



FERMENTING

FOOD

STEP BY STEP



Over 80
step-by-step recipes
for successfully
fermenting kombucha,
kimchi, yogurt, vinegar,
and kefir

Adam Elabd



FERMENTING **FOOD** **STEP BY STEP**







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To my grandmother, who taught me the love, common sense, and joy of cooking. She also makes a mean pickle.

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 A WORLD OF IDEAS:
SEE ALL THERE IS TO KNOW

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INTRODUCTION

Fermenting food is an exciting journey, full of unexpected side roads, interesting discoveries, and uniquely satisfying results. My main goal and wish is that you have fun with fermentation. If you open up to it and allow it to do so, fermentation will become a regular part of food preparation and interaction in your home. At its core, fermentation is simple, safe, and practical.

Take this book not as a list of recipes for specific fermentations, but as a manual for understanding the basic principles behind several different types of fermentation. I have tried to include a range of methods and techniques that you can study and apply to whatever suits your fancy. I never do anything the same way twice and prefer to open my fermentation and creation to the infinite possibility of the moment. Instead of trying to pin down the “perfect” sauerkraut, allow each batch to be a perfect expression of your kitchen, pantry, thoughts, feelings, and abundance in different moments in time.

For me, the main benefit of making your own food is the depth of connection that you gain from spending time with it. Allow that time to be free flowing and true to who you are and what you have been provided.

USING THIS BOOK

This book isn't necessarily intended to be read in order from front to back; it's meant to be explored. Most of the ferments can be made with nothing more than a few simple ingredients and a little bit of patience, but there are a few recipes that require another recipe as an ingredient. In these cases, the recipe names appear in boldface type on the ingredients list, so you'll know to look for them elsewhere in the book.





GETTING STARTED

A little foundational knowledge is important to have if you want to be successful with your ferments. In this chapter, you'll learn the basic facts about fermentation, a little history behind the process, what tools and equipment you'll need, how to source your ingredients, and more.

WHAT IS FERMENTATION?

Fermentation is akin to alchemy. Given the right conditions, simple ingredients can come together and undergo a transformation to become something entirely different and new.

WINE

Grapes are transformed into wine when they are crushed and the naturally-occurring yeast on the grape skins feasts on the sugars.

YEAST

GRAPES



BEER

When yeast is added to malted grains, such as barley or wheat, the yeast consumes the sugars to create beer.

YEAST

MALTED GRAIN



FROM FRESH TO FERMENTED

When microorganisms, known as the starter, are introduced to the carbohydrates in food and kept under certain conditions for an extended period of time, fermentation takes place. These microorganisms, such as yeast or bacteria, convert carbohydrates in foods, such as starches or sugars, into alcohols or acids. The alcohols or acids serve as a natural preservative. This process transforms the characteristics of foods, often deepening colors, softening textures, introducing pungent aromas, and producing tangy or sour flavors. The end product of the fermentation process depends on both the type of starter introduced as well as

the food to which the fermentation occurs, but the result is a new type of food that is naturally preserved, with deeper, more intense flavors.

THE IMPORTANCE OF A STARTER

A “starter” is the culture (bacteria, yeast, or mold) that causes fermentation. In some foods, such as vegetables, the starter necessary for fermentation is already present, and all that’s required is placing the food in the right environment for fermentation to take place. For other ferments, such as kombucha, the starter must be intentionally introduced.

SAUERKRAUT

When cabbage and salt are combined and massaged to create a brine, the naturally-occurring bacteria present on the cabbage creates sauerkraut.

BACTERIA

CABBAGE



CHEESE

Cheeses of all types involve the introduction of some form of bacteria or mold to transform the milk into something altogether different.

BACTERIA

MILK



A GLOBAL TRADITION

The origins of fermentation are as varied as the foods themselves and the diverse cultures they represent. Nearly every culture on the planet uses fermentation in some form.

Fermented foods are found the world over, and they play an important cultural and practical role in many cuisines. Many ferments can be found in similar forms all over the world, while others are unique to specific locations.

AROUND THE WORLD

Fermenting has roots in cultures from nearly every continent.

Germany, Poland Sauerkraut

Greece Yogurt

France Wine, cheese

Italy Balsamic vinegar, prosciutto, salami

Belgium Beer

Mexico Tepache

Latin America Queso fresco

El Salvador Curtido

Peru Chicha

Egypt Pickled lemon

Ethiopia Injera, t'ej

Russia Kvass

Burma Lahpet


India Dosa, chutney

Korea Kimchi


China, Far East Tofu

Indonesia Tempeh


Japan Miso, amazake, natto




Mexico Jalapeños and other chiles have been used to make hot sauce for centuries.




Germany Sauerkraut is strongly associated with Germany, but fermented cabbage dishes also have roots in China.



Korea Kimchi is the national dish of Korea.



Lebanon Lift, or pickled turnip, is a common addition to Lebanese meals.



Egypt Preserved lemons date back to twelfth-century Egypt.

WHY FERMENT?

Fermenting at home has many benefits. It's a uniquely satisfying way to preserve food, experiment with bold and exciting flavors, and maintain digestive health.

TO PRESERVE

Before refrigeration and pasteurization, fermenting was the primary way for people to preserve perishable foods and access their nutrients year round. Fermentation remains a simple, natural way to extend the life of produce and dairy products, without the need for added preservatives or stabilizers.


FOR FLAVOR

Fermentation unlocks a range of complex flavors. Food that may seem bland or unpalatable can become tangy, salty, sour, or sweet. Many of

the world's most highly prized foods, including wine, cheese, spirits, and vinegar, are made through fermentation.

FOR HEALTH

The human gut is home to a wide variety of probiotics—the “good” bacteria that help to maintain balance in our digestive and immune systems and protect us from illness by preventing the growth and spread of harmful bacteria. This gut flora is with us from birth and grows as we age, but healthy gut flora can be diminished by environmental factors, such as the use of



The tradition of fermenting dates back to the **Neolithic period** when fermented fruit was consumed. **Bread, wine, and cheese** are also among the earliest forms of fermented foods.

antibiotics or the consumption of processed foods. Many modern food production practices create sterile conditions, which may help promote public health by killing bad bacteria, but also eliminates the naturally occurring beneficial bacteria we need to maintain healthy, balanced gut flora. Eating fermented foods, which are rich in beneficial bacteria, can help to restore balance and vitality to the microflora in our guts, improving digestive function and strengthening the immune system.

Powerful Probiotics

Fermentation requires live, active cultures to convert sugar to alcohol or acid, preserving the food and altering its flavor and texture. These cultures are also beneficial to gut health.

Allows nutrients in food to be absorbed easily due to the presence of digestive enzymes

Reduces digestive issues, such as diarrhea and constipation

Protects the body from bacterial infections and illness

Supports and strengthens the immune system

HEALTHY GUT FLORA

GUT FLORA IS WITH US FROM BIRTH AND GROWS AS WE AGE



Preserve Almost Any Food

Almost any type of food— meats, dairy products, fruits and vegetables, grains— can be preserved through fermentation.

TYPES OF FERMENTS

Fermentation types are difficult to categorize, because many traditional ferments are not controlled and may have multiple fermentation processes working in unison. However, these are the most common categories of ferments.

BACTERIAL FERMENTS

Kimchi

Kimchi utilizes the naturally occurring bacteria present on vegetables, such as cabbage or turnips. Traditionally, kimchi is packed into earthenware jars and buried underground to ferment for several months.

Sauerkraut

The cabbage in sauerkraut contains *Lactobacillus*, a naturally occurring bacteria that is present on most fruits and vegetables.



Bacterial ferments are the most common type and are driven by various strains of **beneficial bacteria**. In most bacterial ferments, the bacteria required to ferment the food is **naturally occurring** and already present on the food.



Yogurt

Yogurt utilizes two primary strains of bacteria—*Lactobacillus bulgaricus* and *Streptococcus thermophiles*. These beneficial bacteria consume the milk sugar, or lactose, that is present in milk to produce lactic acid.



Natto

Natto ferments via a specific hay or grass bacterium (*Bacillus subtilis*) that lives on rice straw.

MOLD FERMENTS

Tempeh

The *Rhizopus oligosporus* mold is a key component in making tempeh, which is a fermented bean cake that is treasured for its high nutritional value.



Perhaps the **rarest type** of ferment, mold plays a fascinating role in the fermentation process. Many different molds are used in fermentation, and **each imparts a unique flavor**.



Sake

Aspergillus oryzae, or koji mold, is used to convert the starches in rice into sugars, which can then be fermented with yeast to make sake.

Blue cheese

Blue cheese is made using the *Penicillium* mold strain, which imparts flavor and also gives blue cheese its beautiful blue color.



Brie

Penicillium camemberti is the mold strain that gives Brie its distinctive flavor. It also produces the flavorful rind that encases the cheese.

BACTERIAL/YEAST FERMENTS

Kefir

Kefir is made from kefir “grains,” which are small, gelatinous grains of bacteria and yeast that look somewhat like rice, but can contain up to 35 different strains of beneficial bacteria. Kefir grains can be used again and again for making new batches of kefir.

Kombucha

Kombucha is a tea beverage that utilizes a SCOBY, sugar, and tea. The SCOBY ferments the tea by consuming the sugar, producing a tart and refreshing probiotic beverage.



Some fermentation cultures involve bacteria and yeast **working together in symbiosis**. The starter cultures for these **unique ferments** can vary from SCOBYs, to kefir grains, to a sourdough starter. Most starters can be **maintained and shared**.

Sourdough Bread

Sourdough begins from a starter created by combining *Lactobacillus* bacteria present in flour and the naturally occurring yeasts in the air. If properly maintained, a sourdough starter can be used and shared for years.

Tha Bai

Commonly known as Cambodian fermented rice, Tha Bai is a unique ferment that actually utilizes three different processes—mold, yeast, and bacteria—to produce a uniquely sweet and slightly alcoholic fermentation.

YEAST FERMENTS

Wine

Yeast consumes the naturally occurring sugars in grapes and other fruits to create wine. If air is allowed to get to wine, acetic acid may be produced, which is what turns wine into vinegar.

Beer

Beer is the result of yeast consuming the sugars in malted grains, such as barley or wheat.



Yeast can be naturally occurring or added to a food to facilitate fermentation. When yeast eats the **naturally occurring sugars** in foods (carbohydrates), the result is the **alcohol** that is the foundation of fermented beverages.

Sato (rice wine)

The starchy sugars in rice provide the food for the yeast in sato. In some Asian countries sato is produced in earthenware jugs and called *lao hai*.

Ginger Beer

Ginger beer is made using a fermented starter made from fresh ginger and the wild yeast that is present on the ginger root and in the air.

ESSENTIAL EQUIPMENT

Preparing food for fermentation doesn't require much in the way of special tools. The most important items to have are a sharp, well-made chef's knife and a large cutting board, but there are some specialty tools that can make the job easier.

COMMON TOOLS

Most of the tools you'll need are probably already in your kitchen. If you have to buy any tools, purchase the highest quality possible.

Chef's knife A high-quality chef's knife is a must for preparing vegetables and other ingredients for fermentation.

Paring knife A paring knife is handy for peeling vegetables, or making small slices or cuts in ingredients.

Vegetable peeler A high-quality vegetable peeler makes the job of peeling much easier.

Vegetable scrubber or brush A vegetable scrubber helps remove dirt from cracks and crevices. Look for a brush with thick, dense bristles.

Grater Grating carrots and other root vegetables can introduce a different texture to your ferments.

Microplane This rasp-style grater can quickly and easily grate tough, fibrous ingredients, like fresh ginger.

Cutting board Buy sturdy cutting boards that are large enough to hold large piles. Wood and bamboo are ideal, while glass should be avoided.

Baking surface A pizza stone or cast iron baking surface will help to make crusty breads.

SPECIALTY TOOLS

While most recipes in this book require only common tools, others require some specialty tools. Most of these items can be found at housewares stores or homebrewing supply stores.

Mandoline

A mandoline slicer can make quick work of high-volume cutting jobs, and many come with a variety of blades that will produce different cuts.

You can adjust the slicing thickness.



Look for a slicer made with a sturdy base.

Tamper or pestle

Usually made from wood, a tamper or pestle helps compact ingredients into jars.



A water barrier keeps air out of the vessel.



There are many types of ferments, such as cheeses, that require **further specialty equipment**. This is covered in more detail in each section.

Airlock

Airlocks keep air out of carboys while allowing the gasses to escape. Find them at brewing supply stores.

Look for a medium to large volume scale.



Funnel

A small funnel is needed to fit into narrow-necked vessels like carboys and flip-top bottles.



Scale

A kitchen scale allows you to measure ingredients precisely when baking sourdough breads.



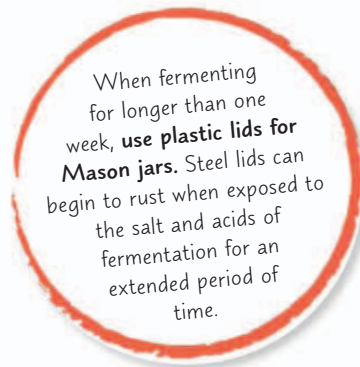
Blender

Look for a powerful blender with a wide mouth for easier cleaning.

FERMENTATION VESSELS

Choosing a vessel is the first step in creating the proper environment for your ferment. There are a variety of vessels to choose from, each suited to different types of ferments.

When shopping for fermenting vessels, glass is generally the best choice. Glass resists the stains and odors that are produced by the fermentation process, and it doesn't corrode.



A 2-quart (2l) Mason jar can be used for many types of ferments.

GLASS MASON JARS

Clear glass mason jars are an ideal vessel for many types of ferments. It's easy to see the contents and track the progress of fermentation, they come in a variety of standard sizes, and they are impervious to odors and stains. The only downside is fragility; the glass can break easily.

Best for: lacto-fermented vegetables, fermented dairy, alcoholic beverages, vinegars

Buy high quality swing-top bottles with thick gaskets that create an airtight seal.



SWING-TOP BOTTLES

Alcoholic beverages often undergo further fermentation and carbonation after bottling. Swing-top bottles provide a tight seal and can be reused multiple times.

Best for: fermented beverages



A basic racking cane and siphon tube is needed to drain the liquid from the carboy.

SANITIZING

Any vessel used for fermenting must be thoroughly sanitized before use. To prevent contamination, wash fermentation vessels and all fermentation equipment thoroughly using a mild, unscented dish soap (one that is not antibacterial) and hot water. Rinse well to remove soapy residue.

The channel is filled with water to create a seal that keeps air out, but allows gasses to escape.



GLASS CARBOYS

A carboy is a jug with a narrow neck opening that can easily be plugged with an airlock, making it ideal for alcohol fermentation. Carboys are available in a range of sizes and can be both glass and plastic, but glass is best for fermenting. A bottle brush is needed to clean them thoroughly.

Best for: fermented beverages

CERAMIC WATER CROCKS

The water crock is a traditional style of fermentation vessel that dates back to ancient times. They often utilize a weighting stone to press down ferments. These beautiful vessels can be used for many types of ferments

Best for: lacto-fermented vegetables

These weights are designed for a tight fit that keeps the food submerged beneath the liquid line.

SOURCING INGREDIENTS

Good ferments start with high-quality ingredients. When selecting ingredients for the recipes in this book, follow these guidelines in order to achieve the best results and greatest health benefits.

