SOS Sport Manual

PRINT INSTRUCTIONS:

1. Print on Legal Size Paper - fold in half to make a manual.
2. Print the Cover by itself (page 20). We print it on color - solar yellow.
3. Print the following pages back to back:
   page 19 and page 2
   page 18 and page 3
   page 17 and page 4
   page 16 and page 5
   page 15 and page 6
   page 14 and page 7
   page 13 and page 8
   page 12 and page 9
   page 11 and page 10
4. It is not necessary to print page 1 - the instruction page.

Dedication

We would like to dedicate this training manual in memory of Douglas Augustine, longtime supporter, encourager and friend.

Gratefully,
The Staff of the
Solar Oven Society

Acknowledgments

We'd like to thank all people who have furthered the cause of solar cooking worldwide. We have learned so much from so many.

We acknowledge and thank God for His enabling.

We specifically want to thank: (There are others we may have inadvertently overlooked - our apology.)

Barbara Kerr and Sherry Cole who "played" in their backyard in Phoenix, Arizona - Barbara the inventor and designer who invented the first cardboard Solar Box Cooker and Sherry the visionary who knew this is a technology to be shared with the world. They are also to be complimented for their work on the vision and designs of a "through the wall" solar oven.

Solar Cookers International - founded and pioneered in part by Bob Metcalf who purchased an early model of a patio solar cooker from Barbara Kerr. Solar Cookers International (SCI) has played a strategic role in promoting solar cooking technology around the world. They have also encouraged solar cooking among refugees in several African nations with the "CooKit" - an aluminized cardboard reflective panel, dark pot and plastic bag. Many of the educational tools in this booklet were developed or designed by SCI. Our thanks to SCI.

SERVE is a registered charitable trust in the UK approved by the governments of Pakistan and Afghanistan. They started their work with solar ovens in 1984 and built and sold over 20,000 using galvanized steel on the exterior. SERVE worked closely with the United Nations High Commission for Refugees and made solar cooking available in refugee camps. In working with refugees they used mud bricks along with a metal liner and glass lid to capture sun energy to successfully cook food in these impoverished areas. Gordon Magney added valuable input to the SOS Sport.

Richard C. Wareham and the Sunstove Organization: Solar Cookers International has hosted several World Conferences on Solar Cooking. Richard Wareham attended the Second such conference in Costa Rica in 1994. Mr. Wareham brought with him the African Sunstove. The African Sunstove is a strategic example of efficiency, durability, attractiveness and low cost in a solar oven using recycled plastic and aluminum. This model helped confirm our dream of a plastic housing from our first trip to Haiti in 1990.

Dr. Paul A. Funk: Persons Helping People hired Paul Funk to assist in the design of a low-cost solar oven for developing countries. Paul received his Master's Degree from the University of Minnesota and Doctorate Degree from the University of Arizona (both in Agricultural Engineering). Research for his degrees centered on solar cooking. Paul's research guided us through numerous technicalities along with assistance in the design of the housing. Paul has served the whole world with his expertise.

Use of a modified acrylic glazing was shared by **Richard Wareham**. The incorporation of a "fence" to hold the glazing in place is credited to **Clinton Loney** of Jamaica. The slanted face comes from the **SERVE model**. Many of these same features were used by other pioneers in the field and are published in *New Prospects in Solar Cooking*, 1991.

Individuals - Bob Nepper, John Roche and Louis Stumpf have sacrificed countless hours in pursuit of amazing assembly jigs that allow for assembly of the solar oven without dependence on electricity or large machinery - beneficial in developing countries. Others who freely shared their technical expertise and skills to walk us through the stages of production and assembly jigs**:** Maynard Borman, Bill Butler, Richard Lund, Bill Stevenson, Tom Viker, and Douglas Youel.

Thanks To Solar Cookers International

Many of the educational tools in this booklet were developed or designed by Solar Cookers International (SCI). Our thanks to SCI for permission to publish some of their materials.

SCI has played a strategic role in promoting solar cooking technology as well as networking individuals and the technology around the world. They have promoted solar cooking among refugees in several African nations with the "CooKit" - an aluminized cardboard reflective panel, dark pot and plastic bag. The plastic bags require periodic replacing.

Additional - continued

The Cooking Process:

Most foods (except beans) need only to be brought to a rolling boil before placing the pot in the Fireless Oven. In the well insulated Fireless Oven hot food will continue to cook without an outside heat source. Usually after two to three hours the food will be ready to eat or can remain warm for a longer period of time.

Beans will usually be an all day process in the Solar Oven. A two-stage process is recommended with a Little Fire Cooker and a Fireless Oven. After an overnight soaking and rinse, bring the beans to a boil (with no salt or seasonings) and simmer for a minimum of 10 minutes on the Little Fire Cooker. Place the pot in the Fireless Oven for 2-4 hours. Remove the pot from the Fireless Oven and simmer on the Little Fire Cooker for another 10 minutes (this time with salt and seasonings added). Place a second time in the Fireless Oven for another 2-4 hours. You will enjoy wonderfully cooked beans with no burned or scorched taste.

Little Fire Cooker

Uses Of The SOS Sport

The use of the SOS Sport is varied. People have reported using it for the following. We do not have all the details to share with you.

1. Cooking Meat, Fish, Vegetables, Fruits and Staples of Rice, Beans, Potatoes, and Corn Meal.
2. Baking Bread, Pastries, Cookies, and Cakes.
3. Warming Food.
4. Pasteurizing Drinking Water. See Page 21.
5. Drying Food. Note: Prop open the lid so moisture can escape. This can be accomplished as easily as folding a piece of wire over the top edges of the solar oven.
6. Drying Wood. Note: Prop open the lid so moisture can escape. This can be accomplished as easily as folding a piece of wire over the top edges of the solar oven.
7. Making Candles. Candle wax can be safely melted in solar ovens without danger of fire.
8. Dying Yarns. Add color to your yarns without fear of the yarn getting too hot.

Solar Cooking
Is
Waterless Cooking!

Do Not Add Water
Unless You
Are You Cooking
Food Items
Such As
Rice, Beans, Corn Meal, Etc.
That Require Absorption of Water
(see page 3, number 12 & page 22, “Health”)

Water Is A Very Dense Medium
And Substantially Slows or Prevents
The Cooking Process!

Parts Of The SOS Sport

Glazing or Lid: Clear covering or lid on the top surface of a solar oven. The glazing allows the sun to shine into the solar oven but holds the heat in, just like a greenhouse. The SOS Sport's glazing is double layered with dead air space between the two layers to provide greater insulation than a single layer.

Housing: Outer shell of the solar oven. The housing provides the exterior shape of the cooker. It also holds the insulation in place and provides a ledge on which the glazing rests. The plastic housing, made from post consumer recycled soft drink bottles, provides protection from weather elements, and durability against breakage.

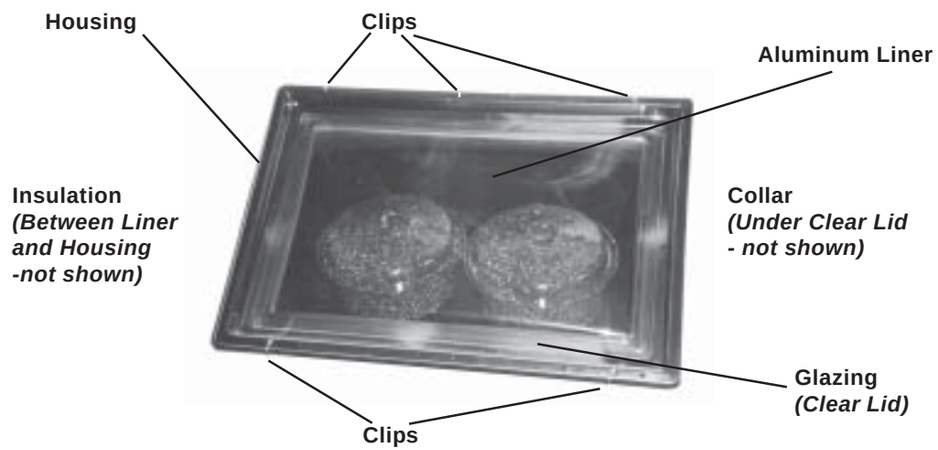
Collar: The collar, also made from recycled plastic, provides a flat surface to seal the inner chamber of the solar oven when the lid or glazing rests on it. The collar adds a nice aesthetic finish to cover the raw edges of the insulation and aluminum.

Clips for the Lid are designed to hold the lid on the oven in windy weather. The tension of the spring clips seal the oven and will also help hold in more heat.

Aluminum Liner: The liner on the inside of the solar oven is made of aluminum to protect the insulation from punctures and deterioration.

Insulation: Composed of a closed-cell (does not absorb moisture), air-filled foam that holds heat on the inside and keeps out cooler outside temperatures.

Accessories: The SOS Sport comes equipped with an **oven thermometer** to confirm when cooking is no longer happening and to confirm when food needs to be removed from the oven. A **WAPI** confirms water pasteurization - page 21. A **manual**. **Two pots** (round roaster - enamel on steel), that hold 3.4 quarts each.



The SOS Sport weighs less than 10 lbs.
The oven is 27 1/2" long x 17" wide (at the lid) x 12 1/4" tall (at the back).

Optional reflectors are available for use to extend the solar cooking season for areas farther from

11. (continued) **Cooker Position / Re-aiming**:
In the **Northern Hemisphere:** point the cooker south.

ALL-DAY ("absentee") COOKING:

COOKING BOTH NOON & EVENING MEALS:
(morning) **(afternoon)**

E Q U A T O R

In the **Southern Hemisphere:** point the cooker north.

