains in developing countries. On the one hand, underdeveloped public standards are a problem in that poor quality produce spoils easily and causes high losses; in countries where formal sector companies, such as supermarkets, can be liable for consumer safety, the absence of food safety standards in traditional markets mean that supermarkets may have to pay damages. This can be especially problematic for global chains under global shareholder and public scrutiny. Moreover, a history of low or no standards means that the mass of suppliers have not had to upgrade quality and safety. Thus, the local supply base is poor relative to supermarkets' needs, both for their local retailing and for supplying regional and global networks from that base.

On the other hand, poor standards in the traditional sector are an opportunity for supermarkets. A retailer in Guatemala, for instance (Berdegué *et al.* 2005), noted that this allows a supermarket to differentiate its product and compete with traditional retailers. To circumvent the problems and take advantage of the opportunity, supermarket chains: (i) formulate private standards of quality and safety; (ii) use first- or second- or third-party certification mechanisms; (iii) use preferred supplier and sometimes specialised/dedicated wholesalers to monitor the implementation of the standards among suppliers; (iv) sometimes use farmer assistance programmes to enable farmers to follow the standards.

Supermarket chains in developing countries are increasingly developing private standards for several reasons: (i) as noted above, public standards are inadequate or missing; (ii) even if the local consumer base demanding high quality or safety standards is limited, global and regional retailers apply private standards to items that enter regional or global procurement networks (such as Carrefour's Quality Line programme); the private standards applied are chain-specific and acceptable to (and usually more demanding than) any public standard in the countries covered in the network, or the standard is matched or identical to a global private standard to which the chain adheres, such as GlobalGap (formerly EurepGap) (www.globalgap.org) and the Global Food Safety Initiative (GFSI of the CIES Food Business Forum (2002), see http://www.ciesnet.com/2-wwedo/2.2-programmes/2.2.foodsafety.asp), or both; (iii) for the local market, private standards are often applied to coordinate supply chains and reduce wastage from poor quality produce; and (iv) as noted above, to compete with traditional retailers. There is little available in terms of statistical/empirical evaluations of the implementation of private produce standards in developing countries (there are a few exceptions, such as Bone & Parker 2005 for Mexico, and Berdegué *et al.* 2005 for Guatemala and Costa Rica). Our points here are based on our field research in a number of developing countries and are stated as working hypotheses.

First, it appears common for supermarkets in developing countries to have private quality standards, often specific to the chain. These are mainly concerning appearance – size, colour, blemishes and other damage, and foreign matter. There is seldom brix testing, taste testing, or testing of flesh consistency. While sometimes industry and public standards exist for quality in a given country, it is our experience that these are usually ignored (by retailers and suppliers) and chain-specific standards are applied. The chains also apply standards to suppliers exporting to them: for example, Dairy Farm International applies very stringent private standards to produce from FreshWorld from South Africa (as pointed out in verbal comments to audience by speaker Danie Kieviet at the Produce Marketing Association convention 'Fresh Summit' in Houston in October 2007).

Second, public standards for produce safety appear to be rare in developing countries. It has been observed that where there do exist, they are not or only partially implemented. It is not surprising why: most produce goes through informal markets where safety cannot be monitored except on an occasional spot basis. In addition, governments usually lack the administrative capacity needed to implement standards (even if they are 'on the books'); most consumers put price and quality first, and produce safety is not a subject much debated or discussed, even in countries where consumers are fanatical about fresh produce (such as in Turkey, see Koc 2007).

Third, it appears through ample first-hand observation that it is very rare for supermarkets in developing countries to implement produce safety standards for produce destined only for the domestic market (produce that does not enter into regional or global networks of the retailer). Interviews with many local producers corroborate this point. There are, however, exceptions. For example, CSU and La

Fragua in Costa Rica and Guatemala had voluntary standards for certain aspects of produce safety for several items (Berdegué *et al.* 2005).

The trend for supermarkets in developing countries appears to be to increase their implementation of private safety standards, because: (i) global and regional chains are increasing their market share, and starting to work to mesh their local and regional and global procurement networks; (ii) food crises, like bird flu and some produce scares, have sensitised the urban consumers (for Thailand, see Posri and Chadbunchachai 2006; for Tianjin China, see Zhang 2005; for Vietnam, see Moustier *et al.* 2006; for chicken and ducks after shock of bird flu, see Phan and Reardon 2007) who tend to trust supermarkets more than wet markets to have the incentive and capacity to deliver food safety; (iii) organic and low-pesticide categories are developing for the local markets, very quickly in growth rate terms but starting from a tiny base and aimed mainly at the upper-income consumers; (iv) some countries' governments are becoming more proactive in addressing produce safety problems. An example of the latter is China. The Ministry of Finance and Commerce is promoting food safety and traceability (as well as farm development), and working with Metro to develop (started in 2007) a direct-purchase programme of produce and meat from Anhui Province into its Shanghai DC. Produce safety is a key aspect of the programme (Lambert & Ren 2007).

Fourth, probably the most common (but still rare and in early stages) implementation of food safety standards by supermarkets in developing countries is where global and regional chains have selected certain local produce items and suppliers to supply their local stores as well as their regional and global networks. An example is Carrefour/China's Quality Line (part of their global programme of Carrefour Filière Qualité); Carrefour worked with groups of farmers to develop supplies of vegetables and fruit (such as pomelo) that they sell to their stores in China and some of which they export into their global network (such as sending pomelos to France). Private quality and safety standards are applied.

Moreover, international and multi-chain private standards, such as GlobalGap (www.globalgap.org, the name since September 2007 for EurepGap), are being implemented by a number of global chains. There are some 80,000 certified suppliers globally. There are counterpart country-specific versions of GlobalGap (such as ChileGap, ChinaGap, KenyaGap, MexicoGap and ThaiGap). This set of standards is already important for suppliers in developing countries selling into global networks of the participating retailers. It is not yet established (by empirical research) to what extent chains are applying GlobalGap or its homologues to farmers supplying to their retail operations in the developing countries. Our hypothesis is that it is still rare, with application reserved for produce going both to the local retail operations and into the global networks. However, just as segregating produce of various grades is costly, so is desegregating; thus, as chains in developing countries increasingly work with the better suppliers who are, simultaneously engaged in export, and for the latter have to meet private standards, the tendency will probably be for a gradual convergence and harmonisation with the local or at least the regional procurement operation and thus an 'importing' of the global standards

into the regional and national sourcing networks. This has already begun and will probably accelerate.

7.6.2 Processed products

Processed products constitute some 65% of supermarket food sales in developing countries and another 20–25% are semi-processed (such as meats and dairy). Thus, these products pass through a stage of processing by second-stage processors or first-stage processors, who are potentially under the food safety scrutiny of governments (and thus on whom public standards of food safety are imposed) or under 'private standards' imposed by the company, or both. It is beyond the scope of this chapter to examine the food processing sector's food safety standards in developing countries, but several general points need to be made to relate this to the supermarket theme.

(i) The larger the food processor, the greater the probability that it will be under government inspection and scrutiny for the application of public regulations of hygiene; small processing firms, slaughterhouses etc. tend to be in the informal sector and generally escape systematic scrutiny.
(ii) The larger the food processor, the greater (by far) the probability that it will self-impose private standards of food safety (Reardon *et al.* 1999).
(iii) The emerging evidence indicates that supermarket chains tend to select the larger processing firms as their preferred suppliers (and exclude the small and informal).
(iv) It is then (nearly) ipso facto the case that supermarket chains would tend to favour (relative to small retailers relying on small processors, informal sector slaughterhouses etc.) consumer food safety because they tend to rely on large-scale processors under greater government or private standard scrutiny.

Moreover, supermarket chains tend to be 'more visible' and under greater public and government scrutiny than many small shops and wet market stall operators, in terms of whether they respect expiry dates, packaging laws etc. They are often also more legally liable and certainly, if they are regional or global chains, more sensitive to public and shareholder opinion of their safety practices. Despite this, evidence (like the CIES food safety and retail study, which included one study on developing countries, Mexico) shows that such laws are only partially applied and safety standard implementation even in large chains is imperfect (Bone & Parker January 2006).

In sum, a working hypothesis that emerges from the above is that, in general, the developing country consumer is favoured with better food safety as the share of supermarkets in overall retail increases, all else equal.

7.7 Conclusions

This chapter finds that it is probable that, because supermarkets market and procure food differently from traditional retailers, they do have an effect on prices,

diets and health. The hypothesised effect on food prices is that supermarkets reduce prices relative to those of traditional retailers, in particular for processed and semi-processed products and staples, for which supermarkets have advantages of economies of scale, bargaining power, and logistics efficiencies (relative to traditional retailers), and only in later stages of supermarket penetration for fresh produce. The emerging evidence broadly supports this hypothesis.

The hypothesised effect on diets is that they reinforce and perhaps magnify the outcomes predicted by 'Bennett's Law' (i.e. as incomes rise, consumers shift to consuming more processed foods relative to staples, regardless of the retail system), with consumers buying disproportionately more value-added staples and non-staples as their incomes rise, and supermarkets making these products more available at lower cost, more convenience and in greater diversity. It is difficult to disentangle the effects of urbanisation, the rise of large-scale processors, and supermarkets on consumers, given their close relationships.

The hypothesised effects on food safety are much less ambiguous. Supermarkets have far more incentives and capacity (than traditional retailers) to deliver the food safety attribute. The evidence shows that supermarkets 'play that card' in competition with traditional retail, that consumers already know this and, where food safety matters to them, act upon it by increasingly shopping at supermarkets, all else being equal.

As in developed countries, governments can find allies in supermarket chains in the promotion of nutrition and food safety, finding ways to magnify the incentives and capacity of supermarkets to help on this score. By contrast, it is improbable that governments can do much to keep large retailers from retailing available products that are seen as unhealthy (that they acquire from processors to on-sell to consumers); food laws and regulations affecting the supply side would be the most efficient way to influence the healthiness and nutrition of foods offered from the manufacturing base.

References

Asfaw, A. (2008). Does supermarket purchase affect the dietary practices of households? Some empirical evidence from Guatemala. *Development Policy Review* **26**(2), 227–43.

Berdegué, J.A., Balsevich, F., Flores, L. & Reardon, T. (2005). Central American supermarkets' private standards of quality and safety in procurement of fresh fruits and vegetables. *Food Policy* **30**(3), 254–69.

Bone, H. & Parker, A. (January 2005). *Food Safety Management by Retailers: A Global Inventory of In-Store Food Safety Requirements*. Working Paper. CIES Global Food Safety Initiative.

Bone, H. & Parker, A. (January 2006). *Food Safety Management by Retailers: An Assessment of In-Store Food Safety Practices*. Working Paper. CIES Global Food Safety Initiative.

Boselie, D. (2002). *Business Case Description: TOPS Supply Chain Project, Thailand. KLICT International Agri Supply Chain Development Program*. Agrichain Competence Center, Den Bosch.

Camara Nacional de Comercio (2005). Cae Consumo de Sectores Medios y Bajos. *Noticias CNC*. Article posted May 10 on website publication of the Camara Nacional de Comercio, Servicios y Turismo de Chile, Santiago, Chile. Retrieved 14 May 2005 from www.cnc.cl.

China Resources Enterprise (July 2002). *Retailing Strategies and Execution Plan*. Retrieved from China Resources Enterprise, Limited, Hong Kong.

CIES Food Business Forum (2002). *Wu-Mart*. CIES Food Business Forum, Paris.

Coca-Cola Retailing Research Council Asia (2005). *The Fresh Imperative: Creating Excellence in Asian Fresh Food Retailing*. Study by Accenture, commissioned by Coca-Cola Retailing Research Council, Atlanta, GA.

D'Haese, M. & Van Huylenbroeck, G. (2005). The rise of supermarkets and changing expenditure patterns of poor rural households case study in the Transkei area, South Africa. *Food Policy* **30**(1), 97–113.

Dries, L. & Reardon, T. (February 2005). *Central and Eastern Europe: Impact of Food Retail Investments on the Food Chain*. Report Series No. 6. FAO Investment Center – EBRD Cooperation Program, London.

Faiguenbaum, S., Berdegué, J.A. & Reardon, T. (2002). The rapid rise of supermarkets in Chile: effects on dairy, vegetable, and beef chains. *Development Policy Review* **20**(4), 459–71.

Farina, E., Gutman, G.E., Lavarello, P.J., Nunes, R. & Reardon, T. (2005). Private and public milk standards in Argentina and Brazil. *Food Policy* **30**(3), 302–15.

Fulponi, L. (2006). Private voluntary standards in the food system: the perspective of major food retailers in OECD countries. *Food Policy* **31**(1), 1–13.

Goldman, A., Krider, R. & Ramaswami, S. (1999). The persistent competitive advantage of traditional food retailers in Asia: wet markets' continued dominance in Hong Kong. *Journal of Macromarketing* **19**(2), 126–39.

Goldman, A. & Vanhonacker, W. (July 2006). *The Food Retail System in China: Strategic Dilemmas and Lessons for Retail Internationalization/Modernization*. Paper presented at the Globalizing Retail Conference, University of Surrey, UK.

Gutman, G. (1997). *Transformaciones recientes en la distribución de alimentos en Argentina, Buenos Aires*. Secretaría de Agricultura, Ganadería, Pesca y Alimentación (SAGPyA) and Instituto Interamericano de Cooperación Agrícola (IICA), Buenos Aires, Argentina.

Hawkes, C. (2008). Dietary implications of supermarket development: a global perspective. *Development Policy Review* **26**(6), 657–92.

Henson, S. & Reardon, T. (2005). Private agri-food standards: implications for food policy and the agri-food system. *Food Policy* **30**(3), 241–53.

Ho, S-C. (2005). Evolution versus tradition in marketing systems: the Hong Kong food-retailing experience. *Journal of Public Policy and Marketing* **24**(1), 90–99.

Hu, D., Fuller, F. & Reardon, T. (2004). The impact of the rapid development of supermarkets on the dairy industry of China. *Zhongguo Nongcun Jingji (Chinese Rural Economy)* **7**(235), 12–18.

Koc, A. (2007). Turkey food system transformation. In: *Regoverning Markets Programme*. Working Paper, Akdeniz University, Department of Economics, Antalya, Turkey.

Lambert, N. & Ren, B. (July 2007). *Metro Cash & Carry China*. Prepared for the IATRC Conference's International Workshop Emerging links between Retail Transformation and Agrifood trade in Asia, Beijing, China.

Minten, B. & Ghorpade, Y. (June 2007). *The Tomato Value Chain in Jaipur: Insights in Traditional Marketing Channels versus Modern Retail*. Working Paper. IFPRI, New Delhi.

Minten, B. & Reardon, T. (2008). Food prices, quality, and quality's pricing in supermarkets vs traditional markets in developing countries. *Review of Agricultural Economics* **30**(3), 480–90.

Moustier, P., Dao, T.A., Hoang, A.B., Vu, B.T., Figuie, M. & Phan, T.G.T. (2006). Supermarkets and the poor in Vietnam. Malica (Markets and Ag Linkages for Cities in Asia) and M4P (Making Markets Work Better for the Poor), Hanoi.

Natawidjaja, R., Reardon, T., Shetty, S., Noor, T.I., Perdana, T., Rasmikayati, E. *et al*. (July 2007). *Horticultural Producers and Supermarket Development in Indonesia*. UNPAD/MSU/World Bank. World Bank Report No. 38543. World Bank, Jakarta, Indonesia.

Neven, D., Reardon, T., Chege, J. & Wang, H. (2006). Supermarkets and consumers in Africa: the case of Nairobi, Kenya. *Journal of International Food and Agribusiness Marketing* **18**(1/2), 103–23.

ACNielsen. (2007). *Survey of Consumer's Shopping Behavior and Perceptions toward Modern and Traditional Trade Channels in Indonesia*. World Bank, Indonesia.

Phan, T.G.T & Reardon, T. (March 2007). *Urban Consumer Preferences for Poultry from Supermarkets versus Traditional Retailers in the Era of Avian Influenza in Ho Chi Minh City, Vietnam*. Report to USAID and Paper published in the FAO/MARD Proceedings of the Workshop. 'The Future of Poultry Farmers in Vietnam after Highly Pathogenic Avian Influenza', Hanoi.

Pingali, P. (2006). Westernization of Asian diets and the transformation of food systems: implications for research and policy. *Food Policy* **32**, 281–98.

Planet Retail (7 June 2004). Consumers forsake wet markets in Asia. *Daily News by M+M Planet Retail*.

Posri, W. & Chadbunchachai, S. (2006). Consumer attitudes towards and willingness to pay for pesticide residue limit compliant 'safe' vegetables in Northeast Thailand. *Journal of International Food and Agribusiness Marketing* **19**(1), 81–101.

Reardon, T. & Berdegué, J.A. (January 2007). *The Retail-Led Transformation of Agrifood Systems and its Implications for Development Policies – A Background Paper Prepared for the World Bank's World Development Report 2008: Agriculture for Development*. Rimisp – Center for Latin American Rural Development, Santiago, Chile.

Reardon, T., Berdegué, J.A., Echánove, F., Cook, R., Tucker, N., Martínez, A. *et al.* (August 2007a). *Supermarkets and Horticultural Development in Mexico: Synthesis of Findings and Recommendations to USAID and GOM*. Report submitted by MSU to USAID/Mexico and USDA/Washington.

Reardon, T., Codron, J-M., Busch, L., Bingen, J., Harris, C. (1999). Global change in agrifood grades and standards: agribusiness strategic responses in developing countries. *International Food and Agribusiness Management Review* **2**(3/4), 421–35.

Reardon, T. & Gulati, A. (February 2008). *The Rise of Supermarkets and Their Development Implications: International Experience Relevant for India*. IFPRI Discussion Paper 007, IFPRI, Washington, DC.

Reardon, T., Henson, S. & Berdegué, J. (2007b). 'Proactive fast-tracking' diffusion of supermarkets in developing countries: implications for market institutions and trade. *Journal of Economic Geography* **7**(4), 1–33.

Reardon, T. & Timmer, C.P. (2007). Transformation of markets for agricultural output in developing countries since 1950: how has thinking changed? In: Evenson, R.E. & Pingali, P. (eds). *Handbook of Agricultural Economics, 3: Agricultural Development: Farmers, Farm Production and Farm Markets*. Elsevier, Amsterdam, pp. 2808–55.

Reardon, T., Timmer, C.P., Barrett, C.B., Berdegue, J. (2003). The rise of supermarkets in Africa, Asia, and Latin America. *American Journal of Agricultural Economics* **85**(5), 1140–46.

Rodríguez, E., Berges, M., Casellas, K., Di Paola, R., Lupín, B., Garrido, L. *et al.* (2002). Consumer behaviour and supermarkets in Argentina. *Development Policy Review* **20**(4), 429–39.

Senauer, B. & Goetz, L. (14 February 2003). *The Growing Middle Class in Developing Countries and the Market for High-Value Food Products*. Paper presented at the Workshop on Global Markets for High-Value Food Economic Research Service. USDA, Washington, DC.

Tessier, S., Traissac, P., Maire, B., Bricas, N., Eymard-Duvernay, S., El Ati, J. *et al.* (2008). Regular users of supermarkets in greater tunis have a slightly improved diet quality. *The Journal of Nutrition* **138**, 768–74.

Traill, W.B. (2006). The rapid rise of supermarkets? *Development Policy Review* **24**(2), 163–74.

Zhang, X. (2005). Chinese consumers' concerns about food safety: case of Tianjun. *Journal of International Food and Agribusiness Marketing* **17**(1), 57–69.

8 The European Union's Common Agricultural Policy and the European Diet: Is There a Link?*

Josef Schmidhuber and Prakash Shetty

8.1 Introduction

Agricultural policy is – whether it be implicit or explicit – an inherent component of trade policy. The core agri-trade issue is 'market access', i.e. the ability to export products to other countries. Key here are subsidies and other supports for domestic farming that can affect the ability of other countries to trade (food safety and quality standards also play an important role, as discussed in Chapter 12).

The Common Agricultural Policy (CAP) of the European Union (EU) is an example of a policy that has huge implications for trade through its provision of support for European farmers. While not explicitly mentioning trade in its objectives, trade-related measures are used extensively – or at least have been – to achieve them. The objectives of the CAP, laid out in the Treaty of Rome of 1957, incorporate: (i) increased agricultural productivity; (ii) a fair standard of living for the farming community; (iii) stable markets; (iv) guaranteed security of supplies; and (v) an assurance of reasonable prices to consumers (Ritson & Fearne 1984). To achieve these objectives, beginning in the 1960s and continuing throughout the 1970s, the CAP erected high protection against foreign competition (tariffs and variable levies) and provided generous producer price support to stimulate domestic production and productivity. These measures allowed the EU to keep prices above equilibrium levels and postpone painful structural adjustment processes which would have created additional unemployment, reduced 'living conditions for the farming community' and reduced incomes in rural areas more generally.

The CAP succeeded in achieving its production and productivity goals very rapidly, and soon the problem became one of surplus, not insufficient, production. Thereafter, pressures appeared for the CAP to change. Pressure came from two sides. Outside the EU, the disposal of surpluses depressed world prices and created tensions with trading partners. Internally, producer support created expensive intervention stocks and mounting budgetary outlays. The strong production focus also aggravated growing environmental problems, notably excess animal manure and water pollution. These tensions created the momentum for a series of successive

* The views expressed in this document are those of the authors, not necessarily those of the FAO.

reforms of the CAP, which overall reduced the level of support prices for a number of major commodities.

In the meantime, the CAP was also receiving criticism from a consumption perspective. Consumer concerns revolved initially around food safety problems, most prominently the bovine spongiform encephalopathy (BSE) crisis but also various salmonella and *E. coli* epidemics. More recently, consumer concerns evolved to include the possible impacts of the CAP on patterns of food consumption and the growing problem of overweight and obesity. Over the last five years in particular, the CAP has also been increasingly associated with poor nutritional outcomes, both inside and outside the EU (e.g. Schäfer Elinder 2003a, 2005). In the United States, too, farm policies have been blamed as a contributor to the epidemic of obesity (Institute for Agriculture & Trade Policy 2007; Muller *et al.* 2007).

The link between the CAP and diet is the focus of this chapter. It first examines whether the aspect of the CAP most widely considered a trade barrier – subsidies – has in fact played a role in the changing European diet since the 1960s, focusing on the 15 European countries that comprised the EU prior to 2004 ('EU-15'). The chapter first describes how the EU-15 diet has changed since the 1970s and then asks if the CAP could be implicated in these changes.

8.2 Changes in the European diet since the 1960s

8.2.1 Dietary energy balance and the incidence of overweight and obesity

Dietary energy supply (DES) in the EU rose from 2,930 kcal/person/day in 1961–1963 to 3,530 kcal/person/day in 2001–2003, an increase of more than 20% (Table 8.1). Countries with relatively low-income levels in the 1960s, notably the Mediterranean countries, experienced the fastest growth. These increases appear to have driven rising overweight and obesity in the region. The percentage of people with excess body weight now exceeds 50% in all EU countries except for three (Table 8.2).

8.2.2 Carbohydrates

Since the 1960s, the share of carbohydrates in the EU-15 diet has declined from 54.3 to 49.8%, largely reflecting steep declines in the Mediterranean countries (Table 8.3). However, during this period, absolute consumption levels remained effectively unchanged from 403 g/person/day in 1961–1963 to 425 g/person/day in 2001–2003. The quality of the carbohydrates consumed in the EU also remained largely unchanged when measured in terms of glycemic load (i.e. the degree to which the carbohydrates affect blood glucose levels; added sugars and refined flours have a high impact on blood glucose levels, relative to complex carbohydrates like whole wheat products). The glycemic load of the EU diet increased by 8% over the past 40 years, exactly the same increase as for the carbohydrates in g/person/day

Table 8.1 Dietary energy supply (DES) in kcal/person/day.

Country/region	1961/63	1971/73	1981/83	1991/93	2001/03
EU-15	2,932	3,115	3,181	3,301	3,534
Austria	3,211	3,253	3,366	3,516	3,742
Belgium–Luxemburg	2,971	3,202	3,358	3,605	N/A
Denmark	3,130	3,109	3,088	3,303	3,451
Finland	3,163	3,163	3,044	3,071	3,153
France	3,237	3,269	3,433	3,537	3,643
Germany	2,920	3,181	3,359	3,365	3,490
Greece	2,796	3,234	3,407	3,612	3,682
Ireland	3,368	3,476	3,574	3,611	3,694
Italy	2,979	3,466	3,418	3,491	3,670
Netherlands	3,062	3,065	3,032	3,285	3,439
Portugal	2,565	3,017	2,812	3,505	3,753
Spain	2,673	2,820	3,046	3,279	3,405
Sweden	2,818	2,878	2,975	3,095	3,157
United Kingdom	3,285	3,265	3,155	3,263	3,444
MED-3	2,857	3,217	3,282	3,424	3,572
EU-25	2,964	3,150	3,204	3,293	N/A

Source: FAOSTAT-1; own calculations.

(Table 8.4). That means that – contrary to developments in many other countries – foods rich in simple carbohydrates, such as added sugars and refined flour, have *not* significantly replaced in large measure foods rich in complex carbohydrates.

The moderate nature of the increase in the glycemic load becomes clear when compared with increases in other regions; the average in 2001–2003 was a little over half of the consumption levels recorded in countries with comparable GDP

Table 8.2 Prevalence of overweight and obesity in the EU-15 (in 2002).

	Mean BMI	Overweight	Obese	Overweight	Obese	Population
	Per cent of population			Millions		
EU-15		56.0	14.8	212.7	56.3	379.7
Austria	26.2	59.0	19.5	4.8	1.6	8.1
Belgium–Luxemburg	25.1	49.0	11.4	5.3	1.2	10.8
Denmark	25.2	50.7	9.6	2.7	0.5	5.4
Finland	26.5	63.8	18.0	3.3	0.9	5.2
France	24.6	44.1	7.2	26.5	4.3	60.0
Germany	26.6	63.7	19.7	52.5	16.2	82.4
Greece	27.6	74.6	26.2	8.2	2.9	11.0
Ireland	25.1	50.0	9.5	2.0	0.4	3.9
Italy	25.4	51.9	12.2	29.8	7.0	57.5
Netherlands	24.8	46.7	9.6	7.5	1.5	16.1
Portugal	25.7	55.5	13.1	5.6	1.3	10.1
Spain	25.8	55.7	15.6	22.8	6.4	41.0
Sweden	25.3	51.7	10.1	4.6	0.9	8.9
United Kingdom	26.4	62.5	18.7	37.1	11.1	59.4

Source: WHO Infobase, UN population assessment 2004; own calculations.

Table 8.3 Share of calories from carbohydrates in total dietary energy supply (%).*

Country/region	1961/63	1971/73	1981/83	1991/93	2001/03
EU-15	54.3	51.1	48.6	47.8	49.8
Austria	56.6	52.1	47.3	47.0	48.6
Belgium–Luxemburg	51.6	47.1	46.5	47.6	48.2
Denmark	55.3	51.6	50.2	52.4	52.4
Finland	57.4	54.3	52.0	53.5	52.4
France	53.4	49.4	45.0	44.8	45.6
Germany	53.0	51.2	50.1	50.0	51.6
Greece	59.9	54.0	53.2	50.5	51.3
Ireland	58.2	54.3	51.6	51.9	50.9
Italy	61.1	56.3	52.4	50.0	49.7
Netherlands	55.4	52.4	50.2	52.0	51.8
Portugal	63.2	58.4	54.0	52.2	51.3
Spain	62.8	56.3	50.6	47.0	45.9
Sweden	52.2	52.6	50.8	51.5	51.5
United Kingdom	52.2	51.2	51.2	50.6	53.0
MED-3	61.6	56.1	51.8	49.0	48.4
EU-25	55.5	52.1	49.7	49.3	51.0

Shaded areas highlight carbohydrate intakes >55% of total calories.
*Within the limits recommended by the joint WHO/FAO Expert Consultation on diet, nutrition and the prevention of chronic diseases (WHO/FAO 2003).
Source: FAOSTAT-1; own calculations.

levels such as the United States. Increases were also higher in neighbouring non-EU countries of the Mediterranean region. In Egypt, for example, consumption is of 400 g of glycemic carbohydrates per person per day. The same holds for the noticeable rise in overweight and obesity in many countries of the region,

Table 8.4 Total dietary glycemic load in g/person/day.

Country/region	1961/63	1971/73	1981/83	1991/93	2001/03
EU-15	211	213	206	210	226
Austria	229	217	204	215	235
Belgium–Luxemburg	206	206	214	231	237
Denmark	221	210	206	221	226
Finland	219	222	193	202	205
France	217	205	196	201	211
Germany	199	214	221	222	234
Greece	220	233	239	240	246
Ireland	269	259	249	262	256
Italy	230	248	228	222	233
Netherlands	224	214	199	226	219
Portugal	204	224	197	240	255
Spain	215	204	197	196	200
Sweden	191	199	195	210	219
United Kingdom	232	223	214	214	234
MED-3	224	231	218	214	222
EU-25	216	218	211	214	229

Source: Nutrient database (USDA 2005); own calculations.

Table 8.5 Share (%) of calories from sugar in total dietary energy supply.*

Country/region	1961/63	1971/73	1981/83	1991/93	2001/03
EU-15	10.6	11.8	11.2	10.6	10.4
Austria	12.4	12.7	12.4	12.1	11.6
Belgium–Luxemburg	9.9	10.2	10.9	11.8	0.0
Denmark	16.3	16.6	15.0	14.3	14.2
Finland	12.2	15.4	11.7	13.4	10.6
France	9.7	12.4	9.9	10.1	10.6
Germany	11.6	12.6	12.9	12.6	12.8
Greece	5.1	7.8	9.2	8.6	9.0
Ireland	15.1	15.1	12.2	12.5	10.7
Italy	8.3	9.2	9.2	8.4	8.2
Netherlands	15.4	15.7	13.6	15.9	13.7
Portugal	7.0	8.9	9.2	8.7	8.3
Spain	7.9	10.2	9.5	8.4	9.7
Sweden	15.5	16.2	14.9	14.8	13.9
United Kingdom	14.7	14.5	14.0	11.5	11.5
MED-3	7.8	9.4	9.3	8.4	8.9
EU-25	10.5	11.8	11.3	10.8	10.7

Shaded areas highlight sugar intakes within recommended upper levels, i.e. <10% of total energy.
*Within the limits recommended by the joint WHO/FAO Expert Consultation on diet, nutrition and the prevention of chronic diseases (WHO/FAO 2003).
Source: FAOSTAT-1; own calculations.

particularly in Lebanon, Egypt and other countries in the Near East/North Africa region that occurred in tandem with leaps in the DES and the glycemic load of the diet.

With regard to sugar, the overall contribution of sugar to the DES has essentially remained constant at about 11% in the EU as a whole since the 1960s (e.g. slightly above the WHO/FAO recommended limit of 10%). But it is important to note that this change masks a steep increase in the Mediterranean countries and a modest decline in some of the northern European countries (Table 8.5).

8.2.3 Fruits and vegetables

Availability data from the FAO Food Balance Sheets (FBS) data suggest that all EU countries have reached and exceeded the recommended minimum intake levels of 400 g/person/day for fruit and vegetables. This development marks an important enhancement in the evolution of dietary patterns: 40 years ago, only six countries had more than 400 g of fruits and vegetables available per person per day (Table 8.6). That said, actual intake data suggest that consumption is actually far lower than indicated by availability data. For example, *intake* data for the United Kingdom suggest that average fruit and vegetable consumption among 19- to 64-year-olds is below three 80 g portions per day, i.e. below 240 g (Henderson & Swan 2002). Likewise, Naska *et al.* (2000) find, using DAFNE data (Lagiou & Trichopoulou 2001; DAFNE-IV); that only in the Mediterranean countries did the

Table 8.6 Fruit and vegetable consumption, availability in g/person/day.*

Country/region	1961/63	1971/73	1981/83	1991/93	2001/03
EU-15	457	519	535	616	623
Austria	533	504	546	605	602
Belgium–Luxemburg	396	493	467	679	702
Denmark	270	300	315	408	629
Finland	167	210	326	382	435
France	590	541	492	581	651
Germany	378	469	469	547	561
Greece	688	943	1117	1211	1144
Ireland	228	261	371	404	528
Italy	632	750	787	853	818
Netherlands	394	439	491	630	660
Portugal	477	549	456	702	831
Spain	586	666	714	779	748
Sweden	280	333	354	428	509
United Kingdom	340	384	396	459	526
MED-3	621	738	791	860	825
EU-25	457	519	535	616	623

Shaded areas signify intakes >400 g/person/day.
*Within the limits recommended by the joint WHO/FAO Expert Consultation on diet, nutrition and the prevention of chronic diseases (WHO/FAO 2003).
Source: FAOSTAT-1; own calculations.

mean daily population intake of fruits and vegetables clearly exceed recommended levels. This suggests that losses at the household level could account for a significant proportion of availability at country level.

8.2.4 Fats

Share of calories from fats has increased significantly in the EU since the 1960s (Table 8.7). The rate of increase was particularly marked in the previously poorer member countries of the Mediterranean region. In Spain, for instance, fat consumption in absolute terms doubled from 72 g/person/day to 154 g/person/day.

The convergence process for overall fat consumption was followed by a convergence process in the various sources for fats and oil consumption. While Mediterranean countries gradually caught up with the high animal fat consumption levels of the other EU countries, core EU members diversified their oil consumption to include the oils and fats of the Mediterranean countries, a development that is most visible in the rapid increases in consumption of sunflower oil and olive oil outside the Mediterranean region.

In terms of foods, the main contributing factor was rapidly rising meat consumption, which increased by a factor of 4.5 from 25 kg/person/year to 118 kg/person/year, with the most pronounced increase in pig meat (pork) consumption, which rose from 8.9 kg/person/year to 65 kg/person/year. Less spectacular, but still impressive, was the growth in milk and egg consumption, with increases from 87 kg/person/year to 170 kg/person/year and 9.4 kg/person/year to

Table 8.7 Share of calories from lipids in the dietary energy supply.*

Country/region	1961/63	1971/73	1981/83	1991/93	2001/03
EU-15	30.6	33.0	34.9	36.7	37.2
Austria	31.9	35.0	39.1	39.5	37.5
Belgium–Luxemburg	36.4	40.1	40.5	41.0	41.5
Denmark	35.6	37.7	36.6	33.2	33.0
Finland	32.6	34.0	34.5	33.0	33.0
France	29.0	33.4	38.4	40.8	41.0
Germany	35.5	35.0	34.8	36.4	35.0
Greece	30.3	36.8	36.3	39.1	37.6
Ireland	31.8	34.4	37.0	35.7	34.5
Italy	24.8	29.7	33.9	37.1	37.7
Netherlands	35.9	37.0	36.7	35.7	35.5
Portugal	20.3	24.6	28.6	31.4	32.5
Spain	24.7	30.4	35.2	39.1	40.0
Sweden	36.3	34.8	36.1	36.1	35.2
United Kingdom	37.7	37.8	37.3	37.7	34.9
MED-3	25.3	30.6	34.6	38.0	38.6
EU-25	30.0	32.4	34.4	35.6	36.1

Shaded areas highlight intakes $\leq$30% energy from fat.
*Within the limits recommended by the joint WHO/FAO Expert Consultation on diet, nutrition and the prevention of chronic diseases (WHO/FAO 2003).
Source: Nutrient database (USDA 2005); own calculations.

14.2 kg/person/year, respectively. On the positive side, the consumption of other, healthier fats also increased, but only relatively modestly. Olive oil consumption, for instance, rose only by about 30% from 8.2 kg/person/year to 11.7 kg/person/year.

8.3 The impact of EU's common agricultural policy on the EU diet

8.3.1 The impact of the CAP on food prices

Has the changing EU diet over past decades been influenced by the CAP? It can be theorised that the CAP has had the potential to affect the EU countries' diet via its effect on food prices. This is because the CAP (i) creates price distortions for the food sector as a whole; and (ii) acts as an implicit 'tax' on consumers by raising domestic food prices relative to international prices. The degree of these price rises varies between foods and occurs because, through tariffs and other measures, the CAP keeps out food produced at lower prices in other countries.

The implications of higher food prices need to be examined at two levels: the primary level of prices at the farm gate (i.e. prices paid *to* farmers for food, not *by* consumers at retail); and the final consumer retail price. In the first instance, a comprehensive and consistent measure to gauge the impacts of agricultural policies on food consumption is the consumer support estimates (CSEs), an indicator of the annual monetary value of gross transfers to (or from) consumers of agricultural

Table 8.8 Taxation and subsidies to EU consumers through the CAP for 2001–2003.

	Million €	**€/person/annum**
1. Taxes		
• Taxes through higher prices than world prices	−51,904	−136.8
• Other taxes on consumers	−698	−1.8
2. Subsidies		
• Subsidies from taxpayers to consumers	3,762	9.9
• Excess feed cost (not relevant as a food tax/subsidy)	570	1.5
Net effect (total tax)	−48,271	−127

Source: OECD (2008); own calculations.

commodities, measured at the farm gate (first consumer) level, arising from policy measures which support agriculture, regardless of their nature, objectives or impact on consumption of farm products. It includes all elements of taxation and support to food consumers at the primary product level (i.e. food prices paid to farmers, not actual retail prices) (OECD 2003).

Applying this definition, the OECD (2007, 2008) calculates that the CAP provided a *net* tax on EU consumers (that is, higher food prices as a result of the taxation effect, minus measures that have the effect of lowering food prices) to the tune of more than €48 billion or €127 per person in 2001–2003 (Table 8.8). About €48 billion of these net distortions are the result of a large tax of €52.5 billion and a much smaller subsidy of nearly €4 billion. Of the tax of €52.5 billion, €52 billion are largely due to the fact that the CAP has meant that EU prices have been kept above international prices.

8.3.2 The commodity specificity of food taxation through the CAP

The overall CSE tax of €52 billion hides important commodity-specific differences. These differences, their per capita equivalents and their evolution over time are summarised in Table 8.9.[1] The results are ordered by the level of taxation in 2001–2003. These summarise a number of important features of the current or rather recent state of the CAP, the comparison with previous years showing the impacts of various CAP reforms. Taxation of consumers through higher prices has become a highly concentrated and food-specific over time. In 2001–2003, milk and meat together accounted for more than 87% of total consumer price taxation (€34.4 billion of €39.6 billion), milk alone for more than 40% (€16.3 billion). This

[1] The sums of the commodity-specific amounts of support do not add-up to the totals in Table 8.8. The reasons are threefold: first, Table 8.9 only includes the price taxation effects, without including any other form of taxation/support. Second, only foods have been included in the list; and third, even if all individual commodities had been included, the sum of the individual estimates would still be below the figures in Table 8.9 as commodity coverage of the PSE calculations is limited and total support is prorated from the explicitly estimated commodities to arrive at an estimate for support/taxation for all agricultural products.

Table 8.9 CAP consumer taxation for different foods in the EU.

	1986/88 (EU-12)				2001/03 (EU-15)			
	Total (mill €)	Per person (€)	Share (%)	Cum. share (%)	Total (mill €)	Per person (€)	Share (%)	Cum. share (%)
Oilseeds	0	0	0.0	0	0	0	0.0	0
Eggs	900	2.7	1.7	1.6	0	0	0.0	0.0
Wheat	6,254	18.4	11.4	13.1	157	0.4	0.4	0.4
Rice	377	1.1	0.7	13.8	180	0.5	0.5	0.9
Potatoes	619	1.8	1.1	14.9	444	1.2	1.2	2.0
Coarse grains	7,043	20.7	12.9	27.8	559	1.5	1.4	3.4
Sheep meat	2,497	7.4	4.6	32.3	1,113	2.9	2.8	6.2
Sugar	2,699	7.9	4.9	37.3	2,739	7.2	6.9	13.1
Poultry	2,950	8.7	5.4	42.7	3,179	8.4	8.1	21.1
Pork	4,473	13.2	8.2	50.9	4,401	11.6	11.2	32.2
Beef	10,208	30.1	18.7	69.5	10,470	27.6	26.5	58.7
Milk	16,667	49.1	30.5	100.0	16,373	43.2	41.5	100.0
Total	54,686	161	100.0		39,615	104	100.0	

Source: OECD (2008); own calculations.

means that consumers paid €34.4 billion more for milk and meat products than they would have paid in the absence of the CAP.[2] Milk and beef alone account for two thirds of all price-related taxation faced by EU consumers. This concentration on animal products was the result of various rounds of CAP reforms, which initially aimed at reducing price support for cereals and left other sectors, such as milk and beef, largely untouched.

The degree to which CAP prices have exceeded those on international markets shows how much more first consumers in the EU have to pay for foods compared to what they would pay in the absence of the CAP (Table 8.10). It could essentially be interpreted as the commodity-specific 'tax rate' of the CAP on the 'first consumer' relative to consumers on the world markets. The results are consistent with the taxation patterns presented in Table 8.9, i.e. the 'tax rates' are largely in line with the overall amounts of extra expenditures shouldered by the consumer. The high overlap between 'tax rate' and 'tax burden' over time could be seen as an indicator that higher price caused by CAP taxation has not changed consumption.

An important exception to this pattern could be sugar (Table 8.10). Sugar consumers have been paying two or even three times more than they would have paid in the absence of the CAP; other things being equal, this high tax on EU sugar consumers could be a reason why sugar consumption has not risen faster in the

[2] It is important to note that CSEs systematically overestimate the true level of price distortions, particularly where large country assumptions apply. For EU milk and meat, this is clearly the case. The overestimation of distortion results from the effect that the EU policy distortions have on the world markets of these commodities: a complete abolition of the policy distortions for milk and meats in the EU would raise world prices for those products and would thus render a smaller than the implicit consumer tax through the CSE/PSE price wedge.

Table 8.10 International-to-domestic price distortions through the CAP.

	Domestic price distortions (ratios of EU prices to international ones)			Internal distortions of relative prices (relative to EU wheat prices)		
	1986/88	1994/96	2001/03	1986/88	1994/96	2001/03
Wheat	2.14	1.14	0.98	1.0	1.0	1.0
Rice	2.43	1.84	1.32	1.1	1.6	1.3
Coarse grains	2.33	1.41	1.05	1.1	1.2	1.1
Oilseeds	1.0	1.0	1.0	0.5	0.9	1.0
Potatoes	1.17	1.15	1.1	0.5	1.0	1.1
Milk	2.76	2.14	1.84	1.3	1.9	1.9
Beef	2.25	1.63	2.54	1.1	1.4	2.6
Pig meat	1.38	1.17	1.25	0.6	1.0	1.3
Poultry	1.79	2.07	1.55	0.8	1.8	1.6
Sheep meat	2.86	1.59	1.36	1.3	1.4	1.4
Eggs	1.4	1.22	1.04	0.7	1.1	1.1
Sugar	3.32	2.13	2.75	1.6	1.9	2.8

EU, European Union.
Source: OECD (2008); own calculations.

EU since the 1960s. It could be speculated, therefore, that the reforms of the EU sugar market reforms decided upon in 2005–2006 (which will see administrative sugar prices fall by 40%) will lead to an increase in sugar consumption in the EU.[3] Notably, too, among the most important exports from the EU to neighbouring Mediterranean and Near East/North Africa countries have been sugar and wheat, and these countries have experienced far higher increase in glycemic load since the 1960s.

8.3.3 CAP subsidies to food consumers

The 'subsidies' CAP provides to food consumers in the EU (i.e. measures that have the effect of making food less expensive) are small relative to taxation (Table 8.8), but have nevertheless attracted attention (e.g. Lang 1996; Schäfer Elinder

[3] From an agricultural policy perspective, the reform of the sugar market regime was undoubtedly an important step towards improving the transfer efficiency of subsidies to farmers, creating allocation efficiency gains for EU agriculture and a more level playing field in the international sugar market. From a nutritional perspective, however, it provides an incentive to consume more sugar and thus a food that is already at or above the recommended maximum of 10% of dietary energy supply. In fact, it may be argued that high sugar prices of the old CAP were a contributing factor to the relative benign carbohydrate consumption patterns in the EU and the relatively low glycemic load of the EU diet (see the first part of this paper). More generally, recent and ongoing reforms of the CAP with a growing reduction in producer price support (and thus consumer taxation) will have a consumption stimulating effect in the EU and should at least from a nutritional perspective (and probably only from a nutritional perspective) not be welcomed.

Table 8.11 Transfers from EU taxpayers to EU consumers.

	1986/88 (EU-12)	1994/96	2001/03 (EU-15)
	Million Euros		
Total	4,387	4,146	3,762
Food (excluding cotton)			
Cereals	310	286	249
Oilseeds	32	0	0
Sugar	−361	−138	248
Sugar storage levies (net)	−65	−24	99
Sugar chemical industry levies (net)	1	67	157
Milk and butter	2,169	1,549	1,035
Olive oil	388	365	26
Cotton	723	1,100	874
Fruit and vegetables (excluding wine)	817	688	809

Source: OECD (2008); own calculations.

2003b). The total amount of subsidies afforded to EU consumers through the CAP was about €4.4 billion in 2001–2003 (Table 8.11). For food alone, i.e. excluding cotton and other non-food items, the total was €2.9 billion. From 1986–1988 to 2001–2003, these consumer food subsidies fell from €3.66 to €2.89 billion or about 21% in nominal terms. Discounting the food subsidies by the average EU CPI, the decline was as high as 48% in real terms. That means that by 2001–2003, the economic value of these subsidies had declined to about half of what it was in 1986–1988.[4] Excluding non-food items, two commodity groups account for 80% of the remaining food subsidies (€2.9 billion): milk and butter (€1.03 billion) and fruit and vegetables (€1.3 billion). For milk and butter subsidies, only half go to food consumption, while the rest is provided to promote the use of skim milk powder (SMP) and in animal feed rations (Table 8.12). The subsidies are thus small compared to the taxation effect of the CAP.

The intention of subsidising butter was to dispose of temporary or structural butter surpluses by giving both private households and the food industry an incentive to replace otherwise cheaper vegetable oils and fats with butter, butter oil and fat. There is some evidence that private households took advantage of temporarily lower butter prices: they stored cheaper butter in their freezers and used it once subsidies had lapsed.

The adverse nutritional effects of butter subsidies in the food industry may have been limited for different reasons. When butter replaces vegetable fats in the food industry, it often replaces shortenings and other hydrogenated fats. Hydrogenated fats and oils are, however, not only a source of saturated fats. They are also the main source for *trans* fats. To the extent that *trans* fats have been reduced, subsidies to increase butter consumption may even have had a positive nutritional outcome.

The second food rubric where consumption subsidies played an important role in the CAP is fruits and vegetables. In general, higher consumption of fruits and

[4] The decline was even steeper on a per capita basis as the 2001–2003 average refers to the EU-15, while the 1986–1988 estimates which are based on transfers within the EU-12.

Table 8.12 Subsidies to milk consumers through the CAP.

	1986/88 (EU-12)	2001/03 (EU-15)
	Million Euros	
Milk and butter, total	2,169	1,035
Other measures relating to butterfat	232	454
School milk	165	77
Aid for SMP for use as feed for calves	901	246
Aid for liquid skimmed milk for use as feed for calves	112	0
Aid for SMP for use as feed as animals feed not for calves	0	0
Aid for liquid skimmed milk for use as animal feed not for calves	179	0
Aid for skimmed milk processed into casein	580	258
Aid for powdered milk with 10% fat for use as feed for calves	0	0
Other aid (milk)	0	0

SMP, Skim Milk Powder.
Source: OECD (2008); own calculations.

vegetables is a highly desirable nutritional outcome and positive health effects may justify otherwise undesirable market interventions. The particular benefits of these subsidies arise from the fact that they aimed to improve access for low-income groups, i.e. consumer groups that typically consume less than the recommended 400 g/person/day. Against these benefits stand the negative implications of higher prices for fruits and vegetables caused by intervention purchases and tariff protection against less expensive foreign supplies. In total, the EU spent about €1.5 billion[5] to support the fruit and vegetable sector in 2001–2003, up from less than €1 billion in 1986–1988.

8.3.4 The impacts of the CAP on *final* food consumption

The next question is to what extent changes in the first consumer price affect *final* consumer prices (i.e. retail prices). The relationship between first and final food price is termed 'vertical price transmission'. The extent of vertical price transmission depends to a large measure on the margins for processing, marketing, distribution etc. Where margins between the first and final consumption are high, the effect of the CAP tax on the final consumer price should be low and vice versa. Clearly, these margins are highly country- and commodity-specific. They are generally lower in developing countries and higher in developed ones, reflecting higher processing and marketing margins. For the EU, foods such as cereals fall into the high margin rubric, products such as milk, butter or eggs into the lower margin category.

Figure 8.1 schematically illustrates the effects of high and low margins in the transmission of price signals from the producer level to the final consumer price. In the high margin case, a 20% producer price increase results in only a 10%

[5] Total expenditure for the sector in the European Agricultural Guarantee and Guidance Fund (EAGGF).

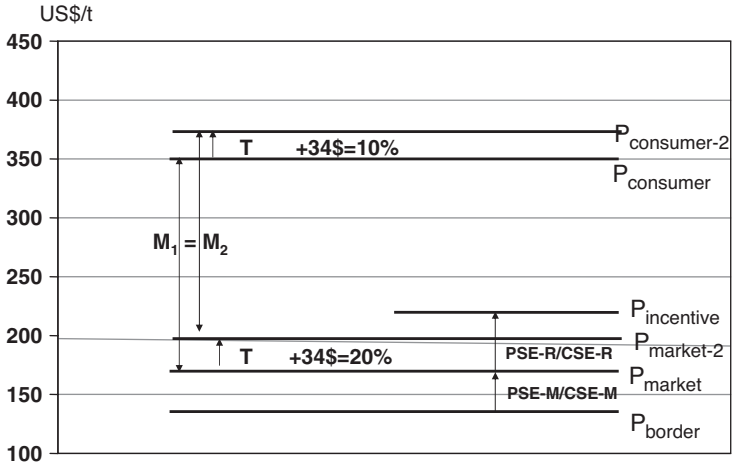

Figure 8.1 Vertical price transmission: the impact of the CAP with high margins. *Source*: Schmidhuber and Britz (2002).

consumer price increase; in the low margin case, it is 15%. In reality, these service margins are much higher, at least in the EU. For instance, the value chain margins between bread and wheat add up to a multiple of 20 relative to the price of wheat; that means that even a 100% increase in the wheat price would translate – *ceteris paribus* – into a mere 5% increase in the bread price. The value chain margins for the same process would obviously be smaller in low-income countries so that price transmission would therefore be more pronounced. Margins are also higher for other products such as eggs or meat, where value added through processing and distribution is relatively less important.

The real importance of the aggregate margin for all products and all EU member countries is illustrated in Figure 8.2. Evaluated at world prices, the value of primary food products used to produce final foodstuffs in the EU was about US$140 billion in 1996. The CAP, which applies a tax on this primary product level, adds another US$48 billion to the value primary product consumption at world prices; this amount is akin to the value of the aggregate CSE tax of the CAP. The value of food consumption at world prices plus the CSE tax amounts to US$187 billion and is the value that first consumers pay before they add their services to the value of primary products.

When food is eventually sold at the retail level, EU final consumers pay more than US$1,000 billion for it, i.e. the sum of the value of primary products, the CSE tax and the value-added margins. On aggregate, these value chain margins were more than four times the value of the primary product and accounted for three quarters (US$780 billion) of the final value of food sold at the retail level. Differently put, the final consumer spends more than five times the value of the first consumer, even after the CSE tax has been added to the expenditures of the first consumer. These high margins mean that even a complete removal of the CSE tax would lower aggregate food prices at the retail level by merely 5%. The same holds

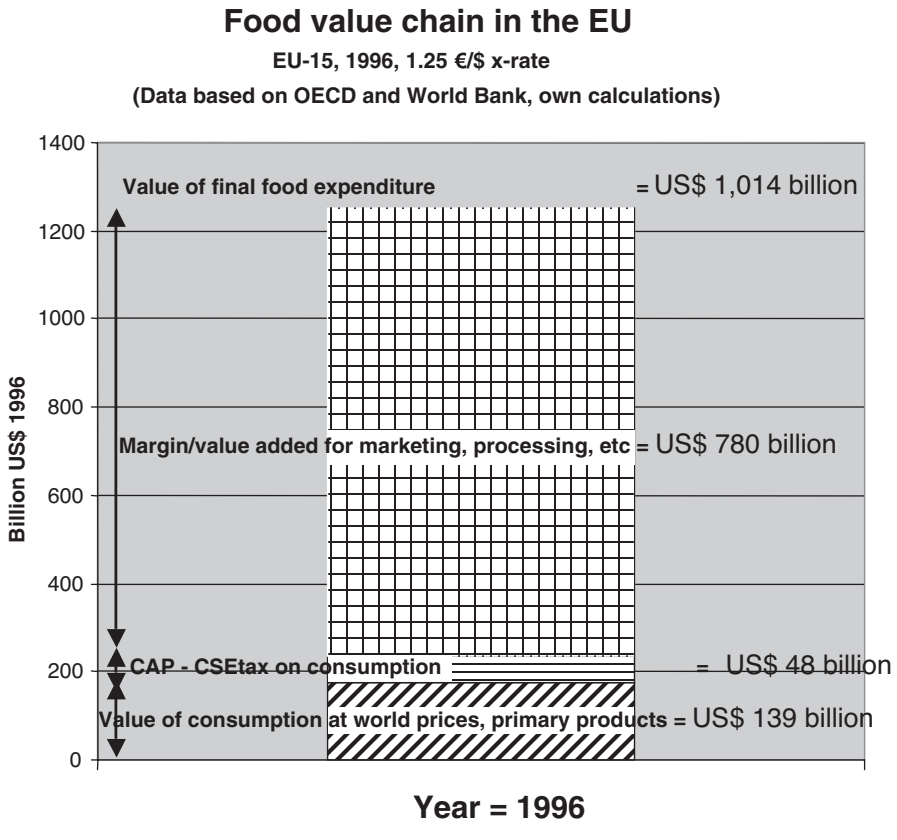

Figure 8.2 Vertical price transmission – the empirical evidence.

for raising the CSE tax. Even if the CSE tax were twice the 1996 level, it would have lifted – *ceteris paribus* – food prices by merely 5%.