ORGANIC AND LOCAL

As a general rule, you should always buy ingredients that are grown with a minimum of added chemicals, so organic is often the best choice. Most supermarkets offer large selections of organic products as an alternative to products grown using synthetic pesticides. Look for ingredients that are labeled as certified organic, which means the producer has followed organic growing practices.

Buying local is also a wise choice. Farmer's markets and farm stands often sell organic produce, and buying from the source allows you to ask the supplier how your produce was grown. Before purchasing, ask about growing practices and if chemicals were used.

Fresh produce When possible, purchase organic fruits and vegetables. Synthetic pesticides, herbicides, and fertilizers can have a suppressive effect on the beneficial microorganisms of fermentation. Look for produce that is locally grown, as well. When you eat clean produce from your local farmer's market, you inoculate yourself with local microorganisms.

Dry ingredients When purchasing grains, seeds, nuts, and legumes, purchase organic whenever possible. As is the case with other ingredients, anything containing synthetic pesticides, herbicides, and fertilizers can have a suppressive effect on the fermentation process. It may be difficult to find organic dry goods, so look online if you can't find these ingredients locally.

Always use **fresh ingredients** that haven't been canned or frozen. **Canned** produce may contain **contaminants** that can affect the ferment, while frozen may not ferment nearly as well as fresh.



STARTERS

Many of the recipes in this book call for “starters,” the ingredient that introduces the microorganisms needed for fermentation to the food product. Some starters, such as whey, are the product of another ferment. Other starters, such as mesophilic starters (for cheese)

or water kefir grains, are commercially available. In most cases, starters can be found in specialty stores or online. Specialty ingredients such as Shanghai yeast balls or koji can be found at ethnic markets or through online sources.

Dairy For the purposes of fermentation, all dairy should be sourced from cows that have not been treated with any hormones, antibiotics, or other synthetic drugs. Use whole milk products from pasture-raised animals as often as possible. Pasture-raised cows and goats have been shown to produce healthier milk with more good fats and fewer bad ones.

Salt Don't reach for the iodized table salt. This refined salt has been stripped of its minerals and has added iodine, which may inhibit fermentation. Instead, look for naturally derived salt varieties that are rich in minerals. Sea salts come in a range of colors and have unique flavor profiles thanks to beneficial trace minerals. Kosher or pickling salt can be used, but these refined salts may contain anti-caking agents.

Water Depending on your municipality and where you get your water from, your tap water may be treated with high levels of chlorine, fluorine, and other chemicals. Chlorine, in particular, inhibits microorganism growth and imparts an unfavorable flavor. Instead of tap water, use clean, filtered water or spring water for ferments. Avoid distilled water, which has been stripped of naturally occurring minerals.



IDEAL FERMENTATION ENVIRONMENTS

WATCH THE LIGHT

Light can interfere with the fermentation process, so it's best to keep ferments in a dark place, especially those that are particularly light sensitive, such as vinegars and kombucha. To minimize the risk of light interference, use an opaque fermentation vessel (such as clay), store in a dark cabinet or closet, or surround the fermentation vessel with a dark fabric.

FIND THE RIGHT TEMPERATURE

Most ferments have an optimal temperature range. Fermenting below the ideal range can result in the microorganisms becoming dormant, while fermenting above the active range can kill the beneficial microorganisms. Ambient room temperature (65°F–75°F; 18°C–24°C) is within the optimal fermentation range for many ferments, but some require temperature control.

Staying Warm

To keep your ferments warm, create an incubation chamber. A cooler filled with hot water bottles, a pre-warmed oven, or a front-loading food dehydrator all work well for this purpose.

Keeping Cool

Cooling is more difficult and requires a dedicated refrigerator with independent thermostat control. Plan to start ferments that prefer cooler temperatures when the ambient temperature in your home is most suited for them.

BE PATIENT

An integral part of fermentation is allowing enough time to pass for the microorganisms to do their work. Krauts, kimchis, and wines that are uninspiring or downright off-putting at first can blossom and mature into delightful creations after several months or years of being left to their own devices.





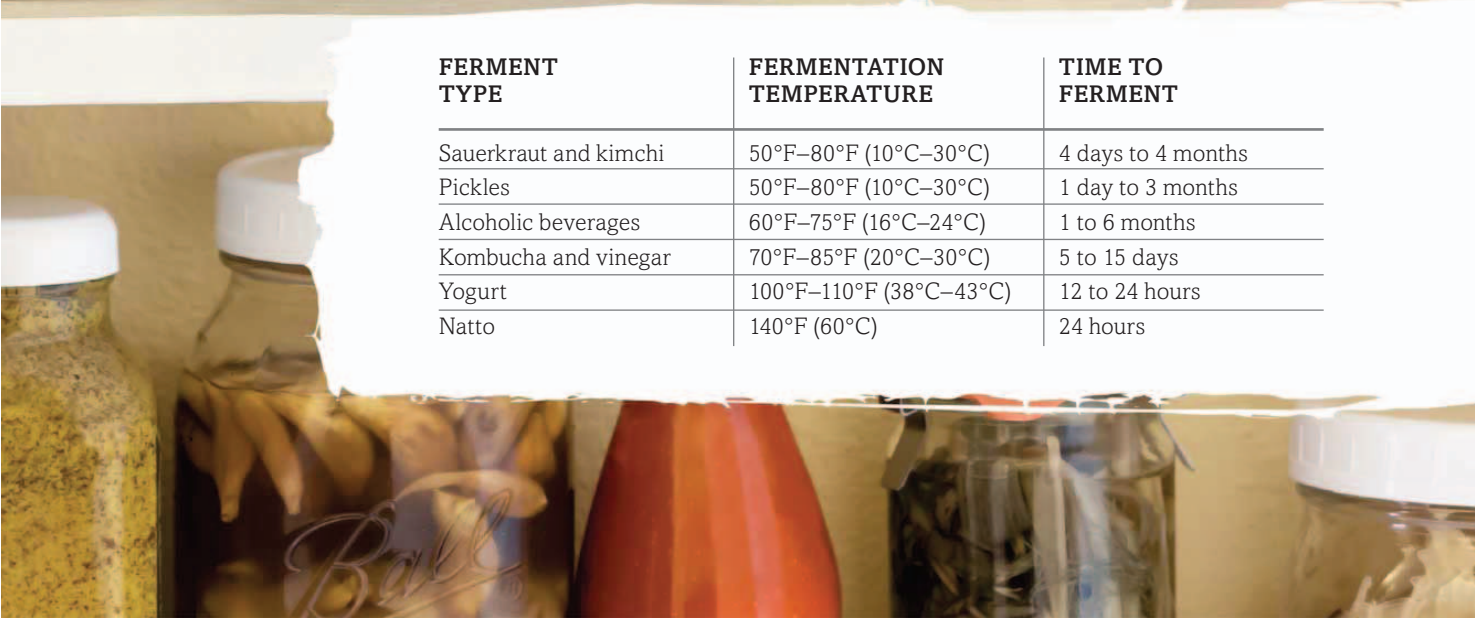
For long-term aging, store your ferments in a **dark, cool, and dry place**. Cellars and basements are ideal as their temperatures do not fluctuate much with the seasons.

FERMENT TYPE

FERMENTATION TEMPERATURE

TIME TO FERMENT

Sauerkraut and kimchi	50°F–80°F (10°C–30°C)	4 days to 4 months
Pickles	50°F–80°F (10°C–30°C)	1 day to 3 months
Alcoholic beverages	60°F–75°F (16°C–24°C)	1 to 6 months
Kombucha and vinegar	70°F–85°F (20°C–30°C)	5 to 15 days
Yogurt	100°F–110°F (38°C–43°C)	12 to 24 hours
Natto	140°F (60°C)	24 hours



CHECKING YOUR FERMENTS

Fermentation can seem like a mysterious process, and it's common to worry about spoilage or contamination. However, if you rely on your senses, you'll soon learn to discern the good from the bad.

1 LOOK

Most ferments go through considerable transformation and can look dramatically different before and after fermenting. As the acids of fermentation build up, expect greens to dull, reds and purples to brighten, and yellows and oranges to deepen.

Don't be alarmed by discolored vegetables, white mold, or yeasty films that may form on the surface of vegetable ferments. In most cases, you can scrape off the discolored layer and enjoy everything underneath.

Discard your ferment if you see:

- Brightly colored molds
- Black molds

2 SMELL

Fermentation stinks! This is part of the process. Aside from the smell of the ferment itself, you may also catch the scent of different compounds gassing out of the ferment. Apples, cabbage and other foods high in sulfur can give off a sulphurous, "rotten-egg" smell mid-way through fermentation, but this will not be present in the final product. However, there are some smells that indicate spoilage.

Discard your ferment if you smell:

- Ammonia (except natto)
- Acetone or nail polish
- Rotting or putrid smell





While many people often believe fermented food is spoiled food, it's quite the opposite. Fermented food **truly is preserved**, and it's done so **without artificial chemicals or additives**.

4 TASTE

Fermented foods are often considered delicacies due to the pungent and deep flavors they exhibit. While these may not always be appealing at first, your appetite for the rich flavors, textures, and aromas of fermented foods will develop and grow as you explore different ferments. However, if something truly does taste spoiled or rotten, it should not be eaten.

Discard your ferment if you taste:

- Rotten or putrid flavors

3 TOUCH

While there are several ferments that are intentionally slimy, sticky, or mushy, these are usually not desirable textures. You can check the texture of the food by touching it, as well as gauging it by mouth feel. Keep in mind, however, that just because something feels unusual does not necessarily mean that it has gone bad.

Discard your ferment if you feel:

- Slimy textures (if unexpected)





VEGETABLES AND FRUITS

When people think of fermented vegetables, they typically think of dishes like Sauerkraut or Kimchi. But did you know that tea leaves can be fermented? Or plums? This chapter will teach you some universal recipes you may have heard of, and a few new ones that you've probably never tried.

This classic cucumber pickle has a delicious, zesty flavor. The salt aids in preservation and helps to maintain the cucumber's crunch.

Ferment Bacterial **Prep** 15 minutes **Time** 3 to 5 days **Yield** 4 cups

PICKLING

Persian cucumbers are perfect for pickling due to their small size, thin skin, and lack of seeds. If you can't find Persian cucumbers, other varieties will also work well. You can also experiment with different herb and spice additions to create your own unique pickles. Dill, coriander, or mustard seed are all flavorful additions.

METHOD

1 Slice cucumbers into halves or spears (make sure they don't exceed the height of your jar in length).

White, green, or red peppercorns can also be used.

English or Kirby cucumbers also pickle well. **Avoid American (slicing) cucumbers**, as they have large, less tender seeds and the skins are often waxed, so they need to be peeled.

YOU WILL NEED...

- 6 to 8 medium Persian cucumbers
- 20 black peppercorns
- 4 cloves garlic, peeled and sliced
- 2 bay leaves
- 4 tsp. salt
- 1 cup water
- 1 1-quart (1l) jar





The salt will settle to the bottom.

2 Place peppercorns, garlic, and bay leaves in the bottom of a 1-quart (1l) jar. Pack cucumber spears tightly into the jar, leaving 1 inch (2.5cm) of headspace. Sprinkle salt over the cucumbers.



3 Add enough water to completely submerge cucumbers.



4 Screw on lid and let sit at room temperature, away from direct sunlight, for 1 week. At this point, pickles should be tender and fully permeated with brine. Some color change is normal. Pickles will keep, refrigerated, for up to 3 months.

This is one of the most practical and adaptable pickling techniques you can use. This version calls for carrots, onions, and celery, along with cumin, coriander, and peppercorns, but you can vary the vegetables and spices to suit your tastes.

Ferment Bacterial **Prep** 5 minutes **Time** 24 to 36 hours **Yield** 4 cups

CONTINUOUS PICKLE

YOU WILL NEED...

- 2 medium carrots, peeled
- 3 stalks celery
- 1 medium onion
- 2 tsp. cumin seed
- 2 tsp. coriander seed
- 1 tsp. black peppercorns
- 1 to 2 cups apple cider vinegar or lemon juice
- 1 TB. salt
- 1 1-quart (1l) jar

METHOD

- 1** Chop carrots and celery into large chunks or sticks. Slice onion into eighths.
- 2** Place cumin, coriander, and peppercorns in the bottom of a 1-quart (1l) glass jar. Pack vegetables into jar and sprinkle with salt. Add vinegar or lemon juice to cover.
- 3** Screw the lid on tightly and refrigerate. Depending on how thick the vegetables are, they could be ready to eat within a day.
- 4** When the pickles run low, simply add more cut vegetables to the jar. Top off with more vinegar or lemon juice as necessary.

After several rounds of pickling, the brine will become **heavily marinated** and **flavorful**. You can **bottle the brine** and use it as a tangy seasoning on rice, salads, or grilled vegetables.



This recipe involves a technique common in Indian pickling called tempering. Spices are quickly roasted in hot oil to release flavor and aroma before they are added to the pickling jar.

Ferment Bacterial **Prep** 15 minutes **Time** 1 to 2 weeks **Yield** 4 cups

TURMERIC & CARROT PICKLES

YOU WILL NEED...

- 1 tsp. coconut oil
- 2 tsp. coriander seed
- 1 tsp. black mustard seed
- 1 tsp. black peppercorns
- 8 to 10 fresh curry leaves (if available)
- 2 or 3 carrots, cut into sticks
- 3 or 4 pieces fresh turmeric root, cut into wedges
- 2 cups cauliflower florets
- 1 (1–2-in.; 2.5–5cm) piece fresh ginger, peeled and thinly sliced
- 5 cloves garlic, whole or sliced
- 1 or 2 Thai chiles (optional)
- 1 TB. salt
- 1 to 2 cups lemon juice
- 1 1-quart (1l) jar

METHOD

- 1** To temper spices, heat coconut oil over high heat in a small frying pan. Add the coriander, black mustard seed, and peppercorns. After about 1 minute, when spices begin to release their aroma, add curry leaves (if using). Stir the spices a few times and remove from heat.
- 2** Transfer the tempered spices to a 1-quart (1l) jar. Pack carrots, turmeric root, cauliflower, ginger, garlic, and chiles (if using) tightly into the jar.
- 3** Sprinkle salt over vegetables and then add enough lemon juice to cover.
- 4** Screw the lid on tightly and let sit at room temperature, away from light, for 1 to 2 weeks before eating. Pickles will keep, refrigerated, for several months.

If you can find it, use white turmeric instead of yellow. White turmeric shares some flavor notes with its yellow cousin, but also has notes of mango and ginger.

Preserved lemons have a bold combination of salty, sour, and bitter flavors. They make an excellent accompaniment to braised meat dishes or a flavorful addition to grain salads.

Ferment Bacterial **Prep** 15 minutes **Time** 2 to 4 weeks **Yield** 2 cups

EGYPTIAN PRESERVED LEMON

In Egypt, this ferment is often made with the key lime, which has a thin skin and pickles very nicely. The larger yellow lemon is used in Morocco and added, along with green olives, to chicken tagine. Preserved lemons can be quite salty and sour, so cut them into smaller, more manageable pieces when serving on their own.

YOU WILL NEED...