ALL-DAY ("absentee") COOKING:

COOKING BOTH NOON & EVENING MEALS:
(afternoon) **(morning)**

12. **Do not add water to fresh vegetables, fruits or meats**. Try the usual amount of liquid to hydrate or rehydrate dry foods. If you desire, decrease the amount of liquid to your preference on subsequent cooking experiences. Generally this would be a minimal adjustment.

13. **Stirring or turning over is not required** when cooking in the SOS Sport as required when cooking with open flames or hot burners. (**It is okay to "peek".** Promptly replace the lids of the pots and close the glazing for the hot temperatures to resume. The less you peek, the sooner the food is cooked.)

14. **Several uncovered bowls** can be placed inside a larger covered pot for cooking—such as individual custard dishes.

15. **Pots with dark-colored interiors such as Teflon, etc.** You may cover the vessel with clear saran wrap or a clear lid (vs. a dark-colored lid), if more than one half of the interior walls and/or floor remain exposed and not covered with food. (Use black paint only on the exterior of pots - not interiors.)

16. **Leftovers** are easily warmed up in the SOS Sport. **Liquids (broth) from meats** can be used for making soups, gravies, flavoring for rice, etc.

17. **Water on Glazing / Moisture in Oven**: On high-humidity days and colder days, moisture may condense on the underside of the glazing. If it does not adequately run off the slant of the glazing, simply wipe the glazing with a soft clean cloth. **When finished cooking - take the lid off of the oven, tip it towards a corner, and pour out any collected water.**

How Do Solar Ovens Work?

We often share the following dialogue with children in elementary schools:

Q: What does it feel like when you enter an automobile with the windows rolled up on a sunny summer day?

A: HOT!

Q: Now - imagine if the roof of the car was glass or clear plastic instead of metal or canvas. Would it be hotter inside the car?

A: YES!

Q: Usually we sit on nice upholstery inside a car. Can you imagine what it would feel like inside this hot car with a glass roof if we were sitting on black metal instead of nice cloth or leather?

Reaction: OUCH!

The effect of the sun in an automobile with the windows closed is the same energy that cooks food inside of a solar oven.

General Principles

The SOS Sport and many other models of solar ovens use the design of an outer casing and an inner casing or liner with insulation in-between. Many different materials are used for the outer and inner casings - plastic, reed baskets or folded mats, metal, cardboard, wood, mud bricks, etc. Insulation is as varied also - crumpled newspaper, dried grass, feathers, wool, commercial insulation products.

♦ **Clear Glazings** of glass, plastic, polyester film or other materials stretch across the open cavity of solar ovens to allow sunshine into the cooker.

♦ **Sunlight** is absorbed on the surfaces of dark pots and a dark metal floor. As the sunlight is absorbed, light rays are changed to heat rays. Heat rays are longer in length than light rays and are not able to pass back out of a solar oven through the glazing.

♦ **Insulation** between the aluminum walls and housing increases the retention of heat in the solar oven.

♦ **Exterior Reflector Panels** help bounce additional sunlight unto the pots and floor of a solar oven to help improve the performance. Reflectors mounted on the exterior of solar ovens can be a disadvantage in windy weather when they act as a "sail" and tip over the cooker, spilling its food contents.

♦ **Walls - 2 Basic Designs**: Shiny internal walls serve as reflectors on the interior of ovens to bounce additional sun rays within the cooker to the pots and floor for additional heat absorption. Dark walls absorb more heat in addition to absorption on the floor.

♦ **Black Color** is better for heat absorption. Other dark colors can be used also.

♦ **Pots and Pans** must be dark colored! Materials can be enamel on steel, aluminum, stainless steel, pottery, ceramic, or glass. Thicker mediums like glass, pottery and cast iron delay the cooking process on the front end, but help retain heat at the end of the day.

Duration Of Time For Solar Cooking On A Sunny Day

EASY TO COOK
2 Hours or Less

EGGS

RICE

FRUIT

VEGETABLES
(above ground)

FISH

CHICKEN

MEDIUM
3 - 4 Hours

POTATOES

VEGETABLES
(roots)

SOME BEANS
LENTILS

MOST MEAT

BREADS

HARD TO COOK
5 - 8 Hours

LARGE ROASTS
(all meats get more tender)

SOUPS AND STEWS

MOST DRIED BEANS

Benefits Of Using Solar Ovens

Use of solar ovens has numbers of benefits, both for everyone globally and those who personally use them.

Foods cooked in solar ovens help produce strong healthy bodies - Pasteurized water reduces disease - Lesser numbers of open fires reduce numbers of burns - Smokeless solar cooking reduces eye and lung disease - Strong, healthy bodies one meal at a time!

Health:

- Foods cooked in the SOS Sport are **nutritious** and **tender**. No water is added to fruits, vegetables or meats — therefore the food retains **more vitamins and minerals**. The slower process of passive solar cooking will cook food that is **very flavorful** and tender. **Tender food** aids digestion and nutrient absorption and is especially beneficial for children, seniors, and the toothless.

- **Water** can be **pasteurized**, killing waterborne bacteria and other parasites. Water is pasteurized in an SOS Sport when it is heated to 65°C or 150°F. Individual families can make their own water, milk and baby formula safe for drinking by using the free energy of the sun and an SOS Sport. One gallon (3.8 liters) of water heated in a solar oven will take approximately four hours to pasteurize on a sunny day. The SOS Sport comes complete with a reusable thermometer that has a memory (the WAPI, see page 21) to confirm pasteurization.

- **Fewer** children will experience **burns** from cooking fires.

- Use of the SOS Sport is **smokeless**. In developing countries, meal preparation in cooking huts is equal to inhaling the smoke of 10 or more packs of cigarettes a day. Inhaled smoke has a negative impact on lungs for adults and children. Using the SOS Sport can **reduce** the incidence of **respiratory illnesses** and **eye diseases** caused by smoke.

Efficiency:

- The SOS Sport actually **saves time**. Food preparation basically involves the same amount of time regardless of whether the food is cooked in an SOS Sport, microwave, oven, on a burner, charcoal grill, or over an open fire. In the SOS Sport, no stirring or turning of food is necessary. The chef can "abandon" the food to run errands or get involved in other activities without worries about overcooking. The food uses less water for cooking in an SOS Sport. Clean up of pots is easy with no food sticking. Less water is required for clean up.

MEATS: Add no water or oil. Longer cooking equals more tender meat and more browning. When using BBQ sauce or other glazing, bake meats for 1½ to 2 hours, drain fluids, add sauce and continue cooking in SOS Sport. Marinating meats also provides wonderful flavor in solar cooking.

CHICKEN: 2-3 hours cut up, 3-4 hours whole. Longer to brown.

FISH: 1 to 2 hours.

BEEF, LAMB, OTHER RED MEATS:
2 hours for small cuts, 3 to 6 hours for large pieces.

TURKEY: large and whole, all day. Best to cut up.

PORK: cook on days with FULL, DIRECT OVERHEAD SUN! As always, be sure cooked pork is white (not pink) before eating. Pork chops (thin slices): 2 to 2½ hours. 5 lb. roast: 6 hours to all day.

SAUCES/GRAVIES: (made with flour or starch): Heat juices and flour separately, with or without a bit of cooking oil in the flour. Combine immediately and stir. Ready quickly.

PASTAS: Heat water with a bit of oil in one pot and dry pasta in another pot. Heat both until water is boiling or near boiling. Add hot pasta to hot water. Stir and put back into SOS Sport for about 8 minutes. Sauces and meat can be warming/cooking in a third or fourth pot.

BAKING: Baking is best done in the middle of the day. Preheat the SOS Sport. Breads and cakes can be dried out more than desired if left in the SOS Sport too long.

BREADS: 3 hours for whole loaves. 2 to 2½ hours for dinner and sweet rolls.

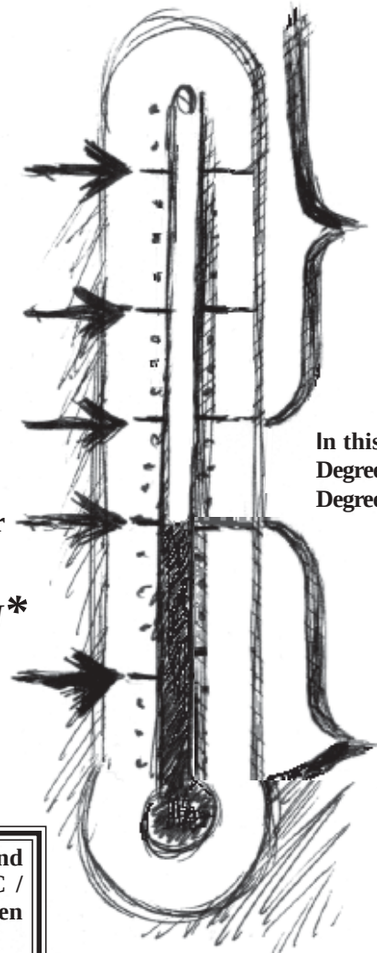
CAKES: 1½ to 2 hours.

COOKIES: 1½ hours. Cookies don't need a cover.

PIZZA: Bake crust in one pot; cook sauce, herbs and meat in another pot. When crust is baked and meat is done, add ingredients to the crust. Sprinkle cheese on top. Return to SOS Sport for 10 minutes or until cheese is melted.

ROASTING NUTS: Bake uncovered. Peanuts (groundnuts): 2 hours. Almonds: 1 hour.