8.4 Summary and conclusions

This analysis leads to a series of conclusions about whether the CAP has been a driver of dietary changes in the EU. First, since CAP has significantly raised primary food prices, it is unlikely to have been a key driver of the increasing energy intake observed in the EU-15 since the 1960s, and thus overweight/obesity. Second, the CAP has particularly raised the prices of foods that are generally associated with adverse health effects, notably sugar, milk and dairy products (butter) as well as meat, particularly beef. In terms of nutrients, the CAP appears to have placed a particularly strong tax on saturated fats, cholesterol and sugar, i.e. those nutrients that are generally associated with particularly adverse health impacts (WHO/FAO 2003). But with perhaps the exception of sugar, its higher food prices do not appear to have had a strong effect on curbing consumption. Third, the high margins and low vertical price transmission mean that the CAP has had little impact on final

consumer food prices, and thus if the CAP has reduced food consumption in the EU at all, the effects would have been small. This also implies that even a complete removal of the CSE tax would thus be unlikely to stimulate food consumption. Fourth, price-lowering measures in the CAP have likely to have had a very low impact because of their small scale. For example, while subsidised butter or school milk consumption could have increased unwanted fat and calorie intake, their overall subsidy effect remained too small to be a key factor.

This suggests that the CAP has not been, and would not be, an efficient tool for changing food consumption in the EU; a finding that does not support the notion that high farm subsidies have been causing poor nutritional outcomes, either in the EU or elsewhere in the OECD. If anything, the main instruments of the CAP should even have curbed food consumption, rather than stimulated it, notably of saturated fats and sugar. Drivers of changes in consumption patterns and excess consumption are thus more likely to be the result of overall increases of income, the rise of supermarkets and changes in food distribution systems, women's participation in the workforce and the growing importance of food consumed outside home.

While consumers in the EU appear not to have been influenced by the CAP to consume more, the opposite is likely true for consumers in countries outside the EU, particularly in food-importing developing countries (USDA 2003, 2005). At home, the CAP helped to hold prices above equilibrium levels and may have even helped to curb consumption; abroad, export subsidies and import substitution policies kept world prices below equilibrium levels and stimulated consumption. Lower service and distribution margins in the value chain of these countries mean that the price-reducing effects of the CAP on final consumers were much more significant. As long as consumption levels remained low, the price reducing effect of EU policies could be seen as a stimulus that helped overcome nutritional deficits (notwithstanding their adverse impacts on domestic farmers). In the Near East/North Africa region, for example, low food prices partly due to CAP export subsidies may well have helped improve the nutritional status of the region when undernutrition was the main nutritional problem. But after the nutritional status had improved, low prices (in part due to subsidised imports) may have stimulated over-consumption, and contributed to the region's growing overweight and obesity problem.

For the ongoing reforms of the CAP, the analysis reveals an interesting conflict of interest, albeit hardly perceived as such. Economists have made the case for CAP reforms on the basis that the CAP has created not only an unduly high burden on taxpayers but also on consumers; benefits of CAP reforms for consumers would arise from cheaper food, economists' gauged these benefits in terms of an increased *consumer surplus*. These arguments certainly hold true when the possible externalities of excess food consumption can be neglected. Reforms of the CAP and decoupling of support would however also lower food prices and, *ceteris paribus*, result in higher consumption. It is therefore surprising that nutritionists (e.g. Schäfer Elinder 2003a) have asked for the same reforms, from the perspective of curbing excess food consumption in the EU. Rather, they should have a vested interest in keeping the CAP.

References

DAFNE IV – European Food (2002). *Availability Databank based on Household Budget Surveys*. Retrieved from http://ec.europa.eu/health/ph_projects/2002/monitoring/monitoring_2002_04_en.htm.

Henderson, L.G.J. & Swan, G. (2002). *National Diet and Nutritional Survey*. Her Majesty's Stationery Office, London.

Institute for Agriculture and Trade Policy (2007). *The Farm Bill and Public Health: An Overview*. Retrieved from http://www.healthobservatory.org/library.cfm?refid=99606.

Lagiou, P. & Trichopoulou, A. (2001). The DAFNE initiative: the methodology for assessing dietary patterns across Europe using household budget survey data. *Public Health Nutrition* **4**(6), 1135–41.

Lang, T. (November 1996). *Health Impact Assessment of the EU Common Agricultural Policy*. A NIPH Policy report. National Institute of Public Health, Copenhagen.

Muller, M., Schoonover, H. & Wallinga, D. (2007). *Considering the Contribution of U.S. Food and Agricultural Policy to the Obesity Epidemic: Overview and Opportunities*. Institute for Agriculture and Trade Policy, Minneapolis, MN.

Naska, A., Vasdekis, V.G., Trichopoulou, A., Friel, S., Leonhauser, I.U., Moreiras, O. *et al.* (2000). Fruit and vegetable availability among ten European countries: how does it compare with the 'Five-a Day' recommendation? *British Journal of Nutrition* **84**, 549–56.

OECD (2003). *Glossary of Statistical Terms*. Retrieved from http://stats.oecd.org/glossary/detail.asp?ID=2150.

OECD (2007). *Agricultural Policies in OECD Countries: Monitoring and Evaluation*. OECD, Paris.

OECD (2008). *PSE and CSE Database*. OECD, Paris.

Ritson, C. & Fearne, A. (1984). Long-term goals for the CAP. *European Review of Agricultural Economics* **11**, 207–16.

Schäfer Elinder, L. (2003a). Public health should return to the core of CAP reform. *EuroChoices* **2**(2), 32–5.

Schäfer Elinder, L. (2003b). Public health aspects of the EU common agricultural policy. *Developments and Recommendations for Change in Four Sectors: Fruit and Vegetables, Dairy, Wine and Tobacco*. National Institute of Public Health, Ostersund, Sweden.

Schäfer Elinder, L. (2005). Obesity, hunger, and agriculture: the damaging role of subsidies. *British Medical Journal* **331**, 1333–36.

Schmidhuber, J. & Britz, W. (2002). The impacts of OECD policy reform on international agricultural commodity markets: first results of a quantitative assessment based on the @2030 model. *Schriften der Gesellschaft fürWirtschafts- und Sozialwissenschaften des Landbaues e.V.* Band 36, Münster-Hiltrup.

USDA (2003). *International Comparison Project (ICP) International Food Consumption Patterns: Data and Methodology*. Retrieved from http://www.ers.usda.gov/data/InternationalFoodDemand/DataAndMethodology.htm.

USDA (2005). *National Nutrient Database for Standard Reference*, Release 18. Retrieved from http://www.nal.usda.gov/fnic/foodcomp/Data/SR18/sr18.html.

WHO/FAO (2003). *Diet, Nutrition and the Prevention of Chronic Diseases: Report of a joint WHO/FAO Expert Consultation*. WHO Technical Report Series, No. 916. WHO, Geneva.

9 The Effect of Trade and Trade Policy on Diet and Health in the Pacific Islands

Anne Marie Thow and Wendy Snowdon

9.1 Introduction

In 2000, Fiji, usually famed for its pristine beaches, provoked debate in both nutrition and trade circles by banning the sale of lamb and mutton flaps, a fatty meat import, on the basis that they were harmful to human health (Kumar 2000). While many in the nutrition sector hailed this action as important in combating the harmful diet changes due to unhealthy and low-quality imports (Parkinson 1999), concerns were expressed by those in the meat industry that the ban set a bad precedent in international trade practice (Choudry 2002). While the ban was a sales ban under the Fair Trading Act and thus did not ostensibly relate to trade (in that it did not refer to imports), the product was solely imported and this meant that the ban was effectively an import ban. In fact, New Zealand considered taking action against the ban through the World Trade Organization (WTO) on this basis (Ministry of Health, NZAID *et al.* 2007). Still, despite these concerns, the association between imported food and poor diet-related health has continued to generate interest in restrictive trade measures in Pacific Island nations (Clarke & McKenzie 2007; Hughes 2003; Lawrence 2003). In 2007, Samoa followed suit and implemented a ban on the import of turkey tails (AFP 2008a).

This chapter examines the diet and nutrition transition in the Pacific in the context of the concurrent changes to trade policy and eventual trade liberalisation. The Pacific Island region has experienced great change in both international trade and diet since the late nineteenth century, and considerable attention has been given to the relationship between these factors (e.g. Hughes 2003). The integration of the Pacific into the global economy during the past 100 years and the dramatic contrast between the traditional and modern diet presents a good case study for examining the pathways and mechanisms through which trade influences diet. In addition, the relatively small size and bounded geography of Pacific Island economies provides a particularly discrete situation to trace the pathways through which trade affects diet. The chapter first summarises the dietary changes observed in the Pacific. It then discusses in detail the mechanisms through which trade policy change has enabled dietary change in the Pacific. Finally, it explores future challenges for the Pacific and looks at the implications of this relationship for the development of healthy trade policy.

9.2 Historical changes in diet and health in the Pacific

The Pacific Islands comprise 21 countries or territories, encompassing tens of thousands of islands and atolls scattered over millions of square kilometres of the Pacific Ocean. The Pacific Islands have traditionally been divided into three sub-regions, with Micronesia to the north, Polynesia to the east and Melanesia between.

Until the early 1900s, diets in the Pacific were mostly limited to traditional indigenous foods, and initial reports by European explorers indicate healthy populations (Browne & Scott 1989: 1; McGee 1975; Parkinson 1982). These traditional diets, while somewhat limited in diversity, were generally healthy and food insecurity was rare, both for populations living on fertile volcanic islands and for those on coral atolls. The diet was based on large quantities of staple foods – roots, tubers and fruits. These contributed a high percentage of daily nutritional requirements and often contained protein of high biological value. Green leaves were plentiful and provided an adequate source of most vitamins and important amounts of calcium and iron (Parkinson 1982). Protein intake was more than adequate and the diet contained large amounts of fibre. Malnutrition only occurred when societies were disrupted by war, drought, hurricanes and/or disease (McGee 1975: 1; Parkinson 1982). The major limitation of the traditional diet was that its high-fibre content was not suitable for immature digestive systems and made weaning difficult; energy and protein intakes were often below recommendations among children aged 1–2 years (Coyne 1984: 17).

With the extensive local food supply and relative isolation from other countries, food imports were negligible prior to colonisation. However, by the mid-twentieth century, widespread colonisation and the World War II (WWII) had triggered dramatic changes in sovereignty and opened transport routes, in turn leading to rising availability of a whole new source of food for the islanders. As this occurred, Western attitudes towards traditional Pacific foods – particularly a dislike of the 'uncivilised' staple crops, and concern over the lack of meals as defined by Western-educated nutritionists – conferred a high status to the consumption of imported foods (Pollock 2007).

In the first half of the twentieth century, although there were some signs of 'ill-balanced' diets in conjunction with a move towards imported foods among urban populations, there were few cases of malnutrition (Massal 1954). The 1950s then marked the onset of a 'nutrition transition' throughout the Pacific – a shift towards diets high in fat (particularly saturated fat) and sugar, and low in fibre, which has been observed throughout the developing world (Popkin 2002, also see Chapters 1 and 3). Consumption of imported foods increased steadily, alongside a shift away from the more traditional diet. In the 'modern' diet, traditional starchy roots and low-fat meats have been replaced with low-fibre foods, high in refined carbohydrates (particularly sugar), salt and fat, with fatty meats being of particular concern (Table 9.1). In addition, increasing levels of food insecurity have been reported with urbanisation and rising dependence on imported foods (Simatupang & Fleming 2005; Thaman 1995). It is notable that these changes in consumption have occurred in spite of evidence that traditional foods are still well-liked: studies have

Table 9.1 Summary of dietary change in the Pacific.

Traditional diet	Modern diet
High fibre – root crops (staple), fruit	Low fibre – flour (bread) and rice replacing root crops, sugar, low fruit and vegetables
Low fat for volcanic islands, moderate to high fat for atolls – main sources coconut cream and fish	High fat – vegetable oil and processed foods main sources
Low animal product – fish, seafood	High animal – cheap processed meat, imported fresh meat, growing local industry
Low diversity – but sufficient quantities consumed to ensure adequate micronutrient	High diversity – new foods (including many processed)
Adequate vitamin/mineral intake – leafy greens, large quantity of root crops consumed	Extensive vitamin/mineral deficiency (e.g. anaemia in Fiji)
Low energy density (large amounts required, which provided adequate amounts of micronutrients)	Moderate–high energy density

Source: Derived from information in Coyne (1984, 2000) and Parkinson (1982, 1990).

found that they remain important at community feasts and that even people with higher incomes preferentially purchase them (Evans *et al.* 2001; Parkinson 1973; Schoeffel 1992).

This period also saw a shift in the burden of disease towards diet-related chronic diseases. Life expectancy has increased in most Pacific Island countries since the 1960s, particularly as a result of reductions in infant and infectious disease mortality arising from improved infant nutrition and public health measures (Coyne 1984; Haberkorn 2004). However, chronic diseases have been an emerging problem, with high rates of obesity, diabetes and cardiovascular disease found among people in their productive years (Collins *et al.* 1996; Coyne 2000). The rates of overweight and obesity in many countries in the Pacific are the highest in the world, notably in Nauru and parts of Micronesia (Cassels 2006; Coyne 2000). Diet-related chronic diseases are the greatest single cause of death in the region, accounting for over 50% of deaths (Khaleghian 2003: 9). Rates of diabetes range from 15 to 25% through Melanesia and Polynesia, and up to 53% among older women in Nauru, resulting in significant morbidity (Coyne 2000; Keke *et al*. 2007).

9.3 International trade, food and nutrition in the Pacific

9.3.1 Overview

During the twentieth century, Pacific Island nations shifted from a context of effective isolation to one characterised by heavy reliance on trade (Table 9.2). At the same time, the stark contrast between the comparatively healthy traditional Pacific diet and the introduced Western diet has made the nutrition transition painfully

Table 9.2 Timeline of key trade-related changes in the Pacific.

Timeframe	Trade-related changes
Late 1800s	Colonisation by Japan, United States, European nations *Trade policy largely determined by colonial powers*
Early 1900s	Expansion of trade, focused on colonial relationships *Rising demand for commodities produced in Pacific*
Mid-1900s	Decolonisation post-World War II *More control of trade policy by national governments*
Late 1900s	Expansion of trade *Increased trade regionally and outside of colonial relationships* *Brief interventionist period around 1980s*
Early 2000s	Expansion of trade via PICTA and PACER *Focus on regional trade*

PICTA, Pacific Islands Countries Trade Agreement; PACER, Pacific Agreement on Closer Economic Relations.
Source: Denoon (1997), Browne and Scott (1989), Tapuaiga (2004) and Singh (2006).

obvious throughout the region. As a result, there has been extensive discussion of the role of trade in changing dietary patterns in the Pacific.

In the early 1900s, the Pacific was characterised by extensive colonisation and the beginning of rapid increases in trade beyond the region. The trade policies and patterns which developed in the colonial era still persist today, notably the focus on the export of primary commodities. Colonisation of the Pacific Islands by Japan, America and European nations began in the mid- to late-1800s, following only approximately 50 years of consistent, relatively low-level, contact with the outside world (Browne & Scott 1989). From a situation of almost exclusive regional trade in the context of a subsistence economy, the region began exporting commodities to Europe, America and Japan, and became a market for these countries' goods wherever possible (Denoon 1997: 101; Fieldhouse 1999: 72). Due to colonisation and the strategic significance of the Pacific during WWII, the Pacific Island nations rapidly became 'open' economies, and trade very quickly became significant proportion of the gross domestic product (GDP).

After the mid-twentieth century, in the wake of the global depression and WWII, many Pacific Islands became independent and began to shift away from colonial ties. This changed the pattern of trade in the region. While some Pacific Island countries remained 'free associates' (e.g. of the United States or New Zealand), national governments assumed responsibility for making trade policy. Most countries have maintained a relatively open trade policy regime, and in many Pacific Island countries, the ratio of imports to GDP exceeds 50% (Singh 2006; Tapuaiga 2004). Many governments briefly implemented interventionist policies in the 1980s (i.e. high import barriers), but shifted again towards more liberalised trade policy agendas in the 1990s with the first three Pacific Islands to become members of the WTO acceding in 1996. The Pacific Islands Countries Trade Agreement (PICTA) came into force in 2003 and has since expanded to the Pacific Agreement on Closer Economic Relations (PACER), which includes Australia and New Zealand (Pacific Islands Forum Secretariat 2009). For the Pacific, trade liberalisation has incorporated reductions in tariff and non-tariff barriers to trade, a shift towards export promotion,

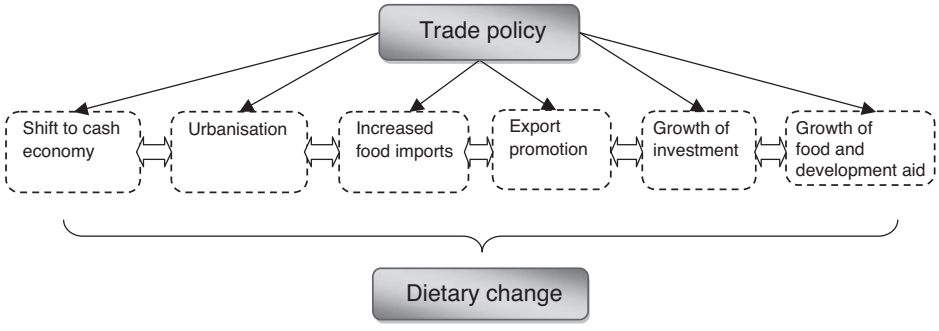

Figure 9.1 Six key pathways through which trade policy has influenced dietary change in the Pacific Islands.

and sectoral liberalisation in line with the WTO trade liberalisation agenda. This was expected to improve efficiency through increasing competition and lowering domestic prices, and facilitate foreign direct investment (FDI) (Tapuaiga 2004). However, it should also be noted that in net food importing developing countries like the Pacific Islands, consumers often stand to lose more from freer trade than domestic producers are likely to gain (FAO 2002: 27).

The following sections discuss in detail six mechanisms through which trade has affected dietary patterns in the Pacific (Figure 9.1). These six mechanisms overlap, often reinforce each other, and all relate to specific trade-related policy directions. The first three were initiated in the Pacific region's earlier (colonial) phase of integration into the global economy, and have had significant and continuing effects on diet. The last three emerged during the post-WWII period.

The first factor was the shift from primarily subsistence agriculture to a cash-based economy in response to market development and involvement in international trade. Second, the creation of administrative centres required to stimulate trade and commerce in the Pacific Islands catalysed urbanisation. Third, there was significant development of agricultural and fishery commodity production and export, reinforcing the shift away from subsistence agriculture. In the post-WWII period, these trade-related shifts in diet continued, and new implications of trade policy for diets emerged. Food imports increased dramatically, stimulating marked dietary change. Financial integration and investment-related policy liberalisation have supported growth in 'Western-style' food service, food retail and food processing. Finally, the 1960s rise in development aid, particularly that in the form of food, has contributed to dietary change.

9.3.2 Market development and the cash economy

One of the immediate consequences of increasing international trade for the Pacific, and one that facilitates many of the other mechanisms of trade-related dietary change, was the shift from a largely subsistence economy to a cash economy (McGee 1975). This shift was encouraged by colonial powers as a means of encouraging participation in the 'productive' labour force through strategies such as direct taxation (Fieldhouse 1999: 90). Employees in plantations and other export-oriented

industries were critical to the success of a colony. In turn, employment in mines, plantations and the service economy created a market of wage earners, whose cash income enabled the purchase of food rather than home production. This rising availability of imported goods resulted in a growing desire for cash, generating a desire for further integration into the cash economy. As these economies changed from a subsistence to cash base, the need to feed the labour force also contributed to increased importation of Western staples, which were preferred by Western administrators (McGee 1975: 3).

The implications of a cash economy for nutrition were complex, but at one level it meant that a much wider variety of foods were available to consumers – it was no longer simply a matter of what one could grow, catch or trade locally. However, many of the foods that became available for cash purchase were of lower nutritional quality – much lower in micronutrients or much higher in saturated fat – compared to traditional Pacific foods. Recently, Lako (2001) has suggested that the transition to a cash economy and rising purchasing power were key contributors to the disease-related dietary shifts in Fiji that continued through the latter half of the twentieth century. She pointed to the introduction of new foods for purchase paralleling integration into the global monetary economy, rising participation in waged labour and declining subsistence agriculture.

The large effect of the development of cash economies in the region is illustrated by the dietary changes which were associated with income fluctuations. With commodity exports the primary source of income, Pacific Island economies became dependent on global prices for these commodities. As prices fluctuated, so too did the level of exports and consequent income of islanders, and in turn, so did their use of imported foods. Both Massal (1954) and Spoehr (1949) document considerable dietary change in Pacific Island countries through periods of high commodity prices for exports and subsequent increases in purchasing power. Massal observed that the economic growth on high volcanic islands, such as Tahiti, fluctuated significantly during the first half of the twentieth century due to changing commodity prices – and with it the nutritional intake of the population (Massal 1954: 4–5). During periods of high income he observed almost complete dependence on imported foods – namely polished rice, white bread, canned meat – and also higher levels of morbidity associated with poor nutrition. As commodity prices declined, he documented a transition back to traditional foods and noted that health conditions greatly improved. In the Marshall Islands, consumption of store-bought foods increased dramatically during the period of Japanese occupation, due to increasing sales of copra (Spoehr 1949: 151–2). This period was also marked by the presence of beri–beri (thiamine deficiency), accompanying consumption of polished rice; this condition is unknown with consumption of traditional Pacific foods. Spoehr suggested that the low consumption of purchased food seen during the subsequent American occupation, when trade with Japan had been cut off, reflected the limited opportunity to purchase imports, indicating that international trade limitations were the driver behind the sudden increased reliance on local foods.

Similarly, Finney (1965) observed in Tahiti that the expansion of trade – stimulated by increased global demand for copra – forced increasing copra production

and large-scale reductions in traditional agriculture and consequent dietary change. While Maiao Island had been involved in commodity export production for some years, when trading ships began to make more visits in the late 1950s, the community responded by reversing the time allocation for subsistence compared to copra production, and rescinded the existing prohibition that had ensured part-time copra production. This 'rational economic decision' to enter the cash economy increased dependence on imported food, virtually eliminating root crops from the diet by the early 1960s and reducing consumption of other staple crops in favour of rice and flour products (Finney 1965).

Simatupang and Fleming (2005: 14) have observed that even the most remote areas of the Pacific Islands have been integrated into the global cash economy to some extent. This shift has continued to have profound, self-reinforcing effects: the rising availability of consumer goods, including food, stimulated a desire for cash among Pacific Islanders; this then decreased the incentive for subsistence production; in turn, this increased the need to purchase foods, so perpetuating the cycle.

9.3.3 Urbanisation

Trade was a major factor associated with the creation of urban areas in the Pacific, which had significant implications for dietary change (McCreary 1973). The logistics of colonial trade required the formation of administrative centres which in turn created a rudimentary service economy, attracting people to urban centres (McGee 1975: 4). The population shift to urban areas has been sustained through recent years, with at least half of the Pacific nations having over 50% of their population living in urban centres (Haberkorn 2004).

Urbanisation has had several immediate implications for diet. First, those living in urban areas have reduced access to traditional foods, due to reduced access to land on which to grow subsistence crops and the difficulties in transporting traditional crops (Connell 1983). While traditional staple production was one of most efficient in the world in terms of food energy produced per unit of human labour input, these crops bruise and decay easily and have a high water content. They are bulky, perishable and have significant waste from peeling, in contrast to staples such as wheat and rice, which can be processed into less bulky forms and then easily stored for long periods of time (Thaman & Clarke 1983: 29–32). As storage and transport become much more critical issues for feeding an increasingly urbanised population, the advantages of imported foods (particularly staples) have been increasingly reflected in their comparative price and availability (Narsey 1995).

Urbanisation also resulted in structural changes. Reductions in the living area per household and the need to work outside the home rendered traditional cooking methods and storage methods inconvenient (Parkinson 1973: 90). In the early 1970s, Parkinson (1973) observed a reduction in consumption of traditional foods by Pacific Islanders living in urban areas, which appeared to be mostly due to their urban migration. For example, there was no consideration for storage of local foods in low-cost housing developments and reductions in space had contributed

to a change in cooking methods from a traditional earth oven or open fire (where several different traditional dishes can be cooked separately) to one pot over a primus stove. This contributed to the shift towards more convenient imported foods.

Several studies have also suggested that the move to urban areas increased exposure to expatriates and their diets. A 'demonstration effect' has been noted, with changed consumption stemming from observations of the consumption habits of expatriate residents (a phenomenon which has continued) (Jegasothy & Duval 2003; McGee 1975). For example, in some countries, significant changes in diet began with the introduction of sweets and candy by Americans during WWII (Doumenge *et al.* 1988: 69). In many Pacific countries, such as the Cook Islands, Fiji, Papua New Guinea and Kiribati, increasing reliance on imported food has been more notable in urban areas. In these countries, obesity and chronic diseases are more prevalent in urbanised areas. For example, a 1980 nutrition survey in Fiji found that the urban population tended to have a less traditional diet than their rural counterparts, due to their high consumption of imports (Taylor *et al.*, in Coyne 2000).

In many parts of the world, domestic production has supplied the majority of growing urban food requirements. The situation in the Pacific has been quite different as urban areas instead turned to imports (McGee 1975: 4). While urbanisation has resulted in the proliferation of local markets – which do in part allow the villages and rural areas to provide food to the towns – this has been limited by the inefficiency of local markets, namely poor infrastructure, high production costs and poor marketing practices (Foy 1993; Simatupang & Fleming 2005).

These factors have continued to contribute to increasing consumption of imported foods in urban areas, and are reflected in the fact that urbanised Pacific Islanders have some of the highest rates of hypertension and obesity in the world (Thaman & Clarke 1983: 6; Coyne 2000). This pattern of reliance on imported foods in urban Pacific Island settings is becoming more entrenched. In Fiji, data from the recent Household Income and Expenditure Survey suggest that consumption of traditional root crops (based on expenditure and equivalent subsistence production) in urban areas is approximately one third of that in rural areas, with higher expenditure on cereals in urban areas (Narsey 2006).

9.3.4 Export promotion and domestic production

Export promotion policies, both those associated with colonisation as well as more recent liberalisation, have had significant implications for domestic agricultural production in the Pacific and, subsequently, food availability. Traditional agricultural systems were village-based and based on root crops (Denoon 1997: 83). There was little incentive to produce more than could reasonably be consumed because of difficulties with storage, and thus agriculture was not intensive (Holmes & Holmes 1992).

Colonisation was driven in a large part by growing requirements for primary commodities in the colonising countries as they were industrialising. Despite its small size, the Pacific region became a key producer and exporter of primary commodities such as sugar, cocoa and copra. This change was also driven by Pacific Islanders' increasing need/desire to earn cash (Simatupang & Fleming 2005: 19). More recently, during relatively brief periods in the 1970s and 1980s, many countries implemented policies encouraging import substitution – the domestic production of typically imported goods – with the aim of correcting rising problems pertaining to the balance of payments (Owen 1999). In some countries this was also due to advocacy for the substitution of imported food with traditional foods to mitigate globalisation's dietary effects, with increasing appreciation for the healthfulness of traditional diet (Pollock 2007; Thaman & Clarke 1983). However, this has given way in more recent years to a renewed focus on export promotion for economic reasons as part of a trade liberalisation agenda.

These trade-related agricultural changes initiated diet change in two key ways. First, as already discussed, production of primary export commodities ('cash-cropping') encroached on time and land available for subsistence agriculture (Kahn & Sexton 1988; McGee 1975: 4). Throughout the Pacific, development of agricultural and mining industries has been seen to reduce subsistence activities and to precipitate a shift towards consumption of imported food products (Thaman 1982; Doumenge *et al.* 1988). For example, in Micronesia, Japanese administrators ordered the cutting down of breadfruit to increase copra production, which opened way for imported food (Spoehr 1949: 152). Similarly, in the Cook Islands, citrus fruit and tomato cultivation for export led to the neglect of lands previously devoted to subsistence and traditional farming, resulting in only remnants of taro plots being maintained and a lack of coconut replanting (Johnston 1955). This shift was also made possible by the removal of laws mandating certain levels of subsistence production in some countries after WWII (National Food and Nutrition Centre 1996; Thaman 1982).

Second, traditional agricultural production has been affected by initiatives to increase livestock production. Policies to increase meat production have been part of attempts to stem the heavy reliance on imported meats, particularly in the larger countries such as Fiji and Papua New Guinea. Imports have triggered increasing consumer interest in meat products, and this has created an incentive to promote domestic production (Bewg 1973). In many cases this has been associated with government support for meat production. In Fiji, during the 1980s, there was a concerted effort to increase domestic livestock production, and self-sufficiency in pig and chicken production was achieved (Thaman 1990). However, concerns were raised about negative impacts on traditional food systems, particularly due to erosion of land (Thaman 1982). This local production has continued despite a shift back to export promotion, but production has been outstripped by population growth and imports have risen again (FAO 2003).

A third facet of Pacific export promotion has been the development of commercial fisheries. Fish, traditionally the main protein source in the Pacific, has now become one of the major regional exports and has been consistently highlighted as

a growth area for foreign exchange earnings (ADB 2005; Chandra 1983). While high fish and seafood consumption has continued, potential problems relating to sustainability and food security have emerged (ADB 2005; SPC 2007). In some cases, it has proved difficult for small countries to maximise returns from commercial fishery ventures. For example, Cassels (2006) reports that the Federated States of Micronesia sell its fishing rights to international investors and, as a result, is forgoing a significant source of potential income while its people consume imported processed fish.

Despite the concerns related to domestic food production outlined above, commitment to export promotion policies has remained strong. For example, in the Federated States of Micronesia in the 1980s, concerns raised by public health professionals and supported at a political level did little to reverse policy (and thus agricultural production) trends. While papers and policies espoused the promotion of subsistence local food production, most development efforts and funds were focused on cash crops (Englberger *et al.* 2003). Lack of support for domestic production is a common problem; in Papua New Guinea, the government initiated projects to improve and promote local food production but had insufficient funding to implement them (Choudry 2002). In effect, export-oriented policies and increasing food imports have acted synergistically to reinforce each other (Schoeffel 1992). As food imports have increased (in part due to export earnings), commodity export has been seen as a mechanism for earning foreign exchange, in part to pay for imports of basic foods.

9.3.5 Food imports

The dramatic rise in food imports is the most obvious pathway through which trade policy has influenced diets in the Pacific, particularly since WWII. As early as the 1950s, Pacific nations exhibited a preference for imported foodstuffs, limited only by availability and affordability (Johnston 1955; Massal 1954). Since this time, Western foods have become increasingly available due to imports (Coyne 2000: 24). While there have been periods of interventionist policies in different Pacific Island nations – usually for the protection of specific industries – overall the Pacific has been characterised by relatively open economies, with fairly limited barriers to food imports and exports (Singh 2006). Food imports have risen steadily within the region for all food groups, although most obviously for cereals, namely rice and wheat (Figure 9.2).

Hughes' (2003) comprehensive review of dietary and health change in the Pacific suggested that the increasing consumption of imported foods has been associated with the nutrition transition and the increase in diet-related chronic diseases throughout the Pacific. As already noted, the impact of food imports in many countries has been greater in urban areas due to greater availability, reinforcing the impact of urbanisation on food consumption, as discussed above. In other countries, such as Nauru, which have almost completely shifted consumption to imported foods, very high rates of chronic diseases such as obesity and diabetes

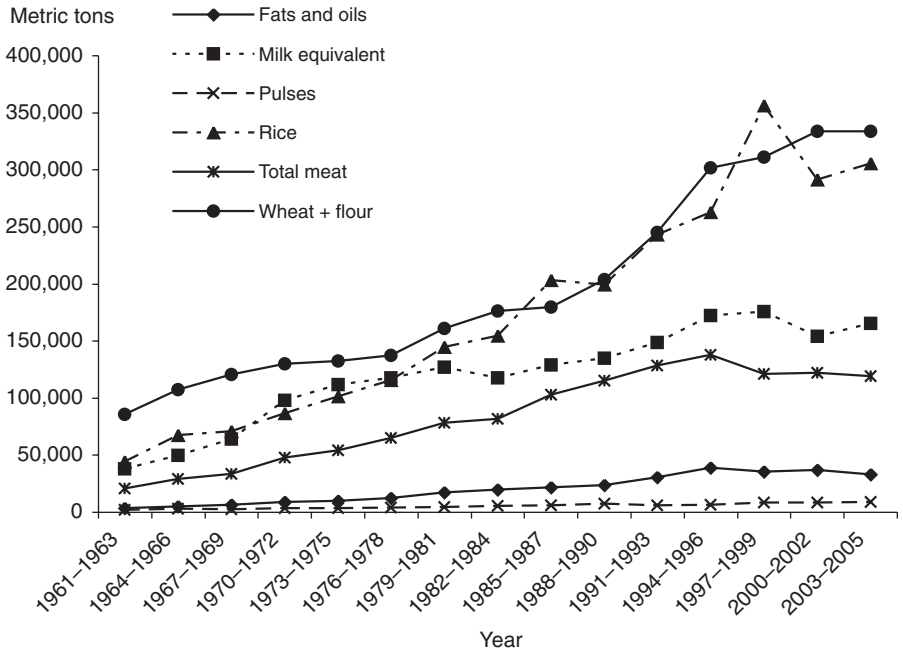

Figure 9.2 Food imports, Oceania region (developing), 1961–2005 (3-year average). Data source: http://faostat.fao.org/site/535/DesktopDefault.aspx?PageID=535#ancor. From FAOSTAT 2009: Trade: TRADESTAT: Crops and livestock products.

have been observed in all sectors of the population. In conjunction with this, imported Western foods, such as eggs, processed cereals and packaged, processed foods acquired a high status in many pacific communities (Kahn & Sexton 1988; Pollock 1992). Imported foods appear to be associated with status and wealth among Pacific Islanders (Cassels 2006; Owen 1999; Thaman & Clarke 1983: 65).

Access is a significant factor in the rising consumption of imported foods, as are economic factors such as price and availability, for which imported foods have an advantage over traditional foods. Generally, it is the imported foods that are cheaper and more convenient than traditional foods, particularly in urban areas (Nadkarni 2007). In Tonga, Evans *et al.* (2001) found that high intakes of imported foods are not due to 'simple preference' but rather to availability, price and convenience. In Vanuatu, imported rice is a key basic food item and has not only a price advantage over local produce, but also significant advantages in terms of its storage and transport. These cost and convenience advantages are significant barriers to proposals promoting the increased consumption of locally grown starchy foods (Welegtabit 2001).

The role of price in the consumption of imported foods is most clearly evident in situations of currency devaluation, during which consumption of domestically produced traditional foods increases where there is capacity for producers to respond. For example, in Papua New Guinea during the 1980s, significant currency

devaluation made imports considerably more expensive and resulted in the price of locally grown staples, such as sweet potato, becoming more competitive than imported rice and flour-based foods. Subsequently, decreased consumption of imported foodstuffs was observed, with increased sales of domestically produced traditional crops (Bourke 2005). In conjunction with evidence that Pacific Islanders in many respects prefer traditional foods to imported foods (Evans *et al.* 2003; Kahn & Sexton 1988), the fact that Papua New Guineans so quickly shifted back to their traditional diet suggests that high availability and relatively low prices are indeed key aspects of the attractiveness of imported food. Recently the rising price of food imports into the Pacific associated with the global food crisis has begun to shift the balance, and there is potential for the price of traditional foods to become more competitive (AFP 2008b). This may increase local production and consumption – particularly if there is significant investment into the local production sector (ADB 2008).

Another factor associated with the historically low price of food imports has been claims of 'dumping' – particularly in regard to low-quality meat products, such as lamb and mutton flaps, and turkey tails (Gittelsohn *et al.* 2003; Lakhan 1989). Gewertz and Errington (2007) have examined in detail the Pacific trade in lamb and mutton flaps. It reveals significant disparities of power as foods generally unacceptable for consumption in their countries of origin are shipped in significant quantities to lower income countries. For Pacific Islanders, the low quality of some imported foods has made them question their governments' ability to ensure a safe and healthy food supply. In Fiji, there has been ongoing public outcry over low-quality food imports, and whether the creation of markets for low-quality and unhealthy imports (including fatty meats and out-of-date products) among low-income consumers is appropriate (Anon 1995; Lakhan 1989). However, in the context of heavily subsidised agricultural production in developed countries, local production of (often healthier) foods cannot compete (Watkins & von Braun 2003). In addition, the development of food standards – often taken for granted in developed countries – has been slow in many Pacific Island countries, due to the need for capacity-building in areas of risk assessment and training (WHO 2003). This suggests again that economic factors are comparatively more important than taste and preference in shaping the rising consumption of food imports into the Pacific region.

9.3.6 Financial integration and investment

It has been proposed that FDI into the food retail, service and processing sectors of developing countries has contributed to the changing food environment (Hawkes 2005). It is likely that this has also been the case in the Pacific, particularly in the larger, more developed economies. Along with trade liberalisation from the mid-1980s, many countries made efforts to streamline and simplify their licencing and other investment-related procedures, as well as to attract investment through tax reform (Browne & Ginting 2006). In line with this, overall FDI has increased

Table 9.3 Foreign direct investment net inflows in some Pacific Island countries.

Country	Annual average ($US million)			Average FDI net inflow over 1998, 1999 and 2000 as per cent GDP in 1999 (%)
	1987–1990	1991–1994	1995–1998	
Fiji	37.1	66.9	40.8	0.05
FSM	N/A	N/A	N/A	N/A
Kiribati	0.2	0.1	0.6	1.17
Nauru	N/A	N/A	N/A	Neg
PNG*	151.4	85	176	5.23
Samoa	1.8	2.9	8.7	0.49
Solomon Islands	8.6	13.5	9.9	1.8
Tonga	0.1	1.1	1.3	1.27
Tuvalu	N/A	N/A	N/A	0.31
Vanuatu	11.5	26.9	30.2	0.9

*FDI changes during 1980s and early 1990s associated with highly volatile large-scale investment in mining industry.
FDI, Foreign Direct Investment; GDP, Gross Domestic Product; FSM, Federated States of Micronesia; PNG, Papua New Guinea, N/A, not available; Neg, negligible.
Source: Prasad (2005).

substantially in many countries with the progressive opening of the region, particularly during the early 1990s (Table 9.3).

While there are limited statistics regarding food-related FDI in the Pacific, growth in the food retail and food processing industries has been observed (Brownell & Yach 2006). In Fiji, a significant growth in the food retail (supermarket) industry has been noted since the early 1990s (Schultz 2004: 206), an observation supported by the dramatic increase in the value of the food retail sector during the same period (General Manager, Morris Hedstrom Ltd, personal communication, 27 May 2008). Schultz also reported a proliferation of global fast-food providers, in addition to small local fast-food services, restaurants and street vendors. These have contributed to dietary change by increasing the availability of processed foods (both imported and local), as well as higher fat fast-foods. Consumption of such foods has been associated with higher body weight in the United States (Pereira *et al.* 2005).

Cassels (2006) has documented the impact of international corporations' investment in primary industry on nutrition in Micronesia. Due to limited domestic investment capacity, many Pacific Island countries sell their fishing rights to international corporations and other countries. As a result, much of the fish that is now consumed has been processed elsewhere and imported into the country, while fresh fish from local waters is exported at little local financial gain to overseas markets. This has created limited financial development and has increased import dependence. Similarly, in Fiji, where there has been significant investment in the canning industry, Schultz (2004: 203) has documented a shift towards consumption of tinned rather than fresh fish and concludes that nutritional quality is usually compromised by cost.

It has also been suggested from observations in other developing countries that sectoral liberalisation of media outlets, in conjunction with food industry investment, is a contributing factor in the nutrition transition (Hawkes 2006). This can occur in two ways, with investment in mass media itself offering increased opportunities for advertising, as well as food companies bringing international expertise to bear in advertising. Thaman (1988) observed that the growth of mass media in the Pacific has played a role in promoting 'commerciogenic' highly processed and imported foods. He reported on a study in Fiji which found that the majority of food-related advertising in newspapers was for imported foods, with over 60% of advertised foods imported, and most of the locally produced foods advertised having high import content. Schultz (2004: 207) also notes that global marketing of 'products and lifestyles' in the Pacific has become common. Other observers have noted that the growing commercialisation propagated through mass media has contributed to the erosion of the traditional economy and indigenous institutions that ensure food security systems in the Pacific, such as customary land and sea tenure (Paulson 1993; Simatupang & Fleming 2005).

9.3.7 Aid and trade

After WWII, and particularly since the 1960s, high levels of development aid have been available to the Pacific Region – in fact, the Pacific receives some of the highest levels of per capita aid in the world (Taylor 2008: 290). It has been suggested that this has propped up the balance of payments, permitting food imports to continue and even grow with limited reference to national income (Browne & Scott 1989: 14). This has also reinforced other mechanisms described above, allowing agricultural policy to focus on export promotion despite limited returns, and limiting the response of domestic production to increasing demand for food.

The political and commercial considerations arising from the dependence of Pacific Island countries on aid may also limit their ability and desire to restrict food imports on health grounds (Foliaki & Pearce 2003). For example, New Zealand is a major donor to the Pacific, as well as a major source of food imports; during the aftermath of Fiji's ban on mutton flap imports, New Zealand threatened to take action through the WTO despite health being one of their aid and development priorities (Kelsey 2004).

Aid in the form of food has also contributed to changing dietary preferences and import dependence. Post-disaster food aid has usually been in the form of basic Western staples and, in some cases, has contributed to both preference for imported food and reduced incentives for Pacific Islanders to continue traditional mixed crop (more disaster-proof) agriculture. This was the case in the Mortlock Islands after Typhoon Pamela, where local assistance efforts were overwhelmed by large amounts of foreign aid (Marshall 1979). The negative impact on diets of food aid has also been documented elsewhere in Micronesia (Cassels 2006; Englberger *et al.* 2003). The US Department of Agriculture implemented supplementary feeding programmes during the 1960s and 1970s, based on imports of surplus commodities,

such as rice and tinned food, from the United States. This precipitated the current dietary dependence on rice as a staple food, as well as increasing consumption of sugar and processed foods. These dietary patterns were reinforced by US nutritional advice, which was not adapted to locally produced Pacific foods.

9.4 Possible areas for action

Trade policy in the Pacific has had in some cases negative, although largely unintended, consequences for diets and nutrition. This raises the question of whether, through deliberate policy action, Pacific Island governments could intervene to create 'healthy' trade policy or at least mitigate the unintended impacts of current policies on the food environment.

One possibility is banning the sale or import of unhealthy foods. The Fiji ban highlighted in the introduction has significantly reduced imports of mutton and lamb flaps from New Zealand (Ministry of Health, NZAID *et al.* 2007), although it has not completely eliminated them or addressed other forms of fatty meats. Similarly, government import statistics show that the Samoan turkey tail import ban has eliminated turkey tail imports. The main limitation of such bans is their product specificity – they do not address other forms of fatty meat, such as tinned meats or lamb necks. Clarke and McKenzie (2007) argue that product bans thus have only a limited effect on obesity control, because of the large numbers of products available that can be easily substituted. However, they can send a clear message to consumers regarding the seriousness of, in this case, the health problems associated with fatty meat consumption. For example, Gewertz and Errington (in press) found that due to an awareness campaign conducted in conjunction with the Fiji lamb and mutton flap ban, consumers were made aware of the unhealthfulness of lamb (and mutton) flaps. From a political point of view, such bans could also be seen as examples of clear or dramatic government action to address a perceived problem and thus gain voter support (but see the analysis by Fidler in Chapter 15).

Another strategy is the promotion of local production with the aim of increasing availability and reducing cost, given the importance of cost in consumption patterns and the cost advantage of imported foods when convenience is taken into account. Brownell and Yach (2006) suggest modifying economic conditions to make healthy foods the logical choice. This could take the form of introduction of differential taxes or duties, or of matching the subsidies and incentives given to producers of export crops with subsidies for those producing for the domestic market. In particular, transport of goods to markets and wastage during storage and transport remain important challenges that must be addressed. The Asian Development Bank (ADB 2005) advocates strategies to increase domestic production of traditional food crops, including rural infrastructure development and investment in extension services for farmers. They also point to the need for improved funding for larger scale agriculture-related investments, such as irrigation systems, wharves, coastal shipping, and health and education services, as critical to raising local productivity. Support for domestic production could also take the form of additional import taxes; Nauru and Samoa have both implemented import taxes on soft drinks (Clarke &

McKenzie 2007). A further possibility is cross-subsidisation, where revenue from taxes or duties on unhealthy products is used to subsidise the cost of healthier foods, for example, root crops, fruit and vegetables.

Similarly, it might also be possible to structure a country's tariff schedule based on healthfulness of foods. As long as tariffs are within the WTO bound tariff rate, countries can determine tariff rates at their own discretion (a point also emphasised by Atkins in Chapter 14) (WTO 2007). Fiji, Papua New Guinea and the Cook Islands have duties or tariffs on imports of less healthy foods, such as sugar, chocolate, instant noodles and vegetable oils (although for many countries this was implemented in order to protect domestic industries) and Samoa has higher duty on fatty meat imports, in addition to its recent ban on turkey tails (Clarke & McKenzie 2007).

Another trade-related strategy is the enforcement of food standards and labelling. This would assist consumers in making educated choices regarding consumption, but would require legislative and enforcement-related capacity building (e.g. in the Customs department) (Clarke & McKenzie 2007). Finally, given the growth in commercial media in the Pacific and its association with changing food and cultural values, the global discussion regarding the restriction of advertising of 'junk food', particularly to children (Hawkes 2004), is a relevant issue for Pacific Island nations. However, the possibility of such restrictions is limited by the lack of domestically-owned and -operated television stations.

9.5 Challenges ahead

Lack of technical capacity presents a serious challenge to implementing coherent policy interventions. Hughes and Lawrence (2005) suggest that Pacific Island nations lack capacity to construct a case for policy intervention and to meet the technical and financial demands to administer and enforce regulatory approaches. These are significant barriers to implementation of such interventions. There also appears to be a lack of political will as revealed in inconsistent or ill-funded policies, such as espousing traditional crop production while at the same time investing nearly exclusively in export-oriented agriculture. In addition, international aid and development priorities remain focused on the development of agricultural export industries as a means of raising national income, despite the lack of economic progress – as well as negative implications for domestic food production – experienced by Pacific Islands who have implemented such reforms (Cirikiyasawa 2007). This is likely the result of a failure to consider dietary implications of trade and economic policies. In response, there needs to be continued effort to help trade policy-makers to understand these implications and the potential population benefits of incorporating nutritional concerns onto the trade agenda.

In addition, the complexity of international trade rules and a persistent emphasis on freer trade have sometimes created artificial barriers to policy action, with technically permissible policy options being overlooked. Clarke and McKenzie (2007) suggest that countries require advice regarding development and implementation of policy interventions in a way consistent with international trade commitments. For

example, Pacific Island countries could be provided with information on, Ghana's introduction of standards for the percentage of fat in imported meat, which could be an alternative policy option to bans on imported meats.

Continuing trade liberalisation in the region in line with WTO priorities, namely agricultural reform, export promotion and economic liberalisation, will continue to support the mechanisms for the dietary changes in the Pacific Islands. WTO negotiations – the Doha Development Agenda – are currently stalled, as countries seek to identify a way forward for liberalisation that takes into account the special situation of low-income countries. However, trade liberalisation in the Pacific is continuing – mainly through the regional PICTA and PACER agreements. These agreements may also reduce national control over trade policy measures, and reduce scope for influencing such policies to promote healthy diets.

Trade liberalisation is also an outcome of the WTO accession process, in which acceding countries are required to agree to unilateral reductions in barriers to trade. Currently, Fiji, Papua New Guinea, the Solomon Islands and Tonga are members of the WTO, with Samoa and Vanuatu in the process of accession. During accession negotiations, countries desiring membership are reviewed by a working party, which recommends trade reforms. In the case of the Pacific, Kelsey has documented the significant role of Australia and New Zealand in determining the reforms required, suggesting that such reforms may not always be in the best interests of the acceding country (Kelsey 2004).

In addition, trade-related agricultural policy will need to take into account changes in domestic production related to climate change and rising ocean levels and soil degradation. These changes have the potential to amplify existing dietary problems, particularly the low availability of traditional food crops (SPC 2008). Population growth is aggravating these concerns, with serious reductions in per capita agricultural land observed in many Pacific Island countries (Simatupang & Fleming 2005: 12). This is leading to further dependence on imports, which is in turn problematic within the context of rising commodity prices. These sustained and likely long-term price rises are one of the most significant trade-related changes ahead. Recommendations to increase local food production (e.g. ADB 2008) will only be able to be implemented in the context of a holistic strategy incorporating a modified trade liberalisation agenda allowing for support of domestic production. However, it is possible that consumer concern over rising prices will force countries to consider the nutritional implications of economic and trade policy making.

9.6 Conclusions

There has been recent and dramatic dietary change in the Pacific, from a healthful traditional diet to a modern diet associated with high rates of chronic disease. Trade has clearly been one of these upstream drivers of dietary change, in conjunction with other economic, political, social and demographic changes that have occurred during the twentieth century. The six key mechanisms through which trade has facilitated dietary transition are: physical integration with the global cash economy, urbanisation, export-oriented agricultural policies, food imports, investment and

aid dependency. These mechanisms have worked in concert and reinforced each other. For example, integration with the cash economy and export promotion have supported urbanisation, urbanisation and export promotion have stimulated purchase of imported food; the cash economy has required ongoing aid and investment, and the current aid agenda encourages financial and trade liberalisation.

These pathways have been identified in the context of small island states, and thus offer a particularly discrete example of the linkages. They also highlight the potential pathways through which trade-related policy change may be affecting developing countries globally. By articulating these pathways, it also becomes evident that there is scope for mediating or attenuating unintended impacts.

Economic and health-related goals are interdependent, and there is increasing recognition of the importance of a healthy population for sustainable economic growth (Taniguchi & Wang 2003). The impact of trade on diet and health in the Pacific suggest that further exploration of options for healthy trade policy could be part of the solution in creating a healthier food environment. While global commodity price rises present a serious challenge to Pacific Island policy makers, they also present an opportunity to amplify discussion and acknowledgement of the interrelationship between trade and diet.

References

Anon (12 September 1995). Fiji a dumping ground for second class goods: Punja. *The Fiji Times*, p. 4.

ADB (Asian Development Bank) (2005). *On or Beyond the Horizon: A Discussion Paper on Options for Improving Economic Outcomes from the Western and Central Pacific Tuna Fishery*. ADB, Manila, Philippines.

ADB (Asian Development Bank) (2008). *Living with High Prices: A Policy Brief*. ADB, Manila, Philippines.

AFP (Agence France-Presse) (2008a). *Modern Life Means Modern Ills for Obese Pacific Islanders*. Retrieved 5 March 2008 from http://afp.google.com/article/ALeqM5ju26-r3oLMhR0QssuEzYduCEpIDQ.

AFP (Agence France-Presse) (2008b). *Pacific Islands Hit by High World Food Prices*. ABS-CBN News Online. Retrieved 2 July 2009 from http://www.abs-cbnews.com/storypage.aspx?StoryId=122011.

Bewg, W.P. (1973). Production and consumption of meat in the South Pacific. *South Pacific Bulletin* fourth quarter, 22–3.

Bourke, R.M. (2005). Marketed fresh food: a successful part of the Papua New Guinea economy. *Development Bulletin* **67**, 22–4.

Browne, C. & Ginting, E. (2006). Public sector activities. In: Browne, C. (ed.). *Pacific Island Economies*. International Monetary Fund, Washington, DC.

Browne, C. & Scott, D.A. (1989). *Economic Development in Seven Pacific Island Countries*. International Monetary Fund, Washington, DC.

Brownell, K. & Yach, D. (2006). Lessons from a small country about the global obesity crisis. *Globalization and Health* **2**(11).

Cassels, S. (2006). Overweight in the Pacific: links between foreign dependence, global food trade and obesity in the Federated States of Micronesia. *Globalization and Health* **2**(10).

Chandra, S. (1983). *Agricultural Development in Fiji*. Australian Universities' International Development Program, Canberra.

Choudry, A. (2002). *Killing Me Softly*. Retrieved 1 February 2008 from http://www.zmag.org/sustainers/content/2002-08/03choudry.cfm.

Cirikiyasawa, P.N.B. (2007). *Bringing Down the Barriers – Charting a Dynamic Export Development Agenda: Fiji Islands Background Country Report*. International Trade Centre: UNCTAD/WTO, Montreux, Switzerland.

Clarke, D. & McKenzie, T. (2007). *Legislative Interventions to Prevent and Decrease Obesity in Pacific Island Countries*. Allen and Clarke, Policy and Regulatory Specialists Limited, Wellington.

Collins, V.R., Dowse, G.K., Cabealawa, S., Ram, P. & Zimmet, P. (1996). High mortality from cardiovascular disease and analysis of risk factors in Indian and Melanesian Fijians. *International Journal of Epidemiology* **25**(1), 59–69.

Connell, J. (1983). *Migration, Employment and Development in the South Pacific*. Country report no. 22: Western Samoa. South Pacific Commission, Noumea.

Coyne, T. (1984). *The Effect of Urbanisation and Western diet on the Health of Pacific Island Populations*. South Pacific Commission, Noumea.

Coyne, T. (2000). *Lifestyle Diseases in Pacific Communities*. Secretariat of the Pacific Community, Noumea.

Denoon, D. (1997). Pacific Edens? Myths and realities of primitive affluence. In: Denoon, D., Firth, S., Linnekin, J., Meleisea, M. & Nero, K. (eds). *The Cambridge History of the Pacific Islanders*. Cambridge University Press, Cambridge.

Doumenge, J.P., Villenave, D. & Chapuis, O. (1988). *Agriculture, Food and Nutrition in Four South Pacific Archipelagos: New Caledonia, Vanuatu, French Polynesia, Wallis and Futuna*. The Regional Co-ordination Centre for Research and Development of Coarse Grains, Pulses, Roots and Tuber Crops in the Humid Tropics of Asia and the Pacific, Bogor, Indonesia.

Englberger, L., Marks, G.C. & Fitzgerald, M.H. (2003). Insights on food and nutrition in the Federated States of Micronesia: a review of the literature. *Public Health Nutrition* **6**(1), 5–17.

Evans, M., Sinclair, R.C., Fusimalohi, C. & Liava'a, V. (2001). Globalization, diet and health: an example from Tonga. *Bulletin of the World Health Organization* **79**(9), 856–62.

Evans, M., Sinclair, R.C., Fusimalohi, C., Liava'a, V. & Freeman, M. (2003). Consumption of traditional versus imported foods in Tonga: implications for programs designed to reduce diet-related non-communicable diseases in developing countries. *Ecology of Food and Nutrition* **42**, 153–76.

FAO (Food and Agriculture Organization of the United Nations) (2003). *WTO Agreement on Agriculture: The Implementation Experience – Developing Country Case Studies*. FAO Economic and Social Department, Rome.

FAO (UN Food and Agriculture Organization) (2002). *World Agriculture Towards 2015/2030*. Summary report. FAO, Rome.

Fieldhouse, D. (1999). *The West and the Third World: Trade, Colonialism, Dependence and Development*. Blackwell Publishers, Oxford.