- 4 to 5 medium lemons (preferably Meyer or other thin-skinned variety)
- ¼ cup salt
- 1 TB. nigella seeds (black seed)
- 10 saffron threads or 20 safflower threads
- 1 1-pint (500ml) jar

METHOD

- 1** Starting from the stem end, slice lemons into quarters, leaving the end of the lemon intact.
- 2** In a small bowl, combine salt, nigella, and saffron. Over a bowl, liberally spread the salt and spice mixture on all exposed surfaces of the lemons.
- 3** Pack lemons tightly into a 1-pint (500ml) jar, pressing down to aid in releasing the juices.
- 4** Sprinkle any remaining salt mixture on top and screw the lid on tightly. Store at room temperature, away from direct sunlight, for at least 2 weeks.
- 5** Refrigerate after opening. Preserved lemons will keep, refrigerated, for several months.





Lift is a tangy and toothsome pickle with a full-bodied texture. One small beet spear is added to infuse the turnips with a beautiful bright fuchsia color.

Ferment Bacterial **Prep** 15 minutes **Time** 1 to 2 weeks **Yield** 4 cups

LIFT (EGYPTIAN PICKLED TURNIPS)

Pickled turnips are a common addition to shawerma and falafel sandwiches across the Middle East. Egyptian falafel, known as *taameyya*, is made with fava beans instead of chickpeas. Try garnishing a fava bean salad or cooked fava beans with your homemade lift to give it an authentic twist.

YOU WILL NEED...

- | | |
|---|-------------------------------|
| 1 to 2 medium turnips, sliced into small spears | 2 TB. salt |
| 1 small beet, sliced into small spears | 1 cup raw apple cider vinegar |
| | 1 cup water |
| | 1 1-quart (1l) jar |

METHOD

- Cut off the stem end of 1 turnip and set aside.
- Slice turnips into uniform spears and pack tightly into a 1-quart (1l) jar along with a small slice of beet.
- Add salt, raw apple cider vinegar, and water until the brine level is above the turnips.
- Wedge the stem end of the turnip into the jar so that it holds the spears below the brine. Screw the lid on tightly.
- Let sit at room temperature, out of direct sunlight, for 1 to 2 weeks. At this point, the lift should be ready to eat. It will keep, refrigerated, for several months.

BASIC KNIFE TECHNIQUES

A good chef's knife is one of the most useful and versatile tools to have in your kitchen. With this simple blade, you can prepare vegetables for just about any type of ferment.



🏠 MEDIUM DICE

A medium dice creates cubes about $\frac{1}{2}$ inch (1.25cm) on all sides. Cut your ingredient lengthwise into $\frac{1}{2}$ -inch slabs, stack the slabs and cut into $\frac{1}{2}$ -inch (1.25cm) strips, then cut the strips at $\frac{1}{2}$ -inch (1.25cm) intervals into cubes.

📏 FINE DICE

A small dice creates cubes about $\frac{1}{4}$ inch (.5cm) on all sides. Cut your ingredient lengthwise into $\frac{1}{4}$ -inch (.5cm) slabs, stack the slabs and cut into $\frac{1}{4}$ -inch (.5cm) strips, then cut the strips at $\frac{1}{4}$ -inch (.5cm) intervals into cubes.





🏠 PASTE

To make a garlic paste, trim and peel garlic, slice finely, and then chop. Bring near the edge of the cutting board and add a small amount of salt. Lay the knife on top of the garlic, parallel to the cutting board, and use the blade to mash the garlic into the cutting board.



🏠 MINCE

Finer than a dice but not quite a paste, a mince works well for herbs as well as vegetables. Chop finely and then continue to chop in a side-to-side motion until you achieve a fine, even texture.



Always work with **high-quality knives** that are **sharp, well-balanced, and suitably sized** for the job. As a general rule, a **chef's knife** will handle any of these techniques with relative ease.

🏠 COARSE CHOP

Many ferments call for leafy greens like bok choy or Napa cabbage to be coarsely chopped. Cut perpendicular to the stem in $\frac{1}{2}$ - to 2-inch (1.25–5cm) pieces.



This quick pickle is often served as an appetizer and palate cleanser in sushi restaurants. The crisp cucumber and toasted sesame seeds make it a great addition to any fish-based meal.

Ferment Bacterial **Prep** 20 minutes **Time** 30 to 60 minutes **Yield** 2 cups

SUNOMONO (JAPANESE PICKLED CUCUMBER)

Ginger incorporates best into marinades and dressings when grated very finely. To grate, peel the ginger by scraping the skin off with the edge of a spoon held at a 45-degree angle. Once the ginger is peeled, use a Microplane grater to get the finest results.

YOU WILL NEED...

- 4 to 5 Persian cucumbers, finely sliced
- ½ tsp. salt
- 2 TB. wakame seaweed flakes
- ¼ cup rice wine vinegar
- 1 tsp. sugar
- ½ tsp. tamari or soy sauce
- 2 tsp. fresh ginger, peeled and finely grated
- 1 TB. sesame seeds, toasted
- 1 TB. toasted sesame oil

METHOD

- 1** In a medium bowl, combine cucumbers and salt. Set aside to sweat for 5 to 10 minutes.
- 2** In a small bowl, combine wakame seaweed with a splash of filtered or spring water to rehydrate.
- 3** In a medium bowl, combine rice wine vinegar, sugar, tamari, and ginger. Stir until sugar is dissolved.
- 4** Squeeze cucumber slices to force out as much liquid as possible. Discard liquid.
- 5** Add cucumber and rehydrated wakame to brine and mix well. Marinate at room temperature for 30 to 60 minutes.
- 6** Just before serving, dress with toasted sesame seeds and toasted sesame oil. Refrigerate leftovers in an airtight container for up to 4 days.

This potent medicinal pickle is made with the unripe ume plum. Serve these strongly salty, aromatic gems with rice or as part of ochazuke, a dish made with rice, green tea, seaweed, and green onions.

Ferment Bacterial **Prep** 5 minutes **Time** 1 to 2 months **Yield** 4 cups

UMEBOSHI (PICKLED UME PLUM)

This recipe calls for sun drying, so plan to make it when you'll have several days of warm sunshine. If unripe ume plums are unavailable, unripe apricots can be used instead.

YOU WILL NEED...

- 1 lb. (450g) unripe ume plums or apricots
- 2 oz. salt
- ¼ cup neutral alcohol, such as shochu or vodka
- 5 to 10 red shiso (perilla) leaves (optional)
- 1 1-quart (1l) jar

METHOD

- 1** Remove stems from ume, using a toothpick if needed. Place in a medium bowl and cover with water. Soak for 8 to 10 hours or overnight.
- 2** Drain water and rinse ume with neutral alcohol to reduce chance of mold.
- 3** Pack ume in a 1-quart (1l) jar, adding a layer of salt between each layer of ume. Screw lid on tightly and let sit at room temperature for 3 weeks.
- 4** After 3 weeks, remove ume from jar, reserving the brine. Spread ume in a single layer on a screen and dry in the sun for 3 days (bring inside at night to prevent them from becoming wet with dew).
- 5** Once the ume are shriveled and the salt has begun to come to the surface (you will see a thin white salt crust), return to a jar with red shiso (if using) and reserved pickling brine.
- 6** Cover tightly with lid and age for another 3 to 4 weeks at room temperature. For a refined umeboshi, age for 1 to 3 years.



Extend the life of aging garlic and take advantage of its concentrated flavor by pickling it. Pickled garlic is a welcome addition to any pickle plate or salad.

Ferment Bacterial **Prep** 10 minutes **Time** 2 to 3 weeks **Yield** 4 cups

PICKLED GARLIC

YOU WILL NEED...

- 6 heads garlic, peeled
- 1 TB. salt
- 2 to 3 cups lemon juice
- 1 1-quart (1l) jar

METHOD

- 1** Pack garlic cloves tightly into a 1-quart (1l) jar.
- 2** Sprinkle salt over the surface of the garlic. Add enough lemon juice to cover.
- 3** Screw the lid on tightly and let sit at room temperature, out of direct sunlight, for at least 2 weeks.
- 4** After 2 weeks, taste the garlic. It can be eaten directly out of the jar and should have a mild, well-rounded flavor.
- 5** Store in the pantry instead of the fridge to allow flavors to continue developing. Pickled garlic will keep for several months.

Pickled garlic can be **cooked or used raw**. It's a great addition to stir fries, baked veggies, braised meats, and salads. For brightly colored garlic, **add beets or turmeric** to the pickling jar.



Pickling mellows ginger's spicy bite and adds a tangy sweetness. The delicate slices are often served as a palate-cleansing accompaniment to sushi.

Ferment Bacterial **Prep** 40 minutes **Time** 1 to 2 weeks **Yield** 2 cups

PICKLED GINGER

YOU WILL NEED...

- 1 lb. (450g) fresh ginger
- 4 quarts (4l) water
- ½ TB. salt
- 2 TB. honey
- 1 cup rice wine vinegar
- 1 1-pint (500ml) jar

METHOD

- 1** Peel ginger by scraping skin off with the side of a metal spoon. Slice very thin with a peeler, mandolin, or sharp knife.
- 2** In a saucepan, combine ginger and 2 quarts (2l) water. Bring to a boil over high heat and boil for 20 minutes. Strain and return ginger to pot. Reserve boiling water for another use if desired.
- 3** Add the remaining 2 quarts (2l) water to the pot with the ginger and bring to a boil. Boil 20 minutes. Strain ginger and place in a 1-pint (500ml) jar. Reserve boiling water if desired.
- 4** In a small bowl, combine salt, honey, and rice wine vinegar. Stir until honey and salt are dissolved. Pour over ginger until covered. Press down to push out all air bubbles.
- 5** Seal jar and let sit at room temperature, away from sunlight, for 1 to 2 weeks. Pickled ginger will keep, refrigerated, for several months.

The reserved boiling water is a **powerful ginger tea** that can be consumed on its own, used instead of water to cook ginger rice, or **fermented with sugar and yeast** for ginger beer.

Sauerkraut translates to “sour cabbage” in German, but the flavor is also earthy, salty, and unique. Use the juice from plain sauerkraut to start other lacto-ferments.

Ferment Bacterial **Prep** 40 minutes **Time** 5+ days **Yield** 2 quarts (2l)

SAUERKRAUT

You can use any kind of cabbage as the base of your sauerkraut. Green, purple, red, Napa, and Savoy cabbages will all make delicious kraut. You can also add other vegetables, herbs, and spices. Just stay away from anything too starchy, like potatoes and yams, which can create slimy textures and off-flavors.

YOU WILL NEED...

- 1 medium head cabbage
- 1 TB. salt
- 1 2-quart (2l) jar

METHOD

1 Remove one whole outer cabbage leaf and set aside. Cut cabbage in half and remove core. Slice into fine ribbons, about ¼-inch (.5cm) wide.

Try adding shredded **carrots**, whole **garlic**, **jalapeños**, **apples**, or **onions** to your kraut. The preparation of each ingredient will affect the **flavor and texture** of the finished product.

Set aside a whole cabbage leaf to cover the sauerkraut later.





2 In a medium bowl, combine cabbage and salt and mix well to distribute salt evenly.



3 With your hands, massage the cabbage shreds, mashing and squeezing until the cabbage releases a significant amount of liquid.

4 Transfer the mixture to a 2-quart (2l) jar and press down until all of the solids are below the liquid line.



Continued





5 Insert whole cabbage leaf into the mouth of the jar and tuck it around the mixture to keep small bits from floating to the surface.

Sauerkraut, like any fermented food, will have a strong, distinctive smell that is not at all unpleasant. If your kraut develops a smell that is distinctly rotten (sulphery), discard your ferment.

Some discoloration near the surface is normal. Simply scrape off and discard.

6 Place small jar upside down on top of the whole cabbage leaf and press down firmly (this keeps the mixture submerged). Screw the plastic lid tightly on the large jar, then release the lid one-eighth turn to allow gases to escape during the fermentation process.



7 Set the jar on a plate and place out of direct sunlight. Allow to ferment at room temperature for at least 5 days. Refrigerate once satisfied with the level of fermentation.

Krauts can be **aged for months and even years**. If you like a stronger-flavored kraut with more zing, consider a longer ferment time.

A plate will catch any overflow of juices.



Kelp and nori bring the briny flavor of the ocean to this probiotic powerhouse, as well as essential nutrients such as calcium and iodine.

Ferment Bacterial **Prep** 40 minutes **Ferment** 5+ days **Yield** 2 quarts (2l)

SEAWEED KRAUT

YOU WILL NEED...

- 1 medium head cabbage, sliced into ¼ inch (.5cm) ribbons
- ½ TB. salt
- 6 to 7 dried kelp fronds, crumbled
- ½ cup nori, crumbled
- 1 2-quart (2l) jar

METHOD

- 1** In a large bowl, combine cabbage and salt. Cover with a plate and set aside to sweat for 1 to 3 hours.
- 2** Add kelp and nori to cabbage. With clean hands, mix the seaweed and cabbage thoroughly, massaging to release liquid.
- 3** Transfer the mixture to a 2-quart (2l) glass jar and press down until all of the solids are below the liquid line.
- 4** Screw on the lid tightly and place out of direct sunlight. Allow to ferment at room temperature for at least 5 days.
- 5** Refrigerate once satisfied with the level of fermentation. Kraut will keep for several months in the refrigerator.

Experiment with different kinds and combinations of seaweeds. **Sea palm, dulse, kelp, nori, kombu, wakame,** or **spirulina** will each lend different flavors and nutritional benefits.



This Indian-inspired spiced kraut is bursting with aromatic and savory flavors. You can keep spices whole or grind them, depending on your preference.

Ferment Bacterial **Prep time** 45 minutes **Ferment time** 5 days **Yield** 2 quarts (2l)

MASALA KRAUT

YOU WILL NEED...

- 1 medium head cabbage, sliced into ¼-inch (.5cm) ribbons
- 1 TB. salt
- 1 small onion, finely chopped
- 1 (1½-in.; 3.75cm) piece fresh ginger, peeled and grated
- 1 tsp. coriander seed
- 12 to 15 curry leaves, finely chopped
- 2 tsp. black mustard seed
- 1 tsp. cumin seed
- 1 tsp. turmeric
- 1 tsp. fenugreek
- ¼ tsp. asafoetida powder (hing)
- 1 tsp. cayenne (optional)
- 1 2-quart (2l) jar

METHOD

- 1** In a large bowl, combine cabbage and salt. Cover with a plate and set aside for 1 to 3 hours.
- 2** Add onion and ginger to cabbage and mix to combine.
- 3** Add coriander seed, curry leaves, black mustard seed, cumin seed, turmeric, fenugreek, and asafoetida to cabbage mixture. With clean hands, mix and massage thoroughly. Add cayenne (if using) and mix in well with a spoon.
- 4** Transfer the mixture to a 2-quart (2l) jar and press down until all of the solids are below the liquid line.
- 5** Screw on the lid tightly and place out of direct sunlight. Allow to ferment at room temperature for at least 5 days.
- 6** Refrigerate once satisfied with the level of fermentation. Kraut will keep for several months in the refrigerator.

Asafoetida powder, or hing, is derived from a species of **fennel** and is a common ingredient in **Indian vegetarian cuisine**. It can be purchased at Indian groceries or specialty spice stores.



This kraut made with all root vegetables is tangy and toothsome. For textural and visual variety, process your root vegetables using several different techniques, such as slicing, grating, and chopping.

Ferment Bacterial **Prep** 40 minutes **Time** 5+ days **Yield** 6 cups

ROOT KRAUT

This kraut technique works well with a wide variety of root vegetables. Try experimenting with carrot, jicama, radish, kohlrabi, horseradish, ginger, turmeric, onions, and garlic. Just avoid starchy roots like potato, yam, and taro, which require special care and techniques to ferment.