Temperatures In The SOS Sport



130°C / 266°F
Good Sunshine Equals Good Temperatures

100°C / 212°F
Water Boils

82°C / 180°F
Food Cooks

65°C / 150°F & Higher
Water Pasteurization*

32°C / 90°F
Warm/Hot Daytime Temperature

Solar Cooking

In this manual:
Degrees Fahrenheit will be abbreviated: °F
Degrees Centigrade will be abbreviated: °C

Danger Zone Where Bacteria In Food Multiplies

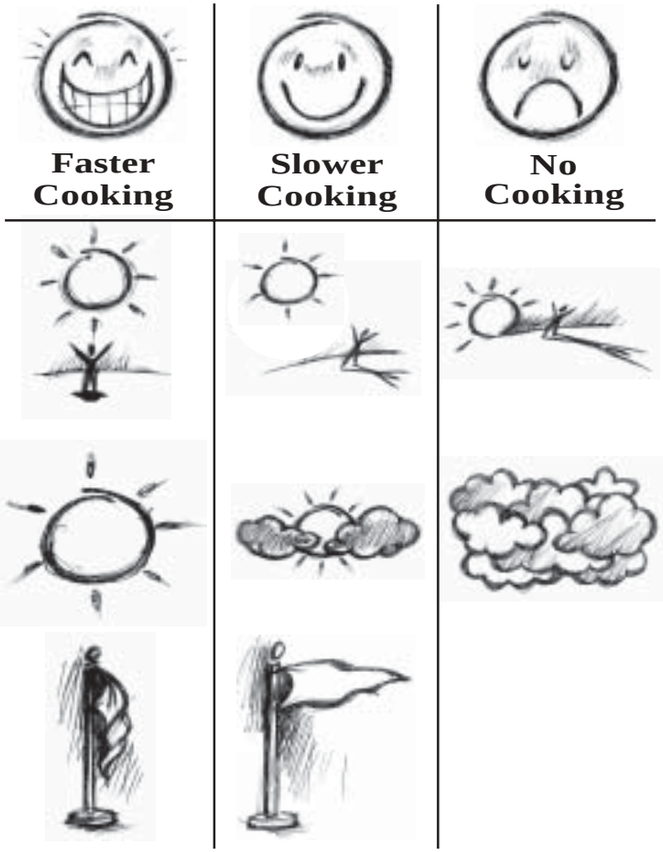
- **Oven Temperatures At 60°C / 140°F Or Cooler**
- **Remove Food For Refrigeration Or Cooking Via Alternative Fuel**

*** Disease-causing germs and parasites are killed at 65°C / 150°F for time duration of ten minutes or longer.**

With good sunshine common temperatures in the SOS Sport are temperatures of 99 - 130 degrees Centigrade (°C) or 210 - 266 degrees Fahrenheit (°F). These temperatures allow for slow, flavorful, passive solar cooking. In ideal conditions the SOS Sport will reach temperatures of 149°C / 300°F.

When room (or air) temperatures are 5°C / 41°F or warmer, food should not be left in the SOS Sport overnight. It provides no refrigeration to help preserve the freshness of food. Food spoilage can happen.

Greater solar cooking temperatures are attained via external reflectors. The SOS Sport attains good temperatures for passive solar cooking without reflectors. Reflectors can act as "sails", catching the wind and sometimes overturn the cookers and the food inside. Solar cookers using parabolic dishes will attain even greater temperatures and more quickly. Parabolic dishes do require personal time commitments to regularly aim the cooker at the sun, stir the food to keep from burning, often cost more money, and can involve eye injuries and burns. “Box” style solar ovens do not require time commitments from the cook.



Seasons and Time of Day
Short shadows mean more effective cooking than long shadows.

Clouds or Dust
Crisp, distinct shadows mean better cooking. Faint shadows mean lesser energy for cooking.
Once the food is heated to 180° F or greater, food will continue to cook with just 30 minutes of sunshine per hour. If there is no sun and no shadow (total cloud cover), there is no solar cooking.

Wind Factor
Wind carries heat away from the glazing. Stronger winds diminish cooking performance.

Aiming Cooker at the Sun
If the SOS Sport is “tracked” with the sun (aimed at the sun), cooking will be more effective. Example: in the northern hemisphere, track to the southeast (morning), south (noon), then southwest (afternoon). It is possible to put your food into the SOS Sport in the early morning and leave the cooker facing south all day long to effectively cook many meals. (See Pages 2&3, number 11.)

Altitude Factor
At high altitudes food cooked in the SOS Sport will not get as hot as at sea level (due to reduced boiling point of the water in the food). Cooking temperatures will be lower and the cooking slower.

Cook Early in the Day
Start meal preparations early. Try to have your food in the cooker by 9:00 a.m. In climates that are not arid, moisture evaporating from the surface of the earth (trees, plants, soil, ocean, lakes and streams) collect as clouds in the upper atmosphere. Generally there are more clouds in the afternoon than in the morning.

BAKED POTATOES

This recipe is based on potatoes weighing 1 lb. each, the really choice bakers. For smaller individual potatoes approximately ¼ lb. each, the cooking will be faster.

2 lbs. baking potatoes per Sport cooking pot, 4 lbs total
4 tbs. minced flat parsley
4 tbs. minced fresh chives
fresh ground pepper and salt to taste
butter or olive oil to taste

1. Wash and dry the potatoes. Prick each potato a few times.
2. Place half of the dry potatoes in each Sport cooking pot. Do not add liquid.
3. Put lids on the black cooking pots and place them in the Sport solar oven. Clip the clear lid to the oven. Face the oven into the sun and then rotate it clockwise 30 degrees. Relax and do other things. The potatoes can be left unopened the entire cooking time. Check in 4 hours. If the potatoes are not done, face the oven toward the sun plus 30 degrees clockwise and continue cooking.
4. To serve, open the potatoes and sprinkle with the parsley and chives, add salt & pepper and butter to taste. Enjoy the moist, rich, potato and herb flavors.

Cooking Time - up to 6 hours.
Serves 4 – 6

BAKED ACORN SQUASH

1 acorn squash cut into 2 halves and seeded, per cooking pot
½ tsp. fresh ground black pepper, or to taste
½ tsp. kosher salt, or to taste
½ tsp. ground cumin
2 tbs. butter

1. Place the 2 squash halves in one Sport cooking pot. If they will not lay flat, this is not a problem.
2. Divide the other ingredients evenly between the two squash halves.
3. Put lids on the black cooking pot(s) and place them in the Sport solar oven. Clip the clear lid to the oven. Face the oven into the sun and then rotate it clockwise 30 degrees. Relax and do other things. The squash can be left unopened the entire cooking time. You may check doneness in 4 hours. If the squash are not done, face the oven toward the sun plus 30 degrees clockwise and continue cooking.

Cooking time: 4 – 6 hours
Serves 2 -4

Sirloin Tips With Mushroom and Onion

1½ lbs.	Sirloin Tips (or Sirloin Steak cut up into 1" chunks)
1 lb.	Fresh Mushrooms (or 2 small cans of mushrooms)
1	Medium size Onion
1	Garlic Clove minced (or ¼ to ½ tsp. garlic powder)

1. Cut onion in half (side to side). Cut ½" wedges from both halves of the onion.
2. Slice fresh mushrooms.
3. Cover the bottom of the solar oven pot with sirloin tips (no oil added).
4. Sprinkle diced garlic or garlic powder over the sirloin tips.
5. Add sliced onion and mushroom on top of sirloin tips.
6. Put pot in solar oven to cook.

Bar-B-Que Chicken

1½ - 2 lbs. Chicken cut up into serving sizes. (A whole chicken 3 - 4 lbs. will make two pots of chicken.)
Garlic powder, onion powder, thyme, etc. to taste
Your favorite barbecue sauce.

1. Place cut up chicken pieces on bottom of solar oven pot(s). Add preferred seasonings.
2. Put pot(s) into solar oven.
3. Cook for 1¼ - 2 hours in solar oven. Pour off the broth from the chicken (save it for soups or casserole if desired). Add barbecue sauce over top of chicken pieces. Continue to cook for another hour or more as required or desired.

The longer the chicken cooks the flavors are better blended and the meat more tender.

Baked Fish

1 - 2 lbs. of your favorite fish fillets
Your favorite salsa.

1. Wash fish fillets and dry with paper towel. Place fillets over the bottom of the solar oven pot.
2. Place in solar oven and bake for 1 -1¼ hours.
3. Pour water off of the fish.
4. Spread a layer of salsa over the fish fillets and return to the solar oven for additional 30 - 45 minutes.

Solar Oven Chili

1 lb.	Lean or extra lean ground beef
1 16 oz. can	Red kidney beans, drained
1 14½ oz. can	Diced tomatoes, drained (Or three medium sized fresh tomatoes)
1	Medium onion, cut up
½ cup	Chopped bell pepper (For more flavor add cayenne pepper or jalapeno pepper)
1	Garlic clove minced
1½ Tbsp.	Chili powder
½ tsp.	Ground cumin
½ tsp.	Black pepper

1. Combine all ingredients in a bowl. Mix well. Put ingredients in solar oven pot.
2. Place pot in solar oven for cooking.

CORN-ON-THE-COB (With Husks)

The Sport solar oven is an ideal companion cooker on the patio to prepare delicious vegetables to accompany meat coming from the grill. Because of its unique design, the Sport solar oven cooks vegetables without the addition of extra water. This reduces leaching of flavors and nutrients resulting in tastier, more nutritious vegetables.