Finney, B.R. (1965). Economic change and dietary consequences among the Tahitians. *Micronesica* **2**(1), 1–14.

Foliaki, S. & Pearce, N. (2003). Changing pattern of ill health for indigenous people: control of lifestyle is beyond individuals and depends on social and political factors. *British Medical Journal* **327**, 406–407.

Foy, T. (1993). Urbanization and the urban poor – Vanuatu's food security challenge. *Papua New Guinea Journal of Agriculture, Forestry and Fisheries* **36**(1), 95–104.

Gewertz, D. & Errington, F. (2007). The alimentary forms of the global life: the Pacific Island trade in lamb and mutton flaps. *American Anthropologist* **109**(3), 496–508.

Gewertz, D.B. & Errington, F. (in press). *Cheap Meat: Flap Food Nations in the Pacific Islands*. University of California Press, San Francisco.

Gittelsohn, J., Haberle, H., Vastine, A.E., Dyckman, W. & Palafox, N.A. (2003). Macro- and microlevel processes affect food choice and nutritional status in the Republic of the Marshall Islands. *American Society for Nutritional Sciences* **133**, 310S–13S.

Haberkorn, G. (2004). *Current Pacific Population Dynamics and Recent Trends*.Retrieved 31 July 2007 from http://www.spc.int/demog/en/stats/2004/2004%20Current%20Pacific%20population%20dynamics.doc.

Hawkes, C. (2004). *Marketing Food to Children: The Global Regulatory Environment*. World Health Organization, Geneva.

Hawkes, C. (2005). The role of foreign direct investment in the nutrition transition. *Public Health Nutrition* **8**(4), 357–65.
Hawkes, C. (2006). Uneven dietary development: linking the policies and processes of globalization with the nutrition transition, obesity and diet-related chronic diseases. *Globalization and Health* **2**(4).
Holmes, L.D. & Holmes, E.R. (1992). *Samoan Village Then and Now*, 2nd edn. Harcourt Brace Jovanovich College Publishers, Orlando.
Hughes, R.G. (2003). *Diet, Food Supply and Obesity in the Pacific*. World Health Organization Regional Office for the Western Pacific, Manila.
Hughes, R.G. & Lawrence, M.A. (2005). Globalization, food and health in Pacific Island countries. *Asia Pacific Journal of Clinical Nutrition* **14**(4), 298–306.
Jegasothy, K. & Duval, Y. (2003). Food demand in urban and rural Samoa. *Pacific Economic Bulletin* **18**(2), 50–64.
Johnston, W. (1955). The Cook Islands: settlement in an island group of the South-West Pacific. *Malayan journal of tropical geography* **5**, 1–11.
Kahn, M. & Sexton, L. (1988). The fresh and the canned: food choices in the Pacific. *Food and Foodways* **3**, 1–18.
Kelsey, J. (2004). Pacific Islands and the WTO power politics of accession. *South Bulletin* **86**, 406–12.
Khaleghian, P. (2003). *Noncommunicable Diseases in Pacific Islands Countries: Disease Burden, Economic Cost and Policy Options*. Secretariat of the Pacific Community and The World Bank, Noumea.
Kumar, A. (2000). Fair Trading Decree 1992 (Decree No. 25 of 1992) (Section 102): Order prohibiting the supply of lamb flaps, Government of Fiji.
Lakhan, A. (23 May 1989). Low grade meat dumping claimed. *The Fiji Times*, p. 1.
Lako, J.V. (2001). Dietary trend and diabetes: its association among indigenous Fijians 1952–1994. *Asia Pacific Journal of Clinical Nutrition* **10**(3), 183–7.
Lawrence, M. (2003). *Using Domestic Law in the Fight Against Obesity: An Introductory Guide for the Pacific*. World Health Organization Regional Office for the Western Pacific, Manila.
Marshall, M. (1979). Natural and unnatural disaster in the Mortlock Islands of Micronesia. *Human Organization* **38**(3, Fall), 265–72.
Massal, E. (1954). *Dietary and Nutritional Problems in the Pacific*. Technical Paper No. 59. South Pacific Commission, Noumea, New Caledonia.
McCreary, J.R. (1973). Urbanization in the South Pacific. In: Harré, J. (ed.). *Living in Town: Problems and Priorities in Urban Planning in the South Pacific*. South Pacific Social Sciences Association, and the School of Social and Economic Development, University of the South Pacific, Suva.
McGee, T. (1975). *Food Dependency in the Pacific: A Preliminary Statement*. Working Paper No. 2. Australian National University, Canberra.
Ministry of Health, NZAID, *et al.* (2007). *Joint Report: Impact of New Zealand Export of Sheep Meat (Mutton and Lamb) Flaps on Obesity and Chronic Disease in Pacific Island Countries*. Government of New Zealand, Wellington.
Nadkarni, D. (March 2007). Obesity a problem of poverty. *Islands Business*. Retrieved from http://www.islandsbusiness.com/archives/islands_business/index_dynamic/containerNameToReplace=MiddleMiddle/focusModuleID=17299/overideSkinName=issueArticle-full.tpl.
Narsey, W. (1995). *Nutritional Development within Free Markets*. Paper presented to the National Nutrition Planning Meeting, 22 November 1995. University of the South Pacific, Suva.
Narsey, W. (2006). *Report on the 2002–03 Household Income and Expenditure Survey*. Fiji Islands Bureau of Statistics, Suva.
National Food and Nutrition Centre (27 August 1996). People get inadequate, low quality food supply. *The Fiji Times*, p. 17.
Keke, K., Phongsavan, P., Dan, L., Bacigalupo, M., Smith, B., Thoma, R. *et al.* (2007). *Nauru NCD Risk Factor STEPS Report*. Nauru Ministry of Health, World Health Organization and NSW Centre for Physical Activity and Health, Suva, Fiji.
Owen, K. (1999). What do we know of consumers' preferences and food choices in the islands of the South Pacific. *Contributed Paper to the 43rd Annual Agricultural and Resource Economics Society Conference*. Christchurch, 20–22 January 1999.

Pacific Islands Forum Secretariat (2009). *Regional Trade*. Retrieved 8 March 2009 from http://www.forumsec.org.fj/pages.cfm/economic-growth/regional-trade/.
Parkinson, S. (1982). Nutrition in the South Pacific – past and present. *Journal of Food and Nutrition* **39**(3), 121–5.
Parkinson, S. (1990). Food intake. In: Jansen, A.A.J., Parkinson, S. & Robertson, A.F.S. (eds). Food and Nutrition in Fiji: A Historical Review, Vol. **1**. University of the South Pacific, Suva.
Parkinson, S. (17 December 1999). Lamb flaps and health *(Letter to the Editor)*. *The Fiji Times*, p. 6.
Parkinson, S.V. (1973). Some observations on the cause of malnutrition in the Pacific Island urban communities. In: Harré, J. (ed.). *Living in Town: Problems and Priorities in Urban Planning in the South Pacific*. South Pacific Social Sciences Association, and the School of Social and Economic Development, University of the South Pacific, Suva.
Paulson, D.D. (1993). Hurricane hazard in Western Samoa. *The Geographical Review* **83**(1), 43–54.
Pereira, M., Kartashov, A.I., Ebbeling, C.B., Van Horn, L., Slattery, M.L., Jacobs, D.R. *et al.* (2005). Fast-food habits, weight gain, and insulin resistance (the CARDIA study): 15-year prospective analysis. *Lancet* **365**(9453), 36–42.
Pollock, N.J. (1992). *These Roots Remain: Food Habits in Islands of the Central and Eastern Pacific Since Western Contact*. The Institute for Polynesian Studies, Hawai'i.
Pollock, N.J. (2007). Nutrition and anthropology: cooperation and convergences – Pacific examples. *Ecology of Food and Nutrition* **46**, 245–61.
Popkin, B. (2002). An overview on the nutrition transition and it's health implications: the Bellagio meeting. *Public Health Nutrition* **5**(1A), 93–103.
Prasad, N. (2005). *FDI Data Collection and Analysis in the Forum Island Countries*. United Nations Conference on Trade and Development, Geneva.
Schoeffel, P. (1992). Food, health and development in the Pacific Islands: policy implications for Micronesia. *Journal of Micronesian Studies* **1**(2, Dry Season), 223–50.
Schultz, J.T. (2004). Globalization, urbanization and nutrition transition in a developing country: a case study of Fiji. *Globalization of Food Systems in Developing Countries: Impact on food Security and Nutrition*. FAO Food and Nutrition Paper 83. Food and Agriculture Organization of the United Nations, Rome.
Simatupang, P. & Fleming, E. (2005). *Integrated Report: Food Security Strategies for Selected South Pacific Island Countries*. The Regional Co-ordination Centre for Research and Development of Coarse Grains, Pulses, Roots and Tuber Crops in the Humid Tropics of Asia and the Pacific, Bogor, Indonesia.
Singh, R. (2006). Tonga. In: Browne, C. (ed.). *Pacific Island Economies*. International Monetary Fund, Washington, DC.
SPC (Secretariat of the Pacific Community) (2007). *Planning the Use of Fish for Food Security in the Pacific*. SPC, Apia, Samoa.
SPC (Secretariat of the Pacific Community) (2008). *Statement by the Secretariat of the Pacific Community on behalf of Pacific Island Countries and Territories at the UN-sponsored World Food Summit 08*, Rome.
Spoehr, A. (1949). *Majuro: A Village in the Marshall Islands*. Field Museum of Natural History, Chicago.
Taniguchi, K. & Wang, X. (2003). *Nutrition Intake and Economic Growth: Studies on the Cost of Hunger*. UN Food and Agriculture Organization, Rome.
Tapuaiga, E. (2004). *Trade Liberalization: Prospects and Problems for Small Developing South Pacific Island Economies*. University of the South Pacific Department of Economics, Suva.
Taylor, R. (2008). History of public health in Pacific Island countries. In: Lewis, M.J. & MacPherson, K.L. (eds). *Public Health in Asia and the Pacific*. Routledge, London.
Thaman, R.R. (1982). Deterioration of traditional food systems, increasing malnutrition and food dependency in Pacific Islands. *Journal of Food and Nutrition* **39**(3), 109–19.
Thaman, R.R. (1988). Consumerism, the media, and malnutrition in the Pacific Islands. *Journal of Pacific Studies* **14**, 68–90.
Thaman, R.R. (1990). The evolution of the Fiji food system. In: Jansen, A.A.J., Parkinson, S. & Robertson, A.F.S. (eds). *Food and Nutrition in Fiji: A Historical Review*, Vol. 1. University of the South Pacific, Suva.

Thaman, R.R. (1995). Urban food gardening in the Pacific Islands: a basis for food security in rapidly urbanising small island states. *Habitat International* **19**(2), 209–224.
Thaman, R.R. & Clarke, W.C. (eds) (1983). Food and national development in the South Pacific. *Ray Parkinson Memorial Lectures 1982*. University of the South Pacific, Suva.
Watkins, K. & von Braun, J. (2003). *Time to Stop Dumping on the World's Poor*. International Food Policy Research Institute, Washington, DC.
Welegtabit, S. (2001). *Food Security Strategies for Vanuatu*. The Regional Co-ordination Centre for Research and Development of Roots and Tuber Crops in the Humid Tropics of Asia and the Pacific, Bogor, Indonesia.
WHO (World Health Organization) (2003). *Report of the FAO/SPC/WHO Pacific Islands Food Safety and Quality Consultation*, 11–15 November 2002. World Health Organization Regional Office for the Western Pacific, Philippines.
WTO (World Trade Organization) (2007). *Understanding the WTO*. World Trade Organization, Geneva.

10 Food Imports and Dietary Change: A Perspective from Thailand

W. Philip T. James, Nipa Rojroongwasinkul, Tashmai Rikshasuta and Emorn Wasantwisut

10.1 Introduction

Thailand, like many low- and middle-income countries, is undergoing a rapid transition in diet and lifestyle. As a result of a combination of a comprehensive government strategy in the 1970s (notably the fourth National Economic and Social Development Plan) and economic growth, major problems of malnutrition[1] declined remarkably in Thailand in the 1980s and early 1990s (James 2000; National Economic and Social Advisory Council 2007; World Bank 2005). But during the same time period, new nutritional problems emerged: the prevalence of diet-related chronic disease and associated risk factors. Diabetes, cerebrovascular and coronary heart disease, as well as liver cancer, now contribute significantly to the total burden of disease (BOD; Table 10.1) (Thailand Burden of Disease Project 2007). The magnitude of the health burden reflects the major causes of deaths of the Thai population (1997–1999), with diseases of the circulatory system at the top of the list (Ministry of Public Health Thailand 2002). Hospital admission rates due to coronary heart disease and diabetes have increased markedly in the past 10 years (Figure 10.1). Strokes are within the top three contributors to the health burden of Thailand (Table 10.1) and their prevalence increased by 10–20% in just the 5 years between 1999 and 2004, suggesting that cardiovascular diseases are going to become an unsustainable medical, social and financial problem for Thailand.

Increasing prevalence of core intermediate risk factors is undoubtedly contributing to this shift in the BOD (Figure 10.2). Ministry of Health Thailand (2003–2004) also showed that 23.3% of men and 20.9% of women had hypertension, the prevalence being far higher in older people. The overall hypertension prevalence of 22% in 2004 was double that of only 8 years earlier and four times greater than in 1991. Risk factors were higher in urban than rural populations as shown by the trends in overweight and obesity (Table 10.2). It is evident that overall the proportion of overweight or obesity using the Asian criteria has increased from 36% in 1997 to 41% in 2004 in men and from 47 to 55% in women, with

[1] That is, protein-energy malnutrition, micronutrient deficiencies, including iron, iodine, vitamin A, thiamine and riboflavin.

Table 10.1 BOD of the Thai population in 1999 and 2004 by gender (DALY × 100,000 per year).

	Males			Females		
Rank	**Disease/Condition**	**1999**	**2004**	**Disease/Condition**	**1999**	**2004**
1	HIV/AIDs	9.6	6.4	Stroke	2.8	3.1
2	Traffic accidents	5.1	5.8	HIV/AIDs	3.7	2.9
3	Stroke	2.7	3.3	Diabetes	2.7	2.7
4	Alcoholism	1.3	3.3	Depression	1.5	1.9
5	Liver cancer	2.5	2.8	Coronary heart disease	1.1	1.4
6	Bronchitis	1.6	1.9	Traffic accidents	1.1	1.2
7	Coronary heart disease	1.6	1.8	Liver cancer	1.2	1.2
8	Diabetes	1.7	1.8	Arthritis	1.2	1.2
9	Hepatic cirrhosis	1.2	1.4	Bronchitis	0.9	1.2
10	Depression	1.0	1.4	Cataract	1.0	1.1
	Total	**28.3**	**29.9**	**Total**	**17.2**	**17.9**

Source: Thailand Burden of Disease Project (2007).

the urban population having the greater prevalence of obesity, but with women showing smaller urban–rural differences. The complications of excess weight are marked. For example, the fifth Food and Nutrition Survey in 2003 also showed abnormal blood lipid levels in a high proportion of the population (Ministry of

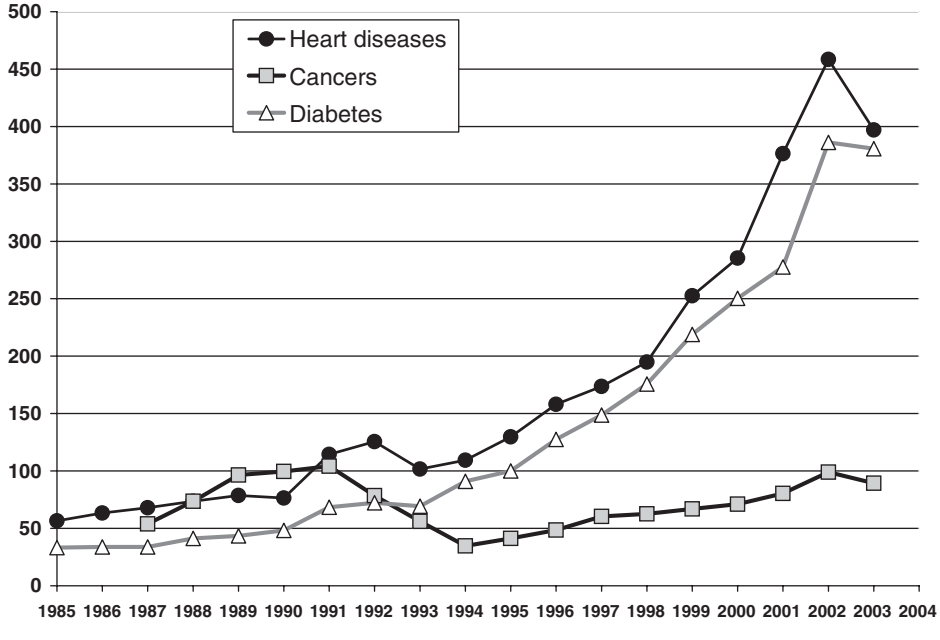

Figure 10.1 Rate of hospitalisations of patients with heart diseases, cancers and diabetes (1985–2003). *Note*: The rate for cancers, since 1994, covers only liver, lung, cervical and breast cancers. *Source*: Inpatients Report, Bureau of Policy and Strategy, Ministry of Public Health.

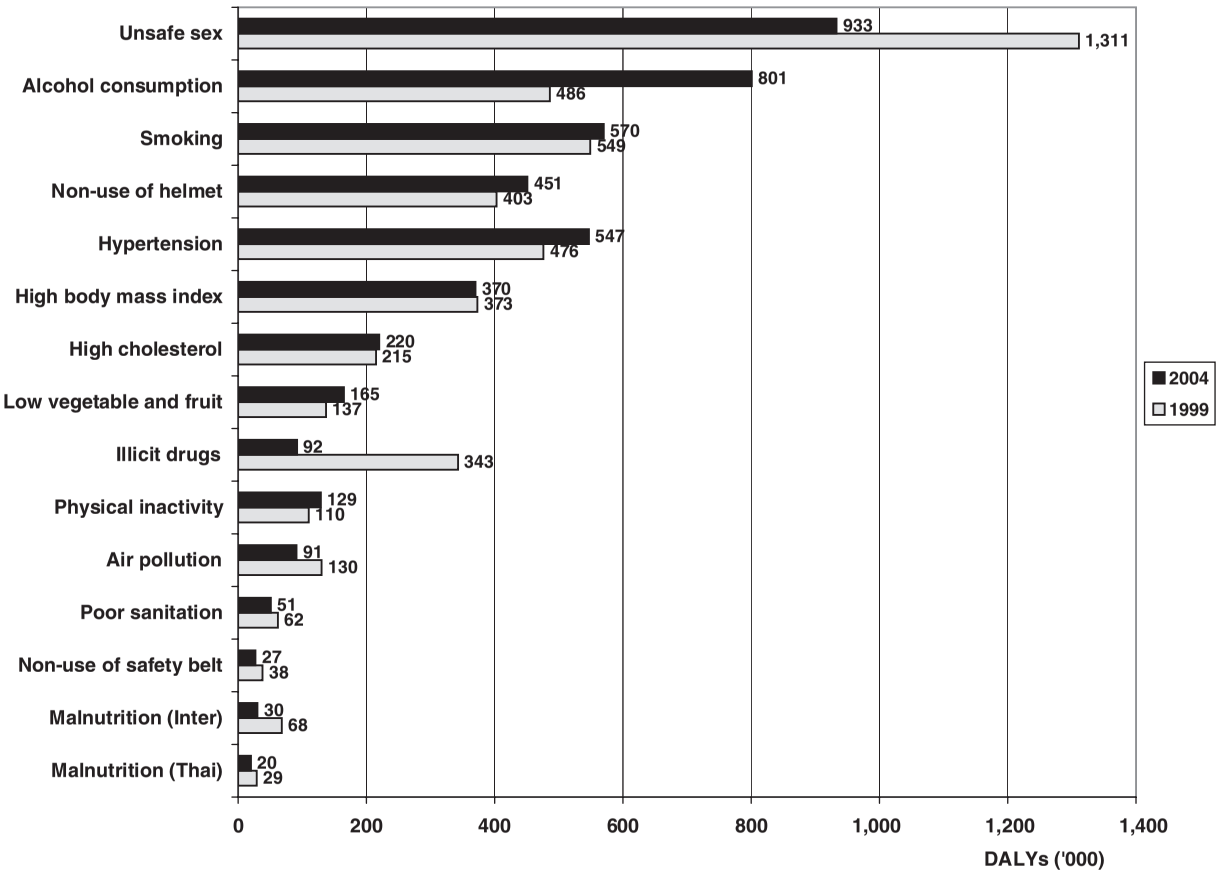

Figure 10.2 Risk determinants and DALYs of the Thai population in 1999 and 2004. *Source*: Burden of Diseases and Risk Determinants Project, 1999–2004, IHPP Thailand.

Table 10.2 Recent trends in the prevalence (%) of excess weight gain in Thailand in rural and urban areas.

	Asian overweight BMIs 23 to <25%				Asian obesity class I BMI ≥ 25 to <30%				Asian obesity class II BMI 30+ %			
	1997		2004		1997		2004		1997		2004	
	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
Urban	19.9	12.9	19.1	17.5	20.4	23.9	25.1	25.4	7.1	9.9	7.1	12.3
Rural	14.9	17.3	17.8	18.6	13.3	22.1	16.8	26.9	2.8	7.3	4.5	8.8
Total	16.5	15.8	18.8	18.4	15.7	22.7	18.1	26.5	4.1	8.3	5.2	9.8

Note: BMI: body mass index calculated as weight (kg)/height $(m)^2$. The standard WHO criteria define BMIs of <25 as normal and overweight as 25-<30 with obesity specified for BMIs of 30+. Asian criteria accepted as relevant in view of undue sensitivity to weight gain of Asian populations. Data from Aekplakorn *et al.* (2007).

Box 10.1 Thailand's history of childhood malnutrition amplifies the adults' sensitivity to chronic diseases.

Asians develop 2–5 times higher rates of diabetes and hypertension than Europeans following modest weight gain. Multiple studies in European, Asians and Hispanic populations reveal the importance of early nutritional experiences both when developing in utero and during the first 2 years of life. Low birth weight as a crude index of multiple nutritional deprivation predicts middle-aged disease and premature death rates through complex epigenetic effects which are still being explored.

Health Thailand 2003) with high total cholesterol levels affecting more than a third of middle-aged adults. The increases in overweight/obesity also meant that nearly a half of middle-aged adults were estimated to be overweight in 2004, and women in particular had a high prevalence of the more hazardous abdominal obesity.

These remarkable increases in risk factors linked to very modest increases in obesity suggest that the Thai population is unduly sensitive to the adult chronic diseases of diabetes, high blood pressure and other cardiovascular diseases (see Box 10.1) (Huxley *et al.* 2008). The Thailand population had a major problem of childhood malnutrition 40 or more years ago which has probably amplified substantially the sensitivity of the middle-aged and elderly to even modest deteriorations in diet and physical inactivity (Yajnik 2000).

The major primary risk determinant of this burden is inappropriate diets; insufficient physical activity is an additional problem. The recent increases in fat intakes and low vegetable intakes are likely to explain the increases in the problem of high blood pressure in Thailand. Hypertension also probably reflects the traditionally high salt and sodium monoglutamate intakes. Rising fat intakes are undoubtedly linked to the rise of coronary artery disease: Chinese, Japanese and Thai rates of coronary artery disease were exceptionally low in the 1950s–1970s because there were negligible national intakes of saturated fat, and total fat intakes provided only 8–14% of the total dietary energy (Chen *et al.* 2006; Keys 1970). Furthermore, in these societies, sugar intakes were negligible at that time, but now sugar is increasingly consumed (e.g. in soft drinks) and this amplifies the risk of obesity and diabetes.

Thailand also has a high prevalence of hepatitis with its associated chronic liver disease, cirrhosis and hepatic cancer. This is due to the lack of clean water and inadequate sanitation which prevailed in Thailand in the past. Current hepatitis levels are amplified by recent increases in alcohol which, with the increased prevalence of smoking, weight gain and dietary changes, are accepted causal factors explaining the increasing cancer rates in Thailand (WCRF/AICR 1997, 2007).

In recognition of these developments, the tenth National Economic and Social Development Plan, covering the period 2007–2011, now identifies one of the strategic goals as '... reducing the increasing rate of five major preventable diseases: cardiovascular, hypertension, diabetes, cancer and stroke so as to increase

productivity and reduce the medical expenditures' (National Economic and Social Advisory Council 2007). Accordingly, the government has developed and/or plans to implement policies which relate both to food quality improvements in schools and other government-controlled catering facilities, and to changes in urban planning and transport in order to increase spontaneous physical activity.

In light of these planned policy developments in Thailand, this chapter examines whether food imports have contributed to changing dietary patterns, and what this might require in terms of strategic changes in trade and domestic policy. It first assesses the dietary changes in Thailand that have contributed to the increasing burden of diet-related chronic diseases. It then estimates the magnitude of food imports contributing to these changes and, alongside a consideration of international and national legal instruments, analyses whether trade restrictions could be an effective instrument for changing food supplies. The potential role of nutrient profiling as a regulatory tool to increase the healthiness of the Thai food supply is then considered.

10.2 Dietary changes in Thailand

10.2.1 Energy

Household surveys measuring food consumption have been conducted in Thailand in five separate years since 1960, the most recent being 2003. Data from 1970 onwards are also available from FAOSTAT of the Food and Agriculture Organization (FAO), the database that collates and standardises national statistics on food availability for consumption. Both sets of data show clearly that dietary patterns have changed significantly in the country over the past 50 years (Tables 10.3 and 10.4).

Taking energy first, the FAO data show an increase of energy intake over past decades in Thailand. Somewhat surprisingly, the household data indicate a decline, particularly in 2003. This decline is likely to reflect inaccuracies in data reporting: while the data take waste (i.e. foods purchased but not consumed) into account, consumers may not necessarily report their true input, and the data do not take into account the increasing proportion of food consumed outside the home.

10.2.2 Fat

In the 1960s and 1970s, Thailand had very low-fat intakes of 9–13% of total energy, these values being then similar to those in China and Japan. Between 1960 and 2003, fat intake doubled (Table 10.3), rising to 23.5% of total energy intake on the basis of dietary surveys. FAO data similarly show a twofold increase in fat availability from vegetable sources together with a further 50% increase in animal fat provision, leading to their estimate that total fat is 19% of total energy intake (Table 10.4). In Western terms, these estimated fat intakes would be considered a low-fat diet, but they are high compared with the traditional intakes in most of the world.

Table 10.3 Dietary intake of energy, protein, fat and carbohydrate in Thailand, 1960–2003.

	Year				
	1960	**1975**	**1986**	**1995**	**2003**
Energy (kcal)	1,821	1,749	1,766	1,751	1,436
Protein (g)	49.1	50.2	50.8	58.1	53.5
As percentage of energy	10.8	11.5	11.5	13.2	13.9
Percentage of intake from animal sources	31.0	39.0	45.1	51.1	54.6
Fat (g)	18.0	25.5	42.6	45.6	38.1
As percentage of energy	8.9	13.1	21.8	22.2	23.9
Carbohydrate (g)	359.0	310.6	293.7	276.9	222.9
As percentage of energy	78.9	71.0	66.7	64.3	62.1

Source: Nutrition Division, Department of Health, Ministry of Public Health. Note the limitations of these data: (a) the sampling frame is based on households with children below 5 years of age only; (b) the actual intakes are simply calculated by dividing the intake by the total numbers in the households; (c) it is difficult to account for seasonal variations which particularly affects certain food groups such as vegetables and fruits; and (d) the method of collection varies with early use of dietary records plus weighing typical food items whereas later the methods used 24 hours recall plus weighing which is recognised to lead to substantial underreporting.

There has also been a marked change in the sources of fat and type of fatty acids. Consumption of milk, vegetable oils, meat poultry and eggs have all risen, implying an increase in saturated fatty acid intakes. Intake of n-3 fatty acids may have increased modestly on a per capita basis (Tables 10.4 and 10.5) but with far more fish now derived from farming rather than sea catches, the amount of n-3 fatty acids in the fish may be very much lower. A 2003 dietary study in Thailand also shows that fats and oils, milk and meat products contributed half of total fat intake, even before the contribution from snacks and fast foods is considered (Department of Health, Nutrition Division, Ministry of Public health 2006 (personal communication)).

There are no detailed studies to help evaluate the intake of the individual fatty acids and there are very sparse data on *trans* fats. Preliminary data suggest that *trans* fat in amounts over 0.7 g/serving occurs in very few food items in Thailand; those few are the more Western foods, such as shortening, puff pastry, doughnut yeast and doughnut cake (Institute of Nutrition, Mahidol, personal communication, 2007). Control of the oil used for deep-frying of street foods is, however, poorly regulated and there may be much higher *trans* fat intakes than currently suggested.

10.2.3 Protein and total carbohydrates

Accompanying the increase in fat intakes is an increase in protein intake and a fall in total carbohydrate consumption. These changes again may be underestimated because of the supposed decline of energy intake. The protein and carbohydrate changes can be explained by a rise in animal protein intake with a fall in rice consumption (Table 10.4). These FAO data suggest cereal consumption – predominantly rice – has fallen progressively over the last 30 or more years as consumption

Table 10.4 Individual food availability or 'intake'.

	kg/caput/year				kcals/caput/day				Protein/caput/day				Fat grams/caput/day			
Total intake					2,115	2,276	2,149	2,424	50	50	49	56	29	32	44	51
Vegetable products					1,908	2,082	1,912	2,120	33	35	30	32	15	18	28	31
Animal products					207	194	237	304	17	15	19	24	14	14	16	21
Commodity	**1970**	**1980**	**1990**	**2003**	**1970**	**1980**	**1990**	**2003**	**1970**	**1980**	**1990**	**2003**	**1970**	**1980**	**1990**	**2003**
Cereals total	152	152	121	122	1,506	1,503	1,187	1,183	27	27	22	22	3	4	3	3
of which Rice	150	144	110	104	1,491	1,428	1,091	1,041	26	25	19	18	3	3	2	2
Starchy roots	9	10	12	17	24	28	35	44	0	0	0	0	0	0	0	0
Sugar cane	11	49	6	4	9	39	4	3	0	0	0	0	0	0	0	0
Sugar + Sweeteners	9	12	20	33	85	116	193	320	0	0	0	0	0	0	0	0
Oil crops	16	12	22	19	82	68	119	105	2	2	4	3	7	6	10	8
Vegetable oils	1	2	5	6	28	59	117	151	0	0	0	0	3	7	13	17
Animal fat	0	0	0	1	10	10	7	15	0	0	0	0	1	1	1	2
Milk	9	8	15	24	11	9	16	29	1	1	1	2	0	0	0	1
Meat	18	19	21	25	100	107	122	153	6	6	7	8	8	9	10	13
Pulses	2	2	2	4	16	20	22	36	1	1	1	2	0	0	0	0
Vegetables	48	53	38	42	34	39	30	34	2	2	1	2	0	0	0	0
Fruit	67	137	89	86	86	141	110	107	1	2	1	1	0	1	1	1
Fish/Seafoods	24	18	21	31	45	34	40	61	7	5	6	10	1	1	1	2
Alcohol	3	9	14	36	21	53	82	119	0	0	0	0	0	0	0	0

Source: FAO Food Balance sheets.

Table 10.5 Dietary intake survey in Thailand, 1960–2003.

Item	Year				
	1960	1975	1986	1995	2003
Rice, cereals and tubers (g)	440.2	374.0	350.9	305.7	361.2
Meat and poultry (g)	17.5	27.0	80.0	71.4	64.0
Fish and shellfish (g)	46.3	51.0	54.4	46.1	31.6
Eggs (g)	4.2	14.0	23.9	21.4	35.6
Milk and products (g)	—	—	70.9	29.3	63.6
Pulses and products (g)	—	4.0	56.9	9.1	19.5
Vegetables (g)	81.9	106.0	115.9	113.4	23.1
Fruits (g)	6.1	36.0	99.2	73.6	77.1
Fats and oils from animal source (g)	0.8	6.0	13.5	1.9	15.0
Fats and oils from plant source (g)	19.0	22.0	9.6	12.1	
Sugar (g)	0.2	7.0	13.6	13.7	7.5

Source: Nutrition Division, Department of Health, Ministry of Public Health. Note the same limitations apply to these data as to the data in Table 10.3 (see footnote to Table 10.3).

of meat and eggs has risen so that, over the last 20 years, about four times more meat and eggs are eaten than in the 1960s and 1970s (Table 10.4). It is also noteworthy that vegetable intake has dropped dramatically; this is partially compensated by the increase in fruit consumption.

10.2.4 Sugar

Data from the sugar industry show that over the last 20 years there has been a major increase in domestic sugar consumption (Figure 10.3). In 2003, the actual domestic consumption was 30.5 kg/caput/year – equivalent to 84 g/head/day. FAO data suggest sugar availability for consumption has increased fourfold to 33 kg/capita/year as sugars and sweeteners (Table 10.4). The FAO data also suggest that in 2003, sugars and sweeteners supplied over 13% of total energy, compared with 4% of the energy from food and drink in 1970.

These increases reflect the fact that sugar is also now present in a far greater range of Thai food products; this makes it very difficult for consumption to be captured by household food surveys. Industrial sources rather than nutritional surveys of food intakes are therefore now more reliable sources of data on true sugar intakes.

10.3 The potential impact of imports and exports on dietary changes in Thailand

10.3.1 Cereals and staples

Over the last 30 years, there has been a marked rise in total cereal imports (Table 10.6), but this relates to the import of non-rice cereals such as wheat and corn – another feature of the Westernisation of the Thai diet (Table 10.6). Traditionally, almost all the cereal produced as well as that consumed in Thailand

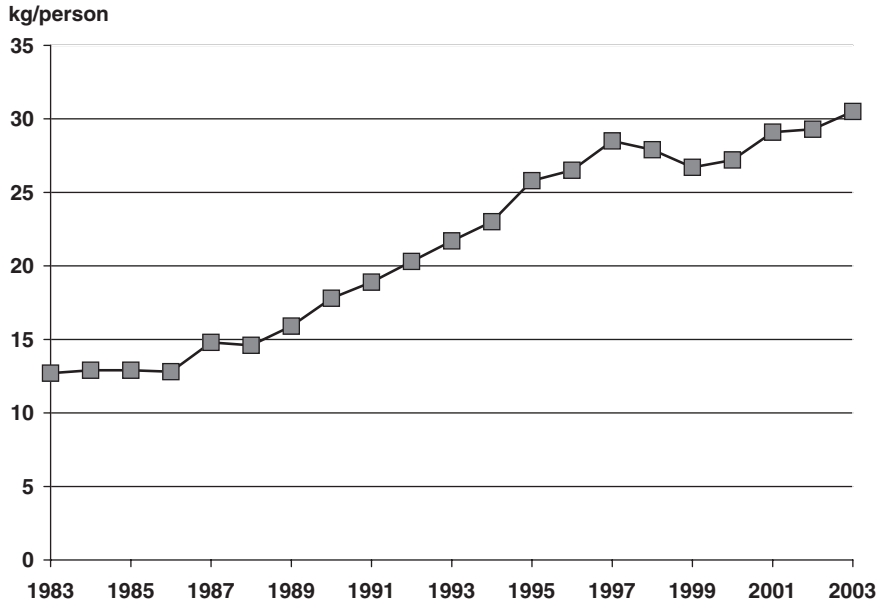

Figure 10.3 Domestic sugar consumption in Thailand (1983–2003). *Source*: Production Management Centre, Office of the Sugar Cane and Sugar Commission, Thailand.

was rice. In 1970, rice was the dominant cereal crop, accounting for 82% of all cereals being produced. Since then the increase in rice production has been very substantial but, given the increase in the Thai population since then, rice production has, on a crude basis, only risen from 850 g/head/day to 980 g/caput/day. In association with declining domestic intake, more Thai rice is now being exported (Table 10.7).

The other main starchy crop produced in Thailand is cassava which, in practice, is almost totally exported; the recent small fall in export ratios simply reflects the importation of potatoes to be used both in the tourist hotels and to make fried potato chips which have now become a commonplace food marketed intensely by Western-controlled food franchises in Thailand (as discussed later).

10.3.2 Sugar

The impact of sugar imports on total availability is negligible in Thailand compared with the very large amounts produced domestically (Table 10.6). Interestingly, the use of sugar cane or sugar/sweeteners for sugar consumption in 1970 was very small, as noted in Table 10.5. However, the data show that in 1970 there was a modest export of sugar but a substantial transfer of sugar cane for use by the manufacturing industries (Table 10.6). In the last three decades of the twentieth century, sugar cane and sugar production increased 15- to 18-fold, and sugar exports increased markedly and now dominate the outlet for sugar production (Table 10.7). Although sugar cane continues to be used in ever-increasing quantities for food processing, its

Table 10.6 Imports in relation to home production in Thailand.

	Production 1,000 tons/year				Imports 1,000 tons/year				Import dependency ratio (%)			
Commodity	**1970**	**1980**	**1990**	**2003**	**1970**	**1980**	**1990**	**2003**	**1970**	**1980**	**1990**	**2003**
Cereals total	11,246	14,829	15,444	22,575	90	249	456	1,218	1	3	4	8
of which Rice	9,238	11,585	11,468	18,170	0	0	0	12	0	0	0	0
Starchy roots	3,563	16,695	20,825	18,645	1	0	51	238	0	0	0	5
Sugar cane	5,102	12,827	33,561	74,258	0	0	0	0	0	0	0	0
Sugar + Sweeteners	435	1,111	3,521	7,724	1	86	6	29	0	12	1	1
Oil crops	1,134	1,206	2,424	2,201	17	104	25	1,736	2	8	1	45
Vegetable oils	56	103	407	992	2	93	19	109	3	5	5	15
Animal fat	18	22	27	31	11	14	26	5	39	4	49	16
Milk	4	30	130	620	316	386	738	1,196	100	100	87	77
Meat	666	895	1,323	2,182	0	0	1	3	0	0	0	0
Pulses	181	348	54	302	0	2	2	10	0	1	3	4
Vegetables	1,934	2,751	2,544	3,236	4	10	11	150	0	0	0	5
Fruit	2,724	7,221	6,249	7,756	1	3	28	187	0	0	1	3
Fish/Seafoods	1,427	1,796	2,776	3,521	32	50	565	1,253	2	4	25	39
Alcohol	123	404	766	2,280	1	3	18	73	1	1	2	3

Source: FAO Food Balance sheets.

Table 10.7 Exports expressed as a percentage of home production.

	Exports 1,000 tons/year				Export as % home production			
	1970	1980	1990	2003	1970	1980	1990	2003
Cereals	2,619	5,270	5,453	8,976	23	36	35	40
of which Rice	1,077	2,863	4,141	8,567	12	25	36	47
Starchy roots	3,588	14,237	22,461	14,488	101	85	108	78
Sugar cane	0	0	0	0	0	0	0	0
Sugar + Sweetners	58	453	2,439	5,450	13	41	69	71
Oil crops	87	60	37	59	8	5	2	3
Vegetable oils	2	11	9	355	3	11	2	36
Animal fat	0	0	0	2	1	1	1	7
Milk	2	30	20	263	59	100	15	42
Meat	0	19	146	549	0	2	11	25
Pulses	101	209	2	40	56	60	3	13
Vegetables	12	29	244	475	1	1	10	15
Fruit	69	246	1,030	2,082	3	3	16	27
Fish/Seafoods	107	680	1,081	1,590	8	38	39	45
Alcohol	0	1	12	77	0	0	2	3

Source: FAO Food Balance sheets.

low extraction rate (considered by FAO to be 11%) means that its contribution is only about 10–15% of total sugar (Table 10.8). It is also noticeable that the amount of sugar cane being produced matches the amount going into food manufacturing; the conversion of cane sugar to alcohol for use as a biofuel in gasoline has been negligible.

Table 10.8 Commodity use in the human food supply in Thailand.

	Food manufacturing				Food sales			
	1,000 tons/year				1,000 tons/year			
Commodity	1970	1980	1990	2003	1970	1980	1990	2003
Cereals total	285	345	265	555	5,512	7,061	6,595	7,669
of which Rice	241	302	195	184	5,435	6,651	5,961	6,557
Starchy roots	0	0	0	0	311	453	678	1,070
Sugar cane	3,921	10,578	33,261	74,000	408	2,249	300	258
Sugar + Sweeteners	0	0	0	0	316	552	1,074	2,062
Oil crops	454	585	1,104	1,838	571	554	1,182	1,186
Vegetable oils	0	0	0	0	43	113	263	393
Animal fat	7	9	11	3	18	21	28	42
Milk	0	0	0	0	317	364	822	1,522
Meat	0	0	0	13	662	870	1,167	1,600
Pulses	0	0	0	0	63	97	127	240
Vegetables	0	0	0	0	1,743	2,476	2075	2,629
Fruit	14	18	43	81	2,424	6,346	4,841	5,430
Fish/Seafoods	0	0	0	0	874	844	1,139	1,925
Alcohol	0	0	0	0	124	406	773	2,231

Source: FAO Food Balance sheets.

10.3.3 Fats and oils

Thai oil crop production has doubled since 1970 (Table 10.6). The last 35 years has seen the establishment of a national vegetable oil industry; in 1970, there was almost no palm oil, soya bean, palm kernel oil or coconut oil being produced whereas now about two thirds of domestic production is palm oil. This accounts for 41% of the vegetable oils in the food supply (compared with 1.5% in 1970); soya bean oil is the other dominant oil now available to the Thai population (data not shown). The contribution of soya bean oil depends, as with palm oil, on home production but neighbouring countries, i.e. Malaysia and Indonesia, also export huge amounts of palm oil, some of which comes into Thailand. Nevertheless, Thailand is exporting nearly a third of its home production of palm oil, three times more than the amount it imports. In 2003, palm oil and palm kernel oil, contributed nearly three quarters of the total vegetable oil exports shown in Table 10.7.

Added to the increase in vegetable fat sales is a greater animal fat content in modern Thai foods, this increase now being dominated by fat from pig meat. Meat production has trebled in Thailand and consumption per head has also increased markedly. There is no reliance on imported meat and, in the last 15 years, Thailand has developed a robust poultry export business. A second contributor to the animal fat intake might be considered to be milk intake, three quarters of which is imported. One might therefore assume that the saturated fat content of the Thai diet will have risen further because of increased milk consumption. However, this is not a large effect because the absolute quantities of milk being consumed as fat are estimated to be small on a national per caput basis (Table 10.5). Although some milk is now used in food exports the main use of the modest quantities of milk is clearly in the food chain (Table 10.7).

Although milk is a scarce component in the traditional Thai diet, fish and other seafoods have been important. Furthermore, there has been a marked increase in fish farming (e.g. prawns and shrimp) and, overall, a doubling of fish sales (Table 10.8). Nevertheless, on a population basis, the increase per head of fish in the market place is modest and fish oils make a very small contribution to the overall fat intake of the modern Thai diet (Table 10.5). In addition, Thailand has a substantial fish trade involving both imports (Table 10.6) and exports (Table 10.7).

10.4 The impact of westernisation on Thailand

The analysis here suggests that food imports have not been a causal driver of dietary changes in Thailand. But it is clear that many other trade-related processes have changed the cultural forces and trends that affect dietary habits in the country. Table 10.9 provides a crude analysis of the foreign direct investment (FDI) in Thailand. What are classified as ‘agriculture’, ‘food’ and ‘sugar’ interests have received relatively modest investments from abroad; this probably reflects the emergence of powerful economic forces in the food chain within Thailand itself.

The industrial investment component set out in Table 10.9 includes fast food outlets and supermarket; franchises controlled by transnational companies (TNCs) are

Table 10.9 Foreign direct investment in Thailand ($US millions).

	Sector	1996	2000	2005	Total 10-year (1996–2005) investment
1	Industry	708.85	1,810.67	3,044.09	22,422.89
2	Food and sugar	45.14	93.01	−35.70	1,313.68
3	Textiles	49.28	−3.48	77.92	598.15
4	Metal and non-metallic	112.63		216.24	2,531.62
5	Electrical appliances	240.80	507.23	908.38	5,501.61
6	Machinery and transport equipment	108.61	655.48	1,369.99	6,885.58
7	Chemicals	182.98	393.38	472.53	2,725.44
8	Petroleum products	−250.16	29.30	−441.13	−228.57
9	Construction materials	3.47	57.82	21.02	227.84
10	Others	216.09	161.59	454.85	2,867.54
11	Financial institutions	72.01	132.97	1,547.79	3,057.84
12	Trade	545.12	67.79	358.95	7,298.68
13	Construction	70.42	−1.71	31.09	477.82
14	Mining and quarrying	19.34	−274.74	220.29	1,390.55
15	Agriculture	2.02	0.71	12.61	60.85
16	Services	124.93	448.28	348.15	3,624.69
17	Investment	−21.34	99.12	176.73	585.08
18	Real estate	752.79	69.11	41.48	1,926.20
19	Others	−3.53	461.05	721.99	3,657.03
20	**Total**	**2,270.62**	**2,813.26**	**6,503.17**	**42,497.73**

an additional influence. These foreign investments have had a very visible impact on the food retail and service environment in urban Thailand. For example, the British-based Tesco supermarket chain started investing in Thailand and opened its first store only in 1998. By May 2008, it had over 400 outlets and is described as having 'recently rapidly expanded its franchise deep into provincial areas traditionally controlled by politically powerful local business groups. Tesco's air-conditioned, low-cost concept has been highly successful in Thailand, profoundly transforming the local retail scene in just under a decade' (Crispin 2008).

Many other US-funded fast food outlets also operate, such as Kentucky Fried Chicken, McDonald's, A&W, Pizza Hut, Burger King, Starbucks, Swensen's, Dairy Queen, Baskin Robbins, Sizzlers, Mister Donut, Au Bon Pain, Mrs Fields and Auntie Anne's. Foreign-based food businesses in 2002 were estimated to account for 80% of the food franchise market and this sector has been growing at 15–20% per year with only 10% of these businesses operating with Thai associates. These developments are recognised as major drivers in the transformation of the food

systems in Thailand with intense marketing campaigns not only based on the price and 'value' of their products, but also by highlighting the attractiveness of products associated with the affluent Western lifestyle. For example, PepsiCo, through its subsidiary Frito-Lay, now controls the snack market, having run an aggressive campaign to overtake and replace domestic manufacturers. The snack industry specifically targets the 5- to 24-year olds to embed snack eating into the Thai culture. Already children derive almost a quarter of their calorie intakes from snacks, with potato chips being one of its very successful products (Hawkes 2006). The Thai advertising market has in fact been dominated by US-based agencies since the 1940s, but the rapid increase in the entry of transnational agencies was evident from the 1980s onwards

There are no data on the relative nutrient content in relation to volumes of the different products sold by foreign-owned supermarkets and fast food outlets but their websites and other marketing techniques provide ample evidence of the marked shift in the promotion of products other than the traditional low-fat, low-sugar Thai foods.

10.5 Implications for the applicability of trade restrictions to promote a healthier food supply

10.5.1 Implication of food production and import data

The analysis presented here suggests that the three dominant deleterious changes in the food supply – the increases in sugar, total fat and saturated fatty acid intakes – are not related primarily to the mass importation of foods (other than milk). Rather, the changes have been driven by a combination of the transformation of the agricultural priorities and food chain within Thailand itself, and broader changes in culture and marketing, largely resulting from global influences. As a result of the first of these changes, the vast majority of fats and sugars foods are produced in Thailand itself; import restrictions would thus have only a very modest effect on the overall availability of sugars and vegetable fats in the domestic market. Thus domestic sugar and fat consumption would unlikely be affected by trade-restrictive measures, and should rather be dealt with by national domestic policy changes to address broader global influences.

10.5.2 Implication of international and national legal instruments

Consideration of whether trade restrictions would be an appropriate policy instrument has thus far been considered in the light of data on food imports and production. Consideration of this question also requires an assessment of whether it would be a possible policy approach under international and national law and associated mechanisms (as also discussed by Josling *et al.* in Chapter 12, Atkins in Chapter 14 and Fidler in Chapter 15). Thailand is a member of the World

Trade Organization (WTO) and therefore has to respond to the General Agreement on Tariffs and Trade (GATT) as well as the WTO Agreement on Sanitary and Phytosanitary Measures (SPS). Therefore, the implementation of any standard measures relating to domestic and imported foods must follow the WTO principle of National Treatment, i.e. the principle of giving goods from other countries the same treatment as national products. The Thai government is thus required to enforce the same rules and regulations without discriminating between domestic and foreign foods. This is required to prevent trade partners from claiming that Thailand uses unlawful non-tariff measures to limit the sale of their products. Thus, to restrict trade, Thailand would have to prove that the restricted measure is not arbitrary, does not discriminate between similar products produced domestically compared with the imported foods and that these measures are essential for protecting the health, hygiene and life of humans, animals and plants in Thailand. It is also required to show that this is not a deliberate and unnecessary obstacle to trade and that the measure being introduced is the least restrictive means of achieving the health protection compared to other options (see Chapter 15).

In theory, one potential mechanism available to a country is the use of 'special and differential treatment' (S&DT), a WTO principle allowing developing countries to have lesser reduction commitments on tariffs than developed countries in order to protect national food security or livelihoods (a theme elaborated on by Atkins in Chapter 14). But it is difficult to see how Thailand could, on the basis of the principal agricultural imports and exports, invoke the need for special measures. Not only is Thailand a major sugar producer, but it is now evident that Thailand is also exporting oils (Table 10.7). Thus, if the aim was to limit fats and sugar imports, Thailand's current exports of these commodities would limit the ability to make a case, particularly as Thailand's economy has been developing so well in recent years.

Import restrictions could also, in principle, be based on food safety considerations (as discussed at greater length by Josling *et al.* in Chapter 12 and Fidler in Chapter 15). The WTO's SPS Agreement allows foods with toxicants, such as heavy metals or the cancer-inducing aflatoxin, or infective agents such as avian flu, to be restricted for public health reasons, but does not recognise the 'toxicity' of nutrients. While controversial, it could be argued that saturated fats, sugars or salt have many features analogous to classic toxicants, in that repeated exposure of the population to appreciable amounts of these foods would induce the population risk factors to rise (e.g. raised blood cholesterol, weight gain and increases in hypertension). In that sense, saturated fats are just as damaging, if not more harmful on a population basis, as the steady consumption of modest amounts of a heavy metal. The argument is stronger for *trans* fats, since they are considered even more harmful than saturated fatty acids. The government of Thailand has not yet followed the US example and declared *trans* fats to be unsafe in any amount (U.S. FDA 2003), but if they were deemed to be hazardous, then the Thailand FDA would have two options: (i) setting food standards to apply to all food products within Thailand, whether imported or produced locally; or (ii) a more selective approach whereby specific products which

might or do contain substantial amounts of *trans* fats could be banned. These measures, either singly or combined, would then require the Ministry to specify that *trans* fats are a prohibited substance in foods. Restricting the import of foods contaminated with *trans* fats would then require effective control measures to be undertaken by the Customs Office. This approach would not be counter to the WTO's SPS Agreement because equivalent standards would be set for local as well as imported foods.

Nevertheless, to be WTO compliant, such restrictions would also have to be based on existing international standards, which are, in this case, set by the Codex Alimentarius (discussed by L'Abbé *et al.* in Chapter 13). While there are Codex measures that specify maximum levels of factors in food considered to be harmful (like toxicants), there are none that deal with the quantities of nutrients in food, such as saturated or *trans* fats or sugars or salt. This neglect of the harmful effects of some nutrients is occuring despite calls by WHO Expert Groups for the Codex Alimentarius Commission to change its position in the light of new scientific evidence about the enormous health burden induced by foods rich in fat, saturated fat, free sugars and salt. The original WHO Report (WHO 1990: appendix 6) on diet, nutrition and the prevention of chronic diseases proposed an international definition of foods low, medium and high in a range of macronutrients which, if implemented, would have led to a universal system of classifying foods and clarified the implications of policy decisions affecting the whole food chain. However, these and similar proposals have been repeatedly rejected because Codex decisions are dominated by economic rather than health concerns, and are influenced by lobbying by the food industry. Codex is thus not considered here a promising avenue for change in this regard (but see differing perspective by L'Abbe *et al.* in Chapter 13).

In addition, there is no mechanism in trade law which would in any way restrict the influence of Western fast food outlets and Western supermarkets; they simply invest money in Thailand and then set about producing Western-style fast foods with a nutrient content very different from that of traditional Thai foods.

There are also national provisions and mechanisms to consider. The Exports and Imports of Goods Act of 1989, amongst many other measures in Thailand, allows the Minister of Commerce, with Cabinet approval, to determine if a particular good is prohibited or requires approval for export or import on the basis of public health concerns. Thailand also has a national Committee on International Trade, composed of a wide range of government departments, which is commercial in intent and is involved in determining how international agreements on trade should be implemented. These mechanisms have provided the means for Thailand to restrict imports. For example, following the outbreaks of bovine spongiform encephalitis (BSE), Thailand prohibited the import of beef and beef products from the United Kingdom. The measures were invoked under the WTO rules because the phytosanitary regulations permit the blocking of imported foods that are 'hazardous to health'. Similarly, poultry and products from the WHO-declared endemic areas for avian flu are banned under the same international regulations. More controversially, Thailand also restricted the importation of genetically modified

foods (GMOs) under the same phytosanitary terms but this has led to substantial disputes with the United States and Europe.[2]

None of these bans consider nutrients and this reflects the lack of consideration and expertise in the relevant laws and committees on the nutritional value of foods, as well as a general lack of representation from the health sector in these deliberations.

Regulations covering domestic foods also provide a rather limited scope for action. The legal mechanisms within Thailand are dominated by a series of legislative Acts, i.e. the Animal Epidemics Act of 1956 (revised by the Animal Slaughter and Sale Act of 1992), the Food and Consumer Protection Acts of 1979, and the Dangerous Substance Act passed in 1992. These acts deal with a large range of issues. The first Food Act of 1979 was unsurprisingly introduced to deal with food quality and the potential contamination of foods by introducing standards for foods which were imported or distributed in the country. The legislation also, however, included criteria for specifying the nutritional value of products as the problems of malnutrition and nutritional adequacy had already become a high profile issue in Thailand. To cover these issues, the legislation was wide-ranging, with enforcement measures assigned to the Ministry of Health and covering such issues as food processing, safety criteria for food-related machinery, food storage, food additives, contaminants, criteria for food container labelling, as well as the distribution and marketing of foods, including food claims and nutritional facts permitted on labels. The act was constructed so that it allowed the monitoring and inspection of foods and the rapid response to any problems which arose from a public health point of view.