YOU WILL NEED...

- 1 large yellow beet, sliced, grated, or chopped
- 1 medium turnip, sliced, grated, or chopped
- 1 small rutabaga, sliced, grated, or chopped
- 2 parsnips, sliced, grated, or chopped
- ¼ bulb celeriac (celery root), sliced, grated, or chopped
- 1 TB. green peppercorns
- 1 TB. salt
- 1 2-quart (2l) jar

METHOD

- 1** In a large bowl, combine beet, turnip, rutabaga, parsnips, celeriac, green peppercorns, and salt. Cover with a plate and set aside to sweat for 1 to 3 hours.
- 2** With your hands, mix thoroughly and massage to release liquid.
- 3** Transfer the mixture to a 2-quart (2l) jar and press down until all of the solids are below the liquid line.
- 4** Screw on the lid tightly and place out of direct sunlight. Allow to ferment at room temperature for at least 5 days.
- 5** Refrigerate once satisfied with the level of fermentation. Kraut will keep for several months in the refrigerator.

This cabbage pickle is a common side dish in El Salvador. Its vinegary tang and crunchy texture will bring brightness and flavor to sandwiches or long-simmered meat dishes.

Ferment Bacterial **Prep** 40 minutes **Time** 1 day **Yield** 2 quarts (2l)

CURTIDO

Green cabbage and white onion are most often used for curtido, but you could also use red cabbage and red onion in this recipe for a vibrant, fuchsia-hued ferment.

Curtido is traditionally served along with red salsa on top of pupusas, thick Salvadorian tortillas that are stuffed with cheese, beans, vegetables, or meat.

YOU WILL NEED...

- 1 medium head cabbage, sliced into ¼-inch (.5cm) ribbons
- 2 carrots, peeled and grated
- 1 small onion, thinly sliced
- 1 TB. dried oregano
- ½ cup raw apple cider vinegar
- 1 TB. salt
- 2 jalapeños, thinly sliced (optional)
- 1 tsp. cayenne (optional)
- 1 2-quart (2l) jar

METHOD

- 1** In a large bowl, combine cabbage, carrots, onion, oregano, apple cider vinegar, and salt. Cover with a plate and let sit for 1 hour at room temperature.
- 2** With your hands, mix thoroughly and massage to release liquid. Add jalapeños (if using) and cayenne (if using).
- 3** Transfer the mixture to a 2-quart (2l) jar and press down until all of the solids are below the liquid line.
- 4** Screw on the lid and then loosen it with a one-eighth turn. Place out of direct sunlight and ferment at room temperature for at least 1 day.
- 5** Refrigerate once satisfied with the level of fermentation. Curtido will keep, refrigerated, for several months.



Kimchi is a spicy fermented dish from Korea that can be made with a variety of ingredients. This basic version is fresh, pungent, and flavorful.

Ferment Bacterial/Yeast **Prep** 3 hours **Time** 1 to 2 weeks **Yield** 2 quarts (2l)

KIMCHI

Kimchi benefits from a lower fermentation temperature (below 80°F; 27°C) and a few weeks of aging. Even if your batch tastes bland after the week-long ferment, it may blossom after a month of aging in the fridge.

YOU WILL NEED...

- 1 medium Napa cabbage
- 1/4 cup salt
- 1 medium Korean or daikon radish
- 1 ripe pear
- 1/2 white onion
- 1 (3-in.; 7.5cm) piece fresh ginger
- 5 cloves garlic
- 1/2 cup gochugaru
- 1 tsp. fish sauce (optional)
- 5 to 7 green onions, finely chopped
- 1 2-quart (2l) jar



Cutting the cabbage into quarters makes it easier to distribute the seasonings.

METHOD

- 1 Cut cabbage into quarters and remove inner stem while keeping leaves intact.

2 Generously distribute salt between leaves, working it all the way down to the core. Place cabbage in a shallow bowl and let sit at room temperature for 2 to 6 hours.

Gochugaru is a coarsely ground red pepper with a texture **between a flake and a powder**. It can be found online and in Korean markets.



3 In a food processor fitted with a chopping blade, purée radish, pear, white onion, ginger, garlic, gochugaru, and fish sauce (if using) into a smooth paste.

Garlic cloves can be added whole to the food processor.



4 Rinse salt from cabbage, being sure to rinse between the leaves. Squeeze out as much water from the cabbage as possible.

In Korea, kimchi is often made with **vegetables that are in season, and isn't limited to cabbage** as the main ingredient. Try using cucumber, cubed daikon radish, or bok choy in place of cabbage.



Try to distribute the paste on the cabbage as evenly as possible.

5 Spread paste and chopped green onions onto all leaves, making sure to cover them all the way down to the core.





Loosening the lid slightly allows gases to escape.

6 Pack seasoned cabbage quarters into a 2-quart (2l) jar and press down to release trapped air. Spread any remaining paste on the surface of the cabbage. Screw on the lid tightly and then loosen it with a one-eighth turn.

Check your kimchi often to ensure that no mold forms on the surface of the ferment.

Kimchi is an **incredibly versatile condiment**. It's delicious eaten on its own, but it's also a flavorful addition to eggs, stir fries, soups, and salads. Some people even like it **on hot dogs** in place of sauerkraut!

Fermenting will soften the vegetables and deepen the spice flavors.



7 Place out of direct sunlight and ferment at room temperature for 1 to 2 weeks. Once you are satisfied with the level of fermentation, refrigerate and chop to serve. Kimchi will keep, refrigerated, several months.



This twist on kimchi replaces the traditional Napa cabbage with bok choy and uses green chiles instead of red chile paste for a lighter color and milder flavor.

Ferment Bacterial/Yeast **Prep** 3 hours **Time** 1 to 2 weeks **Yield** 2 quarts (2l)

BOK CHOY WHITE KIMCHI

Bok choy is just one of the greens that can stand in for cabbage in kimchi. Try experimenting with other leafy greens like kale, collard, baby bok choy, and chard. Keep in mind that tender greens ferment faster than sturdy ones.

YOU WILL NEED...

- 2 lb. (1kg) bok choy, cut into quarters
- 1 small Korean or daikon radish, shredded or sliced
- 3 TB. salt
- ½ ripe pear, cored
- ½ white onion
- 1 (2-in.; 5cm) piece fresh ginger, peeled
- 2 cloves garlic
- 3 or 4 green chiles, such as jalapeño or serrano, stems and seeds removed
- ½ tsp. fish sauce (optional)
- 3 or 4 green onions, white and green parts, finely chopped
- ½ bunch cilantro, stems and leaves, finely chopped
- 1 2-quart (2l) jar

METHOD

- 1** In a large bowl, combine bok choy and radish. Sprinkle with salt and allow to sit at room temperature for 1 to 3 hours.
- 2** In a food processor fitted with a chopping blade, purée pear, onion, ginger, garlic, chiles, and fish sauce (if using) into a smooth paste.
- 3** Rinse salt from bok choy and daikon and squeeze out as much water as possible.
- 4** Spread paste, chopped green onion, and cilantro all over bok choy and daikon.
- 5** Pack seasoned bok choy and daikon into a 2-quart (2l) jar and press down to release trapped air. Spread any remaining paste on surface of vegetables.
- 6** Screw on the lid and then loosen with a one-eighth turn. Ferment at room temperature, away from direct sunlight, for 1 to 2 weeks.
- 7** Once you are satisfied with the level of fermentation, refrigerate and chop to serve. Kimchi will keep, refrigerated, for several months.

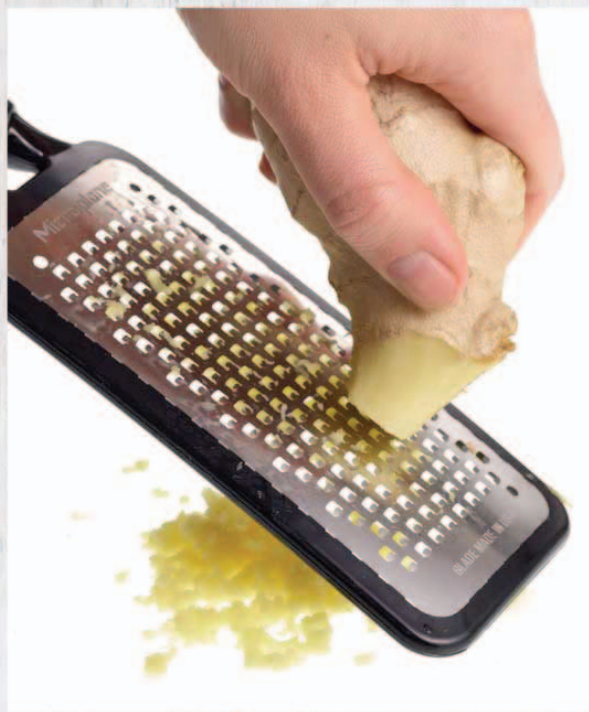
SLICING, PEELING, & GRATING TECHNIQUES

When preparing a large batch of vegetables for fermentation, the right tool can save time and create shapes and sizes that may be hard or impossible to achieve with a knife. Here are some handy tools and the results they produce.



↩ ZEST

The small, sharp holes of a rasp-style grater, such as a Microplane, are perfect for zesting citrus fruits. They can also be used to create a paste-like consistency out of ginger, radish, and onion.



The techniques you use can **impact the taste and textures** of your ferments. Experiment with **different shapes and sizes** of ingredients to see what best suits your tastes.

↩ FINE GRATE

Use a fine grater to break down tough, fibrous roots and vegetables. This will allow them to break down more easily during fermentation.



🏠 COARSE GRATE

Vegetables that are coarsely grated will add a unique texture to your ferments and won't lose their shape as quickly as items that have been finely grated.

📏 JULIENNE

A zigzag peeler will create thin, julienned strips quickly and easily. It works like a regular peeler and can be found in specialty cookware stores.



📏 THIN SLICES

Use a mandolin to achieve very thin, even slices. Some models can be adjusted for varying thicknesses and may have attachments for julienne or waffle cuts.



🏠 RIBBONS

A peeler isn't just for removing the outer skin! Keep peeling even after you've gotten past the skin to create ribbons. Depending on the length of your peeler, you can achieve long, thin strips that are 1 to 2 inches (2.5–5cm) wide.



The flavor of these tangy and juicy tomatoes deepens and intensifies over time. Try them as a refreshing side dish with grilled meats or served on top of a salad.

Ferment Bacterial **Prep** 15 minutes **Time** 1 to 3 days **Yield** 5 cups

PICKLED TOMATOES

YOU WILL NEED...

- 5 to 6 tomatoes
- 5 cloves garlic
- ¼ cup celery leaf, finely chopped
- 2 tsp. salt
- ¼ cup raw apple cider vinegar

METHOD

- 1** Cut tomatoes into ½-inch (1.25cm) slices, perpendicular to the core.
- 2** With mortar and pestle or the blade of a chef's knife, make a paste out of garlic. Mix in salt and celery leaf. Spread paste over the cut surfaces of the tomatoes.
- 3** In a medium glass or ceramic dish, layer the tomatoes on top of each other, dressing each layer with 1 tablespoon apple cider vinegar.
- 4** Cover and let sit at room temperature for at least 6 hours. If pickling for more than 6 hours, transfer to refrigerator. Use within a week.

After 5 or 6 days in the fridge, these tomatoes can get a bit mushy. That's the perfect time to use them for gazpacho, tomato sauce, or salsa. Just blend them up and use as a tomato base.



This delightfully toothsome pickled eggplant has a deep and balanced flavor. Its tangy flavor is an excellent complement to rich dishes, especially red meats and grilled vegetables.

Ferment Bacterial **Prep** 45 minutes **Time** 1 to 3 days **Yield** 8 to 10 eggplants

PICKLED EGGPLANT

↓ YOU WILL NEED...

- 8 to 10 small finger eggplants
- 8 cloves garlic
- 1 small bunch parsley, leaves and stems, finely chopped
- 1 TB. salt
- ½ cup raw apple cider vinegar

↓ METHOD

- 1** In a saucepan with a steaming basket or a food steamer, steam whole eggplants for 20 to 30 minutes, until tender but not soggy.
- 2** With mortar and pestle or the blade of a chef's knife, make a paste out of garlic. Mix in parsley and salt.
- 3** Remove stems from eggplant and cut a slit down the length of each one, making sure not to cut all the way through. (They should look like little eggplant canoes.)
- 4** Spread 2 to 3 teaspoons of garlic and parsley paste into each eggplant. Stack eggplant in a medium glass or ceramic dish and spread any remaining paste on top. Pour enough apple cider vinegar over the eggplant to submerge.
- 5** Cover and refrigerate. Let sit for at least 1 day before eating. Eggplant will keep, refrigerated, for 1 to 2 weeks.

For a **less sharp pickle**, use **equal parts vinegar and water**. Diluting the vinegar will shorten the life of the pickle, but it will still keep for at least a week.

This unique ferment has a pungent, bittersweet flavor and is considered a digestive aid. It's a great way to make use of the spent tea leaves left over after brewing tea for kombucha.

Ferment Bacterial **Prep** 10 minutes **Time** 4 to 6 days **Yield** ¾ cup

LAHPET (BURMESE PICKLED TEA LEAVES)

In the traditional Burmese dish *lahpet thoke*, lahpet is served on a bed of shredded cabbage and surrounded by piles of fried garlic, fried lima beans, roasted peanuts, toasted sesame seeds, tomatoes, green chiles, dried shrimp, fried shredded coconut, and fried ginger slices. It is dressed with lime juice, sesame or peanut oil, and fish sauce.

YOU WILL NEED...

- 1 cup spent whole tea leaves (green, white, oolong, or pu-erh), packed
- 1 tsp. salt
- 2 TB. lime or lemon juice
- 1 8-ounce (240ml) jar

METHOD

- 1** Remove large stems from tea leaves and finely chop the leaves. In a small bowl, combine chopped tea leaves, salt, and lemon juice and thoroughly mix.
- 2** Pack mixture into an 8-ounce (240ml) jar and cover tightly with lid.
- 3** Ferment at room temperature, away from sunlight, for 4 to 6 days.
- 4** When satisfied with the level of fermentation, transfer to refrigerator. Lahpet will keep, refrigerated, for several months.

Lahpet is popular in Myanmar, where it is considered a **national delicacy** and prized for its **medicinal properties**. In addition to aiding digestion, it is also a **mild stimulant** used to ward off sleepiness.









CONDIMENTS

Some of the most ubiquitous condiments in the world—mustard, ketchup, chutney, hot sauce—take on new life and flavor when they're fermented. This chapter introduces you to some amazing (and healthful) fermented condiments that can add a new dimension of taste to everyday foods.



This fermented ketchup has the familiar tanginess of store-bought varieties, but without the high-fructose corn syrup and preservatives. Its robust flavor is a welcome addition to burgers, fries, meatloaf, or hot dogs.

Ferment Bacterial/Yeast **Prep** 10 minutes **Time** 2 to 3 days **Yield** 1 cup

KETCHUP

You can use any liquid probiotic starter for this recipe, but the final flavor will be affected by the one you choose. Sauerkraut juice or a basic water kefir, such as plain coconut water kefir, are recommended.

YOU WILL NEED...