CORN ON THE COB – "THE SWEETEST YOU'VE EVER TASTED"

3 – 4 ears of just-picked sweet corn, in the husks (per Sport cooking pot)

- Peel off and discard ½ of the husks until you reach the clean, pale-green ones.
- Without separating from the ear, pull back the pale-green husks and carefully remove the silks.
- Replace the husks over the ear.
- From one of the discarded husks, tear off lengthwise a strip about 1/3 the width of the original and use this strip to tie the husk ends together, as pictured.
- Put 3 – 4 ears in each of the Sport cooking pots.

Cover the pots, secure the clear oven top, point at the sun for 3 hours. The cooked corn can stay warm in the oven until needed.
The flavor difference of Sport cooked corn is so sweet and "corny" that it may be best and healthier without additional butter, olive oil or salt and pepper.

BASIL BUTTER
If you want to butter your solar cooked corn on the cob, the following basil butter is great.

- ½ stick unsalted butter
- 1 large sprig of basil
- salt & fresh ground black pepper to taste

Place all ingredients in small pitcher or jar to fit. Put the basil in first, then the salt & pepper and lastly, the butter. The butter melts down over the basil. Any basil essences released will infuse the butter. Use a black jar or place a clear jar in the Sport solar oven inside a cooking pot for 15 minutes or until the butter has melted and the basil essences are absorbed.

CORN-ON-THE-COB (Without Husks)

If fresh corn in the husk is not available, or if maximum quantity is desired this method is excellent too and increases how much can be cooked in a Sport cooking pot.

4 – 6 ears of fresh or frozen corn on the cob (per Sport cooking pot)

- Defrost , if necessary , and bring corn to room temperature
- Break each ear in half
- Put 8 – 12 half ears in each of the Sport cooking pots, as pictured.

Cover the pots, secure the clear oven top, point at the sun for 3 hours. The cooked corn can stay warm in the oven until needed. The flavor difference of Sport cooked corn is so sweet and "corny" that it may be best and healthier without additional butter, olive oil or salt and pepper.

BASIL BUTTER - See Recipe above under Corn-On-The-Cob With Husks

AMBERJACK, HALIBUT, SEA BASS, GROUPER OR SNAPPER STEAKS WITH SWEET CORN, TOMATO AND CUCUMBER RELISH

This recipe is modified for solar cooking from a wonderful Emeril Lagasse recipe published in WINE SPECTATOR, August 31, 2004 edition as a great dish for a great sauvignon blanc wine. It showcases how the SOS Sport solar oven strongly infuses the flavors of the ingredients with the fish. It is easy to succeed on the first try and it cooks quickly in 45 minutes to 75 minutes in good sun.

THE FISH - Emeril's Wine Spectator recipe was for halibut. We like amberjack which is leaner, firmer and tastier but may not be available outside the Gulf of Mexico region. Most any mild, white meat fish would work, however.
4 each, 1/4 pound, fresh, fillets, 1–1½" thick (Recipe for one Sport cooking pot)

If there is any hint of "fishy smell" - follow these instructions:

1. *Wash the seafood under cold running water.*
2. *Soak the fish in acidulated water for 3 minutes. (Acidulated water is made by squeezing one-half lemon in one quart of cold water in a glass bowl.)*
3. *Wash the fish again under cold running water and dry it on paper towels.*

1. Season the 4 fillets on one side by dividing ½ tsp of the dry rub (see recipe below) between the 4 fillets.
2. Season the other side of each fillet with salt and fresh ground black pepper to taste.

THE RELISH

1 large ear of solar cooked corn, the kernels cut from the cob (recipe from Corn-On-The-Cob)
1 large, vine ripe (beefsteak if possible - meaty) tomato, seeded and cut into ½ cubes
1 small cucumber, peeled, seeded and cut into ½ inch cubes
1/3 cup finely sliced green onion, tops only
½ tsp salt
¼ tsp fresh ground pepper
2 tbs extra virgin olive oil

1. In glass bowl, mix all these ingredients together and reserve for later.

EMERIL'S CREOLE SEASONING, DRY RUB

2 tbs. + 1 ½ tsp paprika
2 tbs. salt
2 tbs. garlic powder
1 tbs. fresh ground black pepper
1 tbs. cayenne
1 tbs. dried oregano
1 tbs. onion powder
1 tbs. dried thyme

1. Mix all ingredients. (Store in an airtight container for up to 3 months.)
2. Rub Emeril's Creole Seasoning on one side of each fish fillet.

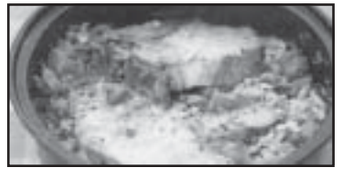
MAKE THE DISH

1. Add pieces of fish to each pot, dry rub side down.
2. Cover the pots and place into the Sport solar oven. Clip the clear lid to the oven. Face the oven toward the sun with the shadow directly behind it and relax. Do not open the oven until 45 minutes have passed. When the fish is opaque and flaky it is done.
3. Place a cup of the relish on the plate and then place a fish fillet on top of the relish.
4. Serve at once.

This dish was designed to go with a crisp California sauvignon blanc wine. And, since the relish calls for one ear of solar cooked corn, we suggest cooking one ear of corn along with a pound of new potatoes (see page 18) in the second Sport cooking pot.

Cooking time; 45 – 75 minutes
Serves 4.

SOLAR ROAST PORK WITH APPLES, PEAR, CABBAGE AND CARAWAY



Use two solar oven pots.
The Sport solar oven bakes pork that stays moist and absorbs the rich flavors of the condiments while it breaks down to that delightful fork tender, stringy-meat expected from great pot roasts.

THE MEAT
2 lbs. pork chops (thick cut preferred)
1 garlic clove, peeled & crushed
½ tsp. salt, or to taste
½ tsp. black pepper, or to taste
1 tbs. olive oil
½ tbs. caraway seeds

THE SAUCE
1 small onion diced
2 apples (any kind) peeled cored and cut into 1 inch cubes
1 pear peeled cored and cut into 1 inch cubes
½ small head of cabbage coarsely chopped
2 Turkish bay leaves
½ tsp. salt, or to taste

MAKE THE DISH
1. Rub the garlic all over the meat. Place one pound of meat in each Sport cooking pot and toss it with the olive oil, caraway seeds and salt & pepper.
2. In a bowl mix the onion, apple, pear, cabbage, bay and salt. Then add the mixture to the meat in the cooking pot.
3. Put the tops on the pots, the pots in the oven. Clip the clear lid to the oven. Point the oven toward the sun so the sun shadow is straight behind the oven. Then rotate the oven clockwise 30 degrees and leave it undisturbed for 4 hours. About 1:30 PM, to optimize sun power, check for doneness and stir the mixture well. Close the oven and then re-point it directly at the sun and then rotate it 30 degrees clockwise.

Cooking Time 5 – 6 hours
Serves 4 - 6. Start by 10 AM. Finish Cooking: 3 -4 PM. Food will keep warm in oven until dinner time.

BONELESS, SKINLESS CHICKEN BREASTS WITH TOMATOES, OLIVES & CAPERS

This dish showcases how the SOS Sport solar oven strongly infuses the flavors of the ingredients with the chicken. It is easy to succeed on the first try and it cooks in 1 - 2 hours in good sun.

CHICKEN
4 each, boneless, skinless chicken breasts – about 2 lbs total
2 tbs. olive oil

THE SAUCE
1 sprig of fresh basil, chopped
4 oz of pitted and sliced kelomata olives packed in oil
2 oz capers, drained
14 oz of fresh or petit diced canned tomatoes, minced
8 tbs. olive oil
salt & fresh ground pepper to taste

MAKE THE DISH
Wash and dry the breasts on paper towels. Rub each piece on all sides with the olive oil. Place 2 tbs. of the olive oil in the bottoms of each of the 2 Sport cook pots and coat the entire bottoms. Add 2 breasts to each pot, divide the sauce ingredients between them and salt and pepper to taste. Pour 2 more tbs. of olive oil over the ingredients in each pot. Mix the contents of each pot well. Cover the pots and place into the Sport solar oven. Clip the clear lid to the oven. Face the oven toward the sun and relax.
This dish will be done in 1 - 2 hours, depending on the sun strength. Serve at once.
Serves 4.

STEAMED NEW POTATOES

1 lb. new red, or Yukon gold potatoes
1 tbs. minced, flat leaf parsley
1 tbs. minced chives
1 tbs. butter
salt and fresh ground pepper to taste

1. Trim the potatoes.
2. Place whole or cut up in one Sport cooking pot with no water.
3. Place top on pot, place pot in oven and clip the clear lid to the oven. Point the oven directly at the sun with the shadow straight behind it. Then rotate the oven 30 degrees and leave it for two hours when the potatoes should be checked for doneness.
4. To serve, divide the potatoes between 4 plates. Crush the potatoes with a fork and then sprinkle parsley and chives over the potatoes. Finally, add the butter and salt and pepper.

Cooking time: 2 – 3 hours
Serves 4

SOLAR COOKED CAMPERS BEEF STEW

Use two solar oven pots.
The idea for this dish is to prepare and start it before leaving camp in the morning. It will be done enough to eat in 3 - 4 hours, but it takes 5 - 6 hours of cooking in good sun for the meat to break down and become "pot roast stringy". Venison, elk, antelope or pork can be substituted.