The Consumer Protection Act 1979 focused on the explicit protection of consumers rather than the issues of food safety, nutritional adequacy and those relating to business practice. Consumers were now able to gain access to a penal court, and a state mechanism was established to monitor the conduct of the business sector and provided consumer redress for infringements of their rights. The act does not, however, readily allow any consumer objection to the relatively unhealthy proportions of nutrients in foods.

10.6 A third way: the potential use of nutrient profiling

A key policy implication of this analysis is that an innovative domestic policy is needed to address rising sugar and fat intakes (James & Rigby 2007; Robertson *et al*. 2004). But, importantly, this policy must take account of the global influences

[2] The United States presented to the WTO their evidence on the safety of GMOs and, although Europe also blocked the imports of GMOs, the procedures for handling disputes in the WTO have meant that the issue was referred to the relevant committee of the Codex Alimentarius Commission. The Commission concluded that there was no evidence that GMOs were hazardous to health. Whilst there is widespread opposition to GMOs within Europe, in Thailand there are currently GMO products, e.g. soya bean sauce using GMO soya beans and potato chips from GMO potatoes.

which now pervade the media and environment of Thailand. Decisions on food policies must apply to all foods sold in the country and, in this way, influence both the global cultural influences and domestic food manufacturing, marketing and sales. The analysis here also shows clearly that the decisions would best be focused on policies relating to fat, sugar and salt intakes as the increase in fats and sugars has been a leading cause of the major increase in the burden of chronic diseases in Thailand; the increasing hypertension rates also require a focus on reducing the traditionally high salt intakes of Thailand.

An appropriate policy prescription would be to use nutrient profiling to develop a system to promote the consumption of more traditional Thai foods which are low in fat and sugars, with an additional policy requiring that the traditional high salt content, commonly found in all Asian diets should now be progressively reduced. With the advent of refrigeration and other forms of food preservation, there is no longer the need for using salt in its traditional role as an antibacterial agent.

'Nutrient profiling' is the system for classifying foods on the basis of their potential health impact. In the approach, population-wide intake goals (e.g. fat should only comprise 30% of total fat intake) are applied to individual foods. This approach was proposed by the WHO Technical Report in 1990 (WHO 1990) and has been adopted in some countries for specific purposes, notably in the United Kingdom, where nutrient profiling is used as a system for defining which foods can and cannot be advertised (U.K. Food Standards Agency 2005) and also forms the basis for traffic light labelling.

Nutrient profiling could apply to both domestically produced and imported foods in all countries and could be based on internationally recognised criteria, such as that laid out in the WHO/FAO Expert Consultation on Diet, Nutrition and the Prevention of Chronic Diseases (WHO/FAO 2003). But to be appropriate, nutrient profile would need to be developed that take into account the real needs of Asian and other susceptible populations. For example, the choice of health goals (notably 30% of energy for the fat intake) in Western countries would be too high for Thailand. Therefore, whereas the WHO and FAO (WHO/FAO 2003) specify fat goals ranging from 15 to 30%, in Thailand the value should be 15%. Following the usual international criteria that a low-fat product should be half the standard value, 7.5% would thus be the upper limit for a low-fat product, and 7.5–15% for a medium fat product. A traffic light approach could then be taken (as already done by the UK government) and foods or dishes labelled as green for low-fat, yellow for medium-fat and red for a high-fat. Similarly, limits to the saturated fat content might be taken in proportion to the total fat content as in all health analyses, i.e. with 5% taken as the upper limit for Thailand and other Asian countries with similar traditional diets. This approach would then allow new standards to be established on a national basis.

In practice, it would be easier to shift policies indirectly in terms of international trade by establishing on a national basis that nutritional criteria have greater importance in health terms than many of the traditional food safety issues and that, within a country, there could be restrictions on the sale of foods on the basis that

their nutrient profile. For example, it would be relatively simple to specify that Thai foods could not be sold implying that they are traditional if their nutrient contents did not comply with a specified nutritional profile very low in fat and sugar. It has been argued by Ministers in Thailand that one of their most important industries – tourism – depends heavily not only on the availability of sandy beaches, sun and a congenial environment but on the special quality of the Thai cuisine. On this basis, if the government set nutrient criteria that Thailand hotels could not serve or market foods deemed to be traditional Thai dishes unless they complied with the usual Thai nutrient content of the 1980s or earlier, this would have a remarkable effect on the use of fats, oils and sugar in catering. If, in addition, the Thai government set criteria for any foods served in organisations receiving financial support from the government, e.g. in local and national government facilities, educational establishments, military and police canteens, etc., this would have a profound effect on the overall availability of high-quality, nutrient-rich foods rather than the new pervasive Westernised types of Thai foods now found in Thailand.

The concept of nutrient profiling is new to international negotiators and policy-makers and implies that there are good foods and bad foods. Yet, it has become clear that, in policy terms, the development of nutrient profiling of foods is of exceptional value when it comes to consumer understanding of purchasing options. The British Government has now introduced a form of nutrient profiling for labelling foods high in total energy, total fat, saturated fats, sugars and salt. The nutrient content of each of these is then categorised as high, medium or low, as designated by red, yellow or green. The traffic light labelling of foods is already being shown in the United Kingdom to have an effect on consumers' choice of purchases and has been taken up by several supermarket chains, food manufacturers and restaurants.

It seems clear that national governments would have to take responsibility for applying nutrient profiling before many governments would be willing to use this approach to their food imports. Island communities who rely on imports for the majority of their food, e.g. Singapore and the Pacific and Caribbean states, could argue that these health criteria should be used for limiting trade through the SPS criteria of WTO regulations. But this would need to overcome the current approach of identifying only classically accepted toxins or infective substances as important in the context of the SPS regulations. Food marketers are also totally opposed to nutrient profiling as they quite reasonably see it as having a potentially big impact on sales. Given that huge TNCs from North America and Europe are rapidly investing in the developing world, they would likely perceive nutrient profiling by Thailand and other Asian countries as a threat to their sale of Westernised foods high in fat, sugar and salt.

10.7 Conclusions

Thailand's health burden highlights the problem of chronic disease in middle and low income countries. Chronic diseases rates are now dominating the health burden in Thailand and many Asian, Middle East, Latin American and Caribbean

countries, and are linked to the profound changes in the environmental and economic circumstances of the population. The Thai population appears to share with most of Asia, and probably Latin America and the Caribbean, a marked propensity to develop diabetes, cardiovascular disease and perhaps cancers, even when there are only very modest increases in body weight. This seems to relate to the profound problems of childhood and maternal malnutrition 40–60 years ago, which almost certainly affected the population's intrinsic biological sensitivity to developing chronic diseases when exposed to what is now termed the 'toxic environment' of Western lifestyles characterised by limited physical activity and energy-dense diets. With economic development and urbanisation has come not only a marked reduction in physical activity, but also a very substantial documented change in dietary patterns. A substantial increase in total fat and sugar consumption, with a fall in the traditional consumption of rice has occurred within the last 25 years.

An analysis of Thailand's food imports and exports demonstrates that agricultural products form an important part of trade, with Thailand being recognised as a sugar, vegetable oil and meat exporter. Given the current perspective on the balance of trade in foods, it is unlikely that Thailand could invoke new approaches to trade restrictions based on attempts to limit the development of the adult chronic disease burden: these problems clearly must be dealt with on a national basis. It is also evident that the food culture within Thailand is swinging towards the consumption of Westernised diets, and this is being heavily promoted by foreign-owned fast food outlets and supermarkets. But there is no mechanism within international trade law for dealing with this problem; new approaches to national policy need to be developed which then may indirectly impact on international trade.

It is suggested that, following the authors' consultation with senior government officials relating to health and to economic and social development in Thailand, that Thailand could evolve a completely new policy by promoting more traditional Thai foods. This promotion would not be based on traditional health-promoting measures, but could use a nutrient profiling system whereby the health value of foods with different nutrient contents is defined. There could be restrictions on the production and sale of foods in government establishments, hotels and catering outlets which claim to be selling traditional Thai foods. This profiling would also allow food labelling, like the UK-based traffic light labelling scheme. The methodology for defining optimum nutrient profiling would require a global, preferably WHO-based, set of criteria. It is suggested here that labelling all Thai foods with 'traffic lights' and imposing nutrient criteria on foods sold in government-backed and commercial outlets selling traditional Thai foods would have a marked effect in shifting the Thai back towards the better nutrient and health profiles of the 1980s. Problems will, of course, arise as a result of the complexity of the food market (e.g. the popularity of street foods), and also because political instability, which, like many other countries, makes it difficult to develop and sustain good policies and appropriate legal mechanisms.

Another important conclusion of this analysis is that the role of trade in changing diets needs to be assessed on a case-by-case basis in order to identify the most appropriate and potentially effective policy solution.

References

Aekplakorn, W., Hogan, M.C., Chongsuvivatwong, V., Tatsanavivat, P., Chariyalertsak, S., Boonthum, A. *et al.* (2007). Trends in obesity and associations with education and urban or rural residence in Thailand. *Obesity* **15**, 3113–21.

Chen, J., Peto, R., Wen-Harn, P., Liu, B.Q., Campbell, C., Boreham, J. *et al.* (2006). *Mortality, Biochemistry, Diet and Lifestyle in Rural China: Geographic Study of the Characteristics of 69 Counties in Mainland China and 16 Areas in Taiwan*. Oxford University Press, Oxford.

Crispin, S.W. (3 May 2008). Asia hand: what's eating Thai Tesco. *Asian Times*. Retrieved from http://www.atimes.com/atimes/Southeast_Asia/JE03Ae02.html.

Hawkes, C. (2006). Uneven dietary development: linking the policies and processes of globalization with the nutrition transition, obesity and diet-related chronic diseases. *Globalization and Health* **2**(4).

Huxley, R., James, W.P.T., Barzi, F., Patel, J.V., Lear, S.A., Suriyawongpaisal, P. *et al.*, on behalf of the Obesity in Asia Collaboration (2008). Ethnic comparisons of the cross-sectional relationships between measures of body size with diabetes and hypertension. *Obesity Reviews* **9**(Suppl 1), 53–61.

James, W.P.T. (2000). Ending malnutrition by 2020: an agenda for change in the millennium. *Food and Nutrition Bulletin* **21**(3s), 1–88.

James, W.P.T. & Rigby, N. (2007). The challenge of the chronic diseases epidemic for science and society. In: Mann, J.I. & Truswell, A.S. (eds). *Essentials in Human Nutrition*, 3rd edn. Oxford University Press, Oxford, pp. 249–59.

Keys, A. (1970). Coronary heart disease in seven countries. *Circulation* **41**(Suppl 4), I186–95.

Ministry of Health Thailand (2003). *The Fifth Thailand Food and Nutrition Survey*.

Ministry of Health Thailand (2003–2004). *The Third National Health Examination Survey*.

Ministry of Public Health Thailand (2002). *Thailand Health Profile 1999–2000*. Bureau of Policy and Strategy, Bangkok, Thailand.

National Economic and Social Advisory Council (1977). *The 4th National Economic and Social Development Plan 1977–1981*. Office of the Economic and Social Development Board. Retrieved from http://www2.nesac.go.th/english/.

National Economic and Social Advisory Council (2007). *The 10th National Economic and Social Development Plan 2007–2011*. Office of the Economic and Social Development Board. Retrieved from http://www2.nesac.go.th/english/.

Robertson, A., Tirado, C., Lobstein, T., Jermini, M., Knai, C., Jensen, J.H. *et al.* (2004). *Food and Health in Europe: A New Basis of Action*. European Series No. 96. WHO, Copenhagen.

Thailand Burden of Disease Project (2007). *International Health Policy Program (IHPP), Thailand*. Retrieved from http://thaibod.org.

U.K. Food Standards Agency (2005). *Signposting Labelling Scheme*. Retrieved from http://www.food.gov.uk/foodlabelling/signposting/. See also *Use for Controlling Marketing*. Retrieved from http://www.food.gov.uk/healthiereating/advertisingtochildren/.

U.S. Food and Drug Administration (2003). Rules and regulations. *Federal Register* **68**(133), 41433–506.

World Bank (2005). *Repositioning Nutrition as Central to Development : A Strategy for Large Scale Action*. World Bank, Washington, DC.

World Cancer Research Fund/American Institute for Cancer Research (1997). *Food, Nutrition and the Prevention of Cancer: A Global Perspective*. American Institute for Cancer Research, Washington, DC.

World Cancer Research Fund/American Institute of Cancer Research (2007). *Food, Nutrition, Physical Activity, and the Prevention of Cancer: A Global Perspective*. American Institute for Cancer Research, Washington, DC.

World Health Organization (1990). *Diet, Nutrition and the Prevention of Chronic Diseases*. Technical Report Series 797. World Health Organization, Geneva.

World Health Organization/Food and Agriculture Organization (2003). *Diet, Nutrition and the Prevention of Chronic Diseases*. WHO Technical Series Report No. 916, World Health Organization, Geneva.

Yajnik, C. (2000). Interactions of perturbations in intrauterine growth and growth during childhood on the risk of adult-onset disease. *Proceedings of the Nutrition Society* **59**, 1–9.

Part 3
Policy Options

11 Tackling Childhood Obesity in an Era of Trade Liberalisation

Tim Lobstein

11.1 Introduction

While trade liberalisation may contribute to global wealth and economic development, the process is not without its drawbacks: in particular the opening of markets facilitates the importation of foods and the inward investment of capital in the manufacture and retail of foods, that can undermine healthy dietary patterns. Trade liberalisation has the effect of 'Coca-colonisation': the replacement of traditional dietary patterns with new patterns dominated by sugary beverages, snack foods, confectionery and meals bought from modern chains of fast-service restaurants.

The export of 'Western' diets brings in its train Western patterns of diet-related disease, the most obvious of which for children is high adiposity – childhood obesity. Childhood obesity is rising worldwide (Wang & Lobstein 2006) and is of particular concern since it raises the risk of an early onset of heart disease, hypertension, type II diabetes, liver disorders and a number of other chronic diseases (Lobstein & Jackson-Leach 2006). It is also widely recognised that children deserve special protection from commercial influences that undermine their health (Swinburn *et al.* 2008).

This chapter considers the policies needed to address unhealthy diets and reduce obesity among children. It starts by identifying some of the outcomes of trade and financial liberalisation for foods popular with children, and then makes the case for strong intervention to address the problem in an era of free market ideology. It reviews the recommendations made by expert consultations of the World Health Organization (WHO) to tackle child obesity and sets out specific policy options to address the trade-related influences on childhood obesity at all scales, from global to local.

11.2 Investment in the manufacturing, retailing and marketing of obesogenic foods

11.2.1 Investment in manufacturing and retail

While much attention has focused on the rising levels of food imports and exports arising from trade liberalisation, the inward movement of capital as foreign investment has even greater implications for the Westernisation of dietary patterns among children (also discussed in Chapter 3). Investment in mass-produced foods, such

as soft drinks, yields significant returns in capturing a local market. Investment in manufacturing, for example, increases efficiencies and reduces costs, thereby making more products available at lower prices, which in turn means products formerly only available to a small section of the population are now available to many more. Figures from the soft drinks industry show that increasing the capacity of a single canning unit from 300 cans per minute to 800 cans per minute reduces the production cost from nearly 6 pence per litre to less than 3 pence per litre (Monopolies and Mergers Commission 1991). Further increases in capacity cause a less significant price per litre decrease, but allow much greater volumes to be produced.

These simple relationships underpin the expansion of markets in emerging and transition economies. Globally, the United States has taken the lead with investments into foreign food processing companies growing from US$9 billion in 1980 to US$36 billion in 2000. Sales by those companies increased from US$39.2 billion in 1982 to US$150 billion in 2000 (Bolling & Somwaru 2001). In 1998, US-based companies, such as McDonald's and Kentucky Fried Chicken (KFC), invested US$5.7 billion in catering outlets overseas (Harris *et al.* 2002), thereby not only influencing the availability of foods for those eating out of the home but also, owing to their purchasing power in agricultural markets, shaping the regional production of agricultural commodities (e.g. beef, sugar and potatoes). This reduces the prices of these commodities in the wholesale marketplace and increases the opportunities for other companies to develop similar processed foods and beverages for catering and for domestic consumption (Hawkes 2005, 2006).

A clear example of this trend is the pattern of foreign direct investment seen in Eastern Europe. Organization for Economic Co-operation and Development (OECD) data on investment into Eastern Europe during the transitional period of the 1990s, when formerly centralised 'command' economies were being dismantled in favour of liberalised market economies, show that some US$7 billion were invested in the food and agriculture sector. Nearly two-thirds of that inward investment was being put into just two areas of food production: confectionery and soft drinks (Figure 11.1).

This investment encourages the growth of consumption of particular foods: in Poland, for example, chocolate confectionery sales rose 26% over the period 1999–2004, while sugar confectionery rose 22% and soft drinks consumption rose over 50% (Datamonitor 2005; Euromonitor 2005). In Russia, which has seen similar patterns of inward investment in agri-food businesses, the market for snacks has grown rapidly: in just 2 years (1998–2000) sales volume trebled from 66,000 tonnes to 200,310 tonnes and grew a further 85% in 2001 (AAFC 2003). Similar trends have been reported elsewhere: figures for the 5-year period of 1998–2003 show the volume of soft drinks sold in the Latin American region rising from 48 billion litres to 61 billion litres, while in the Asia-Pacific region, the volume of soft drinks sales grew from 39 billion litres to 67 billion litres (Euromonitor International 2005) (billions = thousand millions). In Africa, the soft drinks company Coca-Cola invested nearly US$500 million during the decade 1993–2003. At the end of that period, the company reported sales worth over US$800 million in 2003 alone, with revenue growing by over 20% per annum (Cummings 2004).

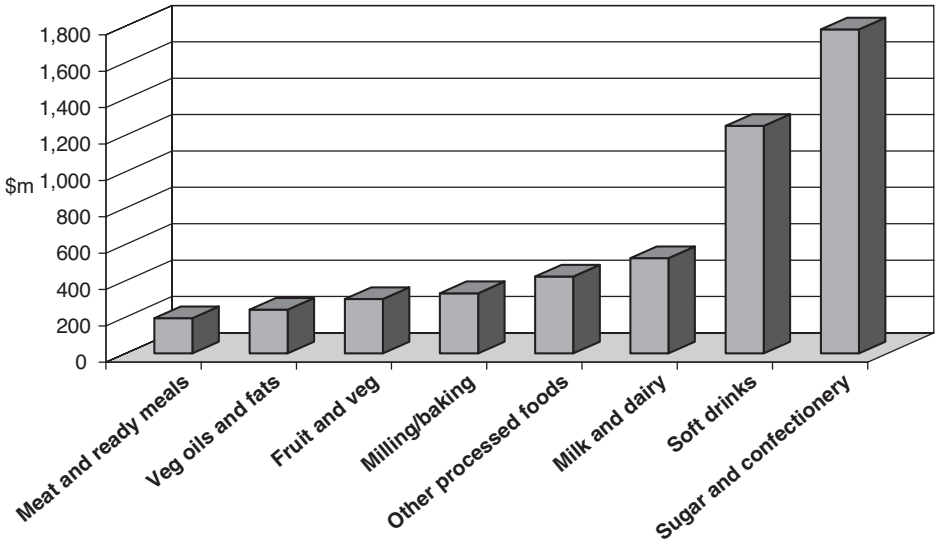

Figure 11.1 Foreign direct investment into Eastern Europe's agri-food sector* (1990–1997). *Excludes alcohol and tobacco sectors. Country data estimates for Albania, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Lithuania, Poland, Romania, Russia and Ukraine. *Source*: OECD (1998).

Fast-food stores have also seen rapid growth in the developing world. In the 10-year period of 1991–2001, the number of McDonald's outlets increased from around 200 to over 1,500 in Latin America, and from 1,400 to over 6,700 in the Asia-Pacific region (McDonald's Corporation 1996, 2001) (see Figure 11.2).

11.2.2 Investment in marketing and promotion

Market growth is driven not only by investment in manufacturing and retail, but by advertising and other forms of promotional marketing. Advertising growth in Eastern Europe during the late 1990s and early 2000s has been very high – over 50% per annum in some countries – compared with the more 'mature' markets of Western Europe (Figure 11.3). Although these figures comprise all advertising expenditure, they are indicative of trends in food advertising. For example, the advertising budget for the snack industry in Russia grew rapidly in the early 2000s, from US$18.5 million in 2000 to US$67 million in 2001 (AAFC 2003).

The pattern in Eastern Europe has been matched around the world. In 2001, the global advertising budget for food products was estimated to be around $40 billion (Millstone & Lang 2002), a figure that exceeded the national economies of two-thirds the world's nations (69% of nations had a gross domestic product under US$40 billion in 2003; World Bank 2003). Coca-Cola, the world's largest beverage company, spent between US$10–30 million advertising its products in 2000 in each of its markets in Venezuela, Turkey, China, South Africa, Hungary, Poland,

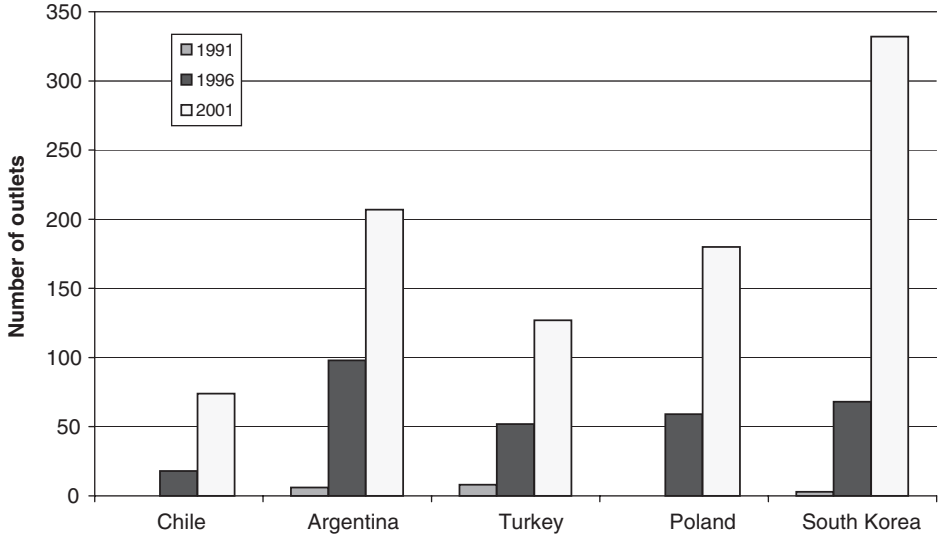

Figure 11.2 The rise of fast-food outlets in developing markets shown by the brand leader McDonald's (1991–2001). *Source*: McDonald's Corporation (1996, 2001).

India, Columbia, Chile and Argentina, and spent over US$50 million advertising in Mexico and Russia (Millstone & Lang 2002).

In these target markets, children's diets show a matching change. Surveys of Moscow mothers' practices in 2002 and 2005 showed a 49% decline in the number of mothers making traditional kasha porridge for their children and a 52% decline in the number making fruit puree (Decision News Media 2005). By 2005, Russian children as young as 5 years old were rapidly adapting to 'Western' foods, with 81% of 5-year-olds regularly eating potato chips, 78% chocolate, 70% chewing gum and 66% drinking carbonated soft drinks (Dujinina 2005). In 2005, the Russian children's food market was estimated to be worth US$150 million and predicted to rise to US$400 million. Russian schoolchildren's pocket money was estimated to be worth US$65 million in 2000 rising to US$160 million in 2004 (Decision News Media 2005).

11.3 Marketing that targets children

Children are a prime target of the food companies' marketing strategies around the world (Dalmeny *et al.* 2003). A survey conducted in the early 1990s found children's television in Australia contained 29 advertisements per hour of programming, a little ahead of the 24 advertisements per hour in the United States and 17 advertisements per hour in the United Kingdom (Dibb 1996). Food products constituted the single largest category of products being marketed in 13 of the 15 regions analysed, with children being exposed to as many as 12 food-related advertisements per hour.

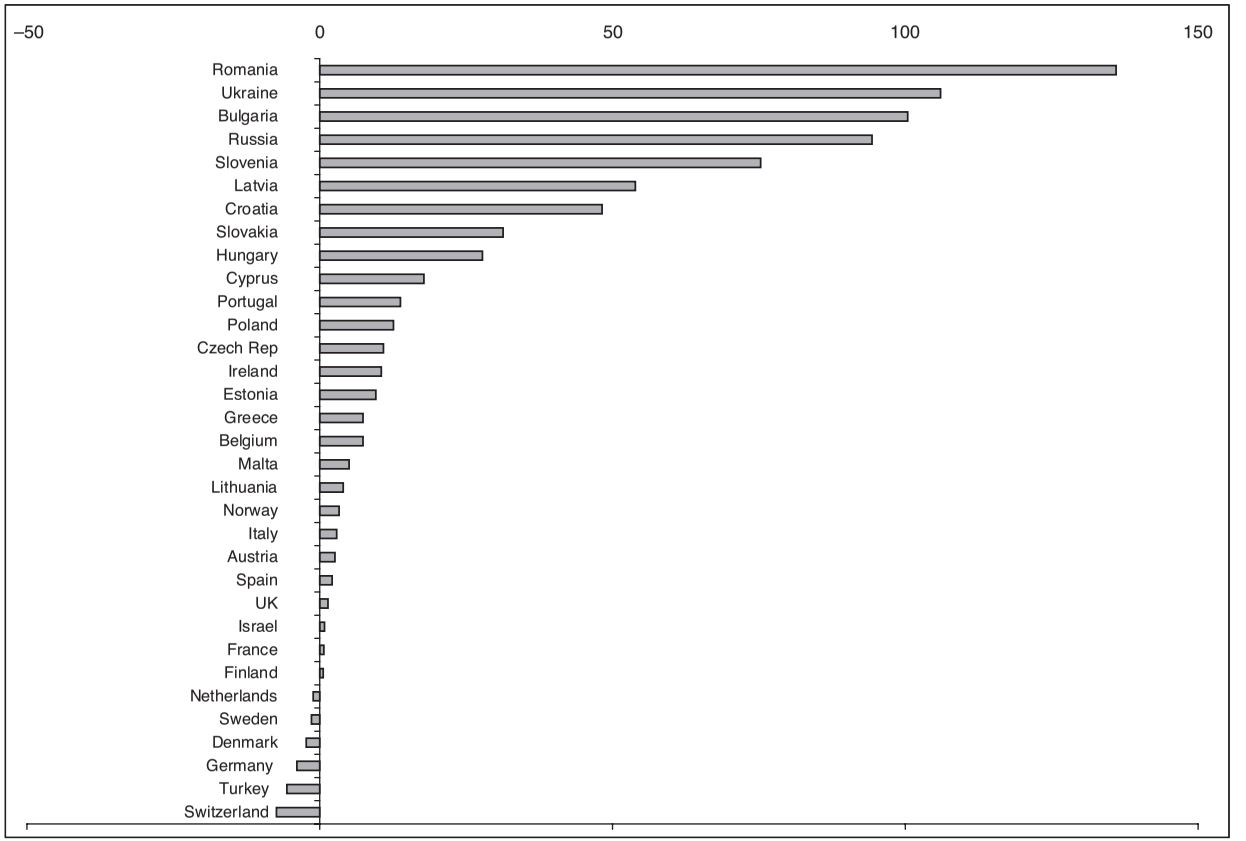

Figure 11.3 Annual percentage rise in advertising expenditure, Europe 1998–2003. *Source*: Branca *et al.* (2007), with permission from WHO.

More recent data show that children and adolescents in the United States are estimated to watch over three hours television per day (Kaiser Family Foundation 2006), and a similar figure has been given for children in the United Kingdom, where the total time spent watching TV exceeds 1,000 hours per year, compared to approximately 860 hours per year spent in a school classroom (Clark 2002). These trends are also found in developing economies: children in the Philippines are reported to watch an average of 1.5 hours of television daily, while families in Brazil and Chile watch 4–5 hours per day (Kennedy *et al.* 2004). It has been reported that 68% of Filipino children 'love to watch' televised advertisements, as do 73% of Pakistani children (de Cruz *et al.* 2004). In these countries, food products represented between 50 and 75% of the products advertised during children's programming.

As shown in Table 11.1, food companies' marketing methods do not rely solely on television. Other approaches include in-store singing contests (e.g. KFC), community sports sponsorship (McDonald's), organised zoo trips (KFC), music band tie-ins (Coca-Cola), sponsored schoolbooks (Pepsi) and downloadable animations from the internet (KFC) (Dalmeny *et al.* 2003). The use of celebrities in food advertising is widespread, such as David Beckham promoting Pepsi (PepsiCo 2003). Food companies also sponsor events popular with children: of the 15 official sponsors of the football World Cup 2006, two were food and beverage companies: McDonald's and Coca-Cola (Fifa 2006). Of the 11 official 'partners' of the Olympic Games, two are food and beverage companies: McDonald's (a sponsor since 1976) and Coca-Cola (a sponsor since 1928; International Olympic Committee 2006).

New forms of advertising are increasingly being employed which by-pass parental control and target children directly. These include internet promotion (using interactive games, free downloads, blogs and chatterbots), SMS texting to children's cell phones, product promotions in schools and preschools and brand advertising in educational materials. In the United States, a report from the Kaiser Family Foundation (2006) revealed that 85% of companies which advertised children's products on television also had child-friendly interactive websites, and of these, nearly all (97%) of the websites contained branded images promoting specific products. During a 3-month period in 2005, over 12.2 million children visited commercial websites promoting food and beverage products (Kaiser Family Foundation 2006). In the European Union, it was estimated in 2003 that over 13 million children were regularly using the internet, including four million children under the age of 12 (Nielsen 2003). Most major food brands have websites and many have sites specifically designed to attract children as young as 6 years old (Food Commission 2005). For example, the Burger King website *Subservient Chicken* received 20 million hits worldwide in the first week in 2004 and some 400 million hits in its first year (Anderson 2005).

New forms of advertising are also emerging in public areas such as on-screen advertising in public transport and interactive electronic hoardings. More traditionally, children are targeted with techniques at point-of-sale. Labelling and packaging are common means of attracting children to food products, and fast-food outlets frequently offer collectable models, toys, puzzles and child-attractive food

Table 11.1 Examples of media and sales promotion methods used to market foods and beverages.

Broadcast
- TV and radio advertising
- TV and radio programme sponsorship
- TV programme product placement

Non-broadcast
- Cinema advertising
- Film product placement
- Posters and advertising boards
- Print media such as magazines and comic books
- Branded books, such as counting books for preschool children
- Internet: email clubs, chat rooms and free ring tones
- Websites providing puzzles and interactive games
- Promotional sales by telephone
- Text messaging to mobile telephones
- Direct marketing, such as home catalogues, mailshots and leafleting
- Sponsorship of events, venues, teams and sports heroes
- Cross-branding of logos on household goods
- Branded toys, such as a playhouse designed as a fast-food store
- Branded computer games and product placement in computer games

In-store
- On-shelf displays
- Displays at checkout tills
- Special offers and pricing incentives
- Purchase-linked gifts, toys and collectibles
- Free samples and tastings

On or in the product
- Product formulation, such as colour and shape
- Product portions, such as king size
- In- and on-pack promotions, such as gifts, games, puzzles and vouchers
- Packaging design, imagery, colours and sizes

In school
- Sponsorship of educational materials and equipment
- Vending machines in schools and youth clubs
- School participation in promotion and sampling schemes

Source: Branca *et al.* (2007), with permission from WHO.

packages designed specifically to influence children's choices. In 1999, a Burger King promotion in the United States using a series of collectable Teletubbies dolls increased the sales of Kids Club Meals by 50 million in 6 weeks, doubling the normal sales of these meals (Brandweek 1999; Burger King Corporation 1999a). Although designed to appeal to young children, the scheme can have a multiplier effect on customers. This is acknowledged by the companies: 'Kids don't come into restaurants by themselves; they bring their parents and brothers and sisters. As a result, average checks are in the $8–10 range for families with children at Burger King' (Burger King Corporation 1999b).

Advertisers are also increasingly using schools as an opportunity to target children with their marketing messages. In the United States, schools are involved in a

wide range of commercially related activities, from non-controversial approaches, such as grants and gifts, to highly controversial activities, such as market research and nutritionally questionable practices, such as the signing of contracts between school boards and beverage companies giving the latter exclusive 'pouring rights' within the school in return for a donation (GAO 2000).

Not least, food products are developed specifically to attract children. Foods are coloured, flavoured and shaped using a variety of additives to alter the inherent nature of the food and increase the product's attractiveness (Elliott 2007; Fitzhugh & Lobstein 2000). A survey of children's foods in the United Kingdom found that 68% of the products that were packaged to attract children were found to contain additives to enhance the colour or flavour of the product (Fitzhugh & Lobstein 2000). According to one major food company, Nestlé, such additives make 'an important contribution to the attractiveness of the finished product, and the pleasure people derive from it' and that without added colouring 'many products would not exist' (Nestlé Inc 2000). The use of these additives essentially as marketing devices provides processed foods with an enormous competitive advantage over foods such as fruits and vegetables that do not use (and may be prohibited from using) such additives.

An analysis of food products marketed to children found the nutritional quality of the foods to be poor (Fitzhugh & Lobstein 2000). The survey looked at foods in the United Kingdom sold explicitly as children's products, and excluded soft drinks, snacks and special 'treats' such as birthday cakes, since these are foods that would be expected by parents to be of poor nutritional value. Of the remaining products designed to be attractive to children, the majority (77%) had high levels of fat, saturated fat, sugar or sodium (Table 11.2).

All these marketing techniques work: two systematic reviews have documented the effect of advertising on children's knowledge, behaviour and health (Hasting *et al.* 2003; Institute of Medicine 2005). Children are keen to purchase and consume the products that are heavily advertised. Although much of a child's diet may be influenced by parents, carers and schools, children exert strong persuasive ability, sometimes called in the trade 'pester power'. Children are often the decision-makers during shopping expeditions, and especially when deciding on family visits to restaurants. However, it is when children are left to purchase foods without

Table 11.2 Nutritional quality of foods labelled or packaged to attract children.

Number of products identified	*358*
High fat (>20 g/100 g)	16%
High saturated fat (>5 g/100 g)	30%
High salt (>0.5 g sodium/100 g)	46%
High sugar (>10 g/100 g)	57%
One or more of the above	77%
Low in fat and saturated fat and sugar and salt	**1%**

Survey undertaken in UK supermarkets (1999–2000).
Source: Fitzhugh and Lobstein (2000).

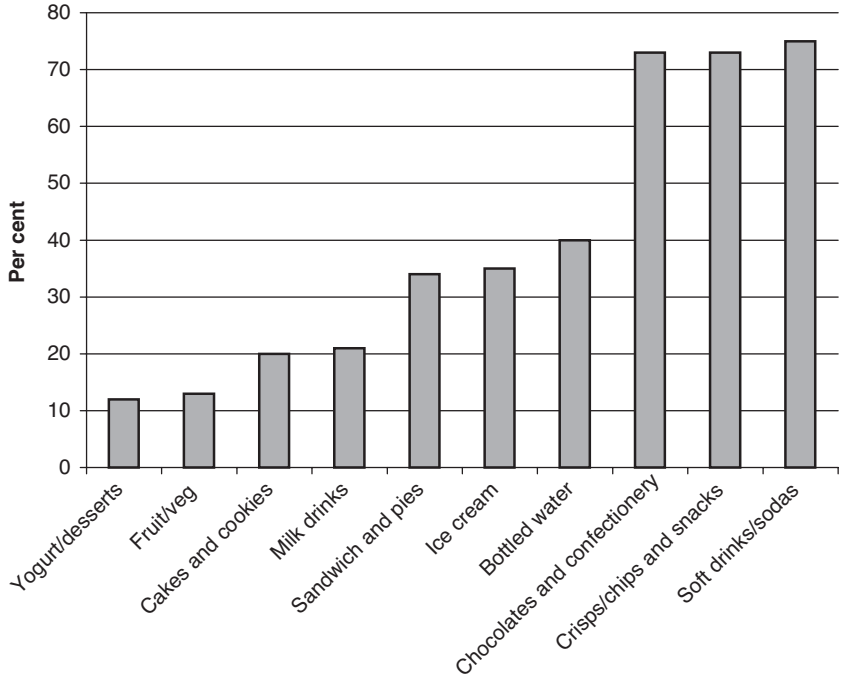

Figure 11.4 UK teenage food purchases. *Source*: IGD (2003).

parental control that the effects of marketing are most clearly observed. Data from UK surveys of older children's own expenditure on food show a strong preference for confectionery, snacks and soft drinks, which are the most heavily promoted and marketed foods – i.e. those foods sold at relatively low-cost, high attractiveness in terms of packaging and formulation, ready availability and strongly advertised (see Figure 11.4).

11.4 The case for intervention

Trade liberalisation and open-border access to foreign investment represent moves towards the realisation of 'free market' economies unhampered by intervention, especially state intervention. However, most countries recognise the need for some forms of government regulation of everyday life, including some regulation of marketplaces. This is usually justified by showing that such regulation or intervention serves to remove 'market failures' or forms of distortion in the operation of the free market.

As discussed at greater length by Suhrcke *et al.* (2006), under ideal conditions, the free coordination of individuals produces an outcome that is not only in the best interest of the individual but represents at the same time the best possible outcome for society. The neoclassical economic model, on which this ideal view is based, posits the following central assumptions:

(i) All costs and benefits are 'internal' (or 'private'): All the costs and benefits associated with a given choice are taken into account and borne by the person making that choice.
(ii) Rationality: Individuals maximise some objective function (e.g. their utility function) under the constraints they face, weighing the cost they would expect to incur with the expected benefits of the choice in question. The decision ultimately taken is the one that maximises net benefits (or utility).
(iii) Perfect information: Individuals have complete information about the expected consequences of their actions.
(iv) Preferences are 'time-consistent': Individuals face no serious self-control problems, such as deferring significant health behaviour while indulging in unhealthy behaviour.

If these assumptions were fully met, there might be no justification for public-policy intervention. In reality, however, one or more of the above assumptions often do not hold true, with the result that the market – left alone – does not achieve the outcome most desirable for society.

External costs of diet-related chronic disease include the costs to society of health care provision, social and family care, and lost productivity. There may also be specific costs borne by other members of society: in the case of tobacco, a major external cost arises from 'secondary' smoking. With obesity, secondary or external costs may arise when obese people cause suffering to others close by (e.g. in airline seats) or raise the price of goods (e.g. air tickets to pay for the extra fuel) or put another person at risk of ill health (an argument here might be the risks to the foetus of a pregnant obese woman). In all these cases, the *costs are not borne internally or privately* but are borne by the population more generally.

The assumption that people act rationally (i.e. maximise their expected utility) represents a core pillar of economic thought. However, in the specific case of children and adolescents, the *rationality assumption does not hold true* – their choices may not be in their best interests, especially given the lasting impact that poor health behaviour may have over a lifetime. Age restrictions on the purchase of alcohol and tobacco products follow this line of reasoning. It is not easy to determine an age at which rationality would prevail, and indeed it might be argued that, even for adults, much of the efficacy of modern forms of marketing is due to its ability to influence non-rational impulses (Packard 1957).

Insufficient or asymmetric information may create further reasons for intervention. Asymmetric information occurs when one party to an exchange has private information that it does not share with the other party and a mechanism may be required to ensure the information is disclosed. Insufficient information can be corrected using comprehensive or targeted information campaigns. *Imperfect information* may also occur where the health effects following the consumption of a product are insufficiently understood and researched, or where industry's marketing efforts distort information, intentionally or otherwise.

A fourth justification for intervention has been described as *time-inconsistent behaviour*, in which a commitment made today by a perfectly informed and rational

individual will be reneged upon at the point when the commitment should be respected. For example, a smoker asked today to stop smoking immediately will probably answer no, but might agree to stop smoking in 1 year. One year from now, if asked again to quit smoking, the smoker might prefer to continue smoking rather than adhere to the previous commitment to quit. The present 'self' disagrees with his or her future 'self'. A similar pattern can be found among those who intend to lose weight.

Besides these classical justifications for intervention, there are also a wide range of other arguments used by governments to justify intervening in markets, such as competition failure (e.g. where a supermarket chain dominates local retail supplies), capital investment support (e.g. to encourage fruit orchards, which show no return for 10–20 years), the protection of essential resources (e.g. fish stocks and crop diversity) and income support to compensate employment loss, disability, etc.

Moving only a little beyond the framework of strict classical economics, the case for intervention becomes even stronger. People can only make personal choices about diet, physical activity and other health-promoting actions within a specific context. If this context is strongly conducive to an increased risk of obesity, then the healthier choices may be hard to make. Social, cultural and economic pressures can make the exercise of individual choices difficult and these pressures can affect some people more than others. Although certain lifestyle behaviours may be classified as 'avoidable', in reality they can be fully avoided only when the circumstances in which choices are made are understood, addressed and changed so as to promote rather than hinder the selection of healthy options (Dowler 2001; McKee & Raine 2005; Tesh 1988).

In practice, the avoidance of the pervasive drivers of obesity would require an individual or family to produce a robust 'microenvironment' which can withstand these obesogenic pressures. Such action would require quite extraordinary skill, time, commitment and resources. In reality, the case for population-based interventions to protect health is increasingly accepted and methods are needed for introducing these interventions in ways that do not themselves undermine social cohesion or health, or increase inequalities.

11.5 Policies to tackle child obesity

11.5.1 Required interventions in the obesogenic environment

A simple model of the obesogenic environment that children inhabit is illustrated in Figure 11.5. In this model, a child may be able to exert some self-control and rational choice and may be given the knowledge and skills to help understand the context of their choices. Yet, children cannot be expected to bear the full burden of responsibility for preventing excess weight gain. The prevention of childhood obesity thus requires intervention at all levels, from family to school to neighbourhood, using legislative and regulatory approaches that are assessed for their health impact (Box 11.1).

Box 11.1 The different scales of interventions required to address childhood obesity.

The prevention of childhood obesity requires:

(i) Improving the **family**'s ability to support a child in making changes, which in turn, needs support from school and community, for example...

(ii) Ensuring the **school** has health-promoting policies on diet and physical activity, and that **peer** group beliefs help the child, which in turn, requires that...

(iii) The **cultural** norms, skills and traditional practices transmitted by the school are conducive to health promotion, and that the community provides a supportive environment, such as...

(iv) **Neighbourhood** policies for safe and secure streets and recreation facilities, and ensuring universal access to health-enhancing food supplies, which in turn requires that...

(v) Authorities at **municipal** and **regional** level are supporting such policies, e.g. for safe streets and improved food access through appropriate infrastructure, and that...

(vi) **National and international bodies**, which set standards and provide services, encourage better public health, and **commercial practices** consistently promote healthy choices, which in turn, may require...

(vii) **Legislative and regulatory support** to ensure that strategies for obesity reduction are fully resourced and implemented, appropriate control measures are enforced, and that these are not contradicted by other government policies, and that...

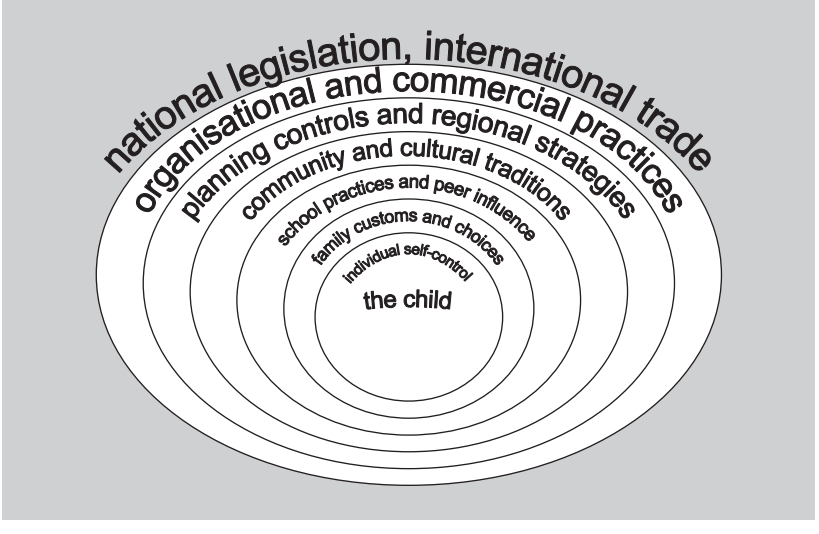

Figure 11.5 Schematic of a child's obesogenic environment. *Source*: Adapted from Lobstein *et al.* (2004).

(viii) Government and inter-governmental activities in all departments, including education, agriculture, transport, trade, environment and social welfare **policies are assessed for their health impact**, and government food purchases, e.g. for departmental staff, for military, police, prisons, hospitals and schools and other agencies involved in **public sector supply contracts are consistent with health and nutrition policies**.

Source: Adapted from Lobstein *et al.* (2004: 7–8).

11.5.2 Policies recommended by World Health Organization consultations

Reviews of polices to tackle childhood obesity recognise the poor evidence base available and the need to rely on expert opinion and experience of public health initiatives in other fields (Flynn *et al.* 2006; Lobstein & Swinburn 2007). In May 2004, health ministries across the world endorsed the *WHO Global Strategy on Diet, Physical Activity and Health* at a meeting of the World Health Assembly. The Global Strategy included several recommendations relevant to addressing the food aspects of childhood obesity (Box 11.2) (also see discussion of the WHO Global Strategy by L'Abbé *et al.* in Chapter 13).

Box 11.2 Recommendations made in the *WHO Global Strategy on Diet, Physical Activity and Health* relevant to childhood obesity.

- **Accurate and balanced information** is a prerequisite for ensuring healthy choices. Governments should support measures to improve information, taking account of literacy levels, communication barriers and local culture.
- **Food advertising** affects food choices and influences dietary habits. Governments should work with consumer groups and the private sector to develop appropriate approaches to deal with the marketing of food to children, and to deal with such issues as sponsorship, promotion and advertising.
- **Labelling** can inform consumers on the content of processed foods. Governments may require information to be provided on key nutritional aspects, as proposed in the Codex Guidelines on Nutrition Labelling.
- **National food and agricultural policies** should be consistent with the protection and promotion of public health. Governments should be encouraged to examine food and agricultural policies for potential health effects on the food supply. Measures, including market incentives, should be considered to promote the development, production and marketing of food products that contribute to a healthy diet and are consistent with national or international dietary recommendations.

(*Continued*)

- **Prices** influence consumer choices. Several countries use fiscal measures, including taxes, to influence availability of, access to, and consumption of, various foods; and some use public funds and subsidies to promote access among poor communities to recreational and sporting facilities.
- **School policies** and programmes should support the adoption of healthy diets and physical activity. Schools influence the lives of most children in all countries. They should protect their health by providing health information, improving health literacy, and promoting healthy diets, physical activity and other healthy behaviours. Governments should adopt policies that support healthy diets at school and limit the availability of products high in salt, sugar and fats. Schools should consider, together with parents and responsible authorities, issuing contracts for school lunches to local food growers in order to ensure a local market for healthy foods.
- **Codex Alimentarius Commission** norms and standards can be used to strengthen public health. Areas for action include labelling to allow consumers to be better informed; measures to minimise the impact of marketing on unhealthy dietary patterns; production and processing standards regarding the nutritional quality and safety of products.
- **Civil society** and non-governmental organisations can lead grass-roots mobilisation and advocate that healthy diets and physical activity should be placed on the public agenda; emphasise the role of governments in promoting public health, healthy diets and physical activity; and monitor government and private sector progress in achieving objectives.
- **The food industry**, retailers, catering companies and advertising businesses have important parts to play as advocates for healthy lifestyles. Because many companies operate globally, international collaboration is crucial. Initiatives by the food industry to reduce the fat, sugar and salt content of processed foods and portion sizes, to increase introduction of innovative, healthy and nutritious choices, and to review current marketing practices, could accelerate health gains worldwide. Specific recommendations to the food industry include:
  - limit the levels of saturated fats, *trans*-fatty acids, free sugars and salt in existing products;
  - develop and provide affordable, healthy and nutritious choices to consumers;
  - provide consumers with adequate and understandable product and nutrition information; and
  - practice responsible marketing that supports the strategy, particularly with regard to the promotion and marketing of foods high in saturated fats, *trans*-fatty acids, free sugars, or salt, especially to children.

Adapted from World Health Organization (2004).

In addition, three reports of WHO consultations and expert groups have made policy recommendations to tackle the diet-related aspects of childhood obesity. Specifically, in brief:

(i) **WHO Consultation on Obesity 1997** (WHO 2000): This consultation urged national governments to develop their commitment to obesity control and to implement food-based dietary guidelines. Interventions should be made which are sustained over time, allowing 10 years or more to show signs of success. Interventions should be supported by legislation as well as education, as was the case with cigarette sales to minors and car seatbelt use. Educational elements should be consistent across different media, including health and education professionals, industry promotional messages and mass media. Full use should be made of the support available from advocacy organisations, experts and role models who can drive public attitudes and influence politicians.

(ii) **WHO/FAO Expert Consultation on Diet, Nutrition and the Prevention of Chronic Diseases 2002** (WHO 2003): This consultation recommended limiting the exposure of young children to marketing of energy-dense, micronutrient-poor foods, the promotion of active lifestyles, restricted television viewing, plentiful fruit and vegetable consumption and restricted consumption of energy-dense, micronutrient-poor foods (e.g. snacks and soft drinks). For infants, it recommended the promotion of exclusive breastfeeding, avoiding the use of sugars and starches in feeding formula, and allowing infants to self-regulate their energy intake.

(iii) **WHO Expert Meeting on Childhood Obesity 2005** (WHO in press): This consultation recommended that interventions are made at the level of schools, communities and by national governments and international organisations, in order to support local level action. Other relevant recommendations included:
   (a) The need for schools to be fully funded so they do not need to raise funds from commercial interests.
   (b) Governments should ensure that research support and fiscal incentives given to food and agricultural enterprises include health criteria.
   (c) Political donations from food companies should be restricted or banned.
   (d) Access to and affordability of fruits and vegetables should be improved, especially for low-income and disadvantaged population groups.
   (e) Commercial enterprises should ensure that the promotion of food products should be consistent with a healthy diet.
   (f) Enterprises should implement the WHO–UNICEF Code of Marketing of Breast Milk Substitutes in all countries, and support the development of an International Code of Marketing of Food to Children.

From these general recommendations emerge a number of significant actions that could be taken to address the trade-related influence on childhood obesity at all levels, from global to local.

11.5.3 Actions needed at a global level

At the global level, that there is scope for aligning the food quality requirements established for trade – such as those formulated in the international food trading standards organisation Codex Alimentarius – to ensure that they properly support and promote nutrition (for further discussion see L'Abbé *et al.* in Chapter 13). Product information and product labelling issues come within this scope, as do food quality issues, such as the fat and salt levels in exported foods and processed food products.

International standards can be matched by national quality standards – e.g. for fat content of meat carcasses. The setting of high national standards and the requirement that importers and domestic producers abide by these standards equally, helps to overcome accusations of protectionism or market distortions while ensuring that health concerns are fully reflected in food production.

Such measures can be complemented by specific measures to protect certain foods of good nutritional value. Governments need to consider whether any categories of food can be designated as special national, regional or local dishes or components, so that they might be protected from competing products that have lower nutritional standards, and can base their justification for this protection on the *Cassis de Dijon* (protected designation) argument.

It is also conceivable that imported foods and food products could be restricted if they can be shown to raise the risk of ill health. The Sanitary and Phytosanitary (SPS) instruments, which can be invoked under the World Trade Organization (WTO) agreements, permit the restriction of food imports if these pose a possible threat to health, justifiable scientifically. Products containing high levels of salt, saturated fats or *trans* fats might be susceptible to this approach (James *et al.* examine this question at greater length in Chapter 10, as does Josling *et al.* in Chapter 12).

A further opportunity for intervention lies in the establishment of international codes and conventions which limit marketing activities. Such codes already operate more or less successfully in sectors such as armaments, pharmaceuticals, alcohol, tobacco and breast milk substitutes. In May 2007, the World Health Assembly urged the WHO Secretariat to develop a set of recommendations on controlling marketing to children, and this is currently underway. A set of proposed controls has been drafted for submission to the WHO by a group of consumer and public health organisations concerned with child obesity (Consumers International *et al.* 2008). In order to strengthen the impact of such a code, it may be useful to strengthen the WHO's authority in setting standards for health globally. This may require the support of governments in extending the WHO's regulation-setting competencies to include tackling chronic disease.

Other measures may also empower moves to restrict marketing to children. For example, the Convention on the Rights of the Child might be reviewed and amended to explicitly state a child's right to freedom from commercial inducements that are detrimental to their own good health.

11.5.4 Actions needed at a national level

Governments have a wide range of powers available that could be directed towards promoting healthy diets and reducing population exposure to environmental and financial obesogens. In line with international action, they can take action on food marketing to children. That children may need protection from commercial exploitation through advertising is recognised in many countries, and various levels of regulation and voluntary marketing codes are in place (Hawkes 2004). However, consumer advocacy organisations are concerned that these controls are insufficient to prevent children from being unduly influenced to desire the advertised items and to pester their parents to buy them (Dalmeny *et al.* 2003). More national governments are and should be taking stronger action in this area (Hawkes 2007).

Fiscal measures are another option. These could include the imposition of taxes – such as a soft drinks tax, the withdrawal of tax allowances for marketing certain food types, or the subsidisation of other foods, such as state support for fruit and vegetable distribution.

Governments could also consider adding nutrition criteria to their impact assessment of other policy measures, such as withholding local, regional or external development aid to projects that undermine nutrition and physical activity policies, while providing assistance to investments that promote healthier outcomes. Similarly, publicly funded research and technology could be re-assessed using health criteria, so that food industry research support is directed towards, for example, ensuring that fresh, perishable foods can compete fairly with long shelf-life foods (through, say, support for the development of cold chains, city farms, horticulture stores, small abattoirs, dairies and fish farms).

National and local governmental authorities also purchase food for catering to their workforce and through contracts for military, prison, hospital and schools services, care institutions and leisure facilities. Adding nutrition criteria to these contracts could improve quality in the same way that adding ecological criteria can have a positive impact on shaping food production methods (Russell 2007; Sustainable Procurement Group 2002).

As large purchasers, governments can influence the food supply chain directly, but they can also influence the chain through encouraging greater 'market feedback'. The long food chain from farmer to processor to supermarket to shopper to final consumer prevents effective feedback. For primary producers to be more aware of consumers' needs and preferences, there needs to be strong support for consumer advocacy agencies – from public funds if necessary.

11.5.5 Actions needed at a local and community level

In respect of the physical environment, local conditions determine the framework for making policy changes, with urban, small town and rural environments likely to have very differing requirements. Regulating the environment for the provision of retailers, fast-food outlets or street markets requires local knowledge of the terrain, transport infrastructure and population demographics.