- 1 (6-oz.; 175ml) can tomato paste
- 2 TB. starter liquid (sauerkraut juice, water kefir, or whey)
- 1 TB. maple syrup or honey
- 1 clove garlic, minced to a paste
- ¼ tsp. salt
- ⅛ tsp. ground cinnamon
- Pinch ground cloves
- Pinch cayenne
- 2 TB. apple cider vinegar
- 1 1-pint (500ml) jar

METHOD

- 1** Combine tomato paste, starter liquid, maple syrup or honey, garlic, salt, cinnamon, cloves, and cayenne in a 1-pint (500ml) jar and mix well.
- 2** Add apple cider vinegar to surface of ketchup. This will help inhibit the growth of mold on the surface.
- 3** Cover tightly with a lid and let sit at room temperature, away from light, for 2 to 3 days.
- 4** When satisfied with the level of fermentation, mix surface vinegar into ketchup and enjoy. For a thinner ketchup, mix in more starter liquid, vinegar, or water. Ketchup will keep for 1 to 2 weeks in the fridge.

Mole is a sauce from southern Mexico that has many variations and applications. This recipe brings the spicy, smoky, and earthy flavors of mole rojo to ketchup.

Ferment Bacterial/Yeast **Prep** 10 minutes **Time** 2 to 3 days **Yield** 1 cup

MOLE KETCHUP

YOU WILL NEED...

- 1 (6-oz.; 175ml) can tomato paste
- 2 TB. starter liquid (sauerkraut juice, water kefir, or whey)
- 1 TB. maple syrup or honey
- 1 clove garlic, minced to a paste
- ¼ tsp. salt
- ¼ tsp. ground cinnamon
- 2 tsp. cacao powder
- ½ tsp. smoked paprika
- Pinch ground cloves
- Pinch cayenne (optional)
- 3 TB. apple cider vinegar
- 1 1-pint (500ml) jar

METHOD

- 1** Combine tomato paste, starter liquid, maple syrup or honey, garlic paste, salt, cinnamon, cacao powder, smoked paprika, cloves, and cayenne in a 1-pint (500ml) jar and mix well.
- 2** Add apple cider vinegar to surface of ketchup. This will help inhibit the growth of mold on the surface.
- 3** Cover tightly with a lid and let sit at room temperature, away from light, for 2 to 3 days.
- 4** When satisfied with the level of fermentation, mix surface vinegar into ketchup and enjoy. Ketchup will keep for 1 to 2 weeks in the fridge.

To make **Chipotle Chocolate Ketchup**, substitute chipotle powder for the paprika. If the flavor of the cacao is too bitter, add a little more maple syrup or honey.

Homemade horseradish is extra hot, pungent, and medicinal. Use it on sandwiches or as a base for dressings and marinades. A little bit goes a long way!

Ferment Bacterial/Yeast **Prep** 30 minutes **Time** 7 days **Yield** 1¼ cups

HORSERADISH

YOU WILL NEED...

- 1 cup horseradish root (about one half a root)
- 4 TB. apple cider vinegar
- ½ tsp. salt
- 1 1-pint (500ml) jar

METHOD

- 1** Peel horseradish root and cut out any woody parts.
- 2** Outside or in a well-ventilated area, grate horseradish using a Microplane or box grater. (Horseradish can irritate the eyes and nose; use caution and try not to inhale the pungent oils while processing.)
- 3** In a medium bowl, combine grated horseradish, apple cider vinegar, and salt and mix well.
- 4** Transfer to a 1-pint (500ml) jar and cover tightly. Let sit at room temperature, away from light, for at least 1 week.
- 5** When satisfied with the level of fermentation, transfer to refrigerator. Horseradish will keep, refrigerated, for several months.

A food processor will break down the horseradish root into a **more paste-like consistency**. Blend in ½ cup water for a slightly **mellower and smoother** horseradish.



This basic mustard recipe is hot and flavorful. With longer aging, the intense burn will soften and become milder. Serve with grilled meats, spread on sandwiches, or use as a spicy dip.

Ferment Bacterial/Yeast **Prep** 15 minutes **Time** 2 to 3 days **Yield** 1 cup

MUSTARD

Yellow mustard seed tends to be hotter than brown mustard seed. Try playing with different ratios of the two to arrive at your preferred level of intensity.

YOU WILL NEED...

- ½ cup ground mustard seed
- ½ cup water
- 4 TB. starter liquid (sauerkraut juice, whey, or water kefir)
- 1 TB. honey
- ½ tsp. turmeric
- ½ tsp. salt
- 2 TB. apple cider vinegar
- 1 1-pint (500ml) jar

METHOD

- 1** Combine mustard seed, water, starter liquid, honey, turmeric, and salt in a 1-pint (500ml) jar. Mix well.
- 2** Add apple cider vinegar to surface of mustard to inhibit mold growth. Cover jar tightly with lid and let sit at room temperature, away from light, for 2 to 3 days.
- 3** When satisfied with the level of fermentation, transfer to the fridge and enjoy. Mustard will keep, refrigerated, for several months, and its flavor will continue to mellow over time.

This recipe yields a whole-seed mustard with a coarse texture. For a smoother mustard with a more conventional texture, use mustard powder instead of ground mustard seed.

MORE WAYS TO USE CONDIMENTS

When you make fermented condiments, you open the door to a world of possibilities. The condiment recipes in this book can be combined and adapted to create a wide array of dips, toppings, and sauces.

MUSTARD

Honey Mustard Combine Mustard and honey in a 2:1 ratio.

Mustard Vinaigrette Whisk equal parts olive oil and apple cider vinegar with regular or Dijon Mustard. Add salt to taste and honey for sweetness.

KETCHUP

Quick Pizza Sauce Combine 1 cup Ketchup, 1 fresh tomato (grated), 1 tsp. dried oregano, and 2 cloves garlic (paste) and mix well.

Cocktail Sauce Mix 1 cup Ketchup with 2 TB. Horseradish, a squirt of lemon juice, ½ tsp. Wild Habanero Hot Sauce, and ground black pepper to taste.

CULTURED COCONUT CREAM

Cake Frosting Combine 1 cup Cultured Coconut Cream with ¼ cup maple syrup or honey and a dash of vanilla extract.

Coconut Chocolate Pudding

Combine 1 cup Cultured Coconut Cream with 1 TB. cacao powder and 2 TB. honey or maple syrup. Top with nuts or fresh fruit.

CASHEW SPREAD

Vegan Aioli Combine 1 cup Cashew Spread with 3 cloves garlic (paste) and a pinch of salt to taste.

Creamy Avocado Dip

Combine 1 mashed avocado with 2 TB. Cashew Spread and salt and cayenne to taste.

HORSERADISH

Creamy Horseradish Salad

Dressing Combine ½ cup Sour Cream, 2 TB. Horseradish, 2 TB. fresh herbs, salt and pepper to taste.

Red Horseradish Combine ½ cup Horseradish with 2 TB. grated beet.

HOT SAUCE

Fresh Salsa Combine 2 tomatoes (chopped), ¼ medium onion (diced), ¼ cup cilantro (chopped), 2 to 4 TB. Jalapeño Hot Sauce, juice of 1 lime, and salt to taste.

Spicy Aioli Combine 1 cup Cashew Spread, 2 to 4 TB. Wild Habanero Hot sauce, 2 cloves garlic (paste), and a pinch of salt to taste.

Not Just for Fries

Fermented ketchup makes a great base for other condiments and has no added sugar.





Fermented condiments are a much **healthier alternative** to commercially-made condiments, which can contain processed oils, added sugar, emulsifiers, and preservatives.

Turn Up the Heat!

Wild Habanero Hot Sauce will bring serious heat to chicken wings, add a peppery kick to eggs, and balance the sweetness of chutneys.

Sauerkraut adds a unique tanginess to this mild mustard, perfect for topping brats or hot dogs. As with all homemade mustards, it will continue to mellow with age.

Ferment Bacterial/Yeast **Prep** 5 minutes **Time** 2 to 3 days **Yield** 1 cup

SAUERKRAUT MUSTARD

YOU WILL NEED...

- 3 TB. yellow mustard seed
- ½ cup sauerkraut juice
- ¼ cup sauerkraut
- 1 8-ounce (240ml) jar

METHOD

- 1 Place yellow mustard seed and sauerkraut juice in an 8-ounce (240ml) jar. Screw the lid on tightly and let sit at room temperature for 2 to 3 days.
- 2 In a blender, combine sauerkraut, mustard seed, and soaking liquid. Blend until smooth.
- 3 Transfer to a small jar and refrigerate. Mustard will keep, refrigerated, for several months.

Different krauts will lend **different characteristics** to this mustard. Try using red cabbage kraut for a **vibrant color**, or try a heavily spiced sauerkraut, such as Masala Kraut, for a **unique flavor**.



The original Dijon mustard was made using the juice of unripe green grapes. Today, white wine gives Dijon mustard its characteristic flavor.

Ferment Bacterial **Prep** 5 minutes **Time** 2 to 3 days **Yield** 1¼ cups

DIJON MUSTARD

YOU WILL NEED...

- 2 TB. black mustard seed
- 4 TB. yellow mustard seed
- ¼ cup sauerkraut juice
- ¼ cup white wine (any variety)
- ½ tsp. salt
- 1 1-pint (500ml) jar

METHOD

- 1** Combine black and yellow mustard seeds, sauerkraut juice, white wine, and salt in a 1-pint (500ml) jar.
- 2** Screw the lid on tightly and let sit at room temperature, away from light, for at least 2 to 3 days.
- 3** Transfer contents of jar to a small blender or food processor and blend to a paste.
- 4** Once smooth, transfer mustard to a small jar and refrigerate. Mustard will keep, refrigerated, for several months.

Add a teaspoon or two of dijon mustard to **homemade vinaigrette dressings**. Mustard is an **emulsifier** and will help the oil and vinegar to **mix thoroughly**.

This hot sauce is creamy and flavorful. A longer fermentation time will yield a thicker, salsa-like texture. Blend more of the brine with the peppers for a thinner hot sauce.

Ferment Bacterial **Prep** 15 minutes **Time** 1 to 2 Weeks **Yield** 2 cups

JALAPEÑO HOT SAUCE

The whey and salt brine called for here complements the flavor of the jalapeños, but sauerkraut juice, lemon juice, vinegar, or even a simple salt water brine could also be used. To tone down the heat, incorporate 1 green bell pepper along with the jalapeños. This will keep the color consistent, add some sweetness, and buffer the spiciness of the jalapeños.

➡ **METHOD**

1 Remove stems and then quarter the peppers, leaving the stem end intact.

➡ **YOU WILL NEED...**

- 8 to 10 medium jalapeño peppers
- 1 TB. salt
- 1½ cups whey (from yogurt or cheese making)
- 1 1-quart (1l) jar



2 Pack peppers tightly into a 1-quart (1l) jar, leaving 1 inch (2.5cm) of headspace.





3 Distribute the salt evenly over the peppers.



4 Pour whey over peppers until they are fully submerged. Cover jar with lid and set on a plate (to catch potential overflow). Ferment at room temperature, away from light, for 1 to 2 weeks.

5 Drain peppers, reserving brine. In a blender, purée peppers, adding small amounts of reserved brine as needed. When a pourable consistency is reached, transfer to a bottle or jar and refrigerate. Sauce will keep for several months.



A funnel is helpful when using narrow-necked bottles.

Any type of hot pepper can be used for this recipe. If you like a milder sauce, try Anaheim or poblano peppers as your base. For a more intense sauce, consider the habanero or serrano varieties.

This is a sauce for spice lovers! Habaneros bring an intense heat to this colorful sauce. If you prefer a milder flavor, replace some or all of the habaneros with the chiles of your choice.

Ferment Bacterial/Yeast **Prep** 10 minutes **Time** 1 to 2 weeks **Yield** 2 cups

WILD HABANERO HOT SAUCE

You can reuse the brine from pickling peppers several times, adding complexity and heat to each subsequent batch. You can also use the brine to pickle other vegetables or as part of a marinade. The hot sauce itself is a ferment that deepens and mellows with age.

YOU WILL NEED...

- 12 habanero peppers
- 2 orange bell peppers
- 1½ TB. salt
- 1 to 2 cups water
- 1 1-quart (1l) jar

METHOD

- 1 Remove habanero stems, slice down the middle, and place in a 1-quart (1l) jar.
- 2 Slice orange bell peppers into large pieces and remove seeds. Add to the jar with the habaneros, packing tightly.
- 3 Add salt and enough water to cover all peppers, leaving at least 1 inch (2.5 cm) of headspace to allow for expansion during fermentation.
- 4 Screw on the lid and then loosen with a one-eighth turn. Place jar on a small plate or bowl to catch potential overflow and ferment at room temperature, away from light, for 1 to 2 weeks.
- 5 When satisfied with level of fermentation, pour off and reserve brine. Transfer pickled peppers to a blender or food processor. Purée until a pourable hot sauce consistency is reached, adding small amounts of reserved brine as necessary.
- 6 Transfer to a bottle or jar and refrigerate. Sauce will keep, refrigerated, for several months.





This tangy and delicious spread is reminiscent of mayonnaise in taste and texture, making it an excellent option for those who avoid eggs. Try using it as a dip, as a sandwich spread, or as a base for salad dressing.

Ferment Bacterial/Yeast **Prep** 5 minutes **Time** 2 days **Yield** 2 cups

CASHEW SPREAD

Try experimenting with other nuts in this spread. Cashews will yield the smoothest result in a home blender, but any nut will produce a delicious spread, albeit with a grainier texture.

YOU WILL NEED...

- 1 cup raw, unsalted cashews
- $\frac{3}{4}$ cup **Rejuvelac** (if not available, water can be used)
- $\frac{3}{4}$ cup sauerkraut juice

METHOD

- 1** Rinse cashews and place in a 1-quart (1l) jar. Add Rejuvelac and sauerkraut juice, making sure all cashews are submerged.
- 2** Screw the lid on tightly and ferment at room temperature, away from light, for 1 to 2 days.
- 3** In a blender, combine cashews and half of the soaking liquid. Blend until creamy, adding more soaking liquid if needed to achieve a spreadable consistency.
- 4** Transfer to a jar, cover tightly with lid, and refrigerate 8 to 10 hours or overnight to achieve a thick, creamy texture. Spread will keep, refrigerated, for 3 to 4 weeks.

Roasted onions impart a sweet, caramelized flavor to this tangy spread. Use it to add moisture and flavor to sandwiches, wraps, or grilled meats.

Ferment Bacterial **Prep** 15 minutes **Time** 2 to 3 days **Yield** 2 quarts (2l)

SWEET ONION RELISH

YOU WILL NEED...

- 3 to 4 sweet onions, quartered
- 2 tsp. salt
- 2 TB. starter liquid (whey, sauerkraut juice, or apple cider vinegar)

METHOD

- 1 Preheat oven to 350°F (180°C).
- 2 Place onions in a single layer in a medium clay or ceramic baking dish. Cover and roast for 1 hour. Roasted onions should be very soft and darkly caramelized at the edges.
- 3 Chop onions very finely, mix with starter liquid, and stir to thoroughly combine. Transfer to a jar and cover tightly with lid.
- 4 Ferment at room temperature for 12 to 36 hours before refrigerating. Relish will keep, refrigerated, for up to 1 week.

Clay is an amazing material with **insulating properties** that allow food to cook deeply and evenly. Try using an **unglazed clay casserole** or **covered pot** to cook the onions for this relish.



Chutneys are versatile condiments that can be enjoyed with breads, meats, or cheeses. This sweet-and-sour spiced chutney is delicious on dosa or uttapam.