THE MEAT
1 lb. beef (chuck is the most tasty) stew meat cut into 1 inch cubes
1 tsp. dried thyme
1 tsp salt, or to taste
1 tsp. fresh ground black pepper, or to taste

THE VEGETABLES
1 ½ lb. baking potatoes peeled and cut into 1 inch cubes
1 lb. carrots peeled and cut into 1 inch pieces
1 medium onion peeled and coarsely chopped

THE SAUCE
1 can petit dices tomatoes, drained
½ cup diced onion
½ cup diced celery
½ cup diced carrot

MAKE THE DISH
1. No extra water is necessary and should not be added - the Sport oven retains the moisture of cooking ingredients.
2. Add all the ingredients to the pots and mix well. Put the top on the pots, the pots in the oven. Clip the clear lid to the oven. The oven should be aimed at the sun, so that the sun shadow is straight behind the oven. Next rotate the oven clockwise 30 degrees. There is no danger of fire and the oven will not overcook this dish so it may be left unattended for as long as necessary. It would help, but is not mandatory, to re-point the oven at the sun and then do another 30 degree rotation at about 1:30 PM to optimize sun power.

Cooking Time: 3 – 6 hours
Serves 4

The Solar Oven Society is blessed with the skills of William K.B. Potts, III, aka "Bill". Bill's expertise includes 30 years experience bringing new products to the market. In addition to that, Bill has a strong avocation in cooking. Just like talented musicians can hear various instruments playing specific melodies as they read the score of music, so Bill can distinctly taste the flavors of recipes by simply reading them. In his solar cooking ventures, he has been kind enough to jot down his recipes and share them with the Solar Oven Society.

Please enjoy the delightful recipes of Gourmet Chef Bill.

William KB Potts, III - Gourmet Chef as well as Marketing and Sales Director, Solar Oven Society

SOLAR BAKED FRESH FISH FILLETS

This dish showcases how the SOS Sport solar oven infuses the flavors of the ingredients with the fish while maintaining a moist, flaky fish texture. It is easy to succeed with on the first try and cooks quickly in 45 minutes to 75 minutes in good sun.

The recipe is for one Sport cooking pot, assuming that another dish will be cooked along with the fish, like corn on the cob, potatoes or another side dish. Since fish cooks faster than most every other food you will want to start your complimentary side dishes in a second pot in the solar oven before you start the fish.

THE FISH

4 each, 1/2 pound, fresh fish steaks, 1–1½" thick (Fish fillets - any shell fish, tuna, salmon or any white meat fish.

If there is any hint of "fishy smell" - follow these instructions:

1. *Wash the seafood under cold running water.*
2. *Soak the fish in acidulated water for 3 minutes. (Acidulated water made by squeezing one-half lemon in one quart of cold water in a glass bowl.)*
3. *Wash the fish again under cold running water and dry it on paper towels.*

THE SAUCE

2 tbs. butter
2 tbs. fresh lemon juice
1 sprig of fresh, chopped, flat leafed parsley
salt & fresh ground pepper to taste

MAKE THE DISH

Place 4 fillets in a Sport Cook pot. Put ¼ of the sauce ingredients on top of each fillet.

Cover the pot(s) and place into the Sport solar oven. Clip the clear lid to the oven. Face the oven toward the sun with the shadow directly behind the oven and relax. Do not open the oven to check for doneness until 45 minutes have passed.

The fish will be done in 45 minutes to 1 hour and 15 minutes, depending on the sun strength. Serve at once.

Serves 4.

BROCCOLI

Makes one solar oven pot.

1 lb. broccoli florets, including stems
1/3 clove garlic minced
½ tsp. salt, or to taste
½ tsp. fresh ground black pepper, or to taste
2 tbs. butter or olive oil

1. Wash the florets in cold water and transfer wet to the Sport cooking pot.
2. Add garlic. Do not add salt, pepper, oil or butter, if desired, until cooking is finished.
3. Cook in the Sport solar oven facing the sun for 45 minutes for al détente and longer for softer texture.

The taste of broccoli cooked in the Sport is huge because of the reduced leaching from not using cooking water! You've never tasted broccoli like this.

Cooking Time 45 – 75 minutes.
Serves 2 – 4

BROCCOLI SOUP

A great variation would be to use Sport solar cooked broccoli to make a broccoli soup with cold Sport solar cooked broccoli. Add to prepared chicken broth (cooled to warm) and then processed in a food processor.

WILD RICE

Makes one solar oven pot.

(This recipe is based on the cultivated wild rice widely available in supermarkets. Real, Native American wild rice would cook in much less time.)

1 cub wild rice
4 cups chicken stock (or water)
1 tsp salt
½ cup minced white onion
½ cup minced carrots

Mix all ingredients and stir well.

Put lid on the black cooking pot and place it in the Sport solar oven. Clip the clear lid to the oven. Face the oven into the sun and then rotate it clockwise 30 degrees. Relax and do other things. This rice can be left unopened the entire cooking time. The rice will be done when the black grains have burst open exposing the whitish-gray interior part of the seed and also will have curled into ringlets. Once done, the rice can be left in the oven to stay warm until time to serve, or it can be taken out and reheated later in the oven.

Cooking time – up to 6 hours.
Serves 6 – 8

Recipes

See pages 6 & 7 of this manual to review cooking of vegetables, meats, staples, breads, cakes, etc. See page 19 for additional solar recipes on the world wide web, and solar cookbooks available for purchase.

Mango Banana Bread

Makes two solar oven pots.

60 ml	½ cup	butter or Crisco
60 ml	½ cup	sugar
1	1	egg
2.5 ml	1 tsp	vanilla extract
1½	1½	large ripe bananas (or 2 small bananas)
1	1	ripe mango
250 ml	2 cups	flour
7.5 ml	1 Tbs	baking powder
1	¼ tsp	salt
1.25 ml	½ tsp	cinnamon

1. In small bowl: combine flour, baking powder, salt and cinnamon. Mix well.
2. In second bowl: puree (or mash until like pudding) the bananas and mangos.
3. In large bowl: cream butter or Crisco, with sugar. Add egg, mix well. Add vanilla, mix well. Add fruit, mix well.
4. Add 1/3 dry ingredients to wet ingredients, 1/3 at a time. Mix well after each third.
5. Divide dough into two parts and pour into greased and floured solar oven pots. Spread dough across entire bottom until batter touches sides. Put lids on pots.
6. Put pots in solar oven to bake. Bread is baked when dough comes away from sides of pot.

Shortcake

Makes one solar oven pot.

¼ cup	Butter or margarine (softened)	2 Cups sliced Strawberries (or other fruit - fresh or frozen)
½ cup	Sugar	Vanilla Ice Cream or Whipped Cream
1 or 2	Eggs beaten	
½ cup	Buttermilk (Or, ½ cup water with 2 Tbs powdered buttermilk)	
1 cup	Flour	
1 tsp.	Baking Soda	

1. Cream butter and sugar together.
2. Add beaten egg(s) slowly to butter and sugar mixture. Mix well.
3. Add buttermilk slowly to butter, sugar and egg mixture. Mix well.
4. Sift together the flour and baking soda.
5. Add dry ingredients to liquid ingredients. Stir until well blended.
6. Pour mixture into floured and greased solar oven pot.
7. Put pot with lid on in solar oven for baking. Approximately 1½ - 2 hours.
8. Allow shortcake to cool with lid off of pot.
9. Serve with fresh strawberry slices (or other fruit), juiced with 2 tsp sugar, whipping cream or ice cream.

Solar Cookbooks

1. **Cooking With Sunshine**, by Lorraine Anderson & Rick Palkovic. 2nd Edition.
Our House Publishing, 2505 Westerness Road, Davis, CA 95616.
Chicken, fish, egg and dairy. No beef, pork, or lamb. Some vegetarian menus.
Cost $12.00 + $2.50 shipping and handling. California residents add sales tax.

2. **Eleanor's New Solar Cookbook**, by Eleanor E. Shimeall. 2nd Edition.
Cemese Publishers, P.O. Box 1022, Borrego Springs, CA 92004. Telephone 760-767-3272.
For meat eaters, including red meat. Canning fruit. Pasteurization. Box and panel cooker recipes denoted.
Cost: $10.00 + $2.50 shipping and handling. California residents add sales tax.

3. **Solar Cooking - A Primer/Cookbook**, by Harriet Kofalk. Book Publishing Company, P.O. Box 99, Summertown, TN 38483.
Vegetarian. No animal products. One dish meals. Canning and fruit drying. Perspective articles.
Available via: The Mail Order Catalog 1-800-695-2241. Cost: $8.95 + $3.50 shipping and handling. Tennessee residents add sales tax.

4. **Solar Recipes**, featured on-line by Solar Cookers International. Just go to www.solarcooking.org on the world wide web, then click on Recipes.

Variables In Solar Cooking

Faster Cooking

Slower Cooking

No Cooking

Color of Pots
The exterior of the pots must be colored. In general, the **darker** the color, the **better**. Dull is better than shiny.

Size and Shape of Pots
Several smaller pots are **more effective** than one larger pot. Shallow pots cook faster than tall vessels of the same capacity.

Material and Thickness of Pots
Thinner materials conduct the heat to the food more quickly. If you eat after dark, thicker materials cook the food more slowly, but hold the heat longer. Aluminum is a good conductor. Colored glass can be used. Enamel on steel works well. Clay and cast iron can be used. All require lids.

Food Piece Size
Food cut into smaller pieces cooks faster.

Food Quantity
Greater quantity takes longer to cook.

Water Content
Water is a denser medium to heat. It requires a lot of energy. **No water** is added for meats, vegetables or fruit. Use the least amount of water required for cooking.