Besides regulating outlets, local authorities may consider regulating the marketing environment, for example through the restriction of promotional marketing for energy-dense foods close to schools or through health promotional marketing among specified populations, such as fruit and vegetable discount vouchers offered in community centres and churches in lower income neighbourhoods.

Schools provide a significant opportunity for interventions to promote children's health. Indeed, the ability to run controlled trials using schools has created a 'settings bias' in the literature to the extent of neglecting other opportunities for intervention where controlled environments may be harder to achieve (Branca *et al.* 2007).

Summaries of the evidence base for school interventions (Branca *et al.* 2007; Casey & Crumley 2004; Lytle *et al.* 2002; Micucci *et al.* 2002) suggest that the chances of successful obesity prevention at the community level are increased if measures are broad-based and well-integrated into children's lives, such as:

(i) healthy school policies involving school cafeterias, vending machines and snack bars, plentiful school-based physical activity classes and recess activities;
(ii) classroom health education linked to the school's food and activity practices;
(iii) links between school practice and home and community activities;
(iv) prolonged interventions rather than short-term ones, involving adults and children, at school and at home; and
(v) the involvement of all children, not just some, using techniques sensitive to the cultural, ethnic and gender characteristics of the children.

In its recommendations for school nutrition programmes in the European Region, the WHO identified five key steps in policy implementation: forming the core action group; undertaking a baseline assessment of nutrition; developing a policy based on healthy eating guidelines applied across the school community, the curriculum, the environment and the school health services; developing a plan of the actions to be implemented; and implementing, monitoring and evaluating the plan (Petruso 2006).

Various school fruit schemes have been pioneered. The *School Gruiten* programme in the Netherlands reaches nearly all pupils in 70% of the country's schools; the School Fruit Programme in Norway provides a subsidised apple, pear, carrot, banana or orange each day in school; the UK government provides all children aged 4–6 with a piece of free fruit each school day.

It should be noted that the evidence base for any particular form of intervention being successful is very limited. The most closely controlled and evaluated schemes have shown only modest results, and these are not necessarily sustained after the end of the programme. A Cochrane systematic review conducted in 2001 found only ten trials that were sufficiently large and of sufficient duration and quality to be included in the review; all of these involved children who were already overweight (Campbell *et al.* 2002). An updated Cochrane review in 2005 found 22 studies that tested a variety of intervention programmes, all of which focused directly on

children and which involved increased physical activity and dietary changes, singly or in combination (Summerbell *et al.* 2005). It concluded that there was not enough evidence from trials to prove that any one particular programme can prevent obesity in children, although comprehensive strategies to address dietary and physical activity change, together with psychosocial support and environmental change may help. It noted that the current evidence suggests that many diet and exercise interventions to prevent obesity in children are not effective in preventing weight gain, although they may be effective in promoting a healthy diet and increased physical activity levels.

There have been concerns that anti-obesity programmes may show high levels of methodological rigour but still fail to identify the best practices that are effective and which can form the basis of a health policy (Lobstein 2006; Lobstein & Swinburn 2007). Indeed, the quality of evidence may be unrelated to its practical usefulness, especially when the forms of intervention being examined do not consider 'up stream' population health questions or deal with population inequalities (Flynn *et al.* 2006). For obvious practical reasons, trials of interventions are usually conducted in small groups, in school, community or clinical settings, face-to-face with the children being targeted, and do not look at the larger social determinants of obesity and the prevailing obesogenic environments. In this sense, school interventions should be conducted as a part of a wider social strategy to improve children's nutrition security.

11.6 Conclusion

Public policy under a free market ideology has started from the assumption that obesity is caused by a failure of individuals or families to make healthy lifestyle choices. In a speech in the United Kingdom, in 2006, the then Prime Minister Tony Blair noted: 'Our public health problems are not, strictly speaking, public health problems at all. They are questions of individual lifestyle – obesity, smoking, alcohol abuse, diabetes, sexually transmitted disease. . . – they are the result of millions of individual decisions, at millions of points in time' (BBC 2006). However, the extraordinary rise in the prevalence of obesity witnessed in the last two decades cannot be attributed simply to worldwide failures in personal responsibility. The context in which choices are made must be recognised. The effects of trade and financial liberalisation on obesogenic foods popular with children form an important part of this context.

An unfortunate corollary of the personal responsibility approach is that education gets seen as the logical remedy for a problem like obesity. While this seems like a wholesome, even empowering approach, education alone may be ineffective in changing behaviour (Science Daily 2007). Further, there is the potential for victim-blaming inherent in instructing individuals to change their behaviours without altering the environment to make these changes possible (Crawford 2005). This is especially important in the context of prevailing health disparities (Pomeranz 2008).

Action will not be a simple matter of introducing controls on the nature of the market environment: there are a great many arguments to be won before that can happen. The struggle to introduce controls on tobacco marketing elicited strong opposition from commercial interests. Yet, as the tobacco campaign showed, the global reach of marketing raises significant questions about the ability of single countries to protect their populations. The same applies in food and beverage marketing: for example, in 1980, the Canadian province of Quebec banned marketing of any products to children under age 13. However, access to US television channels is common in Quebec and children are exposed to marketing through the internet and other media produced outside the province. In these conditions, a government initiative may be strongly worded but may still be easily undermined.

A further problem faced when developing regulatory controls is the ability of the industry to influence the political agenda. For example, Coca-Cola spent more than US$1.7 million in 2007 to lobby against marketing regulations, school nutrition legislation and other trade issues in the United States alone (Associated Press 2008).

Governments and health promotion agencies may also opt for 'social marketing' campaigns, in which the skills of marketing are used to promote health messages. Even if this were a plausible strategy to change dietary behaviour, it is faced with severe budgetary problems. Typical budgets for health promotion activities are less than one hundredth of those available to the commercial sector for promoting their products: in the United Kingdom, in 2004, the government budget for promoting healthy diets was some £7 million per annum, while the food industry spent some £750 million on advertising (UK Department of Health 2004). In the United States, the Robert Wood Johnson Foundation has made a US$100 million per year commitment to reverse child obesity trends – the single largest effort of its type in history. However, the food industry spends that much every 3 weeks, marketing just junk foods, just to children, just in the United States (Federal Trade Commission 2008).

The problem of childhood obesity has developed during the modern era of trade liberalisation, itself a result of clear policy decisions. Hard policy decisions are now needed at all levels to reverse current trends.

References

AAFC (2003). *Russian Snack Market Study 2002. International Issues Team*. Agriculture and Agri-Food Canada (AAFC). Retrieved 20 April 2007 from http://atn-riae.agr.ca/europe/e3465.htm.

Anderson, M. (7 March 2005). Sandwich seller. *Adweek*, **46**, 24–5.

Associated Press (21 February 2008). Coca-Cola spent more than $1.7M to Lobby.

BBC (26 July 2006). *Blair Calls for Lifestyle Change*. Retrieved 4 April 2008 from http://news.bbc.co.uk/1/hi/uk_politics/5215548.stm.

Bolling, C. & Somwaru, A. (2001). US food companies access foreign markets though direct investment. *Food Review* **24**, 23–8.

Branca, F., Nikogosian, H. & Lobstein, T. (2007). *The Challenge of Obesity in the WHO European Region and the Strategies for Response*. WHO European Regional Office, Copenhagen, p. 114.

Brandweek (31 May 1999). *Burger King Cooks Up a Winner with Teletubbies Lure*. BPI Communications Inc, New York. Retrieved from http://www.findarticles.com/cf_dls/m0BDW/22_40/54787852/p1/article.jhtml.

Burger King Corporation (24 May 1999a). *Teletubbies Ring Up Record Sales for Burger King*. PRNewswire, Miami. Retrieved from http://www.prnewswire.com/cgi-bin/stories.pl?ACCT=105&STORY=/www/story/05-24-1999/0000947220.

Burger King Corporation (4 June 1999b). *Burger King Restaurants Teletubbies Promotion a Runaway Hit; Toys Run Out*. PRNewswire, Miami. Retrieved from http://www.prnewswire.com/cgi-bin/stories.pl?ACCT=105&STORY=/www/story/06-04-1999/0000956513.

Campbell, K., Waters, E., O'Meara, S., Kelly, S. & Summerbell, C. (2002). Interventions for preventing obesity in children. *Cochrane Database of Systematic Reviews* **2**, CD001871.

Casey, L. & Crumley, E. (2004). *Addressing Childhood Obesity: The Evidence for Action*. Canadian Association of Paediatric Health Centres, Ottawa. Retrieved 22 June 2004 from http://www.caphc.org/childhood_obesity/obesity_report.pdf.

Clark, J. (20 October 2002). Today's pupils see more of TV than their teacher. *The Telegraph*. Retrieved from http://www.telegraph.co.uk/news/main.jhtml?xml=/news/2002/10/20/nkids120.xml.

Consumers International, International Obesity TaskForce & International Association for the Study of Obesity (2008). *Recommendations for an International Code on Marketing of Foods and Non-Alcoholic Beverages to Children*. Retrieved from http://consint.live.poptech.coop/shared_asp_files/GFSR.asp?NodeID=97478.

Crawford, R. (2005). Are you dangerous to your health: the ideology and politics of victim blaming. In: Krieger, N. (ed.). *Embodying Inequality Epidemiologic Perspectives*. Baywood Publishing Company Inc, New York.

Cummings, A.B. (2004). *Our HIV/AIDS Initiatives in Africa: A Report of the Coca Cola Africa Foundation*. The Coca Cola Africa Foundation/The Coca Cola Company, Swaziland.

Dalmeny, K., Hanna, E. & Lobstein, T. (2003). *Broadcasting Bad Health*. International Association of Consumer Food Organizations, London. Retrieved 14 April 2004 from http://www.foodcomm.org.uk/Broadcasting_Bad_Health.pdf.

Datamonitor (January 2005). *Soft Drinks in Poland to 2008*. Global Information Inc. Retrieved from http://www.the-infoshop.com/study/dc26372_soft_drinks.html.

de Cruz, A.E., Phillips, S., Visch, M. & Saunders, D.B. (2004). *The Junk Food Generation*. Consumers International Asia Pacific Office, Kuala Lumpur, Retrieved 15 September 2009 from http://junkfoodgeneration.org/documents/junk_food_generation_2004.pdf.

Decision News Media (10 August 2005). Higher incomes fuel Russian kids' food growth. CEE-foodindustry.com Newsletter, Montpellier. Retrieved 20 April 2007 from http://www.cee-foodindustry.com/news/printNewsBis.asp?id=61780.

Dibb, S. (1996). *A Spoonful of Sugar: Television Food Advertising Aimed at Children – An International Comparative Survey*. Consumers International Programme for Developed Economies, London.

Dowler, E. (2001). Inequalities in diet and physical activity in Europe. *Public Health Nutrition* **4** (2B), 701–709.

Dujinina, A. (3 March 2005). Russian children's food market need legislative overhaul. Foodnavigator.com Newsletter, citing Bychenko, J., Komkon Market Research. Retrieved 9 March 2009 from http://www.foodnavigator.com/Financial-Industry/Russian-children-s-food-market-needs-legislative-overhaul.

Elliott, C. (2007). Assessing 'fun foods': nutritional content and analysis of supermarket foods targeted at children. *Obesity Reviews* **9**, 368–77.

Euromonitor (September 2005). *Consumer Eastern Europe 2005/06*. Euromonitor Ltd. Retrieved from http://www.euromonitor.com/Consumer_Eastern_Europe_2005-06.

Euromonitor International (2005). *World Drinks Marketing Directory 2005*. Retrieved from www.euromonitor.com.

Federal Trade Commission (2008). *Marketing Food to Children and Adolescents: A Review of Industry Activities, Expenditures and Self-Regulation*. Washington, DC.

Fifa (2006). *Official Sponsors 2006*. Fédération Internationale de Football Association (Fifa), Zurich. Retrieved from http://fifaworldcup.yahoo.com/06/en/partners.html.

Fitzhugh, K. & Lobstein, T. (April 2000). *Children's Food Examined: An Examination of the Nutritional Values of 358 Foods Aimed at Children*. The Food Commission, London. Retrieved from http://www.foodcomm.org.uk/childrens_food_examined.htm.

Flynn, M.A., McNeil, D.A., Maloff, B., Mutasingwa, D., Wu, M., Ford, C. *et al.* (2006). Reducing obesity and related chronic disease risk in children and youth: a synthesis of evidence with 'best practice' recommendations. *Obesity Reviews* **7**(Suppl 1), 7–66.

Food Commission (August 2005). Food companies snare children in their webs. *The Food Magazine* **70**, 1, 6–7.

GAO (September 2000). *Commercial Activities in Schools*. Report to Congressional Requesters.GAO/HEHS-00–156. United States General Accounting Office (GAO), Washington, DC. Retrieved from http://www.gao.gov/archive/2000/he00156.pdf.

Harris, J.M., Kaufman, P.R., Martinez, S.W. & Price, C. (2002). *The US Food Marketing System*. USDA, Washington, DC.

Hastings, G., Stead, M., McDermott, L., Forsyth, A., MacKintosh, A.M., Rayner, M. *et al.* (2003). *Review of Research on the Effects of Food Promotion to Children: Final Report*. Prepared for the Food Standards Agency. University of Strathclyde, Strathclyde. Retrieved 9 March 2009 from http://www.foodstandards.gov.uk/multimedia/pdfs/foodpromotiontochildren1.pdf.

Hawkes, C. (2004). *Marketing Food to Children: The Global Regulatory Environment*. World Health Organization, Geneva.

Hawkes, C. (2005). The role of foreign direct investment in the nutrition transition. *Public Health Nutrition* **8**, 357–65.

Hawkes, C. (2006). Uneven dietary development: linking the policies and processes of globalization with the nutrition transition, obesity and diet-related chronic diseases. *Globalization and Health* **2**(4).

Hawkes, C. (2007). Regulating food marketing to children: trends and policy drivers. *American Journal of Public Health* **97**, 1962–73.

IGD (2003). *The Teenage Diet: Now and in the Future*. Institute for Grocery Distribution (IGD), Watford, UK. Retrieved from http://www.igd.com/index.asp?id=1&fid=1&sid=8&tid=34&cid=264.

Institute of Medicine (2005). In: McGinnis, J.M., Gootman, J.A. & Kraak, V.I. (eds). *Food Marketing to Children and Youth: Threat or Opportunity?* Committee on Food Marketing and the Diets of Children and Youth, Food and Nutrition Board, Board on Children, Youth, and Families, Institute of Medicine of the National Academies. National Academies Press, Washington, DC. Retrieved 9 March 2009 from http://www.nap.edu/catalog.php?record_id=11514#toc.

International Olympic Committee (2006). *Olympic Partner Programme*. Retrieved 5 August 2006 from http://www.olympic.org/uk/organisation/facts/programme/sponsors_uk.asp. See also http://multimedia.olympic.org/pdf/en_report_344.pdf.

Kaiser Family Foundation (July 2006). *It's Child's Play: Advergaming and the Online Marketing of Food to Children*. Retrieved 5 August 2006 from http://www.kff.org/entmedia/7536.cfm.

Kennedy, G., Nantel, G. & Shettey, P. (2004). Globalization of food systems in developing countries: a synthesis of country case studies. In: *Globalization of Food Systems in Developing Countries: Impact on Food Security and Nutrition*. Food and Nutrition Paper. Food and Agriculture Organization of the United Nations, Rome, p. 83.

Lobstein, T. (2006). Comment: preventing child obesity – an art and a science. *Obesity Reviews* **7**(Suppl 1), 1–5.

Lobstein, T., Baur, L., Uauy, R. & IASO International Obesity TaskForce (2004). Obesity in children and young people: a crisis in public health. *Obesity Reviews* **5**(Suppl 1), 4–104.

Lobstein, T. & Jackson-Leach, R. (2006). Estimated burden of paediatric obesity and comorbidities in Europe. Part 2. Numbers of children with indicators of obesity-related disease. *International Journal of Pediatric Obesity* **1**, 33–41.

Lobstein, T. & Swinburn, B. (2007). Health promotion to prevent obesity: evidence and policy needs. In: McQueen, D. & Jones, C. (eds). *Global Perspectives on Health Promotion Effectiveness*. Springer, Vancouver.

Lytle, L.A., Jacobs, D.R., Perry, C.L. & Klepp, K.I. (2002). Achieving physiological change in school-based intervention trials: what makes a preventive intervention successful? *British Journal of Nutrition* **88**, 219–21.

McDonald's Corporation (1996). *Annual Report 1996: Performance at a Glance*. Retrieved 20 April 2005 from http://www.mcdonalds.com/corp/invest/pub/annual_rpt_archives.html.

McDonald's Corporation (2001). *Annual Report 2001: Financial Information*. Retrieved 20 April 2005 from http://www.mcdonalds.com/corp/invest/pub/annual_rpt_archives.html.

McKee, M. & Raine, R. (2005). Choosing health? First choose your philosophy. *The Lancet* **365**, 369–71.

Micucci, S., Thomas, H. & Vohra, J. (2002). *The Effectiveness of School-Based Strategies for the Primary Prevention of Obesity and for Promoting Physical Activity and/or Nutrition, the Major Modifiable Risk Factors for Type 2 Diabetes: A Review of Reviews*. Public Health Research, Education and Development Program, Effective Public Health Practice Project, Hamilton, Ontario. Retrieved 22 June 2004 from http://www.hamilton.ca/phcs/ephpp/Research/Full-Reviews/Diabetes-Review.pdf.

Millstone, E. & Lang, T. (2002). *The Atlas of Food: Who Eats What, Where and Why*. Earthscan Publications, London.

Monopolies and Mergers Commission (1991). *Carbonated Drinks*. MMC, London.

Nestlé Inc (January 2000). Nestlé Inc. correspondence published. In: *The Food Magazine* **48**, 23.

Nielsen, A.C. (29 September 2003). *13 Million Kids Using the Internet Across Europe*. Nielsen/NetRatings Briefing Paper Aug02-Aug03. Retrieved from http://www.netratings.com/pr/pr_030929_uk.pdf.

OECD (1998). *Impediments to Efficiency in the Agro-food Chain in Bulgaria, Romania and Slovenia*. Agriculture Policy Paper No 1998-02, CCNM/AGE/PP(98)50. Organization for Economic Cooperation and Development (OECD), Paris.

Packard, V. (1957). *The Hidden Persuaders*. Penguin, London.

PepsiCo (2003). *Pepsico International. Players and Teams – Pepsi Football 2003*. Retrieved 1 September 2003 from http://www.pepsi-football.co.uk/teams.asp?team=1.

Petruso, T. (ed.). (2006). *Food and Nutrition Policy for Schools: A Tool for the Development of School Nutrition Programmes in the European Region*. World Health Organization Regional Office for Europe, Copenhagen.

Pomeranz, J. (2008). A historical analysis of public health, the law, and stigmatized social groups: the need for both obesity and weight bias legislation. *Obesity (Silver Spring)* **16**(Suppl 2), S93–103.

Russell, C. (2007). *A Fresh Approach to Hospital Food: The Cornwall Food Programme*. The Soil Association, Bristol. Retrieved 9 March 2009 from http://www.foodforlife.org.uk/resources/documents/Resources/A_fresh_approach_to_hospital_food_report.pdf.

Science Daily (10 September 2007). *Diet Education Had No Long Term Impact on Childhood Obesity*. Retrieved 23 October 2007 from http://www.sciencedaily.com/releases/2007/10/071008193447.htm.

Suhrcke, M., Nugent, R.A., Stuckler, D. & Rocco, L. (2006). *Chronic Disease: An Economic Perspective*. Oxford Health Alliance, London.

Summerbell, C.D., Waters, E., Edmunds, L.D., Kelly, S., Brown, T. & Campbell, K.J. (2005). Interventions for preventing obesity in children. *Cochrane Database of Systematic Reviews*. Retrieved 28 April 2008 from http://www.cochrane.org/reviews/en/ab001871.html.

Sustainable Procurement Group (2002). *Food Procurement for Health and Sustainable Development*. Sustainable Development Commission, London. Retrieved 9 March 2009 from http://www.sd-commission.org.uk/publications/downloads/020501%20Food%20procurement%20for%20health%20and%20sd.pdf.

Swinburn, B., Sacks, G., Lobstein, T., Rigby, N., Baur, L.A., Brownell, K.D. et al., for International Obesity Taskforce Working Group on Marketing to Children (2008). The 'Sydney Principles' for reducing the commercial promotion of foods and beverages to children. *Public Health Nutrition* **11**, 881–6.

Tesh, S. (1988). *Hidden Argument: Political Ideology and Disease Prevention Policy*. Rutgers University Press, New Brunswick and London.

UK Department of Health (2004). Health in the consumer society. In: *Choosing Health: Making Healthy Choices Easier*. The Stationery Office, London.

Wang, Y. & Lobstein, T. (2006). Worldwide trends in childhood overweight and obesity. *International Journal of Pediatric Obesity* **1**, 11–25.

World Bank (2003). *World Bank Statistical Indicators*. Retrieved 20 April 2005 from http://www.worldbank.org/data/databytopic/GDP.pdf.

World Health Organization/Food and Agriculture Organization (2000). *Obesity, Preventing and Managing the Global Epidemic*. Report of a WHO Consultation. Technical Report Series 894. World Health Organization, Geneva.

World Health Organization/Food and Agriculture Organization (2003). *Diet, Nutrition and the Prevention of Chronic Diseases*. WHO Technical Report Series No. 916. World Health Organization, Geneva.

World Health Organization/Food and Agriculture Organization (2004). *Global Strategy on Diet, Physical Activity and Health*. World Health Organization, Geneva.

World Health Organization/Food and Agriculture Organization (in press). *WHO Expert Meeting on Childhood Obesity*, held in Kobe, Japan, 20–24 June 2005. World Health Organization, Geneva.

12 National Food Regulations and the WTO Agreement on Sanitary and Phytosanitary Measures: Implications for Trade-Related Measures to Promote Healthy Diets

Tim Josling, David Orden and Donna Roberts

12.1 Introduction

For decades, countries have used a range of different regulatory measures to improve food safety and quality. But as food trade expanded and countries developed closer economic relationships (see Chapter 2), the differences among these regulatory decisions became a source of international trade conflict. While some of the health and safety regulations were quite appropriate and legitimate, others appeared to be applied with the purpose of protecting domestic food markets from international competition. The Uruguay Round, under the auspices of the General Agreement on Tariffs and Trade (GATT), proved to be an opportune time to reduce what had become barriers to trade.

In 1995, the World Trade Organization (WTO) adopted the Agreement on Sanitary and Phytosanitary Measures (SPS Agreement) and the Agreement on Technical Barriers to Trade (TBT Agreement) following 8 years of negotiations during the Uruguay Round of trade talks (WTO 1995). The agreements are international rules that aim to discipline the regulatory measures used by countries to achieve legitimate food safety and quality. Food safety refers to health and safety issues for people, plants and animals and is sometimes called 'biosafety'. Food quality refers to consumer's attributes that are not directly related to safety, such as 'freshly squeezed', 'organic' or 'animal friendly'. With the aim of promoting coherence between national food safety and quality regulations, these rules oblige WTO members to adhere to certain criteria in formulating their domestic and trade regulations. In the case of food safety, the SPS Agreement requires governments to apply such regulations 'only to the extent necessary to protect human, animal or plant life or health', to base them 'on scientific principles' and not to maintain

them 'without sufficient scientific evidence'.[1] Measures should in addition be formulated to achieve their objectives in the least trade-distorting manner. In the case of food quality, the TBT Agreement requires that such measures be appropriate to the objective of the regulation and be the least trade-distorting way of achieving a 'legitimate' objective.

This chapter examines the role of national food safety and quality regulations in trade, and reviews the degree of success for the SPS Agreements in promoting coherence between these regulations. Although the focus will be on the SPS Agreement as it relates most directly to health issues, the TBT Agreement will be referred in some cases. The chapter then draws implications from these experiences for the potential role of national and international food regulations in promoting healthy diets. Underlying the institutions and rules discussed in this chapter is the view that a free, open global trading system for food is consistent with national objectives related to good health as well as bringing the benefits of economic growth (for a more complete elaboration of this theme, see Josling *et al.* 2004).

12.2 The role of national food regulations in trade

12.2.1 The classification of the goals of food regulations

National food regulations take many different forms. Broadly, they can be classified by their goals and their implementation method. A particularly important difference is whether the aim of the food regulations is to reduce risks found on or in foods, such as pathogens or pests, or to address the issue of food quality, such as cosmetic standards or information about the product. These goals influence the policy instruments that are appropriate to fulfil the regulatory objective. For risk-related goals, government-mandated food regulations on national markets are the most appropriate instrument. In contrast, for quality goals, measures undertaken voluntarily by the private sector – albeit with varying and sometimes significant degrees of government involvement – are often more appropriate (see Section 12.2.3). This is because in most countries, governments accept that the provision of a safe food is a public responsibility. In contrast, food choices made by consumers in their capacity as individuals have generally not been considered to be the direct responsibility of government. Moreover, the governance of food quality is tied to changes in perception and taste, and it is the market, rather than the government, that is likely to be the more agile institution for accommodating a wide range of continually evolving consumer preferences. This is not to deny that risk-related regulations are sometimes distorted for protectionist purposes to give an economic advantage to domestic producers, nor to exclude that the lack of public regulations can interfere with the provision of product quality. In both types of regulations,

[1] WTO SPS Agreement, Article 2:2. There is a partial exception to the 'scientific evidence' requirement in the case of temporary measures where such evidence is not available (Article 5:7).

there is a great deal of disparity among countries, and this leads to tensions when goods are traded.

12.2.2 Risk-reducing regulations and trade

Risk-reducing regulations include those that address animal and plant pests and diseases, and those that address human health hazards. For animal and plant pests and diseases, the basic standards for controls are broadly accepted among countries. There are three major bodies with the responsibility of developing multilateral standards and monitoring health and disease threats: the Office International des Epizooties (OIE), the International Plant Protection Convention (IPPC) and the Codex Alimentarius Commission (see Glossary). Each of these agencies is named by the Agreement as the appropriate bodies for the purposes of developing 'harmonised' standards.

Still, challenges to harmonisation of standards for animal and plant pests and diseases remain. For governments, the costs of new infestations or epidemics can be high, such as when foot-and-mouth disease breaks out in a country previously considered free of the disease. New zoonotic diseases, such as bovine spongiform encephalopathy (BSE) or deadly avian influenza also impose high costs. Given these costs, international borders sometimes become a convenient surrogate for defining risk levels, leading governments to implement illegitimate regulations that act as trade barriers.

The regulation of hazards to human health (i.e. food safety, including zoonotic diseases) poses challenges for somewhat different reasons than the regulation of pests and diseases affecting animals and plants. To start with, the *perception* by the general public of food safety risks influence governments when they estimate the benefits of regulating food safety relative to the cost imposed on industry by these regulations. It has long been recognised that unfamiliar risks, such as those associated with new food production technologies, are more alarming to consumers than familiar risks. Even when a natural contaminant is identified as the source of food-borne illness, broad consumer avoidance of the implicated product can trigger a dramatic fall in consumption out of proportion with the actual risk involved. National governments thus stand to gain from developing and enforcing food safety regulations that act to maintain confidence in the food supply, whether or not the actual scientific risk is high.

Since consumer demands for protection from food-borne hazards vary across countries – depending on consumer's perception of risk, income etc. – the global harmonisation of such standards faces real challenges. Likewise, the capacity to regulate effectively varies with levels of national income and development. Poorer countries will typically have less comprehensive programmes in place for the assurance of food safety. The export of high-value and processed foods from some developing countries suggests that consumers in developed countries are prepared to trust imported food if it meets the standards set in their domestic markets. But it follows that the impact on developing-country exports can be severe if they are unable to meet high standards. An evaluative literature has emerged on these issues

and public capacity-strengthening projects and private investments aimed at meeting food and agricultural standards have proliferated in developing countries over the past decade (Henson 2006).

Food safety regulations that address the use of production-enhancing technologies, including pesticides and other agrochemicals, hormones, veterinary drugs and product-enhancing food additives, remain controversial. For these technologies, the scientific basis underlying regulation may itself be unknown or in dispute. Just as often, disputes arise when differences in public perceptions of risk persist between countries despite scientific consensus, or when countries have made different political choices about the adoption of new technologies for reasons unrelated to safety. When strong differences in public perceptions are in play, or when risk-related and other goals become intertwined, international conflicts over regulations are often exacerbated. The duration and intensity of the long-unresolved beef hormones dispute between the United States and the European Union (EU), for example, seem out of proportion with the economic stakes (Josling *et al.* 2004: 115–22). However, the highly politicised interests on both sides have allowed little room for the respective governments to find a satisfactory resolution.

The reform of food safety regulations, particularly in wealthy countries, has placed emphasis on process standards, including the use of hazard analysis and critical control point (HACCP) programmes, to achieve desired content attributes. Process standards are more difficult to implement internationally than product standards, because they involve complex verification and enforcement procedures by private firms or regulatory institutions in two or more countries. Trade problems can arise from a mistrust of regulatory processes across borders, inadequate public-sector enforcement capacity in some countries and differences in accountability imposed on domestic and foreign products. Firms in developing countries are likely to have difficulty meeting food regulatory and traceability requirements imposed by the process standards of developed countries. Yet, disagreements over process standards also arise between high-income countries with high regulatory standards and enforcement capacity. It is difficult to avoid the conclusion that, in some instances, differences over process standards among developed countries are attributable to regulatory protectionism.

12.2.3 Quality regulations and trade

Some of the most serious tests facing the global food system arise from emerging national regulation on food quality. Regulations related to quality cover a wide range of characteristics both of products and how they are produced and handled. Governments intervene by creating public standards for unbranded products, such as identity standards for fish and seafood or quality standards for organic produce. A government may also take another type of approach by setting disclosure requirements, such as country-of-origin labelling. Other measures support the creation of brand identity through geographical indications (GIs) that may have reputational connotations for consumers and thus are of value to firms in specific localities. Governments can also remedy informational failures related to branded

products. Examples include setting identity standards for processed foods to prevent consumer deception, or requiring nutritional labelling so that consumers have information that private firms do not have an incentive to disclose.

Some of the various regulatory measures that governments might adopt to allow consumers to recognise quality attributes can be readily verified through product testing. But a critical new challenge for food regulation is the proliferation of demands that government regulations distinguish among products based on the process by which they are made. Such 'process attributes' are often unrelated to detectable product characteristics. Regulation of trade in genetically modified (GM) products based on their production process is perhaps the paramount controversy in this area. Yet, process attribute regulation is also essential to such emerging consumer-driven demands as organic certification and protection of animal welfare.

Increased consumer demand for quality-related product differentiation is a positive, income-driven phenomenon, attainable at declining cost as information technologies advance. Interest groups that feel strongly about specific food attributes (organic production, free-range eggs or poultry etc.) have an incentive to seek greater government regulation of product quality. In international discussions, some governments have argued that increased regulation reflects a new era in the food sector in which policy-makers must be attuned to the demands of consumer as well as producer advocates. Yet, the new focus on consumer-driven quality regulations can lead to regulatory 'overprotection' by implying that foods not meeting these criteria are somehow unsafe. Producer groups also favour stronger regulations on quality in those instances in which they gain market advantage. This situation can also lead to overprotection to the benefit of domestic industries and hence distort trade.

It is clear that the variations between risk-reducing and quality regulations between countries present the opportunity for controversy and conflict over regulations in the global food system. Regulation is often the subject of international disputes because national institutions are subject to domestic political pressures. It is common even for countries with similar income levels and other characteristics to deviate in their regulatory decisions: with 153 countries in the WTO, the scope for dispute is magnified.

12.3 The role of the WTO in the food regulatory framework

12.3.1 The WTO agreements

National governments have paramount responsibility for food regulation, but the WTO has an important role in both enforcement of disciplines on national regulatory decisions and achieving international coordination of regulations and standards. The SPS and TBT Agreements, supported by the technical expertise of international standards organisations, offer the fundamental disciplines, which are backed up by recourse to the WTO's dispute settlement procedures. Other

agreements play a role in defining the latitude and limits to regulation of food safety and quality within the food sector (see Chapter 2). The WTO Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) regulates the use of GIs, while the WTO Agreement on Agriculture disciplines domestic farm policies (the use of subsidies to encourage food production), as well as food programmes that influence diets (Josling 2006).

More general rules of the WTO also have an impact on food regulation. The two most fundamental regulations prevent discrimination both among sources of supply (the most-favoured-nation principle) and between imports and domestic production (Article III, the National Treatment principle). These orient the trade system towards allowing products to flow among countries, hindered only by tariffs bound in national schedules, and/or restrictions that have defined purposes, such as health and safety regulations. Any restriction on trade other than a customs tariff needs to be 'justified' under the terms of agreement such as the SPS and TBT Agreements.

12.3.2 The role of the SPS and TBT Agreements in promoting coherence between national regulations

The SPS and TBT Agreements aim to reduce disparities between national food regulations and promote coherence both *among* domestic food regulations and *between* domestic regulations and international standards. The development of these agreements at an international level was favoured by the major trading countries as a means of promoting regulatory compatibility among countries on the basis they would help to coordinate action to improve disease and pest control, and to reduce marketing costs for industry.

Coherence is important for both effective domestic regulations and the avoidance of unnecessary conflict between countries. Overall, coherence occurs when costs incurred by traders when marketing their products in other countries (transactions costs) are no greater than necessary. Differences in policies are *legitimate* if rooted in real disparity of circumstances – even if the regulations appear to conflict with trade objectives. But differences are *dubious* when they aim to achieve similar objectives to that of another country, but in a different way. The story of the first 12 years of the operation of the SPS and TBT Agreements is one of distinguishing between legitimate and dubious differences in health and safety measures and in quality and other regulations.

The SPS Agreement contains three specific principles to guide the promotion of domestic and international coherence: (i) increasing transparency; (ii) requiring scientific risk assessment; (iii) encouraging the adoption of harmonised, equivalent and regionally differentiated standards. The TBT Agreement is based on similar principles, but does not require a risk assessment.

The WTO has had some success in the application of each of these basic principles, but application has not progressed as far as it might have, and improvements can still be made (Table 12.1).

Table 12.1 Summary of SPS principles and success of implementation.

Principle	Implication	Implementation	Success
Transparency	National food regulations affecting trade must be made available to traders and governments	Notification to the SPS Committee and the ability to challenge such notifications	Broad success in making regulations readily available
Risk assessment	Regulations related to health must be based on scientific evidence and relate to an acceptable level of risk	Countries have generally introduced risk assessment. WTO panels have reinforced the importance of specific studies for assessing risk	Success has been noticeable in animal and plant health areas, but less robust in issues pertaining to human health
Harmonisation	Adopt international standards	Make use of Codex Alimentarius, OIE and IPPC standards where they exist	Slow growth in agreed standards has hampered trend towards harmonisation
Equivalency	Agreements among exporters and importers that regulatory measures are equivalent	Bilateral equivalency discussions	Relatively few agreements concluded, but some adoption of importer regulations in exporting countries
Regionalisation	Recognition by importing countries that some regions of exporting countries are disease-free	Bilateral discussions on regionalisation	Few agreements to date

SPS, Sanitary and Phytosanitary Standards; WTO, World Trade Organization; OIE, Office International des Epizooties; IPPC, International Plant Protection Convention.
Source: Authors' summary based on Josling *et al.* (2004).

Transparency

The WTO has been successful in promoting transparency with respect to information about regulations and standards among its members. The SPS Agreement promotes transparency through its notification process, which requires countries to notify the WTO whenever they implement a new food regulation (a requirement also in place for the TBT Agreement). This notification process has had two important effects. It has provided (i) private companies with a chance to change production methods to meet new import requirements; and (ii) WTO member countries with the opportunity to question, propose modifications to, or challenge new or existing measures in the committees that implement the two agreements

(i.e. make a 'complaint' or 'counter-notification'[2]). This increased regulatory transparency has led to a far greater scrutiny of measures than occurred before the adoption of the SPS Agreement.

From 1995 to 2004, in the SPS Agreement's first 10 years, WTO members submitted more than 5,350 SPS notifications. In turn, WTO members have registered 330 complaints (or counter-notifications) to the SPS Committee over the same period (Table 12.2). These complaints provide some evidence of the extent to which new regulations have created problems for trade. Developed countries were most often the source (58%) as well as the target (57%) of counter-notifications that identified regulations as unjustified trade impediments. The number of counter-notifications submitted by developed countries about other developed countries' measures demonstrates that access to the same scientific information and technologies still leaves ample scope for disagreement over SPS regulations. Developing countries have filed fewer counter-notifications against other developing countries than against developed countries. The lower frequency of use of the Committee by developing countries reflects a number of factors. These include the extent to which the developing country has permanent representation in Geneva, the prospect that a counter-notification will result in any change in the measure in question, and political considerations that may cause some countries to avoid otherwise plausible counter-notifications.

An examination of the counter-notifications related to human health measures by commodity and hazard provides some insight into the sources of tensions over regulations in international agricultural and food markets (Table 12.3). Most notable are the number of counter-notifications related to the regulation of transmissible spongiform encephalopathies (TSEs), which include BSE. The TSE measures alone accounted for 74 of the counter-notifications related to food safety regulations between 1995 and 2004, indicating that the BSE outbreaks in Europe and North America over the past 10 years significantly disrupted international trade. This impact is related to the fact that cattle, the source of BSE, provide so much food and so many industrial products, including meat and milk for human consumption, gelatine for pharmaceutical purposes, semen for breeding, and other by-products used in cosmetics, commercial animal feed and elsewhere. The EU and Switzerland together accounted for 30 of the TSE counter-notifications, which were often directed to the initial emergency measures adopted by countries in 1996. The EU and individual member states later became the target of 23 complaints following the implementation of their new, extensive BSE regulations. Examples include Chile and Peru's complaints against the EU's ban on the use of fishmeal in ruminant feed, and Australia's complaint against EU restrictions on selected cosmetics. More

[2] Other WTO committees have formally adopted the term 'counter-notifications' to reference complaints recorded in the minutes or reports of committee meetings. The SPS Committee has not done so. Complaints are variously recorded under 'information from members', 'specific trade concerns' and 'other business' in the committee minutes. The term *counter-notification* is used here to help distinguish the complaints raised in the SPS Committee from the complaints that proceed to formal dispute settlement in the WTO.

Table 12.2 Complaints (counter-notifications) in the SPS Committee against trade partners, 1995–2004.*

Country facing complaint	Complaints by developed countries				Complaints by developing countries				Total
	Human health	Plant and animal health	Other†	Subtotal	Human health	Plant and animal health	Other	Subtotal	
Developed country	56	30	4	90	57	32	9	98	188
Developing country	44	44	6	94	10	27	2	39	133
Multiple countries	2	4		6	—	3	—	3	9
Total complaints	102	77	17	190	67	62	11	140	330

*Entries exclude 'repeat interventions' made by WTO members who registered complaints against the same measure more than once.
†Includes complaints related to horizontal regulations with multiple objectives (e.g. the regulation of genetically modified products); administrative requirements; or regulations with unknown objectives.
Source: Roberts and Unnevehr (2005).

Table 12.3 Distribution of complaints (counter-notifications) in the SPS Committee related to human health measures, 1995–2004.*

Commodity	Complaints against measures regulating							Total
	TSEs†	Food additives	Food-borne pathogens	Toxins and heavy metals	Veterinary residues	Pesticide residues	Other‡	
Multiple animal products	67		1	8	1		1	78
Meat, poultry and fish	5		10	3	3			21
Multiple agricultural products		3		14		7	12	36
Dairy and eggs	—	—	6	1	—	—	2	9
Processed products				8		4	3	15
Feedstuffs	2			1	2			5
Horticultural products	—	1	1	—	—	1	—	3
Cereals	—		—	2	—	—	—	2
Total	74	4	18	37	6	12	18	169

*Entries exclude 'repeat interventions' made by WTO members who registered complaints against the same measure more than once.
†Transmissible spongiform encephalopathies (TSEs) include bovine spongiform encephalopathy (BSE).
‡Includes complaints related to horizontal regulations with multiple objectives (e.g. the regulation of genetically modified products); administrative requirements; or regulations with unknown objectives.
Source: Roberts and Unnevehr (2005).

recently, China and Argentina have raised objections to US measures, adopted after the identification of a BSE case in Washington State in 2003, which prohibited the use of selected cattle by-products in food, dietary supplements and cosmetics, and imposed new record-keeping requirements on all exporters, regardless of BSE status (WTO 2005).

Scientific risk assessment

The SPS Agreement requires that countries base national food safety measures on scientific risk assessment. This requirement has been crucial to successfully reducing the disingenuous use of sanitary and phytosanitary regulations and to promoting convergence of SPS measures among countries. The number of cases raised in the WTO has been small relative to the flow of trade, casting some doubt on the often-expressed view that importers regularly use unwarranted regulations to favour domestic producers. The impact of the risk management requirements of the SPS Agreement has extended beyond WTO complaints and dispute settlement decisions to spur broad-based regulatory reviews by countries to determine whether they and their trading partners are complying with the scientific risk assessment obligation. In many cases, regulatory authorities are either unilaterally modifying regulations or voluntarily modifying regulations after technical exchanges. However, it is evident that some convergence gaps remain in regards to the principle of using science as a basis for regulation. In some circumstances, countries' reliance on the precautionary principle to guide risk management decisions has led to high-profile trade disputes, as in the hormones and GM food cases. In others, regulatory decisions impose large economic costs to achieve a rather minimal risk reduction. Such decisions are likely to be controversial.

Harmonisation and equivalence

The WTO's promotion of harmonisation has been less successful than its attempts to increase transparency or the use of risk assessment. The slow adoption of harmonisation on trade since the SPS Agreement came into force appears to have been constrained as much by the lack of international standards as by countries' unwillingness to adopt those standards. The majority of WTO members' early notifications (1995–1999) stated that no international standard existed for the notified measure. Because international standards are a global public good, it is not surprising that national authorities have underinvested in such measures: individual countries have neither the incentive nor the ability to create such standards. Not only are there too few international standards in the food area, but too many of the current international standards are outmoded, contributing to the low adoption rate for those standards that do exist.

Equivalence is an alternative to harmonisation. The SPS and TBT Agreements require WTO members to allow imports from countries that have measures equivalent to their own. This provision endorses regulatory flexibility that allows countries to allocate scarce resources efficiently rather than identically. Yet, the use of equivalence has been limited. Despite the conceptual appeal of equivalence, its use is

constrained by various factors, both operational and political. The administrative burden of equivalence determinations is often significant even among countries with similar capacity levels. Moreover, recognising the equivalence of an alternative regulatory regime may require national regulators to offer the same alternative to domestic producers, requiring in turn new or revised domestic regulations before foreign producers can gain access to the market. Some progress has been made, but experience so far suggests that negotiating equivalence agreements is difficult and their use is not common. To encourage the reporting of equivalence protocols, the WTO adopted specific notification procedures in 2001; since, however, no country has officially notified an equivalence arrangement to the SPS Committee.

Regionalisation

Regionalisation under the SPS Agreement has had so far only limited success, and the successful cases have depended heavily on the efforts of the exporting countries. Argentina's numerous setbacks in its efforts to eradicate foot-and-mouth disease underscores the fact that investments in public-sector regulatory infrastructures are needed as an incentive to private-sector eradication efforts and thus establishment of the preconditions for regionalisation. Yet, it is also evident that national regulation will not always work. Trans-border pest or disease controls may be required where there are insufficient natural barriers or when animals (including wildlife) move freely across borders.

12.4 WTO dispute resolution

The compliance of countries with the WTO agreements is reinforced by the organisation's formal dispute settlement procedures. Only a few conflicts over food regulations have led to the establishment of dispute panels, but these few cases have played a critical role in defining the scope of WTO rules and obligations.

Of 41 formal requests for consultations about food regulations from 1995 to 2006, only 14 such requests (related to ten distinct cases) have advanced to dispute settlement proceedings (Table 12.4). Others have been resolved (or withdrawn) without the expense of a formal panel. There have been rulings by WTO panels in eight of the ten cases through 2006. The panels' findings in six of the eight cases were referred to the Appellate Body for adjudication on points of legal interpretation.[3]

Four of these disputes relate specifically to the SPS Agreement: hormones, salmon, varietal testing and apples. In these four SPS cases, developed countries challenged the regulations of other developed countries and in each case, the panel and Appellate Body concurred that the regulation in question violated the requirement that it be based on a valid risk assessment. These outcomes demonstrate the importance accorded to the principle of science-based risk management in the SPS Agreement and show that even the measures of countries with advanced scientific capacities are not immune to challenge.

[3] Recourse to the Appellate Body is the right of either complainant or respondent, but the appeal can only cover points of law, and not those of substance.

Table 12.4 Disputes over regulation of safety and quality of agricultural products advancing to WTO panels and Appellate Body, 1995–2006.

Dispute settlement number	Petitioners	Respondent	Issue	Agreement(s) referenced in dispute proceedings	Status
1995					
DS 18	Canada	Australia	Measures affecting importation of salmon	SPS, GATT	Panel and AB ruled against Australia
1996					
DS 26/48	United States/Canada	EC	Measures affecting meat and meat products (hormones)	SPS, TBT, GATT, AoA	Panel and AB ruled against EC; panel established in 2005 (DS320/321) to review US and Canadian retaliatory tariffs
DS 58	India, Malaysia, Pakistan, Thailand	United States	Import prohibition on certain shrimp and shrimp products	GATT	Panel and AB ruled against the United States
1997					
DS 76	United States	Japan	Measures affecting agricultural products (varietal testing requirements)	SPS, GATT, AoA	Panel and AB ruled against Japan
1999					
DS 174/290	United States, Australia	EC	Protection of trademarks and GIs for agricultural products and foodstuffs	TRIPS, GATT, TBT, WTO Agreement	Panel ruled against EC
2001					
DS 231	Peru	EC	Trade description of sardines	GATT, TBT	Panel and AB ruled against EC
2002					
DS 245	United States	Japan	Measures affecting the importation of apples	SPS, GATT, AoA	Panel and AB ruled against Japan
DS 270	Philippines	Australia	Importation of fruits and vegetables	GATT, SPS, Import licencing	Panel established in 2003; report not yet circulated
2003					
DS 287	EC	Australia	Quarantine regime for imports	SPS	Panel established in 2003; report not yet circulated
DS 291/292/293	United States/Canada/Argentina	EC	Measures affecting the approval and marketing of biotech products	SPS, GATT, AoA, TBT	Panel ruled against EC

SPS, Agreement on Sanitary and Phytosanitary Measures; GATT, General Agreement on Tariffs and Trade; AB, Appellate Body; EC, European Community; TBT, Agreement on Technical Barriers to Trade; AoA, Agreement on Agriculture; TRIPS, Trade-Related Aspects of Intellectual Property Rights; WTO, World Trade Organization.
Source: WTO (2006a).

The outcome in the hormones case demonstrates further that the WTO can rule against measures based on popular consumer misconceptions of risks, as well as more overt discriminatory measures. The WTO panel rejected the EU's use of the 'precautionary principle' in its legal defence, because no explicit reference to this principle appears in the SPS Agreement. Article 5.7 of the agreement recognises a conditional precautionary principle, which allows countries to provisionally adopt measures on the basis of 'available pertinent information' while seeking additional information 'necessary for a more objective assessment of risk'. However, the EU could not defend its permanent ban by reference to this provision. This result removes a degree of national political sovereignty for regulations in cases in which evidence has not been marshalled to demonstrate any risk from trade. The formal ruling has not resolved this dispute.[4]

The WTO dispute over EU measures regulating biotech products raised some of the same legal issues as the hormones case. Argentina, Canada and the United States argued that the EU Commission's failure to complete the process set out in its own directives and regulations for the premarketing review of 27 biotech products between October 1998 and August 2003 constituted a de facto ban on these products which was not based on a risk assessment (United States 2004). The complainants also argued that nine specific prohibitions by EU member states on biotech products that had been formally approved by the EU were likewise not based on a risk assessment. The EU argued that there have been no undue delays in its scientific approval processes that were 'premised on the application of a prudent and precautionary approach' (European Communities 2004). The WTO panel issued its report in this highly visible dispute in September 2006, concurring with the complainants that the EU had maintained a de facto ban on biotech products that violated its obligations under the SPS Agreement. Specifically, the panel noted that 'it is clear that application of a prudent and precautionary approach is, and must be, subject to reasonable limits, lest the precautionary approach swallow the discipline' imposed by the SPS Agreement (WTO 2006b). The panel likewise agreed with the complainants that the prohibitions maintained by EU member states were not based on a risk assessment.

In the two other cases of food regulation that advanced to rulings by the Appellate Body, developing countries lodged complaints against the measures of developed

[4] In 1999, the WTO authorised the United States and Canada to increase tariffs on $128 million of EU exports when the EU failed to bring its measures into compliance with the SPS Agreement following the Appellate Body ruling. Four years later, the EU notified the WTO that it had met its obligations under the SPS Agreement with the adoption of Directive 2003/74/EC that left the ban in place, but cited new studies to justify its measures. The United States and Canada disagreed with the EU's claim that the new Directive was based on science and that it reflected the WTO's recommendations and rulings, and left their retaliatory tariffs in place. In January 2005, the EU requested that the legality of these tariffs be reviewed by a WTO panel under the terms of the Dispute Settlement Understanding. The panel issued its report in March 2008, recommending that the United States and Canada correct procedural errors to ensure that the retaliatory tariffs comply with DSU rules. Whether the EU's 2003 Directive is legal under the SPS Agreement is still not known, as the panel did not have the authority to review this question.

countries. In the sardine's case, brought by Peru against the EU, the Codex Alimentarius international standard was found to be effective and appropriate to achieve EU objectives of transparency, consumer protection and fair competition. The importance of this case lies in demonstrating that international standards can take precedence over national regulatory decisions and can set bounds on the use of policies that, in effect, limit imports. In the second case, India, Malaysia, Pakistan and Thailand challenged US restrictions on shrimp imports when countries failed to use turtle-excluder devices. The case established the precedent that process standards can be mandated in regulations to achieve an environmental goal. This precedent provides a small but significant challenge to the product–process doctrine, which presumes that any regulation affecting trade based on how a product is produced is out of compliance with the WTO rules. In the shrimp/turtle case, the WTO Appellate Body concluded instead that the objective of the US law was legitimate under GATT Article XX and, ultimately, that US implementation of its policy was justified because of its serious and ongoing efforts to minimise negative trade effects.

The greatest difficulties for WTO dispute resolution arise in cases such as beef hormones or biotechnology in which strongly held differences of views among countries have not been reconciled by other means. That the most contentious of these cases have involved issues of risk again demonstrates the practical limits of science in securing regulatory convergence. Unfortunately, too much reliance on the WTO's dispute resolution process to address these disagreements will create problems for the acceptance of its rulings, as may eventually become evident in cases related to biotech foods. When rulings in favour of the complainant lead to retaliatory tariffs because the respondent fails to change its policy or offer acceptable compensation, the trade system suffers, even if the validity of WTO procedures is upheld.

Other high-profile cases include those related to BSE, foot-and-mouth disease and, recently, avian influenza (Moore & Morgan 2006). These cases have challenged restrictive trade regulations that have been resolved in bilateral deliberations and informal WTO committee discussions. The cases did not involve matters of interpretation of the SPS Agreement, but the challenge was deemed worthwhile to speed up compliance. It is notable that none of these cases resulted in formal WTO disputes. The international standards organisations have offered some constructive evaluations in these cases. Yet, the reach of international disciplines is still limited. For example, after the announcement of a likely BSE link to human variant Creutzfeldt–Jakob disease disrupted world trade in beef and bovine products in 1996, the OIE established that some traded products were not vectors for disease transmission. This allowed certain initial prohibitions to be eased. Yet, nine years later, Canada and the United States faced (and themselves imposed against others) costly embargoes on all meat trade when single domestic incidences of BSE were discovered. Moreover, in this case, the US embargoes were imposed without corresponding internal quarantines. The regulation of agricultural and food safety across and within borders is often not consistent, despite the disciplines attempted through the WTO.

12.5 Challenges to promoting coherence

This review shows that the WTO agreements and committee procedures, together with the reviews that WTO rules have encouraged at national, bilateral and regional levels, have provided useful channels through which countries can strengthen the framework for global food regulation. Countries may also challenge their trade partners' policies through these channels when they doubt that regulations conform to international rules applied to food trade. The institutional innovations that emerged from the Uruguay Round have given the WTO an increased role in shaping regulation in the global food system. The reach of the WTO disciplines and principles has, however, been somewhat limited. National governments remain reluctant to cede too much authority over agricultural and food safety and quality to international decision-making. What emerges then is a picture of modest international success in increasing coherence between the regulatory decisions of sovereign nations so as to avoid the most blatant cases of protectionism, but with a need for ongoing improvements.

Countries face three broad challenges as they seek to improve the coherence of existing food regulations internationally. The first is to achieve the appropriate balance between reliance on domestically determined and internationally agreed-upon product specifications. Common risk-reducing measures can facilitate trade in low-cost, safe products, and the benefits of trade can be enhanced by lowering transactions costs through international harmonisation. The appropriate risk-reduction measures may depend on country-specific circumstances, making harmonisation inappropriate. Undue harmonisation might also impose limits on consumer choice. Finding the right degree of international coordination is one aspect of the dilemma faced by public authorities.

The second broad challenge facing food regulation officials is to maintain both the confidence of consumers and the cooperation of producers in implementing health and quality regulations and standards, while avoiding a 'capture' of the regulations by either group for their own ends. The resolution of this dilemma may require improving national regulatory capacities and developing the competence and authority of international institutions to define and enforce disciplines on national regulators, despite the inevitable limitations of regulatory processes and institutions at the national level.

A third challenge compounds difficulties in addressing the first two. National food markets are highly integrated through global trade and investment. Increasingly, private-sector promulgated standards, together with private supply chains of international scope, are becoming important in determining food market access (see Henson 2006 for a review). Yet, nations remain the principal authority in almost all dimensions of their food regulation and standards. The nature of the public–private relationship is crucial to the effectiveness of regulations. However, the public and the private sector have very different motivations in their standard setting. One aspect of private standards, the minimisation of risk for consumers (and the costs of litigation), is shared. Generally, the public sector is not actively

involved in boosting demand and even less often in increasing market share for some particular actor.

12.6 Implications for national and international food regulations for promoting healthy diets

What lessons can be learned from the WTO approach to food safety for national and international food regulations in promoting healthy diets in the context of international trade? First, it is clear that the focus of WTO rules is the treatment of trade in individual food items, regardless of whether or not they constitute healthy diets. Countries declare individual items to be harmful to the health (of plants, animals and humans) under legitimate national and international regulations. These rules apply to a situation where the products themselves are safe and free of risk, even if inappropriate consumption of those products over time could have health hazards. In other words, regulations apply to foods, not diets. Any attempt to impose trade-related measures relating to diets could therefore be problematic. Only in cases where foods (or the content of foods) are considered unhealthy at levels normally consumed would there be a direct link with diets.[5]

Actions to educate the public are perfectly consistent with an open trade system and a science-based SPS regime. The use of labels, for example, poses few problems so long as they do not discriminate among sources and are no more trade-intrusive than necessary. But national dietary policies involving impediments to trade in goods otherwise regarded as safe as a means of promoting balanced consumption would provide a legitimate source of complaints within the WTO. Even if the domestic policy was based on the soundest principles, the method used (trade restrictions) could be held objectionable when other means (e.g. consumption taxes) exist to meet the same objectives.