Ferment Bacterial **Prep** 5 minutes **Time** 1 to 3 days **Yield** 2 cups

TAMARIND DATE CHUTNEY

YOU WILL NEED...

- ½ cup dates, pitted and chopped (about 8 large dates)
- ½ cup seedless tamarind paste
- 2 cups water
- 1 tsp. cumin seed
- 1 tsp. coriander seed
- 1 tsp. fresh ginger, grated
- ½ tsp. salt
- 1 or 2 dried chiles of your choice
- 2 TB. starter liquid (whey, apple cider vinegar, or sauerkraut juice)
- 1 1-pint (500ml) jar

METHOD

- 1** In a small pot, simmer dates, tamarind paste, and water for 10 to 15 minutes.
- 2** Meanwhile, toast cumin, coriander, and chiles in a dry pan over medium heat for 1 to 2 minutes or until fragrant. Transfer to a spice grinder or mortar and pestle and grind to a coarse powder.
- 3** Add ground spices, ginger, and salt to the pot and continue to simmer until dates disintegrate. Add water in small amounts if mixture begins to get too thick.
- 4** Cool mixture to room temperature and stir in 1 tablespoon starter liquid. Transfer to a 1-pint (500ml) jar and add remaining 1 tablespoon starter liquid to surface. Cover tightly with lid.
- 5** Ferment at room temperature for 1 to 3 days. Stir well before refrigerating. Chutney will keep, refrigerated, for up to 1 week.

Dates bring a rich sweetness to this chutney, but **other dried fruits could be used** as well for a **completely different flavor**. Just make sure that any dried fruits you use are **unsulphured, unsweetened**, and without **added oil**.

This creamy ferment is an excellent vegan yogurt alternative. Top with berries and granola for a probiotic-rich breakfast, or use as a base for curries.

Ferment Bacterial/Yeast **Prep** 30 minutes **Time** 1 to 3 days **Yield** 2 cups

CULTURED COCONUT CREAM

The best tool for opening young coconuts is a product called the Coco Jack (coco-jack.com), which allows you to safely and easily remove the top. A meat cleaver or machete can also be used.

Keep your coconut water!
It's a delicious and
healthful beverage.

YOU WILL NEED...

- 3 young coconuts
- 2 TB. **Coconut Water Kefir**
- 1 1-quart (1l) jar

Although often considered a nut, the fruit of the coconut tree is actually a **drupe**, which is a fruit with a layer of outer flesh surrounding a pit of hard endocarp, with a seed inside.

METHOD

- 1 Remove coconut tops and drain the coconut water (this can be reserved for making coconut water kefir).



Coconut water kefir
serves as your starter.



2 With a sturdy metal spoon, remove all flesh from inside the coconut, being careful not to scoop the fibrous husk along with it.



3 In a blender, combine coconut flesh and coconut water kefir and blend until very smooth. Transfer to a 1-quart (1l) jar.



This "rising" during the fermentation process is normal. Simply stir to recombine.

4 Cover the mouth of the jar with cheesecloth and secure with a rubber band. Let sit at room temperature, away from light, for 1 to 2 days. Coconut cream will rise when fermented and develop a tart flavor. When fully fermented, cover with lid and refrigerate.



Coconut chutney is perfect with dosa, uttapam, roasted vegetables, or as a savory spread on bread. Its spicy, tangy flavor can be intensified by adding more chiles.

Ferment Bacterial/Yeast **Prep** 5 minutes **Time** 10 minutes **Yield** 2 cups

COCONUT CHUTNEY

Black mustard seed, dried chiles, urad daal, and asafoetida powder are commonly used in Indian cooking and can be found in Indian markets. In this recipe, these spices are tempered, or cooked briefly in hot oil to release their flavor and aroma.

YOU WILL NEED...

½ tsp. salt
 2 tsp. fresh ginger, peeled
 and grated
 2 cups **Cultured Coconut Cream**
 2 TB. coconut oil
 1 tsp. black mustard seed
 1 TB. cumin seed
 2 to 3 whole dried red chiles, such
 as cayenne
 1 TB. urad daal
 Pinch asafoetida powder (hing)
 5 to 10 curry leaves,
 preferably fresh

METHOD

- 1** In a medium bowl, mix salt and fresh ginger into cultured coconut cream.
- 2** To temper spices, heat coconut oil in a small pan over medium-high heat. Add urad daal, mustard seed, cumin, and chiles.
- 3** After 1 to 2 minutes, when the spices start to develop some color, add asafoetida powder and curry leaves. Stir for 20 seconds and immediately pour over Cultured Coconut Cream.
- 4** Stir the spices into the coconut cream and serve immediately.





DAIRY

Cheese, sour cream, yogurt—they're all familiar to most of us, but many people don't realize that they're also fermented foods. In this chapter, you'll learn to make these ferments along with creamy Cultured Buttermilk, tangy homemade Yogurt, and delicious Queso Fresco.

Cultured butter is smooth, rich, and deeply flavorful, with a slightly tangy, nutty taste that is delicious on toast or when used in cooking. You can also use it to make ghee.

Ferment Bacterial **Prep** 20 minutes **Time** 6 to 12 hours **Yield** 1 lb. (450g)

CULTURED BUTTER

When purchasing cream to make butter, look for a variety that has not been ultra pasteurized and does not include additives or thickeners, such as carrageen. Ultra pasteurization and additives can inhibit fermentation, making it difficult to form butter.



YOU WILL NEED...

- 4 cups heavy whipping cream
- 1 package buttermilk mesophilic starter (amount adequate for 1-qt. [1] batch)
- 1 to 2 tsp. salt (optional)
- 1 2-quart (2l) jar

METHOD

- 1 Pour cream into a 2-quart (2l) jar and allow it to come to room temperature.

Your jar must be large enough to allow for agitating the cream.



2 Add starter to cream and mix thoroughly. Cover jar tightly with lid and let stand at room temperature for 6 to 12 hours. Longer fermentation will result in a stronger flavor.

To make **ghee**, melt butter in a saucepan over medium heat. Simmer until the top becomes a **deep, translucent yellow**. Decant the yellow butter fat (this is the ghee), leaving the white milk solids behind.



3 Shake jar vigorously for 10 to 15 minutes. You will see the yellow butter begin to curdle out of the white liquid. Pour off the liquid. This is churned buttermilk, and can be reserved for another use

4 Transfer butter to a medium bowl. Add cold water to the bowl and rinse the butter, kneading and pressing to extract excess buttermilk. Discard the cloudy liquid and repeat the rinsing process until water runs clear. Mix in salt, if using. Let butter dry before refrigerating.





Homemade buttermilk lends a tangy flavor and soft texture to baked goods such as pancakes, scones, and biscuits. It's also a wonderful base for creamy salad dressings.

Ferment Bacterial **Prep** 15 minutes **Time** 12 to 24 hours **Yield** 2 quarts (2l)

CULTURED BUTTERMILK

YOU WILL NEED...

- 4 cups whole milk
- 2 to 3 TB. cultured buttermilk (store bought or homemade) or 1 package buttermilk mesophilic starter (amount adequate for 1-qt. [1l] batch)
- 1 1-quart (1l) jar

METHOD

- 1** Pour milk into a 1-quart (1l) jar. Add starter to milk and stir to mix thoroughly.
- 2** Cover mouth of jar with breathable fabric or paper towel and secure with a rubber band.
- 3** Leave at a warm room temperature (70–78°F; 21–26°C) for 12 to 24 hours. At this point, the milk should be thickened and tangy.
- 4** Cover with lid and refrigerate. Buttermilk will keep, refrigerated, for 2 to 3 weeks.

The word "buttermilk" can refer to two different products. **Old-fashioned**, or churned, buttermilk is the slightly sour milk left over after churning cream into butter. **Cultured** buttermilk is thicker and creamier, and is made through fermentation.

Kefir is similar to yogurt, but thinner in consistency. It's rich in probiotics and can be consumed on its own, used in smoothies, or strained in cheesecloth overnight to make a creamy cheese.

Ferment Bacterial/Yeast **Prep** 5 minutes **Time** 12 to 36 hours **Yield** 2 quarts (2l)

KEFIR

Kefir can be made using kefir grains, but they require daily maintenance. Using a reculturable starter, such as direct-set powdered culture starter, is an easier way to begin. Save a few tablespoons of each batch of kefir to use as a starter for the next.

YOU WILL NEED...

- 2 quarts (2l) milk
- 1 package direct-set kefir starter culture (amount adequate for a 2-qt. [2l] batch)
- 1 2-quart (2l) jar

METHOD

- 1** Pour milk into a 2-quart (2l) jar. Add starter to milk and stir to mix thoroughly. Cover tightly with lid.
- 2** Let sit at room temperature for 12 to 36 hours or until kefir has reached your preferred level of sourness. Longer fermentation and warmer temperatures will result in a tangier kefir.
- 3** Transfer to the refrigerator. Kefir will keep, refrigerated, for several weeks.

The direct-set kefir starter culture can be **purchased from online retailers**. You only need to purchase this for your **first batch**; after that, use **3 tablespoons of reserved kefir** to start new batches.



Arguably one of the most ubiquitous ferments on earth, yogurt is healthy and delicious. Longer fermentation time reduces lactose content and makes for a tarter yogurt.

Ferment Bacterial **Prep** 90 minutes **Time** 6 to 24 hours **Yield** 4 cups

YOGURT

Use store-bought plain yogurt as a starter for your first batch of yogurt, but once you've made your own, you can save a portion of your homemade yogurt and use it to start the next batch.

YOU WILL NEED...

- ½ gallon (2l) whole milk
- 2 TB. plain yogurt
- 2 1-quart (1l) jars
- Bottles for hot water
- Small cooler



The plain yogurt must have live, active cultures.

METHOD

1 In a stainless steel pot, heat milk gently to 175°F (79°C), stirring constantly. Remove pot from heat and let milk cool to 110°F (43°C).

Use a thermometer to monitor the temperature. Milk can overheat quickly.



2 Transfer milk to two 1-quart (1l) jars, leaving a bit of space for the yogurt starter.

3 Add 1 tablespoon yogurt to each jar and stir well to combine.

You can make yogurt using a reduced fat milk, such as 2%, but it will affect the end result. Use **whole milk** for a **rich, creamy yogurt** that isn't too thin.



4 Cover tightly with lid.

Continued



Heating milk will cause a layer of fat to separate and rise to the top.





5 Warm a small cooler by rinsing the inside with hot water. Place jars in the cooler, along with a few bottles of hot water (about 125°F; 52°C)

Bottles of hot water help maintain a steady, warm environment for the fermenting yogurt.

You can also use a **food dehydrator** with variable temperature control as an **incubation chamber**. Just make sure it stays below 110°F (43°C) to avoid killing the culture.



Wrap the jars well to contain as much heat as possible.

6 Cover jars and bottles with a scarf or towel and close cooler. Ferment, undisturbed, for 6 to 24 hours. If fermenting for more than 12 hours, refresh the hot water bottles to maintain an overall temperature of 110°F (43°C).

7 Once it reaches your desired level of tartness, refrigerate yogurt overnight to allow it to set. Yogurt will keep, refrigerated, for several weeks.

Top with dried fruits, chopped nuts, or spices for a high-protein power breakfast.

Homemade yogurt may be a bit **thinner than store-bought yogurt**, which often contains additives for thickening. **Straining** homemade yogurt will yield a **thicker texture**.



Tangy Greek yogurt is thick and creamy, rich in protein, and full of beneficial live cultures. Mix with fruit or honey for a satisfying treat, or use as a base for savory dips and sauces.

Ferment Bacterial **Prep** 5 minutes **Time** 2 to 5 hours **Yield** 2 to 3 cups

GREEK YOGURT

YOU WILL NEED...

1 quart (1l) whole milk yogurt

METHOD

1 Line a colander with damp muslin or cheesecloth and place in a large glass bowl.

2 Pour yogurt into the lined colander and cover lightly with muslin. Leave at room temperature for 2 to 3 hours. As yogurt sits, liquid (whey) will begin to collect in the bowl. Reserve the whey for another use if desired.

3 After 2 hours, check consistency of yogurt. When you are satisfied with the thickness, transfer the yogurt to a jar and refrigerate. Yogurt will keep, refrigerated, for several weeks.

The whey produced by straining yogurt is rich in **lactic acid bacteria**. Use as a starter for fermented vegetables or in place of water when baking. **Freeze whey** until ready to use.

This is a very easy and rewarding ferment that results in a sour cream that is richer, thicker, and more flavorful than those found at the store. It's also packed with probiotics.

Ferment Bacterial

Prep time 40 minutes

Ferment time 5+ days

Yield 4 cups

SOUR CREAM

YOU WILL NEED...

- 4 cups heavy cream
- 1 package sour cream mesophilic starter (amount adequate for 1-qt. [1l] batch)
- 1 1-quart (1l) jar

METHOD

1 Pour cream into a 1-quart (1l) jar. Add starter to cream and stir to mix thoroughly. Cover mouth of jar with breathable fabric or paper towel and secure with a rubber band.

2 Leave at a warm room temperature (70–78°F; 21–26°C) for 1 to 3 days. Check regularly for sourness and thickness.

3 When you are satisfied with the results, cover with lid and refrigerate. Sour cream will continue to thicken in the refrigerator and will keep for 2 to 3 weeks.

In Mexico, sour cream, or *crema*, is often used to top **tacos, taquitos, tostadas, and enchiladas**. In some Central American countries, it is served alongside beans and fried plantains.

SIMPLE CHEESEMAKING EQUIPMENT

Line the sieve with muslin before using it to strain cheeses.



A **sieve lined with muslin** can be used for straining, or as a simple cheese mold.



Set a **fine mesh sieve** over a **glass bowl** to collect the whey when making fresh cheeses like queso fresco.

When draining cheeses, **clothespins** are an easy and inexpensive option for securing muslin to a colander or bowl.



S-hooks are useful for hanging cheeses that have been wrapped in muslin to drain.



If you're new to cheesemaking, you don't need to make a huge investment in equipment. You can accomplish many cheesemaking tasks using everyday items that you may already have at home.

Drain the whey from labna or other cheeses using a basic **kitchen colander** lined with muslin.

There are over **2,000 varieties of cheese** in the world, and while cheese making may require some time and patience, many simple cheeses can be made right in your kitchen.

A **strawberry basket** lined with muslin can serve as an inexpensive square cheese mold.

Rubber bands will keep hanging cheeses tightly wrapped.

Muslin is more durable than cheesecloth and can be used to line strainers and molds, or to hang cheeses to drain.



This tangy cheese is made by straining yogurt until nearly all of the whey has been removed. It is thicker than Greek yogurt, but still soft enough to spread. It's delicious with pita bread and lends a creamy component to sandwiches.

Ferment Bacterial **Prep** 5 minutes **Time** 1 to 2 days **Yield** 1 cup

LABNA

Labna is often seasoned with dried herbs and seeds. Try mixing in nigella sativa seeds, dried mint, sumac, or za'atar. You can also roll labna into balls and coat it with seasonings. To store labna balls, submerge them in olive oil and refrigerate.

YOU WILL NEED...