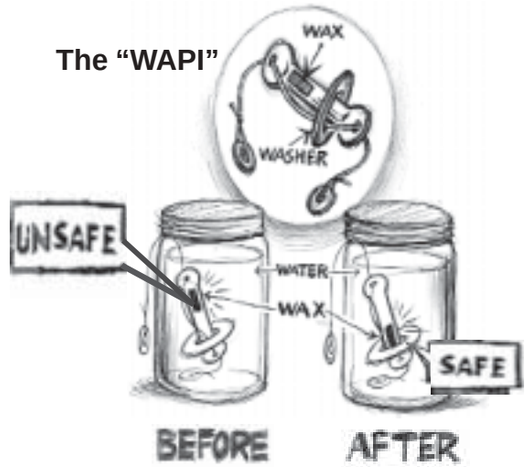
Water Pasteurization

According to the world Health Organization:

- ☑ 80% of all sickness and disease in developing countries is caused by poor water supplies and sanitation. People drink unsafe water and get sick.
- ☑ As many as 50,000 people die per day because of drinking unsafe water.
- ☑ Hundreds of millions suffer from diseases because of unsafe water.

Heat kills disease-causing microbes. They can also be called: bacteria, cysts, viruses, protozoa, germs, bacteria, pathogens, organisms. Some of them are named as such:

- ♦ Fecal contamination:
  - ■ Coliforms
  - ■ E-Coli (Escherichia coli)
- ♦ Cysts:
  - ■ Giardia Lamblia cysts
  - ■ Giardia Muris cysts
  - ■ Eutamoeba Histolytica
- ♦ Viruses:
  - ■ Rotaviruses
  - ■ Enteroviruses



Pasteurization of Naturally Contaminated Water with Solar Energy, research by David A. Ciochetti and Robert H. Metcalf, Ph.D. Microbiologist is published in "Applied and Environmental Microbiology", Feb. 1984, pages 223-228.

Above: The WAPI (WAter Pasteurization Indicator) as illustrated in clear glass jars. Pasteurization occurs best in dark pots. (If jars are used, it is best for them to be painted black on the exterior. Do not screw lids tight. Be careful - glass jars can break.)

The WAPI (**WA**ter **P**asteurization **I**ndicator) is a convenient tool in a solar oven to tell us when water is safe to drink (pasteurized). Solar ovens can heat water and kill bad germs making it safe to drink. You will know when water is safe to drink by the wax at the top of the tube of the WAPI has melted and moved to the bottom of the tube. Whether the wax at the bottom of the tube is clear liquid or white solid, the water is safe to drink. The WAPI is a thermometer "with a memory".

Unheated water is placed in a pot. The WAPI is placed in the center of the pot and not by the edge of the pot. The wax should be at the top on the inside of the tube and large metal washer around the empty tube bottom. Allow the string to hang over the edge of the pot. (See diagram above.) When water is heated to 65°C / 149°F for 10 minutes or longer, it is pasteurized (safe). The wax melts at a higher temperature of 69°C / 156°F. The time it takes in a box-style solar oven to heat from 65°C / 149°F up to 69°C / 156°F takes 10 minutes or longer. The wax will melt and move to the bottom of the tube. The wax in the bottom of the tube can be either clear liquid (water is still hot) or recoagulated and off white in color (water has cooled off again). The water is then safe to drink - it will not cause sickness.

This technology applies to natural contaminants. It does not apply to oil slicks, chemical problems, etc.

Cooking In The SOS Sport

*Estimated cooking times are for 4-6 servings in **good sunshine**:*

COOKED CEREALS & GRAINS

Barley, corn, millet, oats, quinoa, rice, wheat: Shallow pots work best. You can choose from two methods: 1) Heat water and dry grain in separate pots in the solar oven. When the grain is hot (may turn brown) and the water is near boiling, add hot grain to hot water. Leave in solar oven for "X" minutes. 2) Heat combined in the same pot.
You will experience different textures via the two methods. With experience, you may choose to adjust the amount of water (liquids) required to rehydrate the grains. For white rice try 1¾ cups water per 1 cup of rice.
Use method 1) above if your rice or other grains are "pastey" and not fluffy cooked kernals.
Jasmine rice does not work quite as well as some other varieties of rice.

VEGETABLES

FRESH VEGETABLES: Add no water to fresh vegetables. Vegetables can be mushy and lose their color if cooked too long. You may wish to place them in the SOS Sport at an appropriate time prior to completion of other food items to be served.
Artichokes: 2½ hours
Asparagus: ½ to 1 hour. Break off the base of the stems where they break off naturally.
Peas, Lima Beans, Other Green Vegetables: 1 to 2 hours.
Beans (dried): 3 to 5 hours. Soak in water overnight to lessen cooking time.
Beets, Carrots, Potatoes, Rutabagas, Turnips, Other Root Vegetables: 2½ to 4 hours.
Cabbage, Eggplant, Bok Choy, Greens: 1 to 2 hours if cut up. Eggplant turns brownish but flavor is good.
Corn on the Cob: 1 to 2 hours. Cook with or without inner husks in a pot or in a clean black sock.
Onions, Bell Peppers, Leeks: 2 hours. Cook separately or add to other vegetables or meats per personal taste.
Zucchini, Yellow Squash: 1 to 1½ hours. Easily turns mushy if left longer.
Squash (Acorn, Butternut, Buttercup, etc.): 2 hours for small squash. Peal skin and remove seeds after cooked.

CANNED VEGETABLES: Remove most of the liquid from the vegetables. Heat for 1 hour.

FROZEN VEGETABLES: Remove excess frost. Do not add water. Heat for 1½ to 2 hours.

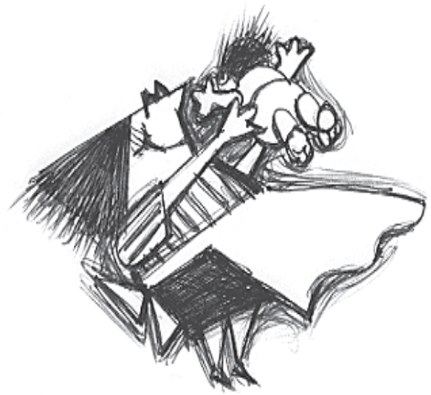
SOUPS/CASSEROLES/STEWS: Crockpot recipes work very well for solar cooking (add water only if rehydrating grains). For soups - cook meats, vegetables, seasonings, etc. in one pot, heat water in second pot. When water is hot and meat and vegetables are fully cooked, combine.

FRUITS:

Baked apples: 1½ to 2 hours. Add no water. Add cinnamon and other spices for flavor as desired.
Plantain: 1 to 1½ hours. Slice plantain and lay slices in pot. If butter or frying flavor is desired, add dots of butter.

EGGS:

Will cook in shells with no water added. 1½ to 2 hours for hard yolks.
If cooked longer, the whites may turn brownish, but the flavor is good.



More time to spend with family members -
Able to bake at my home -
one meal at a time!

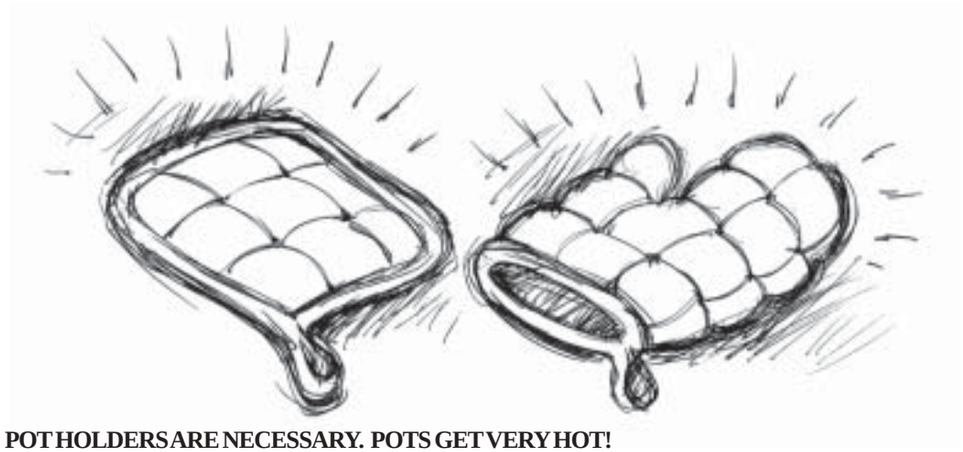
- In many areas around the globe, it is common for family members to spend up to 20 hours - some spend over 40 hours - per week gathering firewood. (Wouldn't you love **extra hours** in your week?)
- The SOS Sport brings the capability of **baking** to each home. For many, it is a struggle to have only a small fire to cook a pot of food. It requires much more fuel to fire an oven. Breads and cakes can be baked in an SOS Sport.
- The SOS Sport holds two medium pots at the 30° slant. Three smaller pots (not provided with the oven) fit the 60° slant. This allows for **variety** in the preparation of more than one food at the same time. Several different foods can be combined in one pot.

Environment:

- Solar ovens use solar energy — **a free, renewable energy**.
- **Reliance on fossil fuels is reduced** — wood, charcoal, bottled gas, kerosene.
- **Pollutants are reduced** and not released into the atmosphere.
- **Deforestation is slowed** . Eighty percent or more of the fuel used in homes in many developing countries is used for cooking meals. The presence of more trees attracts more moisture for crops and helps prevent the expansion of deserts and soil erosion.

Cleaning the air and atmosphere -
Slowing deforestation -
Using dung for fertilizer -
one meal at a time!

- **The use of dung as a fuel is reduced**. Dung can be better used as a fertilizer for greater plant and food production. Dung also used as fertilizer will help with reduction of erosion.