Although this implies that trade agreements such as the WTO are not particularly supportive of intervention at the border to promote healthier diets, the issue is not one of conflict but of complementarity. The trade system encourages trade in products and services that people want and allows governments to keep out those products that are deemed unsafe. Indeed, open trade in agricultural and food products increases the access of consumers to a variety of foods and so the SPS Agreement may contribute significantly to the availability of healthy foods. This may be an economically desirable way of improving diets. Actions of the government to educate consumers and otherwise influence diets are not inconsistent with the maintenance of health and safety regulations in accordance with the WTO.

There is nevertheless ample scope for making multilateral rules more coherent in this area of public policy. One avenue would be agreement at the international

[5] One possible example where common food ingredients have been deemed unsafe in normal use is that of *trans*-fatty acids (as discussed more extensively by Fidler in Chapter 15). The Food and Drug Administration in the United States has suggested that there is no safe level of *trans* fats, but has not banned the importation of foods containing them. This illustrates that there are likely to be ambiguities in the distinction made here between healthy food and healthy diets.

level on dietary principles and guidelines that could then be incorporated in national policies. Where such national policies followed these guidelines, some presumption could be made that these were based on an adequate risk assessment. Once again, trade interventions may not be the appropriate way of translating those guidelines into action. Yet, the increased use of international standards could help to prevent trade disputes from emerging from different national approaches to dietary improvement and the reduction of such problems as obesity.

12.7 Conclusions

Food regulation in all its forms is likely to expand over the coming years, in tandem with increased use of private standards, and the number of international disputes is likely to increase correspondingly. So far, the disciplinary mechanisms in place through the WTO – the negotiated agreements, implementation discussions and informal conflict resolution through the committees, and formal dispute resolution – have proven useful. The WTO rules remain necessary and relevant: disingenuous use of regulatory measures is still evident in agricultural markets and these abuses need to be reined in. The WTO disciplines have not resulted in the 'downward harmonisation' of regulations. No credible evidence has emerged to indicate that WTO rules have prevented countries from achieving legitimate regulatory objectives, even when very trade-restrictive measures have been adopted.

The benefits of having WTO agreements that encourage greater consistency in national food regulations are rarely questioned. Yet, the extension of national health and safety policies to include longer-term issues related to dietary patterns does raise some questions. The WTO rules encourage cross-border transactions among presumably willing suppliers and consumers of products that are allowed to be sold in the importing country. If the importing country were to attempt to influence the importation of these products then it would need to justify such intervention. The health hazards of extended use of a product could be such a justification. But if the problem is misuse of a product that is legally available, trade interventions are rarely going to be the most effective or desirable way of improving diets or reducing obesity.

References

European Communities (2004). *Submissions: European Communities – Measures Affecting the Approval and Marketing of Biotech Products*. WT/DS291, 292, and 293.

Henson, S. (May 2006). *The Role of Public and Private Standards in Regulating International Food Markets*. Paper presented at the International Agricultural Traded Research Consortium symposium on Food Regulation and Trade, Bonn, Germany.

Josling, T. (May 2006). *The Institutional Framework for Food Regulation and Trade*. Paper presented at the International Agricultural Traded Research Consortium Symposium on Food Regulation and Trade, Bonn, Germany.

Josling, T., Roberts, D. & Orden, D. (2004). *Food Regulation and Trade: Toward a Safe and Open Global System*. Institute for International Economics, Washington, DC.

Moore, T. & Morgan, N. (2 April 2006). *Avian Influenza: Trade Issues*. CAST Commentary. QTA, Ames, IA.

Roberts, D. & Unnevehr, L. (2005). Resolving trade disputes arising from trends in food safety regulation: the role of the multilateral governance framework. *World Trade Review* **4**, 469–97.

United States (2004). *Submissions: European Communities – Measures Affecting the Approval and Marketing of Biotech Products*. WT/DS291, 292, and 293.

World Trade Organization (1995). *The Results of the Uruguay Round of Multilateral Trade Negotiations: The Legal Texts*. WTO, Geneva.

World Trade Organization (25 February 2005). *Specific Trade Concerns*. G/SPS/GEN/204/Rev.5.

World Trade Organization (11 October 2006a). *Update of WTO Dispute Settlement Cases*. WT/DS/OV28.

World Trade Organization (29 September 2006b). *European Communities – Measures Affecting the Approval and Marketing of Biotech Products: Reports of the Panel*. WT/DS/291R/292R/293R.

13 The Potential of the Codex Alimentarius to Promote Healthy Diets Worldwide – the Canadian Experience of Implementation

Mary R. L'Abbé, Janine Lewis and Christina Zehaluk

13.1 Introduction

The Codex Alimentarius – the international food code – is the most important international reference point in matters concerning food quality and information on food composition and use. It also has a unique role in international food trade: it sets the standards intended to guide fair and open food trade, and is recognised by the World Trade Organization as an international reference point for the resolution of disputes concerning food safety and consumer protection.

The Codex Alimentarius was developed, and is continually updated, by the Codex Alimentarius Commission, set up in 1963 by the Food and Agriculture Organization of the United Nations (FAO) and the World Health Organization (WHO). It thus predates current international trade rules, its objectives being to protect the health of consumers, ensure fair trade practices and promote coordination of food standards work undertaken by international governmental and non-governmental organisations. In August 2006, 99% of the world's population were represented in the Commission through 174 member countries and one Member Organisation (the European Community).

The Codex Alimentarius ('the Codex') is made up of standards, codes of practice, guidelines and other recommendations that cover issues such as food safety, labelling, composition, additives and hygiene (Box 13.1). Some of these texts are very general and some are very specific. Some deal with detailed requirements related to a food or group of foods; others deal with the operation and management of production processes or the operation of government regulatory systems for food safety and consumer protection (Secretariat of the Codex Alimentarius Commission 2007).

Codex Alimentarius standards and recommendations cover several issues related to nutrition, most notably food labelling and foods for special dietary uses. Yet, with its focus on promoting food safety and consumer protection, the Codex has not historically been perceived as a mechanism to promote healthy diets and address diet-related chronic (non-communicable) diseases. Suggestions that it should play a

Box 13.1 Definitions and examples of standards, codes of practice, guidelines and other recommendations of the Codex Alimentarius.

Codex standards. Standards usually relate to product characteristics and can deal with all government-regulated characteristics appropriate to the commodity, or only one characteristic. An example of a standard dealing with just one characteristic is the maximum residue limits for residues of pesticides or veterinary drugs in foods. An example of a standard with both general- and commodity-specific provisions are those for food additives and contaminants and toxins in foods that contain both. An example of a standard that covers all foods in a category (a 'general standard') is the Codex General Standard for the Labelling of Prepackaged Foods.

Codex codes of practice. These define the production, processing, manufacturing, transport and storage practices for individual foods or groups of foods that are considered essential to ensure the safety and suitability of food for consumption. One example is the Codex General Principles of Food Hygiene, which introduces the use of the hazard analysis and critical control point food safety management system.

Codex guidelines. There are two types of guidelines:

- principles that set out policy in certain key areas; and
- guidelines for the interpretation of these principles or for the interpretation of the provisions of the Codex general standards.

In the first instance, there are specific *Codex Principles* covering: the addition of essential nutrients to foods; food import and export inspection and certification; establishment and application of microbiological criteria for foods; conduct of microbiological risk assessment; and risk analysis of foods derived from modern biotechnology.

The second case, *Interpretative Codex Guidelines*, include those for food labelling, especially the regulation of claims made on the label. This group includes guidelines for nutrition and health claims; conditions for production, marketing and labelling of organic foods; and foods claimed to be 'halal'.

Source: Joint FAO/WHO Food Standards Programme, Secretariat of the Codex Alimentarius Commission (2007).

role began with the passage of the WHO's *Global Strategy on Diet, Physical Activity and Health* (DPAS) in 2004 (WHO 2004). The WHO's Global Strategy was developed in order 'to promote and protect health by guiding the development of an enabling environment for sustainable actions at individual, community, national and global levels that, when taken together, will lead to reduced disease and death rates related to unhealthy diet and physical inactivity' (Article 17). More specifically,

it aims to 'reduce the risk factors for non-communicable diseases that stem from unhealthy diets and physical inactivity by means of essential public health action and health-promoting and disease-preventing measures'; and 'to encourage the development, strengthening and implementation of global, regional, national and community policies and action plans to improve diet' (Article 18).

To move towards these goals, DPAS included a recommendation that the Codex Alimentarius Commission should give full consideration (within the framework of its operational mandate) to evidence-based action to improve the health standards of foods, consistent with the aims and objectives of DPAS. Specifically, Article 59 of DPAS states that:

Public health efforts may be strengthened by the use of international norms and standards, particularly those drawn up by the Codex Alimentarius Commission. Areas for further development could include: labelling to allow consumers to be better informed about the benefits and content of foods; measures to minimise the impact of marketing on unhealthy dietary patterns; fuller information about healthy consumption patterns, including steps to increase the consumption of fruit and vegetables; and production and processing standards regarding the nutritional quality and safety of products. Involvement of governments and nongovernmental organizations as provided for in the Codex should be encouraged.

This chapter examines if and how the Codex Alimentarius could be used as a tool to promote healthy diets through its consideration of DPAS. It starts by describing the steps taken in the Codex Alimentarius Commission up to 2008 to develop a plan to implement DPAS, and draws some conclusions about the appropriate role for the Codex in promoting healthy diets. Using Canada as a case study, it then provides an example of how the actions and experiences of national governments can be used to help lead the development of revisions to Codex Guidelines and Standards, as recommended by the FAO/WHO to implement the DPAS.

13.2 Steps taken by the Codex Alimentarius Commission to implement the DPAS

13.2.1 Process of identifying actions

Following the endorsement of DPAS, the WHO requested in 2005 that the Codex Alimentarius Commission give full consideration to specific actions it could take to implement DPAS. The Commission subsequently requested the WHO, in cooperation with the FAO, to prepare a document outlining specific actions that could be taken; and it identified the Codex Committee on Nutrition and Foods for Special Dietary Uses (CCNFSDU) and the Codex Committee on Food Labelling (CCFL) (CAC 2005; CCEXEC 2005) as the appropriate committees to carry out such work.

As part of the development of the requested 'action document', the WHO and FAO put forward a discussion paper on potential actions that could be taken by the CCNFSDU and the CCFL (CCFL 2006a; CCNFSDU 2005a) and sought their initial views at respective sessions in late 2005 (CCNFSDU 2005b) and in 2006 (CCFL 2006b). The WHO also hosted an FAO/WHO Electronic Forum in early 2006 to enable all Codex members to submit their more detailed views directly to the parent organisations (FAO/WHO 2006). Submissions were invited on:

(i) the role of Codex in implementing DPAS and the nature of the tasks that could be considered;
(ii) the kind of scientific and other support that might be needed; and
(iii) the appropriate means to manage the process within Codex.

Eleven member countries and four international non-government organisations made submissions and these were summarised for the Commission in 2006 (CAC 2006a). In relation to point (i), many respondents acknowledged a role for Codex to implement DPAS within its mandate but some comments cautioned the need for more in-depth analysis of the issues. There was general agreement that existing Codex labelling guidelines afforded the most scope for implementation, although views differed markedly on the need to review Codex commodity standards for particular foods or groups of foods. In relation to point (ii), the role of the WHO and FAO in providing scientific advice to support implementation measures was affirmed particularly in relation to nutrient risk assessments. Scientific advice on consumer use and understanding of labelling was regarded as less relevant in the international context because of the highly variable use and understanding of labelling around the world. Concerning the overall management of nutrition issues within Codex (point iii), the majority of submissions believed that the existing system allowed for appropriate coordination, although some improvements were suggested. The terms of reference of the committees were regarded as sufficiently broad to enable them to undertake implementation activities within the Codex mandate.

13.2.2 Proposed actions

Comments made in session and in written submissions were used to inform the development of the WHO/FAO Draft Action Plan for Codex Implementation of the Global Strategy on Diet, Physical Activity and Health (DAP) (CAC 2006b). The DAP, which was distributed as a Codex Circular Letter in 2006, set out possible actions that could be undertaken by the Codex. The DAP contained nine proposed actions directed to either the CCFL or CCNFSDU or in two cases, to both committees. The context for these proposed actions was established by citation of two key articles from DPAS: Article 59 which suggested areas that the Codex might further develop; and Article 22 which presented the five dietary (nutrients and foods) recommendations for populations and individuals (Box 13.2). The WHO and FAO were careful to ensure that all proposed actions fell within Codex's mandate since some submissions to the Electronic Forum considered that certain areas suggested

Box 13.2 The DPAS dietary recommendations for populations and individuals.

- Achieve energy balance and a healthy weight;
- Limit energy intake from total fats and shift fat consumption away from saturated fats to unsaturated fats and towards the elimination of *trans*-fatty acids;
- Increase consumption of fruits and vegetables, and legumes, whole grains and nuts;
- Limit the intake of free sugars; and
- Limit salt (sodium) consumption from all sources and ensure that salt is iodised.

Source: WHO (2004).

in DPAS such as 'fuller information on healthy consumption patterns' fell outside the Codex mandate. In response to comments received on scientific advice, the FAO and WHO recognised the benefits of timely, scientific advice in facilitating the work of the two committees and undertook to continue to provide such advice based on requests to the Codex Alimentarius Commission, taking account of priorities and budgetary considerations.

Taking into account comments received, the DAP emphasised the alignment of the proposed measures with the Codex mandate of protecting the health of consumers and ensuring fair practices in the food trade (CAC 2007). The measures that aligned with protection of health were those designed to minimise consumption of nutrients that increased the risk of chronic diseases (Box 13.2). Other measures designed to prevent misleading and deceptive claims were aligned with fair trade practices.

Within the Codex framework, it was proposed that measures designed to minimise consumption of risk-increasing nutrients should utilise labelling and/or food composition provisions, whereas measures to prevent misleading and deceptive claims should utilise labelling provisions only. Hence, all the proposed actions for Codex to implement DPAS were grouped under these two regulatory categories: food labelling (eight proposed actions) and food composition (one proposed action). The proposed actions relating to the declaration of nutrients and healthful ingredients on food labelling were considered on the basis that labelling can provide not only more useful information for consumers to make healthy choices, but incentives for food manufacturers to produce healthier versions of their products.

Table 13.1 provides details of the nine proposed actions (adapted from CAC 2006b) together with additional explanatory material that places the proposed actions in the context of the broader work of the two Codex committees. Although the document containing the list of proposed actions is described as a *draft* action plan, it is treated by the Codex Alimentarius Commission and the CCNFSDU and CCFL as the final version.

Table 13.1 Details of the proposed actions in the draft action plan.

Number	Proposed actions	Codex text	Rationale for proposed action	Responsible Codex committee
Labelling				
1	Amend Purpose Clause to refer more explicitly to providing the consumer with information to reduce risk factors for non-communicable diseases and to permit the dietary management of non-communicable diseases of public health significance.	Guidelines on Nutrition Labelling (CAC/GL 2-1985)	To more clearly explain the basis of a 'wise choice' in the existing Purpose Clause in terms of reducing risk and dietary management.	CCFL
2	Require mandatory declaration of the content of key named nutrients (see #3) on labels of all prepackaged foods in accordance with the requirements for Nutrient Declaration.*	Guidelines on Nutrition Labelling (Subsection 3.1)	Citing the precedent of the requirement to always declare the presence of certain foods and ingredients associated with increased health risk (from hypersensitivities) in ingredient lists, the case is made for mandatory declaration of certain nutrients that are also associated with increased risk of chronic diseases.	CCFL
3	Expand the list of key nutrients for mandatory declaration to include: energy value, protein, available carbohydrate, total sugars, fat, saturated fatty acids, *trans*-fatty acids and sodium.	Guidelines on Nutrition Labelling (Paragraphs 3.2.1.1 and 3.2.2.2)	The list of key nutrients is based on those nutrients identified in the DPAS that increase the risk of chronic diseases.	CCFL
4	Develop additional criteria for the presentation of the Nutrient Declaration* to enhance consumer legibility and readability.	Guidelines on Nutrition Labelling	Further development of presentation requirements would facilitate consumers' ability to locate and use the Nutrient Declaration*.	CCFL

(*Continued*)

Table 13.1 Details of the proposed actions in the draft action plan. (*Continued*)

Number	Proposed actions	Codex text	Rationale for proposed action	Responsible Codex committee
5	Develop Nutrient Reference Values (NRVs) for nutrients that are associated with increased or decreased risk of non-communicable diseases, e.g. saturated, n-3 and n-6 polyunsaturated fatty acids, cholesterol and sodium.	Guidelines on Nutrition Labelling	Similar to the NRVs that have been developed for protein, vitamins and minerals, NRVs could be developed for other risk-increasing and risk-decreasing nutrients based on those listed in the WHO/FAO Report on *Diet, Nutrition and Prevention of Chronic Diseases* (WHO/FAO 2003).	CCFL; CCNFSDU
6a	Develop conditions for nutrient claims for *trans*-fatty acids. Include restrictions on both saturated and *trans*-fatty acid in nutrient content and comparative claim conditions for *trans*-fatty acids.	Guidelines for the Use of Nutrition and Health Claims, Table of conditions of nutrient content (CAC/GL 23-1997)	6a and 6b – Claims for nutrients that are associated with increased risk of chronic diseases will both aid consumers in making appropriate food choices and encourage manufacturers to reduce the levels of these nutrients in the foods they produce. 6a – Conditions for *trans*-fatty acids claims do not exist, although *trans*-fatty acids are identified by the WHO/FAO Report on *Diet, Nutrition and Prevention of Chronic Diseases* as increasing health risk.	CCFL; CCNFSDU
6b	Add restrictions on *trans*-fatty acids to the existing nutrient content and comparative claim conditions for saturated fatty acids.	Guidelines for the Use of Nutrition and Health Claims, Table of conditions of nutrient content	Addition of *trans*-fatty acids to claim conditions for saturated fatty acids should be explicitly stated rather than leaving it optional, because *trans*-fatty acids increase health risk.	CCFL; CCNFSDU

7	Support paragraph 5.1.1(e) in the 2006 draft revised requirements for quantitative declaration of ingredients relating to the presence of fruits, vegetables, whole grains or added sugars when these ingredients are the subject of an express or implied claim (CCFL 2006c).	General Standard for the Labelling of Pre-packaged Foods (CODEX STAN 1-1985); Draft revised paragraph 5.1.1e (CCFL 2006c)	DPAS recommends increasing intake of fruit, vegetables, whole grains, legumes and nuts. These foods are known as healthy foods and manufacturers highlight their presence in the claims made about their products. Disclosure of these ingredients on a product label would enable consumers to compare relative amounts in multi-ingredient foods to assist food choices and to encourage manufacturers to increase the levels of these ingredients in the foods they produce.	CCFL
8	Introduce a principle-based approach to permit a modified, standardised food to retain the name (and identity) established for its standardised counterpart food, e.g. margarine when also labelled with a nutrient content claim or comparative claim indicating the modification, e.g. low or lower sodium.	General Standard for the Labelling of Pre-packaged Foods; Codex General Standard for the Use of Dairy Terms (CODEX STAN 206-1999)	Codex standards should not impede the development of modified versions of standardised foods that are intended to assist consumers to improve their food choices. Rather than requiring every relevant Codex commodity committee to review and change the food composition provisions of their standards, an alternative is the use of nutrient claims in conjunction with the name of a standardised food. This use appears to be consistent with requirements in the General Standard for descriptors as necessary to avoid misleading the consumer on the true nature and condition of the food. The General Standard for Use of Dairy Terms appears to permit a similar approach to modification as proposed.	CCFL

(*Continued*)

Table 13.1 Details of the proposed actions in the draft action plan. (*Continued*)

Number	Proposed actions	Codex text	Rationale for proposed action	Responsible Codex committee
Food Composition				
9	Review the need for advice to governments on sound nutrition principles in the production, processing and formulation of foods.	Relevant background documents including repealed Guidelines for the Use of Codex Committees on the Inclusion of Provisions on Nutritional Quality in Food Standards and Other Codex Texts (CAC 1993) and Codex General Principles for the Addition of Essential Nutrients to Foods (CAC GL 09-1987).	This action, based on the WHO/FAO Report on *Diet, Nutrition and Prevention of Chronic Diseases* could advise governments on the development of foods suitable for inclusion in diets to reduce risk of chronic diseases, e.g. advice on more healthful alternatives when aiming to reduce or eliminate *trans*-fatty acids.	CCNFSDU

CAC/GL, Codex Alimentarius Commission Guidelines; CCFL, Codex Committee on Food Labelling; DPAS, Diet, Physical Activity and Health; NRVs, Nutrient Reference Values; WHO/FAO, World Health Organization/Food and Agriculture Organization; CCNFSDU, Codex Committee on Nutrition and Foods for Special Dietary Uses.

Source: Joint FAO/WHO Food Standards Programme. Codex Alimentarius Commission (2006b). Circular Letter, CL 2006/44-CAC.

*Nutrient Declaration is a standardised statement or listing of the nutrient content of a food (Codex Guidelines on Nutrition Labelling).

13.2.3 Consideration of proposed actions

The relevant proposed actions were considered at consecutive sessions of each committee: by CCNFSDU in November 2006 (CCNFSDU 2006), 2007 (CCNFSDU 2007a) and 2008 (CCNFSDU 2008); and CCFL in April 2007 (CCFL 2007) and 2008 (CCFL 2008a). After 3 years of committee consideration (yet to be concluded), over half the proposed actions were agreed upon in full or continue under discussion. Three other proposed actions were not supported although one of these might be revisited in the future depending on the outcomes of other proposed actions.

Actions agreed upon in full

(i) Regarding the nutrients always declared in, and the legibility of the Nutrient Declaration (#3 and #4 in Table 13.1), the CCFL discussed the merits of extending the list of nutrients and the need for development of criteria to enhance the legibility and readability of the Nutrient Declaration (CCFL 2007). The Committee subsequently agreed to submit a project plan for new work (CCFL 2008b) to the Commission for approval to:
   a. commence revision of the list of nutrients that are always declared on a voluntary or possible mandatory basis in the Nutrient Declaration, taking into account DPAS, regional dietary patterns and other relevant factors; and
   b. develop flexible criteria on the presentation of the Nutrient Declaration to increase legibility and readability.

   The Commission approved this proposal for new work in mid-2008 (CAC 2008).

(ii) Regarding Nutrient Reference Values (NRVs) (#5 in Table 13.1), the CCNFSU noted that its existing work to consider revision of the vitamin and mineral NRVs fell within the scope of proposed action #5 (CCNFSDU 2006). The Committee decided to revise the NRVs for vitamins and minerals and submitted a project plan for this work to the Commission (CCNFSDU 2007b) which was subsequently approved in mid-2008 (CAC 2008).

(iii) In relation to NRVs other than for vitamins and minerals (#5 in Table 13.1), the CCNFSDU agreed to seek advice from CCFL on the need to extend the list of NRVs for nutrients other than vitamins and minerals that were associated with increased and decreased risk of chronic diseases (CCNFSDU 2006). There were two reasons for this decision: (i) the format of the Nutrient Declaration in the *Codex Guidelines on Nutrition Labelling* makes no provision, other than for vitamins and minerals, for declaration of nutrient amount as a percentage NRV; and (ii) the conditions for nutrient claims in the *Guidelines for the Use of Nutrition and Health Claims*, other than for vitamins, minerals and protein, are not expressed in terms of a percentage NRV. The CCNFSDU agreed that if CCFL responded affirmatively with details of additional nutrients, it would commence the development of new NRVs for those nutrients (CCNFSDU 2006).

(iv) Further to NRVs other than for vitamins and minerals (#5 in Table 13.1), CCNFDSU noted that CCFL had not reached a conclusion on a need for these NRVs (see section Actions continuing under discussion). However in 2008, the CCNFSDU decided to proceed to establish NRVs for nutrients other than vitamins and minerals by proposing to (i) develop principles and criteria for the development of NRVs for other nutrients associated with risk of chronic diseases; and (ii) based on the agreed-upon principles and criteria, select and prioritise such nutrients for subsequent development of their NRVs (CCNFSDU 2008).

Actions continuing under discussion

(i) The CCFL held a wide diversity of views on the merits of proposed action #2 in Table 13.1 on mandatory Nutrition Declaration (CCFL 2007). The CCFL subsequently agreed to examine issues and concerns about mandatory declaration taking into account the experiences of countries (CCFL 2008a). The requirements for possible mandatory declaration will be further considered following identification of the 'always declared' nutrients (see section Actions agreed upon in full).

(ii) In response to the request from CCNFSDU for advice (#5 in Table 13.1) (see section Actions agreed upon in full), CCFL did not reach a conclusion on the need for NRVs for nutrients other than vitamins and minerals (CCFL 2007). In 2008, the Committee determined that such a decision should be made only after the list of 'always declared' nutrients was identified (CCFL 2008a) (see section Actions agreed upon in full).

(iii) Regarding quantitative declaration of ingredients (#7 in Table 13.1), the CCFL concluded that the particular draft revised labelling provisions for the quantitative declaration of ingredients referenced by the DAP were not appropriate to address the intent of the proposed action (CCFL 2007). Nevertheless, the Committee planned to continue consideration at its 2009 meeting of other mechanisms for quantitative declaration of healthful food ingredients and added sugar when such ingredients are the subject of a claim (CCFL 2008a).

(iv) In relation to use of nutrient claims to modify standardised common names (#8 in Table 13.1), CCFL agreed on work to develop principles for the use of modified common names (CCFL 2007). However, after giving further consideration to the proposed principles-based approach in 2008, the Committee decided it was not appropriate. Instead, CCFL planned to consider the intent of the proposed action by exploring the scope and impact of a commodity standard by standard approach at its 2009 meeting (CCFL 2008a).

Actions not supported

(i) Regarding the purpose clause of the *Guidelines on Nutrition Labelling* (#1 in Table 13.1), CCFL did not support further elaboration of the clause because

it was already sufficiently broad. In addition, labelling was regarded as only one means by which risk factors for chronic diseases could be addressed (CCFL 2007).

(ii) Regarding criteria for *trans*-fatty acid and saturated fatty acid claims (#6a in Table 13.1), CCNFSDU did not support this proposed action to develop new criteria for *trans*-fatty acid claims or to include restrictions on *trans*-fatty acids in the existing conditions for saturated fatty acid claims. In discussion, the present facility for national authorities to take account of *trans*-fatty acids in setting criteria for low saturated fatty acid claims and low cholesterol claims was considered to address the issue to a certain extent (CCNFSDU 2006). The Committee's views were referred to the 2007 meeting of CCFL.

(iii) In relation to criteria for *trans*-fatty acid and saturated fatty acid claims (#6b in Table 13.1), CCFL took note of the CCNFSDU's decision not to support this proposed action, together with the FAO/WHO advice on plans to undertake a review of scientific advice on fats and fatty acids, and concluded that no further work was currently required (CCFL 2007).

(iv) Regarding advice to governments on nutritional quality (#9 in Table 13.1), CCNFSDU agreed to consider the matter in more detail at its next session (CCNFSDU 2006) but in 2007, the Committee considered that several other Codex texts, including those under development or revision by the Committee, dealt with the matter and therefore the proposed action was not considered further (CCNFSDU 2007a).

13.3 What can be concluded about the role of Codex in promoting healthy diets?

An important conclusion from the technical work conducted so far is that Codex is an appropriate mechanism to promote healthier diets worldwide through its role in setting standards on labelling and, to a lesser extent, food composition. These two areas are considered appropriate because they are consistent with the mandate of Codex to protect the health of the consumers and ensure fair practices in food trade. Labelling and food composition are also explicitly mentioned in DPAS. Article 40(4) states that 'consumers require accurate, standardised and comprehensible information on the content of food items in order to make healthy choices. Governments may require information to be provided on key nutritional aspects, as proposed in the Codex Guidelines on Nutrition Labelling'. Article 41(1) states that 'governments could consider additional measures to encourage the reduction of the salt content of processed foods, the use of hydrogenated oils, and the sugar content of beverages and snacks'.

To protect consumer health, the Codex can recommend labelling and food composition measures to minimise the consumption of the nutrients associated with increased risk of chronic (non-communicable) diseases (as identified in the DPAS), and prepare labelling guidelines to prevent misleading and deceptive claims about these nutrients in order to promote fair practices in food trade.

As the details of the above Codex actions demonstrate, most of the recommended actions articulated in the DAP (Table 13.1) have work underway in order to address the relevant sections of Codex texts. For other recommended actions, such as those related to *trans*- and saturated fatty acids (#6a and #6b), the Codex committee noted that the WHO/FAO has scientific reviews underway and starting such work would be premature prior to its completion.

But the nature of the Codex Alimentarius does introduce inherent limits in the actions it can take to promote healthy diets worldwide. Codex standards and guidelines apply only to *foods*; the Codex is not equipped to deal with areas related to healthy *diets* in general, or to dietary patterns to reduce the risk of chronic diseases. Thus, certain areas suggested in the DPAS, such as guidance on food choices that support healthy eating, are usually left to individual national governments or national scientific bodies to develop. Such guidelines or recommendations need to take into account the availability of certain foods, and cultural and other societal factors that are specific to a country or region and are not applicable to the development of international recommendations or to the role of the Codex Alimentarius.

On the other hand, one of the reasons the Codex has real potential to enhance the role of labelling and food composition in the support and promotion of healthy diets is because of its legitimacy. The Codex Alimentarius has a well-established reputation as an international reference; it has become customary for health authorities, government food control officials, manufacturers, scientists and consumer advocates to ask first of all: What does the Codex Alimentarius have to say? (Secretariat of the Codex Alimentarius Commission 2007). According to the results of a formal evaluation of the Codex programme undertaken by the FAO and WHO in 2002, Codex food standards are considered to be very important by members and a vital component in promoting food control systems designed to protect consumer health, including issues related to international trade and the SPS and TBT Agreements of the WTO (FAO/WHO 2002) Low- and middle-income countries find them very important in protecting the health of their consumers by ensuring safe food, whether produced domestically or imported, and for trade facilitation domestically and internationally. High-income countries, with better-developed domestic food legislation and control systems, place more emphasis on the Codex for export facilitation and ensuring the safety of food imports. Producer and consumer non-governmental organisations (NGOs) also rate Codex standards as very important in all their functions.

Codex is, however, an international body and its guidelines and standards are developed by its membership: representatives of national governments and international non-governmental organisations. The development of Codex texts therefore depends on one or more national governments playing a leadership role at Codex. In the area of nutrition labelling, the experiences and regulations or guidelines developed in certain countries are serving as the basis for the development of relevant Codex texts. Such leadership in turn assists the larger assembly of member states and organisations of Codex to develop and adopt relevant standards and guidelines. For example, the experiences of Canada, the United States, the Mercosur countries (Argentina, Brazil, Chile, Paraguay and Uruguay) and the European Community

have facilitated recent discussions in the area of nutrition labelling relative to the implementation of the DPAS. At the 2008 meeting of the CCFL, Canada prepared the background discussion paper and co-chaired with Argentina and Germany the physical working group reviewing potential work in this area for the Committee. Some of the experiences of Canada and how they can contribute to the work of the Codex in implementing the DPAS are detailed in the next section.

13.4 Implementation of DPAS: the Canadian experience

13.4.1 Health Canada – the Food Directorate of the Health Products and Food Branch

In Canada, Codex is coordinated through the Office of the Codex Contact Point for Canada, located in the Food Directorate, Health Products and Food Branch (HPFB) of Health Canada. The mandate of the HPFB is to help Canadians maintain and improve their health by providing access to safe, high-quality food, human and veterinary drugs, medical devices and other health products. More specifically, it aims at minimising health risk factors to Canadians while maximising the safety provided by the regulatory system for health products and food; and, promoting conditions that enable Canadians to make healthy choices and providing information so that they can make informed decisions about their health. Within the HPFB, the Food Directorate is responsible for establishing policies, setting standards, and providing guidance and information on the safety and nutritional value of food.

Canadians' eating patterns contribute to the high incidence of diet-related chronic diseases and conditions in the country, including coronary heart disease, diabetes, osteoporosis, obesity and cancer, which result in premature death and disability for many people each year. Thus, the Food Directorate has for a number of years been taking actions to achieve these aims through policies, guidelines and regulations governing food labelling and food composition. The Food Directorate's initiatives in the areas of labelling (nutrition labelling, nutrition and health claims) and food composition (reducing *trans* fat and sodium levels) are all intended to enable Canadians to make food choices that are consistent with healthy eating. These initiatives include regulatory actions, e.g. nutrition labelling and nutrition and health claims, as well as national leadership in working with key stakeholders from the health sector and the food industry, e.g. with regard to *trans* fat and sodium reductions in the food supply. These initiatives are all relevant examples of the range of activities that address the implementation of the recommendations of the DPAS.

13.4.2 Canadian actions on nutrition labelling and claims

The nutrition information mandated by the nutrition labelling regulations, combined with education on its use, offer a significant public health opportunity to improve the nutritional health and well-being of Canadians.

In 1996, Canada's national plan of action for nutrition, *Nutrition for Health: An Agenda for Action* (Joint Steering Committee 1996), identified key strategies to reduce health risks to Canadians. Food was recognised as an important environmental influence on nutritional health and well-being. The report noted that dietary practices, which assist in reducing the risk of developing chronic diseases, would be strengthened if food were labelled to facilitate informed choice. Food label information, its availability and consumer understanding all contribute to the individual's capacity to adopt eating habits that reduce health risks. Improving the usefulness of nutrition labelling, increasing its availability and broadening public education on its use were some of the key actions identified.

The Food Directorate undertook a Nutrition Labelling Policy Review in 1998, and on 19 October 2000, the Minister of Health announced that the Government of Canada would be issuing new regulations that would make nutrition labelling mandatory on virtually all prepackaged foods.

To help consumers make food choices that will enhance health and reduce risk of chronic disease, a hierarchy of information about nutrition was developed:

(i) Nutrition Labelling: a mandatory 'Nutrition Facts' table on most prepackaged foods, including declaration of energy and 13 core nutrients (see Figure 13.1);
(ii) Nutrient Content Claims: updated criteria and requirements supported by science; and
(iii) Health Claims: conditions and criteria for a number of disease risk reduction health claims, authorising their use for the first time in Canada.

In January 2003, Health Canada published amendments to the *Food and Drug Regulations* that made nutrition labelling mandatory on most prepackaged foods, defined over 40 nutrient content claims and made provision, for the first

Nutrition facts
Per 1 cup (264 g)

Amount	% Daily value
Calories 260	
Fat 13 g	**20%**
Saturated fat 3 g + Trans fat 2 g	**25%**
Cholesterol 30 mg	
Sodium 660 mg	**28%**
Carbohydrate 31 g	**10%**
Fibre 0 g	**0%**
Sugars 5 g	
Protein 5 g	
Vitamin A 4% • Vitamin C 2%	
Calcium 15% • Iron 4%	

Figure 13.1 The Canadian Nutrition Facts table. *Source*: Adapted from Health Canada (2004). http://www.hc-sc.gc.ca/fn-an/label-etiquet/nutrition/cons/cr_tearsheet-cr_fiche-eng.php.

time, for the use of five disease risk reduction health claims (Health Canada 2003).

Nutrition labelling

Objectives of nutrition labelling
The objectives of the regulations on nutrition labelling are:

(i) To enable consumers to make appropriate food choices in relation to reducing the risk of developing chronic diseases and permitting dietary management of chronic diseases of public health significance;
(ii) To encourage the availability of foods with compositional characteristics that contribute to diets that reduce the risk of developing chronic diseases;
(iii) To advance compatibility with the US system and further work towards mutual acceptance by Canada and the United States of their respective nutrition labelling requirements; and
(iv) To provide a system for conveying information about the nutrient content of food in a standardised format which allows for comparison among foods and prevents consumers' confusion in respect of the nutrient value and composition of a food at point of purchase.

Description of the nutrition labelling regulations
Core list and optional nutrients
The *Food and Drug Regulations* require the mandatory declaration of energy value (calories) and 13 core nutrients (fat, saturated fat, *trans* fat, cholesterol, sodium, carbohydrate, fibre, sugars, protein, vitamin A, vitamin C, calcium and iron) presented in the Nutrition Facts table. The Regulations address the method for expressing the energy value and nutrients and the format of the table.

In addition to the core list, other specified nutrients may be declared in the Nutrition Facts table. A declaration of any one of the three groups of fatty acids, monounsaturates, omega-6 or omega-3 polyunsaturates, triggers the declaration of all three. The declaration of total polyunsaturates is only permitted if followed by a declaration of omega-6 and omega-3 polyunsaturates. Any vitamin or mineral nutrient added to the food must be declared, as must any nutrient that is the subject of a claim. Nutrients not specified for mandatory or optional inclusion in the table may be declared elsewhere on the label.

Format requirements
The Regulations require that the Nutrition Facts table has a standardised format that is consistent from label to label, and is legible and readable. Format requirements were intended to ensure that consumers are able to easily find and effectively use the Nutrition Facts table to make food choices. Consultations with literacy experts, consumer advocates and the design and packaging industry confirmed that

when different designs are used, consumers have difficulty finding and understanding the information.

Foods subject to nutrition labelling requirements
In general, the nutrition labelling requirements apply to prepackaged foods. Therefore, foods prepared in restaurants or other food service establishments for immediate consumption are excluded from the scope of the regulations pertaining to nutrition labelling.

A number of categories of prepackaged foods are specifically exempted from these requirements. The exemptions from nutrition labelling and the extended transitional period were intended to alleviate the impact on small businesses and assist such enterprises in complying with the regulations.

Nutrient content claims

Objectives for nutrient content claims
The *Food and Drug Regulations* aim to ensure that nutrient content claims for foods:

(i) enable consumers to make informed dietary choices in order to prevent injury to health;
(ii) are consistent and not deceptive;
(iii) are based on recognised health and scientific criteria; and
(iv) take into account economic and trade considerations where possible and when not in conflict with health and safety criteria.

Description of the nutrient content claims regulations
The requirements pertaining to nutrient content claims apply to all foods, prepackaged and non-prepackaged, whether sold to the trade, at retail or at restaurants and other food service establishments. These requirements define a list of nutrient content claims, regulate their compositional criteria and set out specific labelling requirements for their use.

The compositional criteria for nutrient content claims are based on regulated standardised reference amounts for foods as well as servings of stated size. The reference amounts are derived from the average quantities of foods consumed at single eating occasions. Their use ensures a uniform basis for claims for any specific category of food. A nutrient content claim is more credible and accurate when based on a reference amount that consumers most frequently purchase and consume.

Health claims

Objectives for disease risk reduction health claims
The *Food and Drug Regulations* aim to ensure that disease risk reduction health claims:

(i) are useful to consumers in making informed choices to prevent injury to health by reducing the risk of developing chronic diseases;
(ii) are consistent and not deceptive;
(iii) are based on recognised health and scientific criteria; and
(iv) describe the characteristics of a diet associated with reduced risk of developing the chronic disease identified in the health claim.

Description of regulations for disease risk reduction health claims
The *Food and Drug Regulations* currently permit five disease risk reduction health claims on foods. The Regulations set out the prescribed wording for the permitted claims as well as conditions for foods to carry the claims to ensure that they are consistent and not deceptive. The permitted claims pertain to:

(i) sodium, potassium and hypertension;
(ii) calcium, vitamin D and osteoporosis;
(iii) saturated fat, *trans* fat and heart disease;
(iv) vegetables and fruit and some types of cancer; and
(v) dental caries for chewing gum, hard candy and breath-freshening products that contain a minimal amount of fermentable carbohydrates.

A further two claims related to dietary fibre and the reduction of risk of heart disease, and dietary folate and the reduction of risk of neural tube defects were proposed in 2006 and are under consideration.

Expected impact of nutrition labelling on health costs

Health Canada estimated that nutrition labelling could save $6.3 billion over the next 20 years in direct and indirect health costs. This includes the costs of treating certain cancers, diabetes, coronary heart disease and stroke, as well as the broader economic cost associated with loss of productivity. On the other side, the cost of labelling to the food industry was estimated at about $350 million in one-time costs.

Future work in nutrition labelling and nutrition and health claims

Health Canada is monitoring the use of nutrition labelling to ensure it is achieving its desired objectives. In addition, Health Canada is currently engaged in several initiatives related to extended nutrition labelling as well as health claims.

Labelling of fresh meats, seafood and poultry
A significant proportion of the meat sold in Canada is required to carry nutrition labelling; for example, all cured products such as hams and bacon, all seasoned meats and all ground meats must be labelled. However, at this time, raw, single ingredient, unground meats, meat by-products, poultry meats, poultry meat by-products, and marine and fresh water animal products are exempted from the requirement for a Nutrition Facts table on their labels. This is because of the lack

of representative data on their nutrient composition that takes into account sources of variability including season and feed. Mandating the provision of inaccurate information to consumers would undermine the credibility of the nutrition labelling programme. In addition, since a significant proportion of meat cuts are prepared at the retail level, this may result in differences in grade and trim levels which would be difficult to accurately reflect in the nutrition facts table. However, since nutrition labelling is mandated on comparable products such as raw seasoned meats, it is expected that major cuts of raw single ingredient meat and poultry meat that are packaged in plants will be voluntarily labelled once satisfactory data is available. Health Canada will continue to encourage the industry's efforts to provide nutrient information on a voluntary basis.

Labelling of restaurant foods

There are many challenges with the provision of nutrition information on foods sold in restaurants and other food service establishments. Nutrition labelling is only feasible when foods are produced to standardised specifications, i.e. using standardised recipes, ingredients and strict instructions regarding measurement of ingredients. This is not the situation in most restaurants or in much of the food service industry, and is even more difficult for restaurants which offer daily menus or change their ingredients according to market price and availability. Due to the variability of these products, foods sold in restaurants have been exempted from mandatory nutrition labelling.

Nevertheless, Health Canada is encouraging the restaurant industry to provide nutrition information to consumers. In February 2005, the Canadian Restaurant and Foodservices Association (CRFA) launched voluntary guidelines (CRFA 2005) for providing nutrition information to consumers as a concrete signal that Canadian restaurant chains are committed to providing nutrition information to consumers. This voluntary programme provides consumers with nutrient values that are consistent with the core nutritional label information required for packaged goods and includes, in the same order, calories, fat (saturated, *trans* fat), cholesterol, sodium, carbohydrates (fibre, sugar) and protein content of standard menu items. The CRFA guidelines state that nutrition information should be made readily available to restaurant consumers through in-store brochures or pamphlets, and that the availability of the nutrition brochure will be prominently displayed on menus, menu boards, and such vehicles as take-out and home delivery packaging. Since the February 2005 launch of the CFRA nutrition information programme, more than 25 restaurant chains, representing 40% of all chain establishments, have committed to implementing these guidelines. Many of these chains have completed this process and are already providing nutrition information to their customers.

Health claims modernisation

To improve the current health claim authorisation process, Health Canada launched a consultation in November 2007 on how best to permit appropriately justified claims for foods that support informed consumer choice. The goal of the review

is to develop a revised framework that will support informed consumer choice by allowing foods with proven health benefits to be marketed with substantiated claims, while continuing to protect consumers from misleading and unsubstantiated health claims and supporting conditions for a fair and competitive market environment. The consultations will also begin to examine 'front-of-package' labelling in a Canadian context.

This type of extensive experience with nutrition labelling in Canada, as well as in other countries, is an important means of aiding Codex in its consideration of labelling issues related to the implementation of the recommendations of the DPAS.

13.4.3 Canadian actions on food composition to reduce intakes of *trans* fat and sodium

Canada has commenced work on several initiatives aimed at reducing levels of *trans* fat and sodium in the Canadian food supply, work which addresses some of the DPAS recommendations to 'limit energy intake from total fats and shift fat consumption away from saturated fats to unsaturated fats and towards the elimination of *trans*-fatty acids' as well to 'limit salt (sodium) consumption from all sources and ensure that salt is iodized'. Details of activities to address *trans* fat and sodium are addressed in the following section. At this point in time, neither sodium nor *trans* fats are included in the list of nutrients to be declared in Section 3 – Nutrient Declaration in the *Codex Gudelines on Nutrition Labelling*

Trans fat

Trans fat or *trans*-fatty acids are formed during the partial hydrogenation of unsaturated fats. Vegetable oils which contain high levels of polyunsaturated and monounsaturated fatty acids are hydrogenated to increase their stability and to raise their melting point so they are solid or semi-solid at room temperature. Partially hydrogenated oils are used to make processing, baking and frying shortenings and margarines, all of which are solid at room temperature. *Trans* fats are also found naturally at low levels in some animal-based foods.

Consumption of either saturated or *trans* fat raises the blood levels of the so-called 'bad' cholesterol (serum LDL-cholesterol) which is a risk factor for heart disease. In the 1990s, research confirmed that, in addition to raising 'bad' cholesterol, *trans* fat also reduces the blood levels of the so-called 'good' cholesterol (HDL-cholesterol) which protects against heart disease. On the other hand, dietary saturated fatty acids, an established risk factor for coronary heart disease, raise both LDL-cholesterol and HDL-cholesterol. It has, therefore, been concluded that dietary *trans*-fatty acids pose a greater risk to health than saturated fatty acids.

In 2002, the Panel on Macronutrients of the US National Academies' Institute of Medicine recommended that *trans* fat consumption be as low as possible while

ensuring a nutritionally adequate diet (IOM 2005). The Panel members did not set a safe upper limit because the evidence suggests that any rise in *trans* fat intake increases coronary heart disease risk. They also acknowledged that *trans* fats are unavoidable in ordinary diets. Subsequently, in 2003, the WHO advised that *trans* fat intake be limited to less than 1% of overall energy intake – a limit regarded by that body as a practical level of intake consistent with public health goals (WHO/FAO 2003).

Health Canada has pursued a multi-faceted approach, including labelling and consumer awareness, to reducing *trans* fat in Canadian foods. Canada was the first country to introduce mandatory nutrition labelling which included *trans* fats on the labels of prepackaged foods. This mandatory labelling became effective for most manufacturers in December 2005 (businesses with less than $1 million in annual sales had until December 2007 to comply). It was envisioned that the provision of nutrition information, together with consumer education, would result in consumers making food choices aimed at decreasing their intake of *trans* fat. The requirement to declare *trans* fat content was also intended to act as an incentive for the food industry to decrease the *trans* fat content of foods.

Since the mid-1990s, the *trans* fat intake of Canadians has decreased, from an average of 8.3 to 5 g per person per day in 2005. Nevertheless, this is still above the current recommendations of the WHO and the American Heart Association of 2 to 2.7 g per person per day. This amount is also high compared to Europe and somewhat higher than in the United States. The high intake is due to the widespread use of canola and soya bean oils, which are hydrogenated for use in shortenings and some margarines.

On 18 November 2004, following a debate on *trans* fats in the House of Commons of the Canadian Parliament, Health Canada announced that, in conjunction with the Heart and Stroke Foundation of Canada, it would work through a multi-stakeholder Task Force to develop recommendations and strategies for reducing *trans* fats in Canadian foods to the lowest levels possible. The Task Force included members with recognised expertise in subjects relevant to the issue of *trans* fat (food science and technology of oils; market considerations; and health risk assessment, management and communication).

The final report of the Trans Fats Task Force was released on 28 June 2006 (Health Canada 2006). The Task Force recommended limiting the total amount of *trans* fat in foods by regulation. The limit was set at 2% of total fat content for all vegetable oils and soft, spreadable (tub-type) margarines sold at retail including restaurants and food service establishments. For all other foods sold at retail, the limit was set at 5%. As the Task Force was asked to focus primarily on industrially produced *trans* fat, this limit would not apply to food products for which the fat originates *exclusively* from ruminant meat or dairy products. The Task Force recommended a regulatory approach because it would be applicable to the restaurant and food service industry and in-store bakeries, which are not subject to the nutrition labelling regulations. In addition, the Task Force considered it unlikely that manufacturers would make the transition without a regulatory limit on products where there was a risk of negative economic impact, particularly on products

with a lower margin of profit, or for products where taste, cost and convenience are more important marketing features than nutritional characteristics. The Task Force also recommended that the Government of Canada and all concerned food industry associations urge companies affected to use the most healthful oils for their food applications and provided a list of healthier alternatives to *trans* fats for a variety of food applications in the report (Appendix 14 of the Task Force report).

On 20 June 2007, the then Health Minister Tony Clement announced that Health Canada was adopting the Trans Fat Task Force's recommendation to limit the amount of *trans* fats in foods (Health Canada 2007c). The Department would use these limits as the standard for assessing industry's performance during the next 2 years. Health Canada has been and will continue to monitor the *trans* fat content of the Canadian food supply. He also stated that if significant progress is not made within 2 years in decreasing the *trans* fat in foods, Health Canada will propose regulatory amendments to ensure that the limits recommended by the Trans Fat Task Force are met. In addition, the new *Canada's Food Guide* (2007) now includes information on the importance of limiting *trans* fats and saturated fat in the diet (Health Canada 2007a).

Information to date from the Trans Fat Monitoring Program (Health Canada 2009) indicates that more and more food companies and fast-food restaurants are already taking action. Studies carried out by Health Canada over the past 4 years (2004–2005 to 2008) have shown that most of the major food manufacturers have successfully switched from using partially hydrogenated oils to non-hydrogenated oils (i.e. no *trans* fats) in the preparation of food products. Some of the food products that contain no-*trans* (or very little *trans*) include soft margarines, granola bars, cookies, crackers, snack popcorn, potato chips and corn chips. Although some fast-food restaurants were slow to eliminate *trans* cooking oils, the momentum against *trans* fats has continued to grow with most major multinational fast-food restaurants announcing their switch to no *trans* fat cooking oils. Recent monitoring data from Health Canada laboratories also indicate that in many instances manufacturers are choosing to replace *trans* fats with the healthier alternatives suggested by the Task Force, thereby significantly reducing saturated fats as well.

Thus, it is now possible for educated, health-conscious Canadians to consume a diet that is low in trans and saturated fats. Nevertheless, this will continue to be a challenge for the many Canadians with lower literacy skills or when the information is not readily available to consumers (for example, in restaurants and food services). However, as the reformulation by the food industry to remove *trans* fats continues, this may become less of an issue once *trans* have been virtually eliminated from nearly all foods sold to Canadians.

Sodium

A number of labelling provisions as well as additions to *Canada's Food Guide* have been introduced recently in Canada to help support reducing the sodium intake of Canadians and can serve as a basis for Codex discussions on sodium.

High blood pressure (hypertension) is one of the most important risk factors (second only to tobacco) for cardiovascular diseases, which are the number one cause of death for Canadians. It has been shown that blood pressure rises with increased sodium intake in the general population and that reduced sodium intake decreases blood pressure. The Institute of Medicine (IOM) of the National Academies in their 2004 report on dietary reference intakes for electrolytes including sodium, established adequate intakes for sodium for people aged 1 year and over, ranging from 1,000 mg/day to 1,500 mg/day. In this report, they also concluded that sodium intake of people aged 14 and over should not exceed 2,300 mg/day (tolerable upper intake level – UL). The IOM set the UL for sodium based on the increased risk of higher blood pressure with increased sodium intake (IOM 2004).

According to the Canadian Community Health Survey (CCHS 2.2), conducted in 2004 (Statistics Canada 2007), it is estimated that among people over the age of 19 in Canada, over 85% of men and 60% of women had sodium intakes exceeding the UL for sodium established by the IOM. Similar high intakes are seen in young children and adolescents: more than 90% of children aged 4–8 and 97% of adolescent boys and more than 80% of adolescent girls exceed the UL for sodium (Statistics Canada 2007).

Health Canada is committed to helping Canadians reduce dietary sodium intake. The most recent Canadian food guide *Eating Well with Canada's Food Guide* (Health Canada 2007a) now makes specific recommendations for Canadians to choose foods lower in salt. Sodium is also one of the core nutrients which must always appear in the Nutrition Facts table, which has been mandatory on most prepackaged foods since December 2005. Sodium is declared in the Nutrition Facts table in milligrams (mg) and as a per cent of daily value (%DV) per serving of a food. The %DV allows a quick and easy evaluation of whether the food is relatively high or low in sodium. In addition to the Nutrition Facts table, manufacturers may use nutrient content claims such as 'sodium-free', 'low in sodium', 'reduced in sodium' or 'salt-free', for which nutrient content criteria for each claim are defined in the *Food and Drug Regulations*. In addition, the health claim that relates a healthy diet containing foods high in potassium and low in sodium with reduced risk of high blood pressure, if the food product meets the criteria for sodium content for such claims is set out in the *Food and Drug Regulations*. These claims encourage industry to formulate lower sodium foods and help consumers to identify them.

Although it is possible to achieve a sodium intake lower than the UL of 2,300 mg/day by using the information provided on food labels in the Nutrition Facts table, it is recognised that the high sodium content in processed food products and food service products can make it very difficult for individual Canadians to decrease their daily sodium intake to levels that are recommended.

To further help Canadians reduce sodium intakes, Health Canada announced the creation of a multi-stakeholder Working Group to develop and oversee the implementation of a strategy to reduce sodium in the diets of Canadians (Health Canada 2007b). Since the main contributors to dietary sodium intake in the modern-day diets of Canadians are commercially prepared foods, the terms of reference of the Working Group calls for a major focus of interventions to be on the

reduction/removal of sodium from these foods. They also call for the development of educational efforts to increase public awareness on the need to control sodium and salt intakes. There was consensus that it was time for action to reduce sodium levels in foods and all parties were committed to a collaborative action with Health Canada leadership. The Sodium Working Group commenced their work early in 2008. Details of the terms of reference and progress can be found on the Health Canada website at http://www.hc-sc.gc.ca/fn-an/nutrition/sodium/index-eng.php.

13.5 Conclusions

A number of activities are currently underway in the Codex Alimentarius Commission and the CCNFSDU and CCFL to address the DPAS and thus promote healthy foods and diets worldwide. Codex is viewed by its member states and international non-governmental organisations to be an appropriate mechanism to promote healthier diets worldwide through its role in setting standards and guidelines on labelling, including nutrition labelling and, to a lesser extent, food composition. In other areas related to healthy dietary patterns of eating, the Codex Alimentarius is less applicable because its standards and other texts apply to foods, not diets more generally.