1 quart (1l) whole milk yogurt

METHOD

- 1 Line a colander with damp cheesecloth or muslin and place over a clean bowl.
- 2 Pour yogurt into lined colander, cover lightly with muslin or a dish towel, and allow liquid to drip into the bowl (this liquid is whey). Let sit at room temperature for 12 to 14 hours.
- 3 When the dripping has slowed to a stop, fold the muslin over the yogurt and put a weight on top to press out the rest of the whey. (A jar of water on a plate works well as a weight.)
- 4 Check after another 12 hours. Once the cheese is quite dry, transfer it to a jar and refrigerate. Labna will keep, refrigerated, for several weeks.

In the Middle East, **labna** is often served as part of a meze, a **selection of appetizers and salads**. Other meze dishes might include hummus, falafel, olives, and flatbread.

This soft goat cheese is a great introduction to the vast world of cheese making. Its creamy texture and tangy flavor is perfect for spreading on crackers or topping salads.

Ferment Bacterial **Prep** 30 minutes **Time** 1 to 2 days **Yield** 12 ounces (340g)

CHEVRE

Consider coating your fresh chevre with herbs or spices. Some great additions include spearmint, lavender, citrus zest, white sage, and black pepper. To coat surface, sprinkle herbs on a plate and roll the chevre over them several times until coated.

YOU WILL NEED...

2 quarts (2l) goat milk
 ½ package mesophilic chevre culture (amount adequate for 2-qt. [2l] batch)

METHOD

1 In a stainless steel pot, heat milk over low heat to 85°F (29°C).

Goat milk is slightly sweeter than cow's milk, and imparts a distinctive earthy flavor to chevre.



2 Remove from heat and add starter to milk, stirring gently. Cover pot and let sit at room temperature for 20 to 24 hours.





3 Once a strong curd has developed (curds are visible below whey), transfer curds gently to a bowl lined with muslin or cheesecloth.



4 Tie corners of muslin together and hang over a bowl to collect whey. Allow cheese to hang for at least 6 hours for a creamy cheese or up to 24 hours for a drier and tangier cheese.

Save the **leftover whey** from cheesemaking and use it as a **starter for other ferments**, such as **Jalepeño Hot Sauce**.

5 Once it has reached the texture you desire, form into balls or logs, transfer to an airtight container, and refrigerate.



Form into a log by rolling gently on a clean, smooth surface.



This fresh Mexican cheese is easy to make and very versatile. Its salty flavor and crumbly texture make it perfect for sprinkling on tacos or salads.

Ferment Bacterial **Prep** 2 hours **Time** 6 hours **Yield** 1 pound (450g)

QUESO FRESCO

Queso fresco is traditionally formed into a disk shape, but any style of cheese mold can be used. Try adding chopped jalapeños or dried ancho chiles to the curds in the mold to give it some bite.

YOU WILL NEED...

- 1 gallon (4l) milk
- 1 package mesophilic starter (amount adequate for 1-gal. [4l] batch)
- $\frac{1}{8}$ tsp. rennet diluted in $\frac{1}{4}$ cup water
- 2 tsp. salt
- Cheese mold

METHOD

1 In a large pot over medium high heat, bring milk to 90°F (32°C). Remove from heat, stir in mesophilic starter and let sit, covered, for 40 minutes.

2 Gently stir in rennet to fully combine. Cover and let sit for 45 minutes or until the curd is visible below a layer of whey and pressing into the surface of the curd with a butter knife causes a clean break.

3 When the cheese has fully set, it will be a semi-solid mass. Cut it with a long knife into $\frac{1}{4}$ -inch (.5cm) cubes. Cover and let sit, undisturbed, for 5 minutes.

4 Return pot to burner and slowly heat curds to 90°F (32°C). While maintaining a constant temperature, stir curds gently to encourage them to separate from the whey.

5 With a mesh sieve, strain curds from whey, reserving whey for another use if desired. Place curds in a cheese mold and mix in salt.

6 Cover and set a weight on top of the mold to press the curds into a solid cheese. Let sit at room temperature for 4 to 6 hours.

7 Check after 4 hours. Cheese will become drier the longer it sits in the mold. Refrigerate once satisfied with the texture. Cheese will keep, refrigerated, for 1 to 2 weeks.





LEGUMES AND GRAINS

This chapter draws on culinary traditions from Asia and Central America, and includes the basics of sprouting seeds and grains, how to make Tofu from soybeans, how to ferment rice to make Amazake and Tha Bai, and how to make Nixtamal from corn.

This funky ferment is infamous for its pungent aroma and sticky consistency. It's considered a medicinal food and is often served with rice and hot mustard for breakfast.

Ferment Bacterial **Prep** 4 hours **Ferment** 24 hours **Yield** 4 cups

NATTO (JAPANESE FERMENTED SOYBEAN)

For your first batch, you'll need to purchase prepared natto from an Asian market. After that, you can save a small amount of homemade natto in the freezer and use it to start your next batch.

YOU WILL NEED...

- 1 cup dry soybeans, soaked in water for 6 to 10 hours and drained
- 3 cups water
- 1 package plain natto
- 2 TB. hot water
- 2 1-quart (1l) jars
- Bottles for hot water
- Small cooler

METHOD

- 1** Using a steamer basket, steam soybeans for 2 to 4 hours or until they just smash when pinched. Beans should be cooked, but intact.
- 2** In a small bowl, mix 5 to 6 beans from the premade natto with hot water. Add to the cooked soybeans and mix in thoroughly.
- 3** Transfer inoculated soybeans to two 1-quart (1l) jars. Cover the mouth of each jar with fabric and secure with a rubber band.
- 4** Warm a small cooler by rinsing the interior with hot water. Place jars in the cooler along with a few bottles of hot water (about 120°F; 49°C).
- 5** Cover jars and water bottles with a scarf or towel and close cooler. After 12 hours, refresh the hot water in the jars and then ferment for another 12 hours. (Alternatively, you can incubate in a front-loading food dehydrator at 105°F [41°C] for 24 hours.)
- 6** Natto is ready when a moldy film has developed on the soybeans and a stringy texture is formed when mixed. Natto will also smell strongly of ammonia.
- 7** Cover tightly and refrigerate for 2 to 3 days to allow ammonia smell to dissipate. Natto will keep, refrigerated, for several weeks. Freeze for longer storage.





In this Japanese ferment, koji transforms starchy rice into a sweet rice pudding. Amazake can be used as a sweetener when baking or eaten on its own as a sugar-free dessert.

Ferment Mold **Prep** 10 minutes **Time** 8 to 12 hours **Yield** 2 cups

AMAZAKE (FERMENTED RICE)

Koji is a mold culture made by inoculating cooked grains or legumes with *Aspergillus oryzae*. It is used in many Japanese fermented foods, including mirin, rice vinegar, and sake. Look for dried koji in Asian markets or purchase through online retailers.

YOU WILL NEED...

$\frac{3}{4}$ cup short grain white rice
(sweet or glutinous variety)
 $\frac{1}{2}$ cup dried koji
1 1-quart (1l) jar
Bottles for hot water
Small cooler

METHOD

- 1 Cook rice according to package directions (yield should be about $1\frac{1}{2}$ cups cooked rice).
- 2 While rice is still hot, but not above 140°F (60°C), mix in koji thoroughly. Transfer to a 1-quart (1l) jar and cover tightly with lid.
- 3 Warm a small cooler by rinsing the interior with hot water. Place jar in cooler along with a few bottles of hot water (about 140°F; 60°C).
- 4 Cover jar and water bottles with a scarf or towel and close cooler. Ferment, undisturbed, for 8 to 12 hours. (Alternatively, you can incubate in a front-loading food dehydrator at 125°F [52°C] for 8 to 12 hours.)
- 5 Check the amazake after 8 hours. It is ready when the rice has developed a porridge-like consistency and a very sweet flavor.
- 6 Eat immediately or, for long storage, boil amazake to stop fermentation and refrigerate. Amazake will keep, refrigerated, for 1 to 2 weeks.

The crisp and savory dosa is a South Indian flatbread made without wheat or gluten. It is a nutritious alternative to tortillas, pancakes, and pitas and can be used for wraps or dipping.

Ferment Lacto **Prep** 1 hour **Time** 2 to 3 days **Yield** 30 dosa

DOSA

Dosa are best eaten immediately, but the batter can be made up to a week ahead and kept in the refrigerator until ready for use. Just thin with water as needed before using.

Lentils come in several varieties including brown, yellow, black, red, and green. Any variety may be used for dosa, however, green lentils are harder and may be more difficult to blend.

Add enough water to fully cover rice and lentils.

METHOD

1 In two separate bowls, soak rice and lentils in spring or filtered water for 8 to 10 hours. Soak fenugreek and chana daal (if using) along with lentils.


YOU WILL NEED...

- 2 cups rice (any variety)
- 1 cup lentils (any variety)
- 1 TB. fenugreek (methi)
- ¼ cup chana daal (optional)
- 2 tsp. salt
- ¼ cup ghee, butter, or oil



2 Drain rice and discard soaking water. Transfer rice to a blender and blend into a thin batter, adding soaking water from lentils as necessary. Pour batter into a 1-gallon (4l) jar or stainless steel pot.

3 Transfer lentils, fenugreek, and chana daal to blender, along with the remainder of their soaking water. Blend to a thin batter, adding more spring or filtered water if necessary. Combine with blended rice in jar. Add salt and mix batter to fully incorporate rice and lentils.



The lentil batter should have a thick but pourable consistency.



4 Cover mouth of jar with fabric and a rubber band so the ferment can breathe. Let sit at room temperature (at least 70°F [21°C]) for 1 to 2 days or until it has risen significantly.



5 Stir batter and, if necessary, add water. Batter should be a bit thinner than pancake batter but thick enough to coat the back of a spoon.

To make **Masala Dosa**, spread a thin layer of tomato sauce over the surface of the dosa after adding the ghee, and top with raw onions and peppers, potato masala, and garam masala.



Spread batter thinly for a crisp, crepe-like texture.

6 To cook, heat a cast iron pan or griddle over medium heat until it barely begins to smoke. Sprinkle with a small amount of water and wipe it clean. With a large spoon, add $\frac{1}{4}$ cup batter to the cooking surface and quickly spread it in a circular motion, evening out any thick spots as you go.



Softening the butter will make it easier to spread on the surface of the dosa.

7 Add $\frac{1}{2}$ tsp. ghee, butter, or oil to the surface of the dosa. Let cook until dosa begins to brown and the edges curl up, about 2 minutes. It should easily release from the pan. Flipping it is optional, but not necessary.

8 Serve immediately with the toppings and accompaniments of your choice.

A **common street food** in South India, dosa are often served with **chutney and sambar**, a hearty lentil and vegetable stew





Uttapam is similar to dosa, but it is thick and soft rather than thin and crepe-like. Vegetables and spices are cooked into the batter, yielding a satisfying stuffed pancake.

Ferment Bacterial **Prep** 1 hour **Time** 2 to 3 days **Yield** 25 uttapam

UTTAPAM

Uttapam is spiced with fenugreek, chana daal, and garam masala, which can be found at Indian markets or specialty stores. Any finely chopped vegetables can be added to the uttapam while cooking. Try adding chiles for heat and serving with fruit chutney.

YOU WILL NEED...

- | | |
|----------------------------------|--|
| 2 cups basmati rice | 2 tomatoes, thinly sliced |
| 1 cup dry lentils (any variety) | 1 red onion, thinly sliced |
| 1 TB. fenugreek (methi) | 2 green chiles or bell peppers,
thinly sliced |
| ¼ cup chana daal (optional) | 1 TB. garam masala powder |
| 2 tsp. salt | |
| 2 TB. ghee, butter, or olive oil | |

METHOD

1 Place rice in a medium bowl and add filtered water to cover. Place lentils, fenugreek, and chana daal (if using) in a second bowl and add filtered water to cover. Allow both to soak overnight.

2 Drain rice and discard soaking water. In a blender, combine soaked rice, lentils, fenugreek, and chana daal (if using), along with the soaking liquid from the lentils. Blend until smooth.

3 Transfer batter to a large bowl. Add salt and mix thoroughly. Cover with a clean cloth or dish towel.

4 Set aside to ferment at room temperature for 12 to 48 hours, or until the batter has risen significantly and taken on a slightly sour smell.

5 Heat a cast iron pan over medium heat. Add ½ cup batter to pan and quickly spread in a circle. Drizzle ¼ tsp. ghee over the surface of the batter and sprinkle with some of the onion, bell pepper, tomato, and a small pinch of garam masala.

6 After 4 to 5 minutes, or once the underside is golden brown, flip and cook on the other side until cooked through. Repeat with remaining batter and vegetables.

SOAKING & SPROUTING SEEDS, BEANS, & GRAINS

A good home sprouting setup is inexpensive and easy to prepare. It can be used for sprouting seeds, grains, or beans, but there are some important things to know when putting together your sprouting environment.

USE THE RIGHT CONTAINERS

Mason jars with plastic rings and mesh screens are used to make sprouting vessels that drain. Wire mesh sprouting screens of varying sizes can be purchased online, or you can make your own. Smaller grains and seeds will require a finer mesh, while a more open mesh can be used for larger grains and nuts. Always use the widest mesh possible for optimal drainage.

Sprouting Vessels

Simple Mason jars will suffice, but be sure to use plastic lid rings during soaking and sprouting, as metal rings can rust over time.



KNOW THE SOAKING AND SPROUTING TIMES

Different types of grains, seeds, and legumes require different soaking and sprouting times. The following sprouting chart includes soak and sprout times for some common varieties. The yield will vary based on the type of grain, seed, or bean you use.

SPROUT	SOAK TIME	SPROUT TIME
Beans (any variety)	10–12 hours	3–5 days
Chickpeas	12 hours	2–4 days
Lentils	6–8 hours	3–4 days
Quinoa	3–4 hours	2–3 days
Spelt	6 hours	1–2 days
Teff	3–4 hours	1–2 days
Peas	8 hours	2–3 days
Pumpkin seeds	6 hours	1–2 days
Alfalfa	12 hours	3–5 days
Mustard seeds	5 hours	3–5 days
Radish seeds	6 hours	3–5 days
Rye	6–8 hours	2–3 days
Wheat	8–10 hours	2–3 days
Millet	5 hours	12 hours
Soybean	4–8 hours	3–4 days

KEEP THESE TIPS IN MIND

- Prior to sprouting, store dry seeds, grains, and beans in sealed jars or bags.
- When rinsing your seeds, use fresh, cold water.
- Seeds and grains can be soaked overnight directly in the vessel in which they'll be sprouting.
- After soaking, move your sprouting container to an area with plenty of light to facilitate the sprouting process.

- Keep the sprouting jar tilted down so that water pools toward the the mouth of the jar. This will keep the sprouts moist but not soaking.
- Make sure there is plenty of air circulation and that sprouts are drained properly. Too much moisture will encourage mold growth.
- Store sprouted seeds in a closed container in the refrigerator to keep them fresh and dry.

Eating Sprouts

Sprouts are incredibly healthy and can be eaten on their own, sprinkled on salads, or dried and ground into sprouted flour.

You can replace the mesh insert with a breathable fabric after sprouting.



Sprouted grains are vitamin rich and easily digestible. Soaking neutralizes phytic acid, a compound that prevents the body from fully absorbing nutrients. Enjoy sprouted grains raw or dehydrated and ground into flour.

Ferment Non-fermenting **Prep** 5 minutes **Time** 1 to 5 days **Yield** ⅓ to ¼ cup

SPROUTED GRAIN

YOU WILL NEED...

- 4 TB. whole, dry grain, such as wheat berries, rice, or quinoa
- 1½ cups water, plus more for rinsing
- 1 1-quart (1l) jar with mesh lid

METHOD

- 1** Add grain to a 1-quart (1l) jar and cover with 1½ cups water. Cover jar with a mesh sprouting lid and allow grain to soak for 6 to 12 hours, depending on how hearty the grain is.
- 2** Strain water from grain, rinse, and place at a slight angle with the mouth of the jar angled down to allow the grains to drain fully.
- 3** Rinse and drain 2 to 4 times a day until you see the germ begin to pop out at the tip of the grain. Grains are now sprouted and ready to be eaten, or dehydrate and use to make sprouted flour.

Many grains are suitable for sprouting, but some may take **longer to sprout** or require **more frequent rinsing**. Consult a **sprouting chart** for specific sprouting and rinsing guidelines.



Rejuvelac is a fresh, tangy tonic beverage made with sprouted grain. It contains beneficial bacteria and enzymes that can aid in digestion, and can be used in place of water when baking bread.

Ferment Bacterial **Prep** 5 minutes **Time** 1 to 2 days **Yield** 4 cups

REJUVELAC

YOU WILL NEED...

1/3 to 1/2 cup freshly sprouted grain,
such as brown rice or quinoa

4 cups water

1 1-quart (1l) jar

METHOD

1 Place grains in a 1-quart (1l) jar (or leave them in the jar in which they were sprouted).

2 Add water to jar until grains are submerged, leaving about 1 inch (2.5cm) of headspace.

3 Place a piece of breathable fabric, such as muslin, over the mouth of the jar and secure with a rubber band. Let sit at room temperature, away from light, for 1 to 2 days.

4 Rejuvelac is ready when the water has developed a light, cloudy appearance and fresh, lemony taste. Strain the rejuvelac from the grains and refrigerate. It will keep, refrigerated, for 1 to 2 weeks.

The grains leftover from making rejuvelac are **deeply fermented** and **easy to digest**. They share the tart, lemony flavor of rejuvelac. Mix them into bread dough or use them to coat the surface of a loaf for an added **boost of nutrition** and flavor.



This versatile protein source is an integral part of East Asian and Southeast Asian cuisines. Freshly made, it is warm and creamy, with a firm but yielding texture.

Ferment Non-fermenting **Prep** 12 hours **Time** 20 to 50 minutes **Yield** 1 pound (450g)

TOFU

Tofu is made by adding a solidifying agent, such as nigari, to hot soy milk. Nigari (magnesium chloride derived from sea water), causes the proteins and oils in soy milk to coagulate, creating curds that can be pressed into tofu. Nigari can be found at Japanese markets.

YOU WILL NEED...

- 2 cups dry soybeans
- 6 cups plus 1 gallon (4l) water
- 4 TB. nigari (magnesium chloride)

METHOD

- 1** In a medium bowl, combine 6 cups water and soybeans. Set aside to soak for 8 to 12 hours, or overnight.
- 2** In a blender, combine soybeans and soaking water and blend for 4 to 5 minutes, or until smooth and uniformly white.
- 3** In a large stockpot, combine blended soybeans and 1 gallon (4l) water. Bring to a boil over high heat and then lower to a simmer. Simmer for 15 to 20 minutes, stirring frequently to prevent boiling over.
- 4** Strain contents of pot through a muslin-lined colander or nutmilk bag, reserving the liquid. The liquid is soy milk and the solid pulp is called okara. Return soymilk to the stock pot. (Okara can be discarded or used for baking or veggie patties.)
- 5** Heat soy milk to 180°F (82°C). Add nigari, stir gently, and wait 5 to 10 minutes for soymilk to curdle and the liquid portion to become clear. If the liquid isn't clear after 10 minutes, add an additional tablespoon nigari, stir gently, and wait for 5 more minutes.
- 6** Once curds have formed and liquid is clear, transfer contents of pot to a clean, muslin-lined strainer.
- 7** Fold over or tie muslin and place a jar of water on top to press the liquid out of the tofu. For soft tofu, remove from strainer after 20 minutes. For extra-firm tofu, remove after 50 minutes.
- 8** Transfer tofu to an airtight container and add fresh water until tofu is submerged. Cover and refrigerate. Use tofu within 1 to 2 weeks.

For a complete **change of texture**, try turning your firm tofu into **spongy tofu**. Simply freeze tofu overnight, thaw the next day, and press to remove all water. Spongy tofu is great for grilling or stir-frying.

This Cambodian fermented rice dessert is chewy and alcoholic, with a flavor reminiscent of sweet saki. Serve on its own or topped with shredded coconut.

Ferment Bacterial/Mold/Yeast **Prep** 5 minutes **Time** 2 to 3 days **Yield** 6 cups

THA BAI (CAMBODIAN FERMMENTED RICE)

Fermenting for longer than 3 days will yield a more strongly alcoholic dessert. If you prefer it sweet, you can either eat it while still young or add sweetener to balance the alcohol level.

YOU WILL NEED...

- 2 cups black or purple sweet rice
- 4½ cups water
- 2 jiuqu (Shanghai yeast balls)
- 2 TB. honey, maple syrup, or molasses (optional)

METHOD

- 1** In a mesh strainer, rinse rice two or three times. Place washed rice and water in a pot and cover. Cook over low heat until all water is absorbed.
- 2** Once rice is cooked, turn off heat and cool to room temperature.
- 3** With a mortar and pestle, crush yeast balls and grind to a fine powder.
- 4** Spread rice in a medium glass or ceramic dish. Using a sieve, sprinkle yeast ball powder evenly over the surface of the rice. Mix thoroughly and cover with lid.
- 5** Wrap covered dish with a towel, blanket, or scarf and place in a warm, dark place to incubate and ferment for 2 to 3 days.
- 6** Sweeten with honey, maple syrup, or molasses (if needed) and refrigerate. Tha bai will keep, refrigerated, for 2 to 3 weeks, but may become more strongly alcoholic over time.

Jiuqu, or Shanghai yeast balls, are a type of dried yeast sold for making fermented rice wine. They can be purchased online or in specialty stores.



Nixtamal, or hominy, is made by soaking corn kernels in pickling lime, which increases their nutritional value and makes them easier to digest. Grind nixtamal to make your own fresh masa, or corn dough.

Ferment Non-fermenting **Prep** 90 minutes **Time** 12 hours **Yield** 4 cups

NIXTAMAL

Nixtamal starts with dent corn, or field corn, which is very different from the familiar sweet corn found in the supermarket. It can be purchased online or from some natural food stores.

YOU WILL NEED...

- 6 cups water
- 2 TB. pickling lime (known in Spanish as *cal*, this is food-grade calcium hydroxide)
- 2 cups dry dent corn kernels, rinsed



Dent corn kernels are large and have a thick skin that must be removed before eating.

METHOD

- 1 In a stainless steel pot, combine water and pickling lime. (Take care when using pickling lime; it is caustic and can irritate the skin. Rinse with water if it comes in contact with skin.)



2 Add corn kernels to pot and bring contents to a boil. Lower heat and simmer for 1 hour. Remove from heat, cover, and let sit for 8 to 10 hours at room temperature.

3 Pour off soaking liquid and rinse corn thoroughly, agitating to loosen and remove skins. Rinse 4 to 6 times or until water runs clear.

The skins should come off easily and can be discarded.

Whole kernels are perfect for use in soups.



4 Nixtamal can now be used whole or ground into dough using a crank grinder or food processor. Use within 1 to 2 days or freeze for future use.





BREAD

After tasting the rich, complex flavors of fermented breads, you'll never want a store-bought loaf again. In this chapter, you'll learn how to begin a sourdough starter and make your own crusty sourdough bread; how to make tangy Injera, an Ethiopian flat bread; and how to make nutty Buckwheat Buttermilk Pancakes.



Gorditas are thick Mexican corn cakes made with masa. Freshly baked, these soft and chewy “little fat ones” can be split and filled with your choice of meats, cheeses, or vegetables.

Ferment Non-fermenting **Prep** 20 minutes **Time** 25 minutes **Yield** 6 gorditas

GORDITAS

Fresh masa can be purchased at Mexican markets, or you can make nixtamal and grind your own masa from scratch. Masa should be finely ground for a smooth dough.

↓ YOU WILL NEED...

- 1 tsp. baking powder
- ¼ tsp. salt
- 1 cup fresh, smooth-ground corn masa (nixtamalized corn dough)
- ¼ cup water

↓ METHOD

- 1 Preheat oven to 450°F (230°C).
- 2 In a medium bowl, add baking powder and salt to masa and mix to combine.
- 3 Roll 2 tablespoons of dough into a ball to test its consistency. It should be dry enough to hold its shape, but moist enough that it doesn't crack when the ball is formed. Add water in small amounts until you reach the desired consistency.
- 4 Form the dough into 6 equally sized balls (about 2 TB. each). With the palms of your hands, flatten each ball into a disk of even thickness and place on a lightly oiled baking sheet.
- 5 Bake for 25 minutes or until gorditas are golden and cooked through. Gorditas are best enjoyed fresh, so only cook as many as you plan to eat and save the rest for later.

This Ethiopian flatbread is sour and spongy with a great chewiness. Its flavor and texture pair perfectly with traditional Ethiopian meat and vegetable dishes.

Ferment Bacterial/Yeast **Prep** 5 minutes **Time** 2 to 3 days **Yield** 2 to 3 injera

INJERA

Injera is often served piled with a variety of braised meat, vegetable, and legume dishes called *wots*. Pieces of the pliable flatbread are torn off and used to scoop up the savory wots by hand.

YOU WILL NEED...

- 1½ cups teff flour
- 2 cups water
- ½ tsp. baking powder
- ¼ tsp. salt
- 1 1-quart (1l) jar

METHOD

- 1** In a 1-quart (1l) jar, combine teff flour and water and mix well. Cover mouth of jar with fabric and secure with a rubber band.
- 2** Let sit at room temperature for 2 to 3 days, stirring at least twice a day to aerate batter and encourage wild yeast activity.
- 3** Once batter has begun to bubble visibly, stir in baking powder and salt and let stand for at least 20 minutes.
- 4** Preheat a 10-inch (25cm) cast iron griddle or pan over medium-high heat. Add a few drops of oil to pan and spread evenly. Pour ½ cup batter onto pan and tilt to coat entire surface with batter.
- 5** When bubbles appear over the entire surface of batter, cover with a lid to allow steam to build up and cook the surface, about 3 to 5 minutes.
- 6** Remove from pan and place between two napkins to keep warm while cooking remaining injera.



These gluten-free pancakes have a nutty, slightly sour flavor and a tender texture. They are delicious with cultured coconut cream, fruit, and maple syrup.

Ferment Bacterial **Prep** 15 minutes **Time** 20 minutes **Yield** 8 pancakes

BUCKWHEAT BUTTERMILK PANCAKES

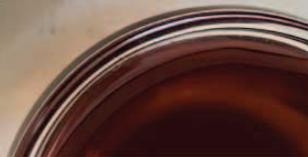
If you don't have buttermilk, substitute 1 cup plain yogurt (not Greek) and $\frac{1}{2}$ cup water. You can also replace half of the buckwheat flour with teff flour, which makes for a balanced complement to the buckwheat.

YOU WILL NEED...

- 1½ cups **Cultured Buttermilk**
- 1 egg
- 1 TB. coconut oil or butter
- 1 cup buckwheat flour
- $\frac{2}{3}$ tsp. baking powder
- $\frac{1}{4}$ tsp. baking soda
- $\frac{1}{4}$ tsp. salt

METHOD

- 1** In a medium bowl, whisk together buttermilk, egg, and coconut oil.
- 2** In another bowl, mix buckwheat flour, baking powder, baking soda, and salt.
- 3** Add dry ingredients to wet ingredients and stir until fully incorporated.
- 4** Let batter rest at least 20 minutes at room temperature or overnight in the refrigerator.
- 5** Heat a cast iron skillet over low heat. Grease pan with a small amount of coconut oil or butter.
- 6** Pour batter in small portions on skillet and cook until bubbles form on the surface. Flip and cook for another 30 seconds or so, until just cooked through. Keep warm until serving.



MAKING & USING SOURDOUGH STARTERS

Sourdough starters are living, active cultures that contain wild yeasts and lactic acid bacteria. Before commercial baker's yeast became available, sourdough starters were the primary method for keeping active yeast ready for baking.

Sourdough starters require a little bit of care and maintenance, but once you have one, chewy, delicious sourdough is never far away. Due to the action of the wild microorganisms on the wheat, naturally leavened breads made with sourdough starter have a different flavor profile and greater

nutritional value than commercially yeasted bread. The character of the sourdough starter will affect the flavor of the finished bread. Try using your starter for Sourdough Bread, Purple Amazake Sourdough, or Sourdough Pizza. Sourdough starter can also be used to start wild beverage ferments.

MAKING A SOURDOUGH STARTER



1 In a 2-quart (2l) jar, combine 2 cups flour (whole wheat or all-purpose) and 2 cups water.



2 Stir to mix thoroughly.



3 Cover the mouth of the jar with breathable fabric and secure with a rubber band. Set in a warm place to ferment.



5 Once starter begins bubbling, it is ready to be primed for use in baking. To prime, add $\frac{1}{4}$ cup flour and 2 TB. water once every 8 hours for 24 hours, mixing well after each addition.



4 Feed the starter once a day until it begins bubbling (usually about 7–10 days). Each day add $\frac{1}{4}$ cup flour and 2 TB. water and stir well.

USING YOUR STARTER

Store your starter in a closed jar in the refrigerator and feed on the day before you use it, after use, and at least once every 2 to 3 days. If the starter becomes too big for the jar, discard a portion. With proper care, your starter will last indefinitely.

SAVING A NEGLECTED STARTER

Sourdough starters are nearly indestructible, but if you neglect one for too long, it can become alcoholic and/or moldy. To revive, pour the liquid off the surface and feed twice a day, stirring well, until it begins to bubble vigorously and smell fruity.

SOURDOUGH TO SHARE

To share sourdough starter, give $\frac{1}{4}$ cup of your sourdough starter to a friend. Have them add 2 cups water and 2 cups flour, stir, cover the mouth of the jar with fabric. Their starter will develop quickly and should be ready for use within 2 to 4 days.

This chewy loaf has tart overtones and a unique expression of wheat flavor. The crunchy crust contrasts beautifully with the fluffy inner crumb. Enjoy plain, with cultured butter, dipped in quality olive oil, or as part of a sauerkraut sandwich.

Ferment Bacterial/Yeast **Prep** 3 hours **Time** 12 to 24 hours **Yield** 1 loaf

SOURDOUGH BREAD

Making a sourdough loaf requires time and patience, so don't rush the process—a really good loaf is worth the wait. For added depth of flavor, add seeds or whole spices to the surface of your loaf for an impressive presentation and wonderful taste.

YOU WILL NEED...

- 1¼ cups (276g) water
- ½ cup (100g) sourdough starter
- 3¼ cups (425g) all-purpose flour
- 1 tsp. (7g) salt
- 2 TB. whole seeds and spices (optional)
- Pizza stone or other baking surface

METHOD

- 1 In a large mixing bowl, combine water and sourdough starter.

Sourdough generally calls for all-purpose (white) flour, however, you can **vary the flavor** by using other flours such as **rye flour** or **whole-grain wheat flour**.

For the best flavor, use filtered water.





2 Add flour, mix until water is fully absorbed