18. **POT HOLDERS ARE NECESSARY. POTS GET VERY HOT!**

19. **RAIN, HEAVY CLOUDS, SCHEDULE CHANGES / FOOD SAFETY**: There are some days when heavy clouds move in, personal schedules change, etc., and food must come out of the SOS Sport to finish cooking via other methods.

    One option for foods which are already cooking (180ºF (82ºC) or hotter) is a hay box which can continue cooking the food. (See article - page 27.)

    Other fuels will be required. There are days when the sun is NOT visible, and NO solar cooking can be accomplished. Wood saved on sunny days can provide fires for cloudy days.

    If weather conditions allow for the oven to cool off between 150º - 50ºF there can be danger of bacterial growth and the food may not be safe for eating. This is true of all methods of food preparation and is not unique to solar cooking. Food in this temperature range for two hours or longer can incubate bacteria. If food has cooled off to these temperatures, reheat the food to kill off any bacterial contamination.

    The Solar Oven Society assumes no liability for requirements of common sense in serving food that has cooled off or is not sufficiently cooked and chances bacterial contamination.

    DO NOT SOLAR COOK ON DAYS WITH HEAVY OR TOTAL CLOUD COVER. Your food will not cook well and may grow bacteria. Also, see “Rain, Clouds”, number 19 on page 4, and "Clouds or Dust" on page 9.

20. **CLEANING**: Use clean soft cloths (that will not scratch the glazing) with vinegar water or dish soap. (Do not use ammonia cleaner on plastic cover.) Dry with another soft cloth. Wipe the interior with a damp cloth if spills occur. Spills clean up best when they first happen and food has not yet baked on to the interior.

21. **KEEP FOOD HOT (after sunset)**: Throw a blanket, coat, etc. over the entire cooker to add additional insulation to hold the heat in. If you are using just one pot, stones or bricks (dark colors better) can be added in the oven during the cooking process as thermal mass. Or, check out Fireless Ovens - page 27.

We encourage you to experiment with your SOS Sport. Try new ideas.
Please share with friends and family.

Background Of The SOS Sport

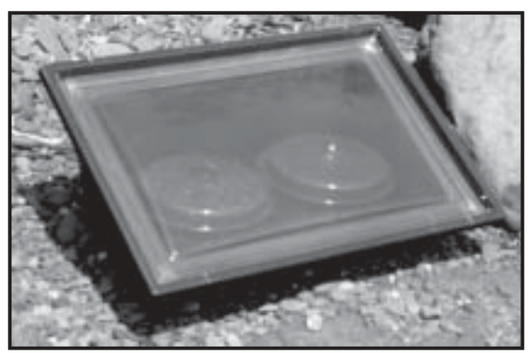
THE *SOS SPORT* DESIGN: ***In addition to qualities of low cost, aesthetics, efficiency and durability, there were other issues considered in the design of this cooker. The SOS Sport was engineered to not exceed 300ºF (149ºC) so that the cook does not have to worry about scorching or burning.***

To be environmentally-conscientious, we make use of as much salvaged and/or recycled material as possible. The plastic exterior casing and the plastic collar on the inside of the oven use post consumer PET plastic. The aluminum liner can be made from used or salvaged printing plates. We use salvaged polyester film.

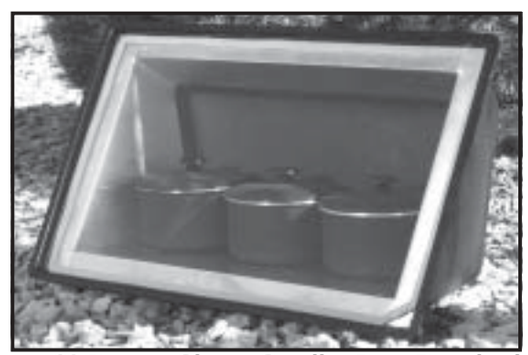
Use of solar energy for cooking food reduces the amount of trees used for firewood or charcoal. In turn, less wood burned means less pollutants, which helps keep our atmosphere clean. Trees facilitate the exchange of carbon dioxide to produce oxygen. Trees and other vegetation also helps hold top soil so it is not washed into our streams, rivers, lakes and the ocean. Good top soil also means good crop production. The presence of trees and other plant life maintains micro-climates which attract rain and can help curb the expansion of the deserts which is happening in many areas of the world, especially sub-Saharan Africa.

The SOS Sport solar oven was designed to be “nestable” to minimize space for shipping. Each nested casing occupies only an additional 1/2 inch, vertically. This makes it cost-effective to ship many more unassembled ovens per container.

The SOS Sport may be used at two different angles (ground to slant of face), approximately 30º and 60º. Most of the time the solar oven will be used at the 30º slant. In earlier morning hours and later afternoon, greater efficiency is achieved using the 60º slant. Or, the farther you live from the equator the 60º slant can extend your solar cooking season when the sun no longer rises directly overhead. Smaller sized pots are required for the 60º slant.



30 Degree Slant - Illustrated Are the Pots Sold With the Oven in the USA.



60 Degree Slant - Smaller Pots Required

How To Use The SOS Sport

Sunny says . . .

1. **Place** the SOS Sport **outside** on a surface that will be **sunny** for several hours - on a table, the ground, roof, deck or balcony.

2. **Start early in the day**. Food rarely overcooks or burns in an SOS Sport. Instead of doing meal preparation later in the day, do it in the early morning. Put food in the SOS Sport by 7, 8, or 9 a.m. (If you are in a climate which is not an arid or semi-arid region, you will find morning hours are generally better cooking hours than afternoon hours. Dew and humidity evaporation in the morning hours often collect as clouds in the afternoon hours. Also, during the morning hours as the sun gets higher in the sky, one has increasing energy as opposed to decreasing energy in the afternoon hours.) At Solar Cookers International, the "Golden Rule" of solar cooking is,

   GET THE FOOD ON EARLY!
   DON'T WORRY ABOUT OVERCOOKING.[1]

   1 Thank you to Solar Cookers International

3. **Dark-colored pots with dark-colored lids are required for solar cooking**. Use dark-colored tight fitting lids. A rare exception to cooking without a lid is baking cookies or roasting nuts.

4. **Several small- to medium-sized pots are better than one large pot**. Heat is transferred from the sides and floor of the pots to the food. The more the surface areas of pots touch the food, the quicker the food will cook.

5. **Do not fill pots more than 2/3 full with dense food.** If food type is leafy vegetable (or similar) it is okay to fill the pot.

6. **Full Pots** are okay for pasteurizing water - the water needs to heat to only 150ºF / 65ºC for ten minutes.

7. **Preheating** the SOS Sport for 15 to 30 minutes is **advised for baking cakes or bread**. Cakes or bread placed in the SOS Sport, especially with a lot of other cold food, may cause the bread or cake to rise improperly. Adding items to be baked with well heated partially cooked food in the cooker will also provide a good source of heat for baking. It is sometimes helpful to turn the covered pots (yes, covered pots) for cakes and breads half way through the baking time to encourage even rising.

8. **Clips for the Lid** serve two purposes. To use: Push down on the plastic lid while lifting the clip over the edge of the lid.
   a. They are designed to hold the lid on the oven in windy weather.
   b. The tension of the spring clip seals the oven and helps hold in more heat.

9. **The SOS Sport allows for continued, effective cooking even on partly-cloudy days.** Once the food is heated to a cooking temperature of 180ºF / 82ºC or higher, just 30 minutes of sunshine per hour will continue cooking food effectively.

10. **Cook separate meals for midday and evening, fast and slow cooking meals simultaneously,** or just **one meal all day**. Prepare the more challenging meals all day, or in the morning. Prepare easy to cook meals (or warm-ups) in the afternoon hours.

11. **No re-aiming at the sun required** for many meals cooked in the SOS Sport**.** Position the SOS Sport so halfway through the anticipated cooking time, the sun will shine directly in front of the cooker. **You can choose to re-aim** the SOS Sport to enhance its cooking effectiveness. You will learn from experience how to maximize its performance for:
    - hard-to-cook food (e.g. large items, dried beans, pork roast, etc.),
    - less than ideal cooking conditions.

Additional Fuel-Saving Measures

Any time food is at 82°C / 180°F or greater, cooking is in process. If food is brought to a boiling temperature (rolling boil) or higher and is then removed from its heat source (Solar Oven, Little Fire Cooker, charcoal, etc.) and placed in a precise-fitting, well-insulated chamber, the heat retained in the food itself allows for cooking to continue. This is known as cooking via a "haybox", a "fireless oven" or a "retained heat oven". Depending on how well insulated the chamber is, cooking can continue for hours.

This is especially ideal for hard to cook foods such as beans, grains, casseroles, etc. Food must first be brought to boiling on a Little Fire Cooker, in a Solar Oven or via another heat source. An important requirement is for steam to be collected under the lid. After you check to see if the food is boiling, return the pot to the Little Fire Cooker (3-4 minutes) or the Solar Oven (10 minutes) to again build up the steam. The pot can now be moved to a Fireless Oven for continued cooking (without a heat source). A second round of food can now be put into the Solar Oven for the duration of the daytime hours or onto the Little Fire Cooker.

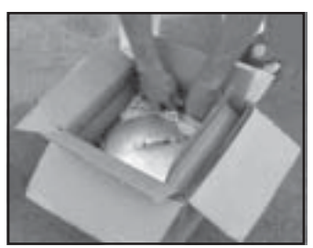
Fireless Cooking just like solar cooking is a slow process and provides excellent flavor. Open pots will not work in a Fireless Oven. Steam captured under the lid is important. Start hard-to-cook foods first and then move them to the Fireless Oven. Continue with cooking easier-to-cook foods in the Solar Oven or on the Little Fire Cooker.

How To Make Fireless - Retained Heat Oven:

Your pot should fit into a tight fitting chamber. There should be as little airspace as possible next to the pot. There should be no (or minimal) opportunity for exchange of air from next to the pot to the outside of the chamber. It is good to include a radiant barrier (shiny material such as aluminum foil) next to the pot. The shiny material reflects the radiant (infra-red) heat back to the pot. Next, add insulation on all sides including the top and bottom.

Several layers of fabric, newspaper, cardboard, blanket, jacket or other flexible material can be wrapped around a pot. Two inches of insulation around the pot is good. Reed baskets and lids can be designed to hold appropriate insulation around the pots.

An additional option for insulation around the radiant barrier and pot is other materials such as a styrofoam box or other cardboard boxes. Scraps of fabric, crumpled newspaper, feathers, wool, dried grass, etc., can be used to fill the air gaps between the pot and the boxes. Remember to insulate on all sides, top and bottom - greater amounts on the top, lesser amounts on the bottom (heat goes up).



Example of a Fireless Oven (also know as a Haybox or a Retained Heat Oven) made from cardboard boxes and stuffed with pieces of cloth around the pot. Additional pieces of cardboard are placed between the inner and outer boxes, as well as on the top. Fireless Ovens can be made from numerous materials.

Table Of Contents

Special Thanks To:

All around the globe who appreciate the beauty of solar cooking:

- ☑ Environmentalists who want to see more trees preserved.
- ☑ Elementary students wanting to live in a cleaner less-polluted world.
- ☑ Curious minds intrigued by using the sun's energy.
- ☑ Outdoor enthusiasts who can't enjoy an open campfire due to fire restrictions.
- ☑ Conscientious consumers wanting to use less energy cooking with sunshine outdoors and not pouring heat and humidity into hot summer homes.
- ☑ Groups playing at the beach or softball tournaments, enjoying fishing or a round of golf, etc., while their food cooks in their solar ovens.
- ☑ Those who enjoy letting the sun do the work for them.
- ☑ Cooks who appreciate easily cleaned cookware.

Citizens in Developing Countries:

- ☑ Women wanting to breathe clean air rather than the smoke of cooking fires.
- ☑ Women and children wanting to see clearly rather than having their eyes damaged by thick smoke in cooking huts.
- ☑ Children who avoid a fall in an open cooking fire.
- ☑ Happy parents with more cash in the family budget from fuel savings.
- ☑ People released from the strain of gathering and carrying wood for cooking.
- ☑ Family members blessed with opportunity to drink pasteurized water.
- ☑ Those wanting to conserve time and not have to stir food over an open fire.
- ☑ Farmers and gardeners who can use dung as fertilizer rather than cooking fuel.
- ☑ People whose habitats are negatively impacted by the volume of trees cut for fire wood.
- ☑ Families who are better fed because no food is wasted by scorching or sticking to cookware.

Bill Sperber was gracious in introducing many to the wonders of solar cooking. This included Mike and Martha Port in April 1988.

Virginia Persons: Prior to her death in 1990, Virginia Persons directed that her estate be used to help alleviate hunger and poverty in the world by helping people help themselves. A 501 (c) (3) non profit organization was formed in her honor in 1991 - thus the name Persons Helping People (PHP). Solar cookers have been a project of Persons Helping People since December 1993.

Michael A. Olson: Personal friend and legal advisor of Virginia Persons, who established the 501 (c) (3) non profit corporation of Persons Helping People (PHP) in honor of Virginia L. Persons. Michael also served as the first Board Chair of PHP.

Board of Directors of Persons Helping People: Their counsel and vision have kept this program moving forward.

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And, we acknowledge others we do not know by name:
Many **pioneers** in solar cooking who have preceded those mentioned.

The **millions of families** world wide who lack adequate fuel for cooking their food. They obviously provide incentive to bring a low-cost, aesthetic, efficient and durable solar oven to market.

Participants who have shared their talents in activities and projects sponsored by the Solar Oven Society in the United States of America and around the globe.

The people of **Haiti** and other places who experience frequent rain showers and pointed out to us the need for a weather-durable housing for a solar cooker.

Numerous Donors - individuals, corporations and foundations who helped us get to our first production run of the SOS Sport in 2003 - among them . . .
Darrell Amiot
Douglas & Shirley Augustine
Gene & Bette Borman
Bill & Ellie Butler
Stan & Doris Hill
Lowell & Lynn Nystrom
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Lois Puckett
John & Mary Roche
American Plastics Council
Coca-Cola & Jeff Foote
Minneapolis Foundation
Minnesota Office of Environmental Assistance
Minnesota Soft Drink Association
NAPCOR & Michael Schedler
Summit Avenue Assembly of God
Anonymous Donors

To all of the above and other donors of resources and time, we acknowledge our thanks.

Solar Cooking Facts:

Reduces reliance on fossil fuels.
Reduces amount of pollutants released into the atmosphere.
Uses solar energy - a free, renewable source of energy.
Helps defer deforestation, which
Indirectly minimizes soil erosion, and thereby
Indirectly curtails the expansion of deserts, leaving trees to help attract rain.
Dried dung otherwise used for fuel can be used more efficiently for crop fertilization.
Pasteurizes water for drinking.
Food cooked in solar ovens is more flavorful and nutritious via slow cooking.
Lung and eye disease are reduced by not cooking over fires. Less burns for children.

Recycled Materials in the SOS Sport:

Recycled soft drink bottles are used for the outer casing.
Recycled soft drink bottles are used for the collar on the interior of the cooker.
Salvaged aluminum printing plates are an option for the liner.
Salvaged polyester film used as part of lids.
As recycled materials are available we are happy
to use them while still retaining quality.

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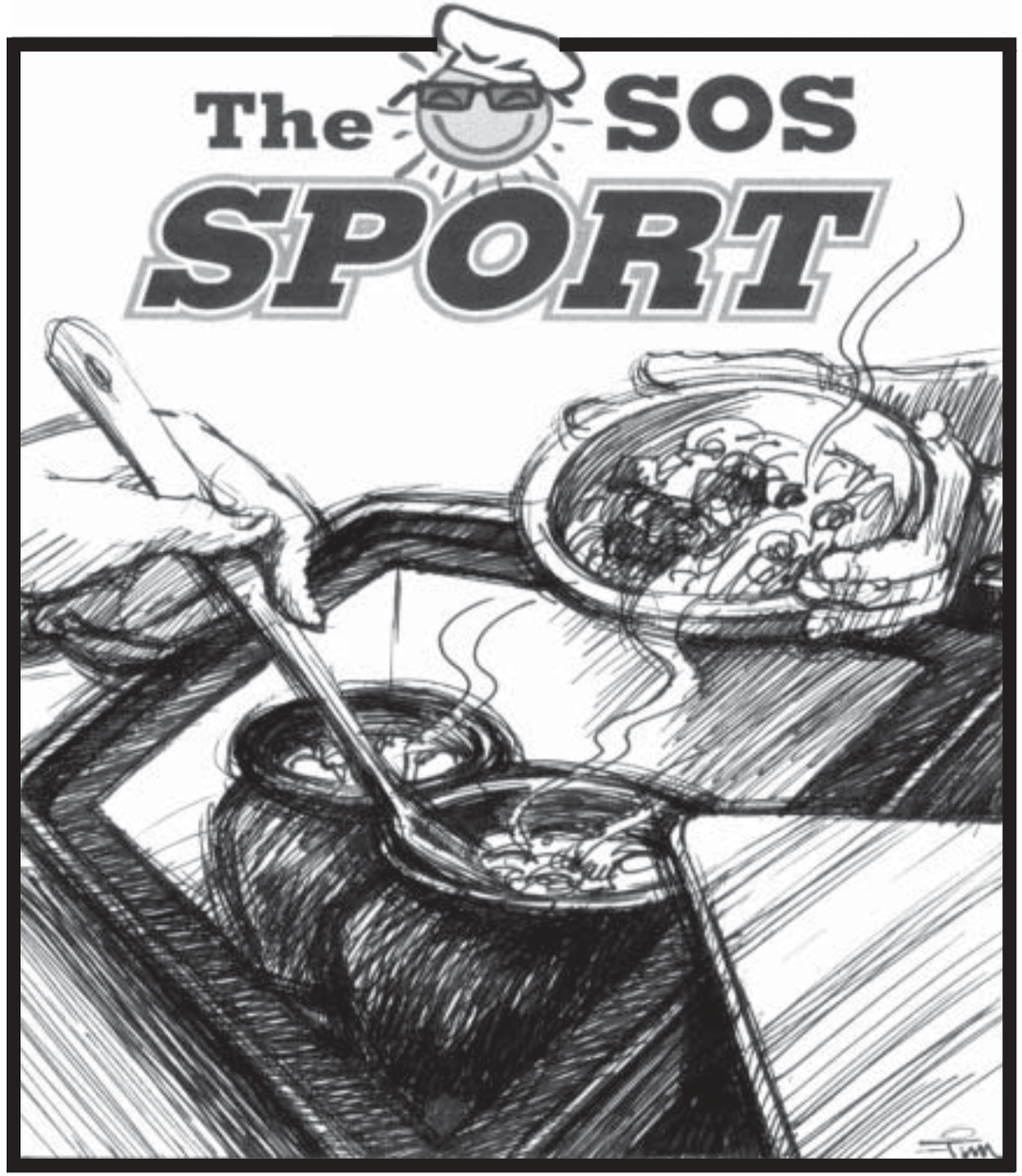

Improving Health And Life Style - Saving Trees - Cleaning The Air - One Meal At A Time!