The experience of countries – like Canada – which have developed extensive mandatory nutrition labelling regulations and have undertaken efforts at a national level to reduce substances, such as saturated and *trans* fats and sodium in foods as well as their intake, could be used as a basis for discussion. These countries could play leadership roles in helping Codex develop Guidelines and Standards that can serve as the basis of national programmes elsewhere and together contribute to reducing diet-related chronic disease globally.

References

Canadian Restaurant and Foodservices Association (2005). *Nutrition Information Program*. Canadian Restaurant and Foodservices Association, Toronto, Canada. Retrieved 15 July 2008 from http://www.crfa.ca/news/bytopic/nutritionandfitness/nutritioninformationprogram.asp.

Food and Agriculture Organization/World Health Organization (FAO/WHO) (2002). *Report of the Evaluation of the Codex Alimentarius and other FAO and WHO Food Standards Work*. Food and Agriculture Organization of the United Nations and World Health Organization, Rome, Geneva. Retrieved 12 March 2009 from http://www.fao.org/docrep/meeting/005/y7871e/y7871e00.htm.

Food and Agriculture Organization/World Health Organization (FAO/WHO) (2006). *e-Forum: Implementation of the Global Strategy on Diet, Physical Activity and Health: Role of Codex Alimentarius Committees*. Food and Agriculture Organization of the United Nations and World Health Organization, Rome, Geneva. Retrieved 3 July 2008 from www.who.int/nutrition/FAOWHO_eforum/en/index.html.

Health Canada (2003). *Nutrition Labelling and Claims*. Health Canada, Ottawa, Canada. Retrieved 15 July 2008 from http://hc-sc.gc.ca/fn-an/label-etiquet/nutrition/reg/index_e.html.

Health Canada (2004). *Compendium of Templates for 'Nutrition Facts.'* Available upon request from the CFIA: http://www.inspection.gc.ca/english/fssa/labeti/nutrikit/sectkae.shtml#k8.

Health Canada (2007a). *Eating Well with Canada's Food Guide*. Health Canada, Ottawa, Canada. Retrieved 15 July 2008 from http://hc-sc.gc.ca/fn-an/food-guide-aliment/index_e.html.

Health Canada (2007b). *The Issue of Sodium*. Health Canada, Ottawa, Canada. Retrieved 5 August 2008 from http://www.hc-sc.gc.ca/fn-an/nutrition/sodium/index-eng.php.

Health Canada (2007c). *Canada's New Government Calls on Industry to Adopt Limits for Trans Fat*. News Release. Health Canada, Ottawa, Canada. Retrieved 5 August 2008 from http://www.hc-sc.gc.ca/ahc-asc/media/nr-cp/_2007/2007_74-eng.php.

Health Canada (2009). *Trans Fat Monitoring Program*. Health Canada, Ottawa, Canada. Retrieved 12 March 2009 from http://www.hc-sc.gc.ca/fn-an/nutrition/gras-trans-fats/tfa-age_tc-tm-eng.php.

Health Canada, Trans Fat Task Force (2006). *TRANSforming the Food Supply – Report of the Trans Fat Task Force*. Submitted to the Minister of Health, June 2006. Minister of Health, Ottawa, Canada. Retrieved 15 July 2008 from http://www.hc-sc.gc.ca/fn-an/nutrition/gras-trans-fats/tf-ge/tf-gt_rep-rap_e.html.

Institute of Medicine (2004). *Dietary Reference Intakes for Water, Potassium, Sodium, Chloride, and Sulfate*. National Academies Press, Washington, DC. Retrieved 15 July 2008 from http://books.nap.edu/catalog.php?record_id=10925.

Institute of Medicine (2005). *Dietary Reference Intakes for Energy, Carbohydrate, Fiber, Fat, Fatty Acids, Cholesterol, Protein, and Amino Acids (Macronutrients)*. National Academies Press, Washington, DC. Retrieved 15 July 2008 from http://www.nap.edu/catalog.php?record_id=10490.

Joint FAO/WHO Food Standards Programme. Codex Alimentarius Commission (1985). *General Standard for the Labelling of Prepackaged Foods* (Codex Stan 1, 1985). Food and Agriculture Organization of the United Nations and World Health Organization, Rome, Geneva. Retrieved 22 February 2009 from http://www.codexalimentarius.net/web/index_en.jsp.

Joint FAO/WHO Food Standards Programme. Codex Alimentarius Commission (1985). *Guidelines on Nutrition Labelling* (CAC/GL 2, 1985). Food and Agriculture Organization of the United Nations and World Health Organization, Rome, Geneva. Retrieved 22 February 2009 from http://www.codexalimentarius.net/web/index_en.jsp.

Joint FAO/WHO Food Standards Programme. Codex Alimentarius Commission (1993). *Procedural Manual*, 8th edn. Food and Agriculture Organization of the United Nations and World Health Organization, Rome, Geneva.

Joint FAO/WHO Food Standards Programme. Codex Alimentarius Commission (1997). *Guidelines for Use of Nutrition and Health Claims* (CAC/GL 23, 1997). Food and Agriculture Organization of the United Nations and World Health Organization, Rome, Geneva. Retrieved 22 February 2009 from http://www.codexalimentarius.net/web/index_en.jsp.

Joint FAO/WHO Food Standards Programme. Codex Alimentarius Commission (1999). *General Standard for the Use of Dairy Terms* (Codex Stan 206, 1999). Food and Agriculture Organization of the United Nations and World Health Organization, Rome, Geneva. Retrieved 22 February 2009 from http://www.codexalimentarius.net/web/index_en.jsp.

Joint FAO/WHO Food Standards Programme. Codex Alimentarius Commission (2005). *Report of the 28th session*, ALINORM 05/28/41.

Joint FAO/WHO Food Standards Programme. Codex Alimentarius Commission (2006a). *Conference Room Document, 29th session*, CAC/29-LIM 6.

Joint FAO/WHO Food Standards Programme. Codex Alimentarius Commission (2006b). *Circular Letter*, CL 2006/44-CAC.

Joint FAO/WHO Food Standards Programme. Codex Alimentarius Commission (2007). *Procedural Manual*, 17th edn. Food and Agriculture Organization of the United Nations and World Health Organization, Rome, Geneva. ftp://ftp.fao.org/codex/Publications/ProcManuals/Manual_17e.pdf. Retrieved 6 August 2009.

Joint FAO/WHO Food Standards Programme. Codex Alimentarius Commission (2008). Report of the 31st session, ALINORM 08/31/REP.

Joint FAO/WHO Food Standards Programme. Codex Committee on Food Labelling (2006a). Agenda paper 34th session, CX/FL 06/34/2-Add 1.

Joint FAO/WHO Food Standards Programme. Codex Committee on Food Labelling (2006b). Report of the 34th session, ALINORM 06/29/22.

Joint FAO/WHO Food Standards Programme. Codex Committee on Food Labelling (2006c). Report of the 34th session, ALINORM 06/29/22, Appendix VI.
Joint FAO/WHO Food Standards Programme. Codex Committee on Food Labelling (2007). Report of the 35th session, ALINORM 07/30/22.
Joint FAO/WHO Food Standards Programme. Codex Committee on Food Labelling (2008a). Report of the 36th session, ALINORM 08/31/22.
Joint FAO/WHO Food Standards Programme. Codex Committee on Food Labelling (2008b). Report of the 36th session, ALINORM 08/31/22, Appendix IX. (Appears as the second Appendix VIII in the ALINORM).
Joint FAO/WHO Food Standards Programme. Codex Committee on Nutrition and Foods for Special Dietary Uses (2005a). Agenda paper 27th session, CX/NFSDU 05/27/2-Add 1.
Joint FAO/WHO Food Standards Programme. Codex Committee on Nutrition and Foods for Special Dietary Uses (2005b). Report of the 27th session, ALINORM 06/29/26.
Joint FAO/WHO Food Standards Programme. Codex Committee on Nutrition and Foods for Special Dietary Uses (2006). Report of the 28th session, ALINORM 07/30/26-Rev.
Joint FAO/WHO Food Standards Programme. Codex Committee on Nutrition and Foods for Special Dietary Uses (2007a). Report of the 29th session, ALINORM 08/31/26.
Joint FAO/WHO Food Standards Programme. Codex Committee on Nutrition and Foods for Special Dietary Uses (2007b). Report of the 29th session, ALINORM 08/31/26, Appendix VII.
Joint FAO/WHO Food Standards Programme. Codex Committee on Nutrition and Foods for Special Dietary Uses (2008). Report of the 30th session, ALINORM 09/32/26.
Joint FAO/WHO Food Standards Programme. Codex Executive Committee (2005). Report of the 55th session, ALINORM 05/28/3.
Joint FAO/WHO Food Standards Programme. Secretariat of the Codex Alimentarius Commission (2007). *Understanding the Codex Alimentarius*. Food and Agriculture Organization of the United Nations and World Health Organization, Rome, Geneva. Retrieved 15 July 2008 from ftp://ftp.fao.org/codex/Publications/understanding/Understanding_EN.pdf.
Joint Steering Committee Responsible for the Development of a National Nutrition Plan for Canada (1996). *Nutrition for Health: An Agenda for Action*. Minister of Health, Ottawa, Canada. Retrieved 15 October 2008 from http://hc-sc.gc.ca/fn-an/nutrition/pol/nutrition_health_agenda-nutrition_virage_sante_e.html.
Statistics Canada (2007). *Health Reports* **2**, 47–52. Retrieved 15 July 2008 from http://www.statcan.ca/ english/freepub/82–003-XIE/82–003-XIE2006006.pdf.
World Health Organization (2002). *World Health Report 2002: Reducing Risks, Promoting Healthy Life*. World Health Organization, Geneva, Switzerland. Retrieved 15 July 2008 from http:// www.int/whr/2002.
World Health Organization (2004). *Global Strategy on Diet, Physical Activity and Health*. World Health Organization, Geneva, Switzerland. Retrieved 15 July 2008 from http://www.who.int/dietphysicalactivity/en/.
World Health Organization/Food and Agriculture Organization (2003). *Diet, Nutrition and the Prevention of Chronic Diseases*. WHO Technical Series Report 916. World Health Organization, Geneva, Switzerland. Retrieved 15 July 2008 from http://www.who.int/nutrition/topics/dietnutrition_and_chronicdiseases/en/index.html.

14 Agricultural Trade Policy Instruments to Promote Healthy Diets in Developing Countries: An Assessment of the Opportunities within the Framework of the WTO Agreement on Agriculture and the Doha Development Agenda

Vincent J. Atkins

14.1 Introduction

In their Global Strategy on Diet, Physical Activity and Health, the World Health Organization (WHO) recommended that 'national food and agricultural policies should be consistent with the protection and promotion of public health. . . . Governments should be encouraged to examine food and agricultural policies for potential health effects on the food supply' (WHO 2007: paragraph 41). Thus far, however, the use of agricultural policies as a tool to help promote healthy diets and reduce the global epidemic of obesity and chronic diseases is not widespread.

One of the most important influences on national agricultural policies over the past decade has been the WTO Agreement on Agriculture (AoA). The AoA emerged from the Uruguay Round of negotiations of the General Agreement on Tariffs and Trade (GATT), which concluded in 1994.[1] Until then, national agricultural policies, with few exceptions, remained outside the purview of multilateral trade negotiations. As a result, average tariff levels tended to be considerably higher for agricultural goods than non-agricultural goods, the sector benefited from large subsidies from governments (domestic support), and export subsidies, though abolished for non-agricultural products, were permitted under certain conditions. These policies were used particularly extensively in developed countries.

The AoA, which became operational from 1 January 1995, sought to correct the distortions created by these unilateral interventionist policies in developed countries. It had the objective of achieving greater liberalisation of agricultural trade and bringing all measures affecting import access and export competition under

[1] The chapter makes extensive use of trade-related terms, which are all defined in the Glossary.

strengthened and more operationally effective GATT rules and disciplines (WTO 2007). Specifically, it aimed to promote greater competition in global agricultural markets by increasing disciplines on the use of direct and indirect subsidies, and other measures affecting directly or indirectly agricultural trade. The AoA has not been altered since its inception, but agriculture is again being negotiated as part of the Doha Development Round of trade talks at the WTO.

The AoA has been critically examined in terms of its effects on reducing distortions in global agricultural trade and on the ability of governments in developing countries to implement agricultural policies in the national interest. Governments in several developing countries as well as a number of non-government organisations (NGOs) have stated that the AoA restricts the ability of governments to nurture their domestic agricultural sectors and implement agricultural policies to alleviate poverty, reduce unemployment and maintain rural livelihoods (Murphy 2002). Others have argued that the AoA does not significantly restrict the ability of developing countries to support their agricultural sectors, since the low levels of domestic support and export subsidies in these countries ensured that the obligations have no significant effect, and that they were granted flexibilities in market access far exceeding their need for tariff protection (IFPRI 2008). Reforms to the AoA are being pursued under the current round of trade negotiations, the Doha Development Agenda (DDA), with a focus on advancing the needs and interests of developing countries.

This chapter examines the degree to which the AoA provides the scope for national policy action, but with a differing perspective: whether the AoA and the DDA reform proposals provide scope for national agricultural policies to be used to encourage consumption of healthy diets and discourage consumption of unhealthy diets, thereby helping to prevent and control obesity and diet-related chronic diseases. It posits that agricultural measures can help in this regard by affecting food availability, price and accessibility, and the income of rural households heavily dependent on agriculture. The chapter identifies specific measures within agricultural trade policy that could be applied within the scope of the AoA and DDA reform proposals to promote healthy diets.

The analysis contained in this chapter was carried out in the context of the Caribbean. In September 2007, the Heads of Government of the Caribbean Community (CARICOM), a regional integration organisation, convened a special summit on chronic diseases during which they agreed that regional governments should utilise flexibilities in the external trade agreements to promote policies which encourage the production and consumption of healthy foods. This chapter thus identifies some of the key agricultural policy instruments which Caribbean countries may utilise in their efforts to control and prevent chronic diseases while maintaining compliance with WTO rules. The chapter first sets out the provisions contained within the AoA.

14.2 Provisions within the AoA and DDA reform proposal

The AoA introduced disciplines in three main areas, namely (i) market access – which deals with the various trade restrictions to imports; (ii) domestic

support – which deals with the subsidies and other programmes under which governments provide assistance to agriculture, including guaranteed prices and farmers' incomes; and (iii) export competition – which deals with measures used to make exports more competitive than they would have been otherwise.

14.2.1 Market access commitments in the AoA

The disciplines introduced in the area of market access required both developed and developing countries to undertake the same types of actions but granted developing countries the flexibility to implement lower levels of concessions over a longer period of time. This flexibility was part of the special and differential treatment (S&DT) provisions granted in the AoA to developing countries.

The Agreement required all WTO members to convert their non-tariff measures, such as import quotas, voluntary export restraints and other quantitative restrictions, into their tariff equivalent, a practice referred to as 'tariffication' (in many instances, countries converted these non-tariff measures into tariff levels which provided a far higher level of protection than the measures which they replaced, a practice called 'dirty tariffication'). Once having 'tariffied', developed countries were required to reduce their tariffs on agricultural products by a simple average of 36% over a period of 6 years, with a minimum cut of 15% on each tariff line. It is worth noting that the obligation was to reduce the average level of tariff by the agreed percentage, once the minimum cut per tariff line was achieved. Thus, a country could undertake the minimum cut on some tariff lines, notably on more sensitive products, and offset this by more significant cuts on less important products, thereby still meeting the tariff reduction obligation without necessarily improving market access for the products of interest to trading partners.

The 'bound tariff rate' represents the highest level of import duty which that country can apply to the product in question. The bound rate of tariff may be exceeded only in very exceptional circumstances, such as when a safeguard is invoked to correct a surge in imports that seriously damage domestic industries or if a developing country experiences an extreme balance of payments problem (GATT 1994: Article XIX).

The AoA required developing countries to reduce their tariffs by an average of 24% over 10 years with a minimum cut of 10% per tariff line. Some developing countries opted to offer 'ceiling bindings' instead of 'tariffying' and reducing tariffs over time. Under that option, developing countries established a maximum tariff at which each tariff line would be bound from the beginning of the agreement. For example, several Caribbean countries bound their agricultural tariffs at 100%, which meant that, as of 1 January 1995, the maximum tariff which could be applied on these products is 100%, a figure which is well above the rate of 40% which is actually applied on most primary agricultural imports in CARICOM. Once a ceiling binding was established, the developing country had no obligation to reduce its 'bound' tariffs from that level. As in the case of developed countries, developing countries had the option of determining the tariff treatment for each tariff line. The

obligation is to ensure that the minimum cut per tariff line is achieved, the average cut is attained or, as in the case of countries choosing ceiling bindings, to ensure that the ceiling binding is not surpassed.

The market access provisions also required countries which tariffied to ensure that the quantities of a product imported before the agreement took effect could continue to be imported and that a minimum quantity of imports was guaranteed at rates of import duty which were not prohibitive. The mechanism used to achieve this was the tariff rate quota, by means of which lower tariff rates (the in-quota tariff) were applied for specified quantities of a product and higher rates (out of quota tariff) for quantities beyond the specified amount.

14.2.2 Domestic support commitments in the AoA

The domestic support measures (subsidies) to the agricultural sector in developed countries, along with export subsidies (described in the next section) are considered to be the most significant cause of distortion in agricultural markets. This is because domestic support to agriculture fuels increases in domestic production beyond domestic demand for those products. In order to maintain high producer prices in the domestic market, the over-supply is disposed of on the world market at prices which are often lower than in the absence of these subsidies, and sometimes at prices even lower than domestic cost of production (a practice known as 'dumping'). The net result of the domestic support measures (and accompanying export subsidies) is to squeeze out imports of agricultural products from lower cost producers by maintaining artificially low prices on world markets, while domestic consumers in the subsidising countries pay an artificially higher price for these products (as discussed by Schmidhuber and Shetty in Chapter 8, this is one effect of the European Unions Common Agricultural Policy). In addition, developed countries sometimes apply high tariffs to ensure that the cheap exports are not re-exported to the subsidising country.

The AoA distinguishes between domestic support measures which directly influence the production and trade of agricultural products and those which do not. Measures that directly influence production levels are termed 'amber box' measures. Under the AoA, these are required to be reduced by 20% over 6 years in the case of developed countries, and by 13% over 10 years for developing countries. The starting point for these reductions was the level of domestic support of the type provided by governments during the period 1986–1988.

Domestic support measures with minimal impact on production and trade are termed 'green box' measures. They can be provided freely once they meet the criteria of being non-trade distorting or minimally trade-distorting. A list of examples of this type of support is contained in an annex to the AoA and includes government services such as research, disease control, infrastructure, certain forms of income support, and public stockholding for food security, assistance to re-structure agriculture and direct payments under environmental and regional assistance programmes. Governments in both developed and developing countries were not

required to make any reduction to these types of support to agriculture. The loose criteria for a 'green box' measure led to a situation in which some countries undertook their WTO obligations to reduce the amount of the support granted under the amber box, while concurrently increasing the amount of support granted under the green box, sometimes using measures whose legitimacy as minimally trade-distorting was considered highly questionable. Consequently, countries succeeded in meeting their obligations under the AoA without any significant decline in the total level of support granted to their agricultural sector.

A third category of support – 'blue box' measures – is used mainly by the EU, but also by the United States and a few other countries. These measures comprise certain direct payments where farmers are required to limit production of certain crops and are not subject to reduction commitments.

Developing countries do have some exemptions to these reduction commitments. As an S&DT measure, Article 6.2 of the AoA allows developing countries to exempt domestic support measures granted under certain government assistance programmes for agricultural and rural development. These measures include investment and agricultural input subsidies to low-income producers in developing countries as well as incentives granted to encourage diversification away from growing illicit narcotic crops. Additionally, developing countries can exempt domestic support granted to the production of specific crops up to 10% of the annual value of production of these crops (product-specific support) and up to 10% of the gross value of agricultural production in any year (non-product specific support). These limits are referred to as the *de minimis* levels of support and comprise domestic support measures otherwise qualifying as trade-distorting and therefore subject to reduction commitments.

14.2.3 Commitments on export competition in the AoA

Export subsidies (payments made to encourage exports) also distort trade. Governments in countries where domestic support is provided often subsidise the cost of exports in order to compete with cheaper exports from non-subsidising (usually developing) countries. These measures are also used to dispose of the surplus generated as a result of domestic support to agriculture. While domestic support measures tend to keep out competing imports from the domestic markets of the countries providing such support and create higher internal prices for consumers, export subsidies tend to depress world market prices and make imports cheaper for countries dependent on food imports. Cheaper world market prices, however, work against the interests of producers in countries in which farmers do not benefit from domestic support, usually poor farmers in developing countries.

Very few countries have the resources to subsidise their agricultural exports. The practice is most widely used on temperate products, mainly in the EU. Their use has resulted in their becoming net exporters of several agricultural products, reversing the trend in which developing countries, on account of their comparative advantages, were largely exporters of primary agricultural produce. As a result, several developing countries face reducing levels of income from agricultural exports and

decimation of their domestic agricultural sectors, while their food import bills have steadily increased. In some instances, however, domestic agro-processing industries benefit from imports of low-cost intermediate inputs, and countries without a viable local agriculture or highly dependent on imports enjoy the benefits of the lower prices of imports resulting from the use of export subsidies.

To reduce the use of export subsidies, the AoA requires WTO members to submit a list of those products to which they grant export subsidies over a representative period and prohibit such subsidies to products not included on the list. WTO members are also required to cut both the amount of money expended on export subsidies as well as the volume of exports that received such subsidies. In the case of developed countries, the requirement was to cut the expenditure on export subsidies by 36% of the 1986–1990 levels over a period of 6 years beginning in 1995. Developing countries were required to reduce expenditure on export subsidies by 24% over 10 years. With respect to the volume of exports which benefited from export subsidies, developed countries were required to reduce the amount by 21% over 6 years while developing countries were given 10 years to reduce those quantities by 14%.

AoA's Article 9.4, as an S&DT measure, allows developing countries, under certain conditions, to use export subsidies to reduce the cost of marketing and transportation of agricultural exports. To do so, they must provide a list to the WTO of products to which they grant export subsidies. The provision allows developing countries to be exempted from reduction commitments with respect to subsidies they provide to their exporters to defray the cost of marketing agricultural products (including handling, upgrading, processing, internal transportation and freight). Such a provision may be utilised to assist agricultural producers to improve the competitiveness of their exports and generate income levels which can encourage them to remain in farming.

14.2.4 Potential changes to the AOA under the DDA for agriculture

The Uruguay Round included a commitment to pursue agricultural trade policy reform though new negotiations. These new negotiations were launched in 2000 as required by Article 20 of the AoA; in 2001, at the fourth Ministerial Conference of the WTO held in Doha, Qatar, WTO member governments agreed to the full scope of the new round of negotiations. The DDA was perceived as an opportunity to more forcefully address the concerns of WTO developing country members, both with respect to the implementation of the existing agreement and the development of new policies. The Doha Ministerial Declaration reconfirmed the long-term objective of the AoA to establish a fair and market-oriented trading system through a programme of fundamental reform. In regards to agriculture, this was defined as substantial improvements in market access, the phasing out all forms of export subsidies and substantial reduction of domestic support.

From then on, the progress was patchy. The Fifth Ministerial Conference of WTO members, held in Cancun, Mexico, in 2003, could not agree on

modalities for commitments. In July 2004, the General Council of the WTO agreed on the 'July 2004 package', which did not state any specifics or targets but provided the framework and structure for future negotiations on the core negotiating issues. Deadlines were set for the completion of the negotiations, first in January 2005, and subsequently in December 2006, but talks were suspended in July 2006 without agreement. Negotiations resumed in early 2007 and, in July of that year, the Chairman of the Special Committee on Agriculture tabled draft proposals on modalities for agriculture, which outlined the major proposals being considered for agricultural reform. These proposals were revised and published in the Chair's Draft of Modalities on Agriculture, first in February of 2008 and in July 2008 (WTO Committee on Agriculture 2008). A mini-ministerial meeting of the WTO (an informal meeting of WTO trade ministers comprising a representative, but less than the full membership of the WTO) was convened in July 2008 with a view to agree on the broad outlines and formulas for tariff reduction and other final commitments to conclude the Doha Round of negotiations. This meeting ended without agreement on these modalities. However, consensus had been achieved, even before the July mini-ministerial meeting, on several proposals for reforms to the AoA, including the proposals discussed in this chapter and outlined in Table 14.2. These proposals are not legally binding and thus are subject to change.

Under the DDA, the reform proposals likewise deal with market access, domestic support and export competition. With regard to market access, there is general agreement for the reduction of tariffs using a tiered formula comprising four bands. Tariff lines occurring in the higher bands will be reduced at a greater rate than tariffs in the lower bands. In the case of developing countries, the cuts in each band will be equivalent to two-thirds the cuts undertaken by developed countries. The starting point for the cuts will be the bound rates of tariff achieved following the Uruguay Round reduction.

Both developed and developing countries will have the option of designating products as sensitive, which will not be subject to the same rate of tariff reduction that would otherwise apply. In addition, developing country members will be able to designate special products on the basis of food or livelihood security and rural development. The precise treatment of these products has yet to be agreed upon but it is expected that they would be either exempted from tariff reduction or, like sensitive products, be subject to lower rates of tariff reduction. Moreover, developing countries will have the flexibility of using a special safeguard mechanism to guard against surges in imports based on price and volume triggers.

Like the provisions in the AoA, the DDA market access reforms would require developing countries to reduce tariff levels. Yet, unlike the AoA which simply required an average cut, the DDA proposals will subject tariff lines to specific cuts depending on the height of the original tariff. Higher tariffs will face higher cuts. However, the reforms grant flexibilities to developing countries which can be used in favour of specific products.

The purpose of the domestic support provisions reforms of the AoA is to substantially reduce trade-distorting support. Yet, the proposals allow for developing countries to continue utilising most of the existing flexibilities available under the

AoA. For example, developing countries which did not undertake commitments on amber box (trade-distorting) measures and which cannot now introduce them, will continue to have access to a *de minimis* level of 10% of the value of agricultural production as well as the flexibilities granted under AoA Article 6.2 with respect to rural development and resource-poor or low-income farmers.

In cases where developing countries have positive domestic support reduction commitments under the AoA, the rate of reduction of overall trade-distorting support is limited to two-thirds the reduction rate for developed countries and will extend over a longer implementation period.

With respect to export competition, WTO members are already required to eliminate all export subsidies granted to agricultural products by the end of 2013. Developing countries are expected to do the same, in equal instalments, in a timeframe to be agreed upon. In accordance with the Hong Kong Ministerial Declaration, made at the sixth meeting of the WTO Ministerial Conference, WTO developing country members will continue to benefit from the provisions of Article 9.4 of the AoA for 5 years after the deadline for the elimination of all forms of export subsidies. This means that developing countries are allowed to provide support to reduce the costs of marketing agricultural exports, including handling, upgrading and other processing costs and the cost of international transport and freight. Developing countries are also allowed to provide support to reduce the costs of internal transport and freight charges on export shipments on terms more favourable than for domestic shipments. The use of such a facility could be beneficial to support the export-oriented farming activities of low-income and other vulnerable groups, and to promote rural development.

14.3 Scope within the AOA and DDA reform proposals for developing countries to modify agricultural policies to promote healthy diets

14.3.1 Overview

The above analysis suggests that the AoA, and the DDA reform proposals, do provide sufficient scope for developing countries to implement agricultural policies with the aim of promoting healthy diets. Tables 14.1 and 14.2 summarise the principal measures and flexibilities available to developing countries in the AoA and DDA reform proposals and identifies some of the trade policy instruments which could be used to promote healthy diets.

14.3.2 Policy instruments under market access

Agreement on Agriculture

The AoA market access commitments provide scope to make selective use of tariff measures to influence the trade of, and therefore price, availability and accessibility

Table 14.1 Summary of measures and flexibilities contained in the WTO Agreement on agriculture and possible trade policy instruments to promote healthy diets.

AoA measure	Flexibility within AoA measure	Agricultural trade policy instrument to promote healthy diets
Market access	Ability to raise tariffs up to bound rate.	Selective tariff changes to influence price, availability and consumption of foods associated with obesity and chronic diseases and to encourage domestic production of healthy alternatives.
	Discretion to determine how each agricultural product would be treated in undertaking tariff reduction once minimum cut is undertaken.	Developing countries which tariffied may reduce tariffs on selected products at higher rates than other products in a manner which favours imports and consumption of healthy foods.
Domestic support	Use of Article 6.2: flexibility to grant support (input and investment subsidies) to resource poor or low-income farmers and to encourage rural development.	Domestic support may be granted to encourage the production for domestic consumption and exports of healthy foods, including fruits and vegetables, and to help low-income households generate income which would alleviate poverty and encourage healthy living.
	De minimis provisions which allow for no reduction in domestic support which is equal to or less than 10% of the value of agricultural production.	Support within the *de minimis* threshold may be granted to benefit production, marketing and trade of specific products (primary and processed) and of the agricultural sector generally, in a manner which benefits the production of healthy food alternatives.
	Green box measures of support may be used without any requirement to reduce the level of such support granted to farmers.	Support which is not targeted at specific commodities and which benefits the agricultural sector in general may be granted to encourage agricultural enterprise and sustain rural livelihoods and development in ways which would perpetuate or encourage healthier lifestyles.
Export competition	Use of Article 9.4 flexibility to grant export subsidies towards reducing cost of marketing exports of agricultural products and for internal transport and freight charges on export shipments, without need to reduce these.	Flexibilities used to grant support where feasible to enhance the competitiveness of domestic agriculture on world markets and thereby sustain domestic agricultural production, including targeted production of healthy foods for domestic use and exports.

to foods associated healthy and unhealthy diets. Tariff levels could be set to provide incentives to either (i) restrict the imports of undesirable foods through maintaining higher tariffs on these products, or (ii) encourage the imports of desirable products through steeper cuts which would result in lower tariff levels. This could be done legitimately by altering tariffs within the limit of the bound rate (see Chapter 15).

Table 14.2 Summary of measures and flexibilities contained in the DDA reform proposals on agriculture and possible trade policy instruments to promote healthy diets.

AoA measure	Flexibility within AoA measure	Agricultural trade policy instrument to promote healthy diets
Market access	Tariff reduction commitments at rates less stringent than that undertaken by developed countries.	Selective tariff reduction to influence the price and availability of food imports associated with obesity and to cushion the domestic agricultural sector from competition fuelled by imports of cheap, subsidised and often unwholesome foods.
	Special products to be either exempted from tariff liberalisation or subjected to lower rates of tariff reduction.	Special products, to be selected on the basis of criteria of food security, livelihood security and rural development should take into account the contribution of products to nutritional well-being. This measure can also shield domestic production of healthy foods from competition with imported substitutes.
	SSM to deal with import surges.	In cases of import surges, developing countries may use the SSM to increase tariffs and thereby curb surges in imports which are likely to harm domestic production, including production of foods contributory to good health.
Domestic support	Continued use of the flexibilities granted under Article 6.2 of the AoA.	Grant of subsidies to benefit domestic production of healthy foods or to generate income which provides access to these foods.
	Continued use of the *de minimis* provisions of the AoA, without commitment to reduce permissible levels of domestic support, for countries which do not have aggregate measure of support, that is, amber box reduction commitments.	Developing countries can continue to use subsidies permitted under the *de minimis* provisions of the AoA to encourage domestic agricultural activities which contribute to production of healthy foods and income generation, particularly for vulnerable groups, including those most susceptible to chronic diseases.
	Continued use of green box measures.	As under the AoA, green box subsidies may be used to benefit the agricultural sector generally, in a manner which would sustain domestic production and thereby ensure income generation which facilitates access to healthy living.
Export competition	Use of Article 9.4 of AoA flexibilities extended to 5 years after the agreed time for ending the use of all export subsidies.	Until 2021, developing countries may grant export subsidies to reduce the marketing costs of agricultural exports and to offset the internal transportation and freight charges on export shipping. Such a flexibility could be used to favour the production and exports of healthy foods.

AoA, Agreement on Agriculture; SSM, special safeguard mechanism.

Tariff measures could also be applied selectively as a means of protecting domestic production of agricultural commodities either for exports or for domestic consumption, which could contribute to sustaining income-generating agricultural production among vulnerable groups. Accessibility to healthy diets is as much a function of the income earning capacity of vulnerable communities as the availability of these healthy choices.

A potential problem with this approach is that developing countries have tended not to reduce high tariffs on agricultural products, in order to protect domestic markets from competition against cheaper imports and to maintain revenues from import duties. Moreover, the products which a developing country may designate as 'special products', and therefore not subject to the generally agreed levels of tariff reduction, may not necessarily be those products desirable for promoting healthy diets. In addition, the use of tariff measures to influence the price of basic food products may result in lower income groups substituting cheaper foods for their more expensive alternatives, whether these foods are imported or produced domestically. This may mean that low-income households, which are often most at risk for chronic and other diseases, will substitute healthier but relatively more expensive foods, for cheaper but nutritionally inferior foods.

DDA reform proposals

As in the case of the AoA, under the DDA reform proposals, developing countries will have some discretion in the treatment which they accord to specific products in the tariff reduction process. Some products may be exempted from tariff reduction; others would be subjected to reductions at predetermined rates. Thus, for example, imports of milk with a high-fat content could be subjected to higher tariffs than imports of low-fat milk. Similarly, tariffs may be used judiciously, along with domestic support measures to encourage the domestic production of healthy foods, to help ensure food security, access to healthy foods and to generate income in rural areas to sustain livelihoods.

With regard to the flexibility to designate special or sensitive products, the criteria of food and rural livelihood security could be based on indicators that include the contribution of the product to nutritional well-being.

14.3.3 Policy instruments under domestic support

Agreement on Agriculture

Domestic support for agricultural production could be used to encourage the production and lower the prices of healthy foods. Analysis by the Institute for Agriculture and Trade Policy in the United States indicates that price support to corn and soya beans has driven down their prices, while the prices of the fruits and vegetables – not benefiting from such subsidies – have steadily increased, a pattern mirrored by consumption patterns (Institute for Agriculture and Trade 2007; but

also see the opposing perspective presented by Schmidhuber and Shetty in Chapter 8). This experience suggests that if domestic support targets healthy foods, the increased availability and lower prices of these foods may lead to higher consumption levels. Domestic support measures thus could be used to encourage the production of and trade in healthy foods.

The scope for developing countries to use domestic support to agriculture as a means of promoting the production of healthy foods is limited by the requirements of the AoA, but is possible (Table 14.1). Under the AoA, such support would be permitted if, for example, it supported farmers in low-income rural communities in developing countries, or if it did not exceed the agreed *de minimis* limits of support. These measures could be geared towards promoting the production and marketing of healthy foods. The flexibilities granted under Article 6.2 to encourage agricultural and rural development could be incorporated into a strategy to encourage the production of fruits, vegetables and other healthy products for consumption and income generation (there are no limits on the amount of support developing countries may grant under Article 6.2 once the objective is within the scope of the Article). Developing countries also have at their disposal the flexibility granted by the provision on *de minimis* levels of support, which would allow for up to 10% of agricultural GDP and 10% of the annual value of production of a specific product to be provided as domestic support of this commodity or to support the agricultural sector generally, which again could be implemented with the aim of promoting availability and access to healthy foods.

There would be some problems in using these measures. To start with, there is little evidence to suggest that developing countries fully utilise the flexibilities granted under the AoA. Moreover, using domestic support to increase the supply of healthy foods could be undermined by imports of cheaper substitutes. Where programmes are being implemented to promote domestic production of healthy foods and to regulate the consumption of foods that contribute to unhealthy diets, the selective use of tariff measures thus may be necessary to preserve the gains from the grant of domestic support measures. Coherence in domestic agricultural policy, external trade policy and health policies would be necessary to ensure the effectiveness of the strategy.

Another problem is that very few developing countries have the budgetary resources needed to grant support to their agricultural sectors on the scale provided by developed countries. In some instances, the terms (such as structural adjustment programmes) under which some developing countries gain access to support from international financial institutions – the International Monetary Fund and the World Bank – limit their abilities to grant domestic support to the productive sectors, including agriculture. Moreover, the widespread use of domestic support measures by developing countries would have equally trade-distorting effects as in the case of developed countries, and should therefore not be perceived as the solution to the problems faced by the agricultural sectors of developing countries. There is also evidence that subsidies result in the inefficient allocation of resources by encouraging resource allocation to activities which benefit from them rather than on the basis of consumer-driven market considerations.

DDA reform proposals

The flexibilities granted to developing countries ensure they will have the means to provide support to the production of selective food products. Therefore, it would be possible to use domestic support measures to encourage the production of healthy foods or to generate income by vulnerable groups to help ensure that they have access to these foods.

14.3.4 Policy instruments under export competition

Agreement on Agriculture

Very few developed countries use export subsidies and only for a very narrow range of products. Even fewer developing countries have the resources to subsidise their exports. Developing countries, heavily dependent on food imports because of the lack of domestic capacity to produce or because the domestic agricultural sector has been decimated by the support policies, benefit from the lower prices resulting from developed countries' export subsidies. However, in many instances, the products which benefit from export subsidies and imported in large volumes, are not health-friendly foods. The main beneficiaries of export subsidies in developed countries are fats, oils, sugar, dairy and livestock (beef). These products are well known for their contribution to obesity, overweight and associated chronic diseases. Continued dependence on imports of subsidised food is therefore unlikely to improve the health status of developing countries.

Still, for developing countries, such export subsidies could be targeted towards the production, processing and export of foods with favourable health benefits, such as fruits and vegetables. Production geared towards exports will impact the local economy and domestic nutritional well-being by improving food security, sustaining income generating activities in rural areas and creating a surplus of healthy foods which can be consumed locally. The difficulty which most developing countries face is obtaining the necessary budgetary resources to grant subsidies to their farming sector.

DDA reform proposals

The limited timeframe and scope for the use of export subsidies mean that such a measure cannot be used as part of a long-term strategy of encouraging the production of healthy foods or to raise income in vulnerable communities towards improving diets.

14.4 Conclusions

Under the AoA and DDA reform proposals, governments in developing countries are required to implement changes in agricultural policies which will lead to greater market opening and less distortion in production and trade. The measures proposed

include flexibilities for developing countries when implementing these changes, mainly in the form of longer periods to implement the commitments, or through lower tariff and domestic support reduction commitments.

The flexibilities under the AoA and the DDA reform proposals provide scope for governments to pursue agricultural policies supportive of a strategy of domestic production and consumption of healthy foods. The ability of developing countries to utilise these agricultural trade policy instruments is, however, subject to some constraints. For example, developing countries which have entered into structural adjustments programmes with international lending institutions may be subject to borrowing conditions, which debar them from utilising some of the measures proposed here. Moreover, many developing countries with the flexibility and willingness to use the measures proposed, may be constrained by lack of resources to do so. Many developing countries, for example, do not utilise the full scope of their *de minimis* allowances, which is a mere 10% of the value of the yearly agricultural output, because of the lack of the budgetary resources to do so. In addition, some developing countries may not consider the reduction in obesity and chronic diseases an important priority for their agricultural sector and may therefore not commit the necessary resources to stimulate changes which would impact positively on health and on the control or prevention of obesity and chronic diseases.

Notwithstanding the limitations faced by developing countries in implementing many of the measures permissible under the AoA, the scope exists for those with the means and the flexibility to do so, to devote resources to agriculture in a manner which would provide incentives for the production, processing, marketing and consumption of certain crops relative to others, thereby promoting healthy diets. As such, market access, domestic support and export competition measures could be used, selectively, to encourage the production and consumption of foods, such as fruits, vegetables and processed products that meet acceptable nutritional requirements. These policy instruments could affect food availability, prices and accessibility in a positive way. However, they would need to be well designed and carefully targeted to have a positive impact (see, for example, Mytton *et al.* 2007). Agricultural policies should also be coupled with other policies, including health and education, to successfully control the problem of obesity and chronic diseases.

One region where agricultural policies could be used successfully to help promote healthy diets is the Caribbean. The independent countries of the Caribbean are all members of the WTO, with the exception of the Bahamas (in the accession process) and are all developing countries, with the exception of Haiti which is a 'least developing' country, according to UN classification, and therefore not subject to several of the concessions and reduction commitments agreed to by other WTO members. The flexibilities under the AoA and the reform proposals of the DDA are, therefore, available to these countries and, in some instances, even greater flexibilities are available to them given their status as small, vulnerable economies for which the DDA reform proposals grant additional concessions. Like the Pacific Island countries (see Chapter 9 by Thow and Snowdon), the Caribbean countries are small island states in which food imports have a very particular influence on dietary patterns. In the Caribbean, the growth of obesity has been blamed partly

on increased imports of processed foods with high fat, sugar or salt content. As such, Caribbean countries could use the flexibilities available in the AoA and the DDA to address the growing problem of obesity and chronic diseases.

To conclude, while developing countries face many constraints to utilise certain policy measures and to provide the necessary support to agriculture, flexibilities exist in the international trade arrangements to support efforts to control the problem of obesity and diet-related chronic diseases. In an environment characterised by policy coherence, partnership with relevant stakeholders, good governance, and supportive legislative and regulatory measures, agricultural policies could play a meaningful role in winning the battle against obesity and diet-related chronic diseases in developing countries.

References

GATT (1994). *The Results of the Uruguay Round of Multilateral Trade Negotiations*. WTO Secretariat, Geneva.

IFPRI (2008). *WTO Negotiations on Agriculture and Developing Countries*. Issue Brief 48, International Food Policy Research Institute, Washington, DC.

Institute for Agriculture and Trade (2007). *A Fair Farm Bill for America*. Retrieved 4 November 2007 from http://www.iatp.org.

Murphy, S. (2002). WTO Agreement on agriculture: suitable model for a global system? *Foreign Policy in Focus* **7**(8). Retrieved 4 November 2007 from http:www.fpif.org/fpiftxt/1328

Mytton, O., Gray, A., Raymer, M. & Rutter, H. (2007). Could targeted food taxes improve health? *Journal of Epidemiology and Community Health* **61**, 689–94.

World Health Organization (2007). *Obesity and Overweight*. Retrieved 4 November 2007 from http://www.who.int/mediaccentre/factsheets/fs311/en/index.html.

World Trade Organization (WTO) (2007). *Understanding the WTO*. WTO, Geneva.

World Trade Organization (WTO) (July 2008). *Revised Draft Modalities for Agriculture, WTO Committee on Agriculture Special Session*. TN/AG/W/4rev3. WTO, Geneva.

15 The Impact of International Trade and Investment Rules on the Ability of Governments to Implement Interventions to Address Obesity: A Case Study of the European Charter on Counteracting Obesity

David P. Fidler

15.1 Introduction

Many countries recognise the growing obesity problem, and Europe has been in the forefront of exploring responses to this epidemic. In November 2006, the World Health Organization (WHO) European Ministerial Conference on Counteracting Obesity adopted the European Charter on Counteracting Obesity (Charter or ECCO) (WHO 2006). The ECCO sets out a series of principles and policy actions to address obesity. It conceives of obesity as an individual, national and international problem, and so calls for anti-obesity action at multiple levels of intervention. The Charter acknowledges that addressing obesity requires international intervention and that national interventions to reduce obesity will have international consequences.

In light of how trade and foreign direct investment (FDI) influence the macroeconomic conditions that factor into obesity, such interventions would have to consider the international rules that regulate trade in goods, services and FDI. The ECCO does not recommend that countries restrict trade in goods, services and investment capital. Evidence to support the effectiveness of such interventions does not exist, and attempts to restrict trade would raise issues under rules governing the European common market. For example, the implementation of the ECCO's recommendations within the European Union would have to conform with European Community (EC) rules on trade in goods, services and capital – which require more liberalisation than anything found at any level, including the World Trade Organization (WTO). Outside the EC, agreements that liberalise trade in goods, services and capital are now so numerous that obesity interventions would have to work within, and not against, these rules.

Thus, public health experts need to understand whether and how international law on trade and FDI affects obesity interventions. To help advance this understanding, this chapter analyses whether the policy recommendations made in the ECCO

are compatible with international trade and investment law, and asks whether international trade rules diminish a government's options for counteracting obesity. The analysis focuses on rules that frequently appear in trade and investment regimes, and, in addition to the ECCO, includes the potential impact of international law on intellectual property rights on treatments for obesity and obesity-related diseases.

15.2 Liberalisation of trade and investment, the obesity problem, and the ECCO

Linkages between globalisation and diet and nutrition establish that trade in goods, services and capital influences the obesity problem (Hawkes 2006). Trade liberalisation in food products affects food prices, the diversity of food options, and the accessibility of different foods. Rules that liberalise FDI open economies to investments in food-industry sectors that affect prices, choices and the nutritional and dietary profiles of populations. Liberalising trade in services can facilitate the growth of advertising services, which can affect how consumers, including children, perceive choices about food.

The policy consequences of these realities are not obvious. Countries pursue trade and investment liberalisation to enhance national security, improve economic well-being and power, and deepen and expand interdependence in order to strengthen international order. These objectives politically dwarf concerns about obesity. Trade and investment policies are geopolitical determinants for national and global health; obesity control is not a geopolitical determinant of national security, economic power and international order.

Accepting that trade and investment policies are factors in obesity prevalence necessitates thinking about anti-obesity measures within an environment in which trade and investment are geopolitically important. The complexities of obesity as a problem often appear when experts admit that evidence of the effectiveness of anti-obesity interventions ranges from weak to non-existent (WHO Regional Office for Europe 2007). Further, the stronger evidence tends to cluster around individual-level interventions (e.g. increased physical activity) as opposed to broad-based economic measures (e.g. higher taxes on energy-dense foods). The WHO Regional Office for Europe acknowledges that little evidence exists that economic instruments, such as taxes, have a sustainable impact on dietary patterns (WHO Regional Office for Europe 2007). Indirect evidence suggests that a causal relationship between such instruments and obesity prevention and control is merely plausible (WHO Regional Office for Europe 2007). In addition, policies that liberalise trade and investment are embedded in the structure of the world economy, which deepens the difficulty of teasing out whether obesity interventions affecting trade and investment would have sustainable public health impact.

These and other reasons explain why it is rare in mainstream policy discussions to see advocacy for anti-obesity measures that seek lower levels of trade and investment. Instead, strategies generally seek to reduce the perceived negative consequences for diet and nutrition that trade and investment policies may create or

exacerbate. The ECCO demonstrates this pattern as it contains interventions that its drafters believe governments should consider and, if possible, enact. Some, but not all, of these interventions have implications for international trade in goods, services and investments.

The relationship between interventions in the ECCO and trade and investment policy implications is not clear because (i) the interventions are only described generally, and (ii) the ECCO does not address trade and investment ramifications of its recommendations. The ECCO recommends, for example, that governments should consider 'economic measures that facilitate healthier food choices' (¶2.4.9), but the Charter does not identify these measures. Specificity in the measure implemented is critical to analysing whether rules on trade and investment might affect anti-obesity measures. The ECCO's lack of specificity, and the general lack of empirical backing for obesity interventions, means that analysing how the ECCO's recommendations relate to rules on trade and investment must be speculative. Thus, this chapter formulates possible specific trade measures that reflect the more general policy interventions in the ECCO and assesses their potential implications for international trade and investment law (Table 15.1).

15.3 International law on trade in goods and obesity interventions

Agreements concerning trade in goods typically regulate the application of tariffs on imports, require non-discriminatory treatment of imports and prohibit the use of quantitative restrictions on imports. In addition, agreements on trade in goods usually regulate food safety measures and technical product standards. Policies to counteract obesity could involve interventions that implicate these rules.

15.3.1 Tariffs on imported goods

The ECCO recommends that governments ensure 'access to and availability of healthier food, including fruits and vegetables' (¶2.4.9) and implement 'economic measures that facilitate healthier food choices' (¶2.4.9). One strategy to achieve these objectives would involve adjusting tariff rates. A tariff is a tax on imported products, and one way to facilitate healthier food choices would be to increase tariffs on products associated with contributing to obesity. The increased tariffs would raise the price of obesogenic products, which may reduce consumption. However, a tariff-based strategy to counteract obesity could face legal problems.

First, agreements involving trade in goods often include binding tariff commitments. Under the WTO's General Agreement on Tariffs and Trade (GATT 1999), for example, a WTO member cannot charge a higher tariff rate if it has agreed to apply a lower tariff to a product (Article II). If a WTO member has bound its tariff rates for products now considered obesogenic, then it cannot charge a tariff rate in excess of its bound rate. If a WTO member has not bound its tariff rate on an

Table 15.1 Summary of ECCO recommendations, possible specific trade measures and the policy space available for obesity interventions.

Type of trade	Recommended ECCO intervention	Possible specific trade measures implementing the ECCO recommendation*	Policy space within International Trade Law for obesity interventions†
Trade in goods	Ensuring access to and availability of healthier foods, including fruits and vegetables (¶2.4.9)	Subsidies to producers of healthy foods and beverages	Yes, as long as the subsidies are not export subsidies and do not distort competition between like domestic and imported products
		Decrease tariff rates on healthy food and beverages	Yes, as long as the lower tariff rates are applied in a non-discriminatory manner (MFN principle)
	Economic measures that facilitate healthier food choices (¶2.4.9)	Increase tariffs on unhealthy food and beverages	No, if the country has bound itself to specific tariff rates on such products
	Achieve affordable pricing for healthier foods (¶2.4.11)	Decrease tariff rates on healthy food and beverages	Yes, as long as the lower tariff rates are applied in a non-discriminatory manner (MFN principle)
		Domestic taxes	Yes, as long as increased or decreased taxes are applied in a non-discriminatory manner (NT principle)
		Subsidies	Yes, as long as the subsidies are not export subsidies and do not distort competition between like domestic and imported products
	Reduction of fat, free (particularly added) sugars and salt in manufactured products (¶2.4.9)	Prohibitions or restrictions on imports of products containing certain levels of fats, sugars, and salt	No, such measures are prohibited quantitative restrictions
	Adequate nutrition labelling (¶2.4.9)	Technical regulations requiring labelling of foods and beverages marketed for sale	Yes, as long as the labelling requirement is applied in a non-discriminatory manner (NT principle)

Table 15.1 *(Continued)*

Type of trade	Recommended ECCO intervention	Possible specific trade measures implementing the ECCO recommendation*	Policy space within International Trade Law for obesity interventions†
Trade in services	Adopt regulations to reduce substantially the extent and impact of commercial promotion of energy-dense food and beverages (¶2.4.6)	Measures that control the content of advertising and marketing services	Yes, as long as the measures are applied in a non-discriminatory manner to service suppliers (MFN and NT principles)
		Measures that prohibit foreign service suppliers from providing advertising and marketing services	Yes, as long as the country has made no specific, legally binding commitments on market access for foreign service suppliers
	Measures to reduce marketing pressure, particularly to children (¶2.4.9)	Prohibitions on marketing certain food and beverage products to children	Yes, as long as the measures are applied in a non-discriminatory manner (MFN and NT principles)
FDI	Reduction of fat, free (particularly added) sugars and salt in manufactured products (¶2.4.9)	Measures that restrict or ban the marketing and sale of manufactured products with high levels of fat, sugar and salt	Yes, as long as the measures are applied in a non-discriminatory manner (MFN and NT principles) and as long as the measures are not characterised as a quantitative restriction on imports
	Adopt regulations to reduce substantially the extent and impact of commercial promotion of energy-dense food and beverages (¶2.4.6)	Measures that restrict the advertising, marketing and sale of obesogenic foods and beverages	Yes, as long as the measures are applied in a non-discriminatory manner (MFN and NT principles)
	Measures to reduce marketing pressure, particularly to children (¶2.4.9)		

*These trade measures are not recommended by the ECCO, but, in order to undertake legal analysis, the general ECCO recommendations must be formulated as specific trade measures.
†General conclusions. The application of rules of international trade and FDI law may vary depending on the content and application of any trade-affecting measure.
ECCO, European charter on counteracting obesity; FDI, foreign direct investment; MFN, most favoured nation; NT, national treatment.

obesogenic product, then it can increase the tariff, as long as it applies the tariff to all imported like products.

Bilateral and regional trade agreements operate under similar principles. States parties to these agreements often identify tariff rates for particular products, and sometimes specify how the bound tariff rates will decrease over time. Whether raising tariffs on imported obesogenic products would violate these rules depends on whether the increased tariff exceeds the bound tariff rate, if any, for the products in question. In a bilateral or regional customs union (e.g. the EC), the states parties agree not to charge any tariffs on goods traded within the union.

Whether raising tariffs, if legally possible, on obesogenic products is a prudent public health strategy is questionable. In all likelihood, the country raising tariffs will have domestic production of the same or similar products, and increased tariffs do not increase the price of domestic unhealthy products. Given this reality, other countries will view increased tariffs as protectionism masquerading as a health measure, and may retaliate by raising their tariffs on exports from the country that first raised its tariffs.

The rules on tariffs do not preclude a country from *lowering* tariffs on healthy imported products in order to enhance their price competitiveness. Given that some evidence suggests that fruits and vegetables tend to be more expensive than processed foods, lowering tariffs on fruits and vegetables might provide consumers with incentives to purchase them. Thus, lowering tariffs could be a way to implement the ECCO's recommendation of ensuring access to and availability of healthier food, including fruits and vegetables through economic measures. Countries that lower tariffs would, however, need to be mindful of rules of non-discrimination that apply to trade in goods, as now discussed.

15.3.2 Non-discriminatory treatment of imported products

Agreements involving trade in goods typically mandate that states parties treat imported products in a non-discriminatory manner under the most-favoured-nation (MFN) principle and the national treatment (NT) principle. The MFN principle requires the importing state party to treat all 'like products' imported from other states parties the same with respect to all measures applied to imports. The NT principle requires the importing state party to treat all imported products the same as 'like' domestic products with respect to domestic taxes and regulations. A state party engages in discriminatory treatment when it changes the conditions of competition to the detriment of the imported product. For the MFN or NT principles to apply, the products being compared have to be 'like products'.

Strategies to counteract obesity may implicate these non-discrimination principles. First, a government might provide more favourable terms (e.g. a lower tariff) for an imported product deemed healthier than a similar but less healthy imported product (e.g. one that contains added fats, sugars or salt). The less favourable treatment of the less healthy product may violate the MFN principle *if* the healthy and less healthy products are like products. Under GATT, the likeness of products

is generally determined by analysing the products' physical characteristics, tariff classifications, end uses, and consumer tastes and habits (Japan – Alcoholic Beverages II 1996). Whether differences in fats, sugars and salt make otherwise identical goods not like products is questionable under these four criteria. Thus, giving better treatment to the healthier product as a way to counteract obesity would probably run into trouble under the non-discrimination principle, and would have to rely on an exception (see Section 15.3.5).

Second, a government might apply a higher domestic tax against imported and domestic products that contain unhealthy levels of added fats, sugars and salt. For example, the government might impose a higher domestic sales tax on all soft drinks containing added sugars regardless of their place of manufacture. As long as the government taxes imported and domestic like products identically, then it does not violate the NT principle. Thus, international rules do not pose a problem for anti-obesity measures that raise domestic taxes identically on like domestic and imported unhealthy products. Other strategies to counter obesity would run into no difficulties with the MFN and NT principles as long as they are applied in a non-discriminatory manner. For example, requirements for nutrition labelling (e.g. as recommended by the ECCO (¶2.4.9)) that apply to all like imported products would satisfy the MFN principle, or which apply to all like imported and domestic products would conform to the NT principle.

15.3.3 Quantitative restrictions on imported products

Most agreements on trade in goods generally prohibit quantitative restrictions (e.g. bans, quotas) on imported products. The ECCO does not recommend banning importation of obesogenic products and, if it did, such a recommendation would be incompatible with both the EC's common market principles and the GATT (Article XI:1). Anti-obesity strategies are unlikely to ban or restrict quantitatively imports of obesogenic foods because, usually, similar or identical foods are manufactured domestically, often through the FDI of multinational food enterprises.

The closest the ECCO comes to territory regulated by the prohibition on quantitative restrictions involves the recommendation to reduce added fats, sugars and salt in manufactured products (¶2.4.9). A measure that restricts added fats, sugars and salt in food products may trigger claims that it constitutes a quantitative restriction. For example, the EC Commission raised concerns that a Danish measure limiting the amount of *trans*-fatty acids in food products would violate EC legal principles that prohibit quantitative restrictions (BBC 2007). If characterised as a quantitative restriction, the Danish measure might still be legal if it was necessary to achieve its objective (see Section 15.3.5). The Danish measure could be characterised, however, as a domestic regulation (e.g. a technical product standard (see Section 15.3.7)) that applies in a non-discriminatory manner to both domestic and imported products, and not as a quantitative restriction applicable only to imported products.

15.3.4 Subsidies for healthier products

The ECCO advises countries to consider measures that ensure access and availability of healthy foods (¶2.4.9), facilitate healthier food choices (¶2.4.9) and achieve affordable pricing for healthier foods (¶2.4.11). In addition to tariffs and domestic taxes, governments could subsidise healthier foods, thus making them more affordable and accessible. Agreements on the trade in goods often contain rules that regulate subsidies and that prohibit subsidies that distort markets in ways that favour domestic products. For example, WTO rules prohibit any subsidy provided to increase exports (Agreement on Subsidies 1999). Export subsidies give subsidised products an unfair advantage in the markets of other countries, and these countries can apply additional tariffs to cancel out the advantage the subsidies provided.

Nothing in the ECCO indicates that export subsidies are an option for countering obesity. A more realistic concern would arise if a government provides subsidies to reduce the price of domestically produced products (e.g. fruits and vegetables), and the lower cost of the subsidised products forced imported like products to lose market share. The subsidies distort the market to favour domestic production, which is protectionism. Other countries could then raise claims against the subsidies under relevant international agreements.

Governments could make subsidy payments for healthy products available to both domestic and foreign producers, or to food retailers that sell both domestic and foreign products. Such subsidies would be non-discriminatory and would not distort competition between domestic and imported products. Why governments would use non-discriminatory subsidies as opposed to other approaches (e.g. lowering domestic taxes on all healthy products) is not clear, which makes the subsidy option more academic than practical.

15.3.5 General exceptions for measures that violate rules on trade in goods

Trade agreements recognise that measures that violate rules can be legitimate under specified exceptions, and such agreements typically include an exception for health measures. Countries that enact anti-obesity measures that violate trade obligations can try to justify such measures under health exceptions. For example, the GATT provides an exception for measures that are necessary to protect human life or health (Article XX(b)). If a GATT violation existed, then the violating WTO member would have to establish that the measure in question was rationally related to the protection of health and was the least GATT-inconsistent measure reasonably available to achieve the level of health protection it sought. This WTO member would have to provide evidence of a health risk associated with the imported product and demonstrate that the measure addresses the risk. The level of health protection the measure seeks to achieve is left to the WTO member's discretion. GATT also requires the WTO member to show that it is not implementing the health-related measure in a way that constitutes arbitrary or unjustified discrimination or a disguised restriction on trade.

In applying GATT's health exception, the WTO Dispute Settlement Body (DSB) has (i) emphasised that the protection of health is a value and interest of the highest order, (ii) underscored that WTO members select their own levels of health protection and (iii) strictly scrutinised proposed less GATT-inconsistent measures for whether they satisfy the level of health protection sought. For example, in *EC – Asbestos*, the Panel and the Appellate Body ruled that France's ban on the sale of asbestos and asbestos-containing products was the least GATT-inconsistent measure that would achieve the objective of zero-tolerance for exposure to asbestos fibres (EC – Asbestos 2001). Important to this decision was the EC's ability to establish scientifically the health dangers asbestos fibres pose.

15.3.6 Rules on food safety

Measures to counteract obesity that restrict added fats, sugars or salt in foods may qualify as sanitary or phytosanitary (SPS) measures and thus be subject to the WTO's Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement 1999). Countries enact SPS measures to protect consumers from risks arising from additives, contaminants, toxins or disease-causing organisms in foods, beverages or feedstuffs. Restrictions on added fats, sugars or salt in foods and beverages may qualify as SPS measures because they seek to protect consumers from risks these additives pose when consumed.

In *EC – Biotech Products*, the Panel held that added genetic material constituted an additive under the SPS Agreement (EC – Biotech Products 2006). This reading of 'additive' could cover added fats, sugars and salt in food and beverage products. The counterargument would be that food safety rules only address additives, contaminants, toxins or disease-causing organisms that directly harm health. Added fats, sugars and salts are not directly harmful; their consumption is only one factor that contributes to obesity (see also James *et al.* in Chapter 10 and Josling *et al.* in Chapter 12). Under this approach, restrictions on added fats, sugars and salts in foods and beverages would not be SPS measures. Given that more demanding rules apply to SPS measures, why strategies to counteract obesity would want to qualify as SPS measures is not clear.

SPS provisions go beyond principles that generally apply to trade in goods (e.g. MFN and NT principles). Under the SPS Agreement, WTO members must base SPS measures on (i) scientific principles and not maintain the measures without sufficient scientific evidence (Article 2.2); (ii) existing international standards (Article 3.1); and (iii) a risk assessment (Article 5.1). Further, the SPS Agreement contains no exceptions to justify violations. Thus, the SPS Agreement (and equivalent provisions in bilateral and regional agreements) contains tougher duties than those applied to measures that affect trade in non-food products.

The SPS Agreement's requirements for a scientific basis, use of international standards, and a risk assessment reflect how public health officials design interventions. Health experts strive to base health measures on science; international health organisations promulgate standards for countries to adopt; and health policy-makers

understand the importance of risk assessments in preparing interventions. Conceptually, the rules in the SPS Agreement do not pose challenges to how public health officials approach their responsibilities.

Whether the SPS rules could affect strategies to counteract obesity depends on a number of factors. First, the anti-obesity strategies would have to fall within the scope of SPS rules by, for example, regulating additives in foods and beverages. Second, whether relevant international standards existed for the areas targeted by anti-obesity interventions would be important to determine. The existence of such standards does not prevent a country from adopting more health-protective SPS measures, as long as the more protective standards are based on a risk assessment and are supported by scientific evidence. Third, the anti-obesity measures have to be based on a risk assessment that establishes a rational relationship between the measures adopted and the risks in question.

Under the SPS Agreement, risk assessment includes scientific evidence and other criteria relevant to the management of health risks. As the Appellate Body stated in *EC – Hormones* (1998), risk assessment involves not only empirical data but also social and other factors that contribute to the existence of risks in the real world (¶187). This approach supports the holistic analyses informing strategies to counteract obesity. In other words, arguments that governments should rely on educating consumers and not regulate the content of products ignore factors that make education-only approaches ineffective. The risk assessment requirement in the SPS Agreement allows policy-makers to think about a variety of considerations in designing SPS measures.

Trade rules on SPS measures also apply disciplines found in general obligations on trade in goods. The SPS Agreement mandates, for example, that WTO members cannot arbitrarily or unjustifiably discriminate in their application of SPS measures, or apply SPS measures in ways that constitute disguised restrictions on trade (Articles 2.3 and 5.5). In counteracting obesity, WTO members would have to ensure that regulation of obesogenic ingredients (e.g. *trans* fat) is consistent across different products, or it may face challenges that their SPS measures create arbitrary or unjustifiable distinctions in the level of health protection in different situations that result in discrimination or disguised restrictions on trade.

In addition, the SPS Agreement provides that WTO members 'shall ensure that such measures are not more trade-restrictive than required to achieve their appropriate level of sanitary or phytosanitary protection, taking into account technical and economic feasibility' (Article 5.6). Under the SPS Agreement, 'a measure is not more trade-restrictive than required unless there is another measure, reasonably available taking into account technical and economic feasibility, that achieves the appropriate level of sanitary or phytosanitary protection and is significantly less restrictive to trade' (Article 5.6, note 3). Strategies to counteract obesity that qualify as SPS measures would have to comply with these disciplines to ensure that the strategies are non-discriminatory, not disguised restrictions on trade, and are the least trade-restrictive strategies reasonably available that achieve the level of health protection sought.

15.3.7 Rules on technical barriers to trade

Some ECCO's recommendations could fall within rules on technical barriers to trade (TBT). For example, within the WTO, restrictions on levels of fats, sugars and salt or labelling requirements could be interpreted as binding technical regulations subject to the Agreement on Technical Barriers to Trade (TBT Agreement 1999). The TBT Agreement defines a technical regulation as a '[d]ocument which lays down product characteristics or their related processes and production methods, including the applicable administrative provisions, with which compliance is mandatory' (Annex 1.1). The TBT Agreement also regulates the use of non-binding technical standards, defined as a '[d]ocument approved by a recognised body, that provides, for common and repeated use, rules, guidelines or characteristics for products or related processes and production methods, with which compliance is not mandatory' (Annex 1.2). Bilateral and regional trade agreements often have rules similar to those in the TBT Agreement.

The TBT Agreement recognises that health is a legitimate reason for enacting technical regulations and standards (Article 2.2). Adoption and implementation of technical regulations and standards must comply with procedural and substantive obligations in the TBT Agreement. WTO members must respect the MFN and NT principles (Article 2.1) and 'shall ensure that technical regulations are not prepared, adopted or applied with a view to or with the effect of creating unnecessary obstacles to international trade. For this purpose, technical regulations shall not be more trade-restrictive than necessary to fulfil a legitimate objective, taking account of the risks non-fulfilment would create' (Article 2.2). Unlike the SPS Agreement, the TBT Agreement contains no obligations that technical regulations be based on a risk assessment and be supported by scientific principles and evidence.

Where WTO members impose technical regulations, and relevant international standards exist or their completion is imminent, WTO members 'shall use them, or the relevant parts of them, as a basis for their technical regulations except when such international standards or relevant parts would be an ineffective or inappropriate means for the fulfilment of the legitimate objectives pursued' (Article 2.4). WTO members shall not maintain technical regulations 'if the circumstances or objectives giving rise to their adoption no longer exist or if the changed circumstances or objectives can be addressed in a less trade-restrictive manner' (Article 2.3).

Strategies to counteract obesity that involve restricting fat, sugar and salt levels or mandating labelling are unlikely to violate the MFN and NT principles, and the same conclusion holds in the context of TBTs. Similar to rules in GATT and the SPS Agreement, technical regulations have to be the least trade-restrictive measures reasonably available to achieve the health objective in question. Like the SPS Agreement, the TBT Agreement requires that technical regulations be based on relevant international standards, except where such standards do not achieve the health objective sought. In terms of substantive obligations, the TBT Agreement does not add rules not found in similar forms in other WTO agreements.

Although countries often complain about labelling requirements, and sometimes threaten to challenge them, nutrition labelling requirements, including for added

fats, sugars and salts, are well established. Thus, the ECCO recommendation concerning nutrition labelling appears to face little trouble from TBT rules in trade agreements. Similarly, the 2004 Danish law restricting the amount of *trans*-fatty acids in food products has not, to the author's knowledge, been challenged as a violation of the TBT Agreement. More generally, WTO members do not frequently litigate claims under the TBT Agreement; to date, the DSB has decided only one case under this agreement (EC – Sardines 2002).

15.4 International law on trade in services and obesity interventions

The ECCO's recommendations concerning restrictions on the advertising of energy-dense foods, particularly promotions aimed at children, bring the ECCO into the realm of international law involving trade in services. In trade agreements, countries have adopted rules that address cross-border trade in services. At the multilateral level, the WTO's General Agreement on Trade in Services (GATS 1999) is the key agreement. However, the GATS does not encompass the universe of trade agreements that liberalise trade in services, nor is the GATS even a good indicator of the extent to which trade in services occurs. Some bilateral and regional agreements liberalise trade in services more than the GATS, and many countries have unilaterally opened their markets to foreign-service providers without making binding commitments under trade agreements.

Health-related restrictions on marketing have proved controversial, as illustrated by problems encountered in efforts to restrict the marketing of breast milk substitutes, tobacco and alcohol. In terms of trade, marketing restrictions can affect trade in goods, and thus be subject to rules examined in Part 15.3. For example, the Panel in *Thailand – Cigarettes* (1990) observed that non-discriminatory advertising restrictions would comply with GATT. This section considers marketing restrictions with respect to trade in advertising services. The GATS will be the focus, keeping in mind the caveats about the need to take into account regional and bilateral trade agreements and the levels of existing trade in services.

Under the GATS, the services at issue would be the cross-border supply of advertising services (Mode 1) and the provision of advertising services through commercial presence (Mode 3) (Article I:2). ECCO-recommended restrictions on the promotion of energy-dense foods and beverages, particularly to children, would, if adopted by WTO members, constitute a measure affecting trade in services (Article I:1). Limiting such restrictions to advertising aimed at children would narrow the effect of the measure on trade in services. WTO members would have to accord MFN treatment to services and service suppliers of other WTO members in implementing anti-obesity advertising restrictions (Article II:1). This general obligation does not pose problems for advertising restrictions because the public health approach would apply marketing restrictions in a non-discriminatory manner to all service providers.

The GATS does not mandate that a WTO member accord NT with respect to measures affecting trade in services, unless such member has made specific commitments to accord NT (Article XVII). Even if a WTO member has made an NT

commitment, this commitment should not create problems for the non-discriminatory application of anti-obesity advertising restrictions. Allowing domestic advertising service providers to market energy-dense foods and beverages freely, but restricting foreign-service providers from doing the same, makes no sense for counteracting obesity.

The ECCO's recommendations on restricting commercial promotion also connect to rules on market access. Under the GATS, WTO members may make specific commitments to increase market access (Article XVI), but GATS does not require WTO members to make such commitments. The GATS also allows WTO members to retain market access restrictions in an area covered by a specific commitment if they inscribe in their schedules the restrictions they wish to maintain (Article XVI:2). Concerns with marketing restrictions might arise under these rules if (i) the WTO member made a specific commitment for full market access, and (ii) the marketing restrictions have an effect equivalent to a quantitative restriction on advertising services.

Marketing restrictions that target a broader range of products and consumers will be more likely to raise questions than more narrowly tailored restrictions. For example, prohibiting all promotion of energy-dense foods and beverages to children and adults may, in effect, be a quantitative restriction on the number of service suppliers able to provide those advertising services. By contrast, tailoring restrictions to advertising aimed at children places no limits on advertising services for the same or similar products to teenagers or adults, and thus is harder to classify as a quantitative restriction for advertising services. In addition, the ongoing spread of restrictions on advertising energy-dense foods and beverages to children suggests that government and corporate actors recognise this activity as legitimate.

Narrowly tailored marketing restrictions would constitute qualitative domestic regulations rather than quantitative restrictions, and the GATS requires that WTO members ensure that all domestic measures of general application affecting trade in services are promptly published (Article III:1) and are administered in a reasonable, objective and impartial manner (Article VI:1). Neither of these obligations presents difficulties for the child-focused marketing restrictions the ECCO contemplates.

In the event ECCO-type advertising restrictions violated specific market access commitments made for advertising services, a WTO member could attempt to justify this violation by establishing that the restrictions were necessary to protect human life or health (Article XIV(b)). This provision of the GATS functions similarly to the general health exception in the GATT (Article XX(b)), meaning that the WTO member appealing to it has to demonstrate that the advertising restrictions (i) rationally relate to the objective of protecting health, (ii) are the least GATS-inconsistent measures reasonably available and (iii) are not implemented in a manner that constitutes arbitrary or unjustified discrimination or a disguised restriction on trade in services.

The ECCO also recommends the development of international approaches, such as an international code on marketing energy-dense food and beverages to children (¶2.4.6). Unlike the SPS Agreement and the TBT Agreement, the GATS does not contain obligations that require WTO members to base measures on relevant

international standards. Nor does GATS contain any 'safe harbour' provisions that deem conformity with relevant international standards to constitute compliance with the GATS. Thus, any non-binding international code on food and beverage advertising to children would not have legal significance in GATS. However, the existence of such a code may have epidemiological and political importance that might factor into the calculations of WTO members with respect to GATS.

15.5 International law on FDI and obesity interventions

ECCO recommendations also connect to international law on FDI. Analyses of the globalisation of food production and trade often highlight FDI in food and beverage manufacturing, processing and retailing. Except for trade in services through commercial presence and the Agreement on Trade-Related Investment Measures (TRIMS 1999), the WTO does not regulate FDI. The main instrument in the FDI realm is the bilateral investment treaty (BIT). States have negotiated over 2000 BITs. Rules on FDI are also found in regional agreements, such as the North American Free Trade Agreement (NAFTA).

The substance of the rules in BITs and regional FDI agreements is fairly uniform, which provides a basis for analysing the ECCO's recommendations against the general principles typically found in instruments regulating FDI. The US model BIT (US-BIT 2004) provides a good template because it embodies the principles and procedures commonly found in BITs and regional trade agreements. These principles and procedures create a comprehensive regime regulating all stages of FDI. The rules most pertinent to ECCO recommendations are those addressing the operation of an investment and the handling of disputes between the host government and the investor.

FDI in the food and beverage sectors constitutes 'investment' within BITs. The US-BIT defines 'investment' very broadly (Article 1). The ECCO does not contain any recommendation that would prohibit or restrict establishing FDI in the food and beverage sectors. Such express restrictions would violate BIT rules on the establishment of investments, such as the obligation to accord foreign investors no less favourable treatment than is given, in like circumstances, to national investors (US-BIT, Article 3).

The ECCO recommendations might raise issues with respect to rules on the operation of investments, especially the recommendations encouraging regulations to reduce the amount of added fats, sugars and salt in foods and beverages and to restrict marketing energy-dense foods and beverages. BITs typically require that the host government abide by the MFN and NT principles with respect to the operation of FDI coming from the other state party. The MFN and NT principles in BITs should pose little concern for implementation of the ECCO recommendations, which require non-discriminatory application for public health effectiveness. BITs also usually require host governments to accord FDI the minimum standard of treatment prescribed by customary international law. The US-BIT defines this minimum standard of treatment to include fair and equitable treatment (e.g. due process) and full protection and security (e.g. police protection) (Article 5). The

ECCO recommendations do not encourage any action that would trigger concerns that a government violated the minimum standard of treatment requirements of a BIT.

However, investors might claim that restrictions on added fats, sugars and salt and on advertising energy-dense foods and beverages are acts tantamount to expropriation, for which the host government must pay compensation under BITs. Foreign investors have made 'regulatory takings' claims in bilateral and regional agreements that include FDI provisions, and these claims have caused controversy, especially within NAFTA. The US-BIT (Annex B) and the Canada model BIT (CA-BIT 2004) (Annex B.13(1)) address the issue of 'indirect expropriation', defined as an action or series of actions by a Party that has an effect equivalent to direct expropriation without the formal transfer of title or outright seizure (Annex B.4; Annex B.13(1)(a)). Determining whether indirect expropriation has occurred involves a case-by-case analysis that considers, among other factors, (i) the economic impact of the action, with the recognition that an adverse effect on the economic value of an investment, by itself, does not establish that indirect expropriation has happened; (ii) the extent to which the action interferes with distinct, reasonable investment-backed expectations; and (iii) the character of the government's action (Annex B.4(a); Annex B.13(1)(b)).

These rules on indirect expropriation reveal why some investors have claimed that serious regulatory action by a host government that has an adverse economic impact and reduces or eliminates anticipated market opportunities constitutes indirect expropriation for which compensation must be paid. Investors made indirect expropriation arguments against proposals in Canada to increase restrictions on marketing tobacco products by prohibiting the use of 'light' and 'mild' as descriptors, which, the argument went, would amount to expropriation of tobacco company trademarks using such terms (Philip Morris n.d.). Plans by the Philippines to impose greater restrictions on advertising breast milk substitutes prompted business interests and the US government to express concerns about the security of investments in the Philippines (Jimenez 2007). Most BITs authorise private investors to pursue claims against host governments through arbitration (e.g. US-BIT, Article 24). This investor-friendly dispute settlement mechanism sometimes encourages investors to leverage their indirect appropriation arguments to pressure host governments not to take regulatory actions.

Learning from their experiences under NAFTA, the United States and Canada addressed the 'regulatory takings' problem in their model BITs. The US-BIT provides that '[e]xcept in rare circumstances, non-discriminatory regulatory actions by a Party that are designed and applied to protect legitimate public welfare objectives, such as public health, safety, and the environment, do not constitute indirect expropriations' (Annex B.4(b)). The CA-BIT states that '[e]xcept in rare circumstances, such as when a measure or series of measures are so severe in the light of their purpose that they cannot be reasonably viewed as having been adopted and applied in good faith, non-discriminatory measures of a Party that are designed and applied to protect legitimate public welfare objectives, such as health, safety and the environment, do not constitute indirect expropriation' (Annex B13.1(c)).

These provisions reduce the probability that non-discriminatory health measures will trigger legitimate claims of indirect expropriation. Again, the existence of these more detailed provisions does not stop investors from opposing domestic regulatory action by arguing that such action amounts to indirect expropriation. Yet, the likelihood such an argument would prevail against the kind of non-discriminatory measures the ECCO recommends is not significant.

Although not probable, the risk of indirect expropriation claims succeeding is not non-existent. Of the ECCO's recommendations, the one perhaps most vulnerable to indirect expropriation claims is the proposal that governments restrict the level of added fats, sugars and salt in foods and beverages. This measure would force affected companies to make many, potentially expensive changes to products. An investor could argue that such regulations have a massive economic effect on its investment and significantly interfere with the investor's reasonable investment-backed expectations. In short, the host government has indirectly expropriated the investment the investor made in the products subsequently banned from sale.

Risk of indirect expropriation claims may also arise from an investor's concern about the impact of concurrent restrictions on the levels of added fats, sugars and salt and on advertising energy-dense foods and beverages. By aggregating the economic impact and the interference with investment-backed expectations of all anti-obesity measures, an investor could try to create a 'rare circumstance' in which non-discriminatory public welfare measures can be deemed indirect expropriation. States party to BITs should be aware of this possibility and develop strategies to minimise the prospect that an indirect expropriation claim would succeed against domestic regulatory actions designed to counteract obesity.

15.6 International law on intellectual property rights and obesity interventions

The ECCO does not discuss treatments for obesity and obesity-related diseases, but the ongoing and, in some contexts, deepening controversies over intellectual property rights and global health counsel that attention be paid to how international law on intellectual property rights might affect strategies to counteract obesity.

Although prevention is the best strategy, trends suggest that treating people for obesity and obesity-related medical conditions may become increasingly important. As in other areas of global health, accessibility and affordability of treatments may become an issue of significance, especially in developing countries. Perhaps sensing a growth market, pharmaceutical companies might have incentives to produce new patented products designed to treat obesity-related conditions. International legal protections for patents, as found in the WTO Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS 1999) and in bilateral and regional agreements, may make accessibility and affordability harder to achieve if treatments are under patent. The costs of the obesity epidemic may increase pressure on governments to engage in compulsory licencing and generic production of patented

treatments in order to increase accessibility and affordability. This scenario would trigger more controversies about patents and compulsory licencing and replay disagreements witnessed in the WTO's adoption of the Doha Declaration on the TRIPS Agreement and Public Health (WTO – TRIPS Agreement and Public Health 2001) and in the pursuit by some countries, such as the United States, of TRIPS-plus provisions in regional and bilateral trade agreements.

15.7 Summary and conclusion

15.7.1 Summary

Trade in Goods. With the caveat that much depends on the nature of any given anti-obesity measure, rules on trade in goods do not significantly restrict the policy options for counteracting obesity (see Table 15.1). Limits on the ability to raise tariffs on imported obesogenic products do not constitute serious constraints because such a strategy is suspect on public health grounds. The duties to respect the MFN and NT principles and to avoid quantitative restrictions do not materially affect strategies to counteract obesity. The obligation that trade-restricting health measures be the least trade-restrictive measures reasonably available perhaps raises the most concerns, particularly in connection with limits on the level of fats, sugars and salt in foods and beverages. These concerns are tempered by the agreements' recognition of each country's right to establish its own level of health protection and by case law that strictly scrutinises alternative, less trade-restrictive measures for their ability to achieve the level of health protection selected.

Trade in Services. The GATS does not significantly shrink policy space with respect to ECCO recommendations on restricting commercial promotion of energy-dense foods and beverages aimed at children. Shrinkage would arise if a WTO member has made broad market access commitments for advertising services. For WTO members that have made minimal or no specific market access commitments on advertising services, the GATS does not affect their discretion to regulate advertising. However, the GATS is not static because further liberalisation is an objective of the Doha Development Agenda, so complacency about the GATS is not warranted. Finally, the GATS does not represent the cutting-edge of trade in services. Deeper, more aggressive liberalisation is taking place in bilateral and regional agreements, which are proliferating as the Doha Development Agenda continues to stagnate.

Foreign Direct Investment. ECCO-recommended obesity interventions that involve regulating the amount of added fats, sugars and salt in foods may raise complaints from foreign investors that such regulations constitute indirect expropriation. The problems experienced with foreign investors threatening litigation against regulatory actions have stimulated countries, such as the United States and Canada, to clarify that non-discriminatory regulations pursuing legitimate objectives do not constitute indirect expropriation. This clarification reduces the

likelihood that public health measures, such as those the ECCO recommends, would form the basis for legitimate claims of indirect expropriation.

Intellectual Property Rights. If the obesity pandemic continues, demand for treatments for obesity-related diseases may increase, which may stimulate development of new, patented products. The protection of the patents on such products may clash with public health desires to increase the products' accessibility and affordability. The end result may be more trade-health controversy over patents, compulsory licencing and generic production.

15.7.2 Conclusion

The scale of the obesity problem, and the scope of the needed responses, has reached global proportions. The global obesity problem involves the globalisation of trade in food products and beverages. The ECCO represents one attempt to advance obesity prevention and management, started by the WHO's Global Strategy on Diet, Physical Activity, and Health (WHA 2004). ECCO recommendations, and other obesity interventions the ECCO does not identify, have implications for the international law designed to facilitate and liberalise trade and FDI flows.

Generally, international rules on trade and FDI do not present significant problems for obesity interventions. Some actions that would violate trade rules, such as banning imports, would not make sense, and the ECCO does not recommend such actions. Public health strategies typically conform to principles common to trade agreements, particularly the MFN and NT obligations. Further, the compatibility of the ECCO recommendations with international law on trade and FDI holds across different agreements, including the GATT, SPS Agreement, TBT Agreement, GATS and BITs. Problems may loom with TRIPS, but the ECCO's recommendations did not address treatments for obesity and obesity-related conditions.

Experiences from other trade-and-health contexts suggest that as strategies to counteract obesity become more robust, controversies with trade might increase. Countries, companies and investors may raise claims (and controversy) under the rules on trade and FDI to oppose more regulation of food, beverages and advertising services. Navigating these controversies requires assessing the likely impact of the rules on strategies to counteract obesity. How such claims play out depends on how specific anti-obesity measures plug into the relevant rules of international law. This chapter's analysis has been limited by the ECCO's general recommendations, which lack details critical to applying the rules on trade and FDI. Understanding these rules in a general manner can, however, help public health officials craft strategies to counteract obesity in ways that avoid legal difficulties.

In short, policy coherence between the ECCO's recommendations and rules of international law and trade and FDI is feasible. But constructing coherence in a sustainable manner remains a challenge, particularly in these early stages of addressing the global problem of obesity. The ECCO and other efforts are taking a governance path less travelled by, and what features of this journey will make all the difference still loom around the next few bends, just beyond the range of epidemiology and international law to predict with confidence.

References

Agreement on the Application of Sanitary and Phytosanitary Measures (1999). In World Trade Organization. *The Legal Texts*. Cambridge University Press, Cambridge, pp. 59–72.

Agreement on Subsidies and Countervailing Measures (1999). In World Trade Organization. *The Legal Texts*. Cambridge University Press, Cambridge, pp. 231–74.

Agreement on Technical Barriers to Trade (1999). In World Trade Organization. *The Legal Texts*. Cambridge University Press, Cambridge, pp. 121–42.

Agreement on Trade-Related Aspects of Intellectual Property Rights (1999). In World Trade Organization. *The Legal Texts*. Cambridge University Press, Cambridge, pp. 321–53.

Agreement on Trade-Related Investment Measures (1999). In World Trade Organization. *The Legal Texts*. Cambridge University Press, Cambridge, pp. 143–6.

BBC (31 January 2007). *Retailers to Stop Trans-Fat Use*. Retrieved 6 October 2007 from http://news.bbc.co.uk/1/hi/health/6314753.stm.

European Communities – Measures Affecting Asbestos and Asbestos Products (2001). WT/DS135 (EC – Asbestos).

European Communities – Measures Affecting the Approval and Marketing of Biotech Products (2006). WT/DS201, WT/DS292, WT/DS293 (EC – Biotech Products).

European Communities – Measures Concerning Meat and Meat Products (Hormones) (1998). WT/DS26 (EC – Hormones).

European Communities – Trade Description of Sardines (2002). WT/DS231 (EC – Sardines).

General Agreement on Tariffs and Trade (1999). In World Trade Organization. *The Legal Texts*. Cambridge University Press, Cambridge, pp. 424–92.

General Agreement on Trade in Services (1999). In World Trade Organization. *The Legal Texts*. Cambridge University Press, Cambridge, pp. 284–319.

Hawkes, C. (2006). Uneven dietary development: linking the policies and processes of globalization with the nutrition transition, obesity and diet-related chronic diseases. *Globalization and Health* **2**(4). http://www.globalizationandhealth.com/content/2/1/4.

Japan – Taxes on Alcoholic Beverages, WT/DS8, WT/DS10, WT/DS11 (1996). Japan – Alcoholic Beverages II.

Jimenez, C.S. (25 July 2007). Spilled corporate milk in the Philippines. *Asia Times Online*. Retrieved 6 October 2007 from http://www.atimes.com/atimes/Southeast_Asia/IG25Ae01.html.

CA-BIT (Model Agreement between Canada and [Country] on the Promotion and Protection of Investment) (2004). Retrieved 6 October 2007 from http://www.naftaclaims.com/commission.htm.

Philip Morris Submission to Canada on NAFTA's Chapter 11 Provision (n.d.). Retrieved 6 October 2007 from http://www.tobacco.org/Documents/0203pmnafta.html.

Thailand – Cigarettes (1990). *Thailand – Restrictions on Importation of and Internal Taxes on Cigarettes*, BISD 37S/200.

US-BIT (Treaty Between the Government of the United States of America and the Government of [Country]) (2004). *Concerning the Encouragement and Reciprocal Protection of Investment*. Retrieved 6 October 2007 from http://www.naftaclaims.com/commission.htm.

World Health Assembly (WHA) (22 May 2004). *Global Strategy on Diet, Physical Activity, and Health*, WHA57.17.

World Health Organization Regional Office for Europe (16 November 2006). *European Charter for Counteracting Obesity*, EUR/06/5062700/8.

World Health Organization Regional Office for Europe (2007). *The Challenge of Obesity in the WHO European Region and the Strategies for Response*. World Health Organization Regional Office for Europe, Copenhagen.

World Trade Organization (21 November 2001). *Doha Declaration on the TRIPS Agreement and Public Health*, WT/MIN(01)/DEC/2.

Glossary of Trade Terms

Anne Marie Thow

Italicisation of terms indicates they are defined elsewhere in the glossary.

Accession: The process of a country becoming a member of an international agreement, such as the *World Trade Organization* (WTO). Negotiations determine the specific obligations a non-member country must meet before it is entitled to full WTO membership benefits.

Agreement on Agriculture (AoA): One of the *Uruguay Round* agreements, the AoA established rules for agricultural trade for all WTO members. The AoA came into effect on 1 January 1995, and its core objective is to establish a fair and market-oriented agricultural trading system.

Agricultural safeguards: Safeguards are provisions permitted under WTO regulations by which imports beyond the safeguard level can be temporarily restricted if the affected industry can show that it will suffer serious injury from the higher level of imports.

Amber Box Measures: WTO designation for Government support to agriculture that distort production and trade, including price support and *subsidies* directly related to production quantities.

Appellate Body: An independent, seven-person body that considers appeals in WTO disputes. When one or more parties to the dispute appeals, the Appellate Body reviews the findings in panel reports.

Applied Tariffs/Rates: In contrast to *bound tariff rates*, which are the highest *tariff* rates that a WTO Member can charge on *imports*, applied tariffs/rates are those actually applied at the border. In practice, countries' (particularly developing countries') applied tariffs are always lower than the bound rate.

Balance of Payments: A record of the economic transactions of a country's residents with the rest of the world. The current account – which records international trade in goods, services and transfer payments – and the capital account – which records international purchases and sales of assets such as stocks, bonds and land – are the two main accounts in the balance of payments.

Balance of Trade: The difference between the value of goods and services that a nation *exports* and the value of the goods and services it *imports*. For example, a trade surplus occurs when a country's exports exceed its imports, resulting in a favourable trade balance.

Bilateral Investment Treaty (BIT): A treaty between two countries that has been designed to promote and protect investment between the two partners. BITs usually

offer investors *national treatment* or *most-favoured-nation treatment*; free transfer of funds and personnel, as well as guarantees against denial of justice, and expropriation without compensation.

Blue Box Measures: WTO designation for support to agriculture that is linked to production, but subject to production limits and therefore minimally *trade distorting*.

Bound Tariff Rates, Tariff Binding: Tariff rates resulting from GATT/WTO negotiations or accessions. Bound rates are enforceable, and if a WTO member raises a *tariff* above the bound rate, the affected countries have the right to retaliate or receive compensation, usually in the form of reduced tariffs on other products they *export* to the offending country.

Caribbean Community (CARICOM): A regional organisation promoting sustainable development, enhanced quality of life and economic advancement for its 15 member countries.

Cash Crops: A crop that is grown especially to sell in order to make money, rather than to use as food or as livestock feed.

Ceiling Bindings: In cases where an existing *tariff* was not already bound, developing countries were allowed to establish ceiling bindings in acceding to the WTO. These ceiling bindings could result in tariffs that were higher than the existing *applied rate*. The ceiling bindings took effect on the first day of implementation of the WTO *Agreement on Agriculture*.

Codex Alimentarius Commission: The Codex Alimentarius Commission is a UN Food and Agriculture Organization/World Health Organization commission under the Joint FAO/WHO Food Standards Programme that aims to protect the health of the consumers, ensure fair trade practices in food trade, and promote coordination of all food standards work undertaken by international governmental and non-governmental organisations. It is responsible for the development of the Codex Alimentarius, a collection of internationally recognised standards, codes of practice, guidelines and other recommendations relating to foods, food production and food safety. The Codex has two committees particularly relevant to nutrition: the Codex Committee on Nutrition and Foods for Special Dietary Uses (CCNFSDU) and the Codex Committee on Food Labelling (CCFL).

Comparative Advantage: A theory advanced by neoclassical economists in the early nineteenth century, comparative advantage exists when a country produces a good or service at a lower opportunity cost than its trading partners. The theory states that trading across borders enables countries to specialise in producing goods consistent with their resource endowment.

Compulsory Licences: When the authorities licence companies or individuals other than the patent owner to use the rights of the patent – to make, use, sell or *import* a product under patent – without the permission of the patent owner. This is permissible for WTO members under the *TRIPS Agreement*, but only provided that certain procedures and conditions are fulfilled.

Countervailing Duties: If a country can demonstrate that its domestic industry is being injured due to subsidised *imports* from another country, the WTO Agreement on subsidies and countervailing measures (SCM) allows the aggrieved importing country to impose custom duties on these subsidised exports.

Customs Union: An agreement by two or more countries to erect a common external *tariff* and to abolish restrictions on trade among members.

***De minimis* Level of Support:** Support to agriculture permissible for WTO members, which is no more than 5% of the total value of agricultural output (10% in the case of developing countries).

Devaluation: Reduction of the value of a country's currency in terms of foreign currencies. Usually refers to adjustment of pegged exchange rates; with floating exchange rates, a decline in the exchange value of a currency is referred to as depreciation.

Dispute Settlement Understanding: The legal process embodied within the agreements of the WTO which allows countries to dispute trade policies and practices of other countries. The decision of the dispute settlement body is enforceable, by allowing aggrieved members to take retaliatory trade actions against the offending member country.

Distortion: When prices and production are higher or lower than levels predicted to exist in a competitive market, due, for example, to the granting of *subsidies* for production (see also 'production distorting' and 'trade distorting').

Doha Development Agenda: The name given by the WTO Secretariat to the trade negotiations that WTO members agreed to embark upon when they met in Doha for the WTO's Fourth *Ministerial Conference*, in November 2001. The term 'development agenda' marked a departure from previous WTO 'rounds' of trade talks. The term 'Doha development agenda' is not defined or even mentioned in the text of the Doha Declaration, so many members prefer the use of the term 'Doha work programme'.

Domestic Support Measures: Any form of government support to agriculture which acts to maintain producer prices at levels above those prevailing in international trade, including direct payments to farmers and input and marketing costs reduction measures.

Dumping: Occurs when goods are sold on the world market below the cost of production to dispose of surpluses or gain access to a market, generally meaning they are exported for less than they are sold in the domestic market or third-country markets. Dumping is generally recognised as an unfair trade practice because it can disrupt markets and injure producers of competitive products in an importing country.

European Community (EC): The EC was originally termed the European Economic Community (EEC), and was established in 1957 to create a common European market. The EEC became the EC in 1992 with the signing of the Treaty on European Union (the 'Maastricht Treaty'), which introduced the political structures that now form the European Union.

Export Competition: The practice of competing internationally in markets for agricultural commodities through the use of measures such as *export subsidies*, subsidised *export credits*, state trading enterprises, differential pricing and abuse of food aid.

Export Credits: The granting to the importer of goods and services an extended term to pay for them.

Export Promotion: When governments attempt to stimulate *exports* by giving incentives to exporting firms, as a strategy for economic development that stresses expanding exports. This is achieved through using policies to assist exporters, such as *export subsidies*.

Export Subsidies: Government payments or other financial contributions by governments to domestic producers or exporters if they *export* their goods or services. Reducing export subsidies liberalises trade by reducing market distortions.

Export Taxes: Taxes on goods or services that become payable when the goods leave the economic territory or when the services are delivered to non-residents; they include tariffs on exports, profits of export monopolies and taxes resulting from multiple exchange rates.

Exports: Goods, services and capital assets sold abroad. The sale of exports is recorded as credits on the *balance of trade* accounts.

Food Security: A situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life. National food security is achieved when a country is able to meet the food requirements of its population, whether through domestic production, *imports* or, as almost every country does, through a combination of the two. Food self-sufficiency describes the case where a country meets all its food needs through domestic production.

Foreign Direct Investment (FDI): An investment in a country other than that of the investor, involving a long-term relationship and control of an enterprise by the investor. Trade *liberalisation* can facilitate FDI into a country through changes in regulations, such as reductions in restrictions on foreign ownership of companies, improved protection of intellectual property rights under the *TRIPS Agreement* and promotion of *national treatment*.

General Agreement on Tariffs and Trade (GATT): A free-trade agreement signed in 1947 by 23 nations. GATT member countries are required to treat all other member countries equally in the application of trade rules, consult with each other about trade matters and attempt to resolve differences through a dispute resolution process. It was superseded by the *World Trade Organization* (WTO) in 1995 after the closure of the *Uruguay Round* of trade talks. An updated General Agreement (GATT 1994) is now one of the WTO's agreements.

General Agreement on Trade in Services (GATS): The first multilateral agreement to provide rules governing services trade. GATS requires countries to provide *national treatment* to foreign service providers in those service industries that they have agreed to liberalise under GATS.

Geographical indications (GIs): The name of a place (or words associated with a place) that is used to identify products which have a particular quality, reputation or other characteristic because they come from that place (e.g. 'Champagne', 'Tequila' or 'Roquefort').

Harmonised Standards: An international nomenclature developed by the World Customs Organization, which allows participating countries to classify traded goods on a common basis.

Hazard Analysis and Critical Control Point (HACCP): A systematic way to control safety hazards by first identifying hazards and their severity and likelihood of occurrence; then identifying critical control points and their monitoring criteria to establish controls that will reduce, prevent or eliminate the identified hazards. The use of HACCP in food safety is becoming more common due to efforts to harmonise food standards with increasing trade.

High-Value Food Products: Processed food products and perishable foods such as meats, fresh fruits and vegetables. These products either require special handling, such as fresh produce, or are processed, which adds substantial value beyond the farm level.

Imports: Goods, services and capital assets purchased from overseas countries. The purchase of imports is recorded as debits on the *balance of trade* accounts.

Import Licence: An authorisation by a government authority for the importation of goods that are subject to restriction. Also called an *import permit*.

Import Substitution: A national economic strategy to build up a domestic economy by emphasising the replacement of imports by domestically produced goods. These policies are designed to both inhibit *imports* and support domestic production.

In-Quota Tariff: The *tariff* applicable to a product imported within the limits of an amount specified under a *tariff rate quota*.

International Plant Protection Convention (IPPC): An international treaty to secure action to prevent the spread and introduction of pests of plants and plant products and to promote appropriate measures for their control.

Liberalisation (Trade): The removal of barriers (such as tariffs or national controls) in order to create a 'free' market in goods, services or finance. Liberalisation is a political philosophy that supports a reduced government role in the economy. It believes that markets should, as far as possible, be left to the forces of supply and demand.

Like Products: Products that are similar, using criteria such as the intended end-use of a product, the product's properties and the commercial substitutability of the two products. Under WTO rules, imported and domestic products that are 'like' must not be treated differently.

Market Access: The government imposed conditions under which a product may enter a country under *non-discriminatory* conditions. It entails the extent to which an *imported* good or service can compete in another market with goods or services produced there.

MERCOSUR: The 'common market of the south'. A free trade area formed in 1991 by Brazil, Argentina, Paraguay and Uruguay. Venezuela announced its intention to join in 2006.

Most-Favoured-Nation (MFN): The WTO principle of not discriminating between one's trading partners.

Ministerial conference: Meetings of the Ministers of Trade of member countries of the WTO. Ministerial conferences are the WTO's highest decision-making body, meeting at least once every 2 years and providing political direction for the organisation.

North American Free Trade Agreement (NAFTA): The agreement to form a free trade area among the United States, Canada and Mexico. The agreement expanded the US-Canada Free Trade Agreement and went into effect from 1 January 1994.

National Treatment (NT): The principle of giving others (e.g. firms or importers) the same treatment as one's own nationals. For example, it requires that *imports* be afforded 'no less favourable' treatment than domestic goods once border measures have been applied.

Non-discrimination: The practice of not making a distinction in favour of or against certain trading partners – e.g. if certain tariff reductions are granted to some trading partners they must be extended to all. This can also mean not making a distinction between imported and domestically produced goods, once goods have entered the market. Non-discrimination is a critical component of the *Most-Favoured-Nation* principle and the *National Treatment* principle.

Non-Tariff Barriers to Trade (NTB): Government measures other than *tariffs* that restrict trade flows, also called *non-tariff measures*. Examples of non-tariff barriers include *quantitative restrictions*, *import licencing*, variable levies, import *quotas* and *technical barriers to trade*.

Office International des Epizooties (OIE): The OIE is the intergovernmental organisation responsible for improving animal health worldwide, and is recognised as a reference organisation by the *World Trade Organization*.

Out-Of-Quota Tariff: The *tariff* rate applicable to products imported in excess of the amount specified under a *tariff rate quota*.

Pacific Agreement on Closer Economic Relations (PACER): A framework for the gradual enhancement of trade and economic integration within the Pacific, including a programme of regional trade facilitation.

Pacific Island Countries Trade Agreement (PICTA): A *trade agreement* amongst Forum Island Countries that came into force in 2003, with the objective of creating a single regional market.

Preferential Treatment: The granting of special trade policy exemptions or privileges to another nation (or group), such as zero tariffs, without the requirement that the developing country reciprocate these measures. Under the WTO Generalised System of Preferences, preferential treatment is offered to products originating in developing countries.

Production Distorting: The tendency to shift the quantity of a product produced above or below what it would be if the product were produced under competitive conditions (see also 'distortion').

Protectionism: A political term used to refer to the implementation of policies favouring domestic business or producers over foreign competitors, in violation of the principles of 'free' trade. Interventionist policies that intervene in trade are often referred to as 'protectionism'.

Quantitative Restriction: A restriction on trade, usually *imports*, that limits the quantity of the good or service that is traded. *Quotas* are the most common example.

Quota: A *quantitative restriction* that limits the number or volume of foreign products that can enter the domestic market.

'Rounds' of trade talks: Cycles of multilateral trade negotiations conducted under the *General Agreement on Tariffs and Trade*, and now under the *World Trade Organization*. Eight rounds have been completed since the GATT was established in 1947. The WTO was established under the *Uruguay Round* (1986–1994) and the current round of negotiations (2001–ongoing) is the *Doha Development Agenda*, or Doha Round.

Sanitary and Phytosanitary (SPS) Measures: Technical barriers designed for the protection of human health or the control of animal and plant pests and diseases. Under the Uruguay Round Agreement on the Application of Sanitary and Phytosanitary Measures, WTO member countries agreed to base any SPS measures on an assessment of risks posed by the import in question and to use scientific methods in assessing the risk. The jointly managed WHO–FAO *Codex Alimentarius* establishes international standards on food composition and labelling.

Schedules: A country's schedule is the document that sets out the terms, conditions and qualifications under which it will import foreign goods or open service sectors to foreign competition. Each WTO Member has its schedule which sets out the areas in which it has made WTO commitments, for instance, maximum *tariff* levels, the service sectors to which it will apply the market access and *national treatment* obligations.

Sensitive Products: Products more likely than others to encounter *tariff* restrictions. Examples are agricultural products, textiles, clothing and footwear. Sensitive products are proposed by developed countries for products they do not wish to open to full liberalisation.

Special and Differential Treatment: A principle allowing developing countries to have lesser reduction commitments than developed countries. In the *Uruguay Round*, disciplines applying to developing and least-developed countries were less stringent than those applying to developed countries.

Special Products: Agricultural products in developing countries exempted from *tariff* reduction, or for which tariffs would be reduced at rates lower than that agreed for other products.

Special Safeguard Mechanism: A mechanism in the *Doha* reforms proposals which would allow developing countries to impose additional *tariffs* on agricultural imports if *import* volumes exceed defined trigger levels or import prices fall below defined trigger prices.

State Trading Enterprises (STE): An entity of goverment that is responsible for buying and/or selling, and/or exporting and/or importing specified products, usually acting as a monopoly. State marketing boards are a form of STE often found in agriculture, such as state wheat or dairy boards. Once common, there are few STEs left after the recent period of trade deregulation and *liberalisation*.

Subsidy: A direct or indirect benefit granted by a government for the production or distribution (including export) of a good. There are two general types of subsidies: export and domestic. An export subsidy is a benefit conferred on a firm by the government that is contingent on *exports*. A domestic subsidy is a benefit not directly linked to exports.

Trade Policy Agenda: A set of trade-related policies implemented or recommended by a government or organisation.

Tariff: Customs duty (a tax) on imports or, more rarely, on exports, levied either on an ad valorem basis (percentage of value) or on a specific basis (e.g. by weight or volume). Tariffs raise revenues for the government and can also be used to support the domestic market.

Tariffication: The conversion of *non-tariff measures* such as *quotas* into approximately equivalent *tariffs*.

Tariff Binding: A commitment not to increase a rate of duty above an agreed level.

Tariff Escalation: Higher import duties on semi-processed products than on raw materials, and higher still on finished products. This practice protects domestic processing industries and discourages the development of processing activity in the countries where raw materials originate.

Tariff Line: A product as defined in lists of *tariff* rates. Products can be sub-divided, the level of detail reflected in the number of digits in the *Harmonised System* (HS) code use to identify the product.

Tariff-Rate Quota (TRQ): Application of a higher tariff rate to imported goods after a certain quantitative limit (quota) has been reached. The in-quota tariff applies to any imports below the quota amount. Increasing the tariff-rate quota increases the amount of the good that can be imported at the lower tariff rate, thereby facilitating trade.

Technical Barriers to Trade (TBT): Regulations, standards (including packaging, marking and labelling requirements), testing and certification procedures, and other *non-tariff barriers* that can create obstacles to trade. Under the *Uruguay Round* Agreement on Technical Barriers to Trade (TBT Agreement), WTO members agreed to disciplines on the use of these measures as they apply to both industrial and agricultural products.

Trade Agreement: A negotiated agreement among two or more countries to limit or alter their policies with respect to trade. They can be bilateral, regional or multilateral:

- **Bilateral trade agreement:** An international trade agreement between just two countries. Since 2003, an increasing number of countries, including WTO Members, have entered into bilateral trade agreements. Such agreements often have far more stringent conditions (relating to liberalisation *schedules*, intellectual property standards etc.) than WTO agreements.
- **Multilateral trade agreement:** An international trade agreement that involves the participation of a large group of countries, each with their own *schedule* of commitments. The WTO is the key forum for multilateral trade negotiations.
- **Regional trade agreement:** An international trade agreement between countries in a region. As with a multilateral trade agreement, each country has their own *schedule* of commitments. For example, *PICTA* and *NAFTA*.

Trade Distorting: Having the tendency to shift the volume or value of a product traded above what would be traded under competitive market conditions.

TRIMs Agreement: The WTO's Agreement on Trade-Related Investment Measures requires member countries to phase out (and refrain from implementing) investment promoting measures that are inconsistent with GATT principles. Such measures have trade distorting or restricting effects; for example, requiring local content in manufacturing.

TRIPS Agreement: The WTO's Agreement on Trade-Related Intellectual Property Rights, which requires minimum standards of intellectual property protection. TRIPS includes numerous 'flexibilities', such as the right to suspend patents for reasons of *orde public*, to exclude plants and animals from patentability, and to issue *compulsory licences* in times of national emergency.

UNCTAD (United Nations Conference on Trade and Development): UN agency established in 1964, which promotes the development-friendly integration of developing countries into the world economy.

Unilateral: Trade measures implemented by only one country (e.g. unilateral trade liberalisation), or an agreement that is imposed on one country by another, which benefits one nation only (e.g. unilateral *tariff* reductions).

Uruguay Round: *Multilateral trade negotiations* launched at Punta del Este, Uruguay in September 1986 and concluded in Geneva in December 1993. Signed by Ministers of Trade in Marrakesh, Morocco, in April 1994. This *round* resulted in the formation of the *World Trade Organization*.

World Trade Organization (WTO): Established on 1 January 1995, as a result of the *Uruguay Round*, the WTO replaces the *General Agreement on Tariffs and Trade* as the legal and institutional foundation of the multilateral trading system of member countries. It provides the principal contractual obligations determining

how governments frame and implement domestic trade legislation and regulations. It is also the platform on which trade relations among countries evolve through collective debate, negotiation and adjudication.

References

3D Trade, Human Rights, Equitable Economy (2004). *Jargon Explained: Glossary of Terms Commonly Used in the WTO*. Retrieved 16 February 2009 from http://www.3dthree.org/pdf_word/m311-3D%20Glossary%20July%202004%20rev.pdf.

Biz/Ed (2009). *Glossary*. Retrieved 10 February 2009 from http://www.bized.co.uk/virtual/dc/resource/glos1.htm.

Business Roundtable (2007). *The Language of Trade*. Retrieved 19 February 2009 from http://trade.businessroundtable.org/glossary/WTO_Glossary_2007.pdf.

Central Financing and Contracting Agency (2008). *Glossary*. Retrieved 10 February 2009 from http://www.safu.hr/en/glossary?sid=007960aa854739adeb91f026621c64b0.

Food and Agriculture Organization (2001). *The State of Food Insecurity 2001*. FAO, Rome.

Global Forum on Food Security and Nutrition (2009). *Glossary*. UN Food and Agriculture Organization. Retrieved 1 March 2009 from http://km.fao.org/fsn/resources/glossary/en/.

Highlight Investments Group (2009). *Trading Glossary*. Retrieved 10 February 2009 from http://www.trading-glossary.com/a.asp.

International Monetary Fund (1998). *The Fabric of Reform – an IMF Video: Glossary*. Retrieved 16 February 2009 from http://www.imf.org/external/pubs/ft/fabric/gloss.htm.

International Plant Protection Convention (2009). *International Phytosanitary Portal*. Retrieved 19 February 2009 from https://www.ippc.int/IPP/En/default.jsp.

Institute for Agriculture and Trade Policy (2005). *Agreement on Agriculture Glossary*. Retrieved 13 March 2009 from http://www.tradeobservatory.org/library.cfm?RefID=37606.

Organization for Economic Co-operation and Development (2001). *Glossary of Statistical Terms*. Retrieved 10 September 2009 from http://stats.oecd.org/glossary/detail.asp?ID=917.

United States Department of Agriculture Foreign Agricultural Service (2005). *Glossary of Agricultural and WTO Terms*. Retrieved 10 February 2009 from http://www.fas.usda.gov/itp/wto/mini-ministerial2008/glossary.pdf.

United States Department of Agriculture Economic Research Service (1996). *A glossary of Trade Terms*. Agricultural Outlook, December 1996.

United States Department of Agriculture Economic Research Service (2008). *Global Food Markets: Glossary*. Retrieved 10 February 2009 from http://www.ers.usda.gov/briefing/ GlobalFoodMarkets/glossary.htm.

Urwin, D. (2001). *Glossary of the European Union and European Communities*. University of Tampere, Finland. Retrieved 19 February 2009 from http://www.uta.fi/FAST/GC/eurgloss.html.

World Trade Organization (2009). *Glossary of Terms: An Informal Guide to WTO Speak*. Retrieved 10 February 2009 from http://www.wto.org/english/thewto_e/minist_e/min99_e/english/about_e/23glos_e.htm.

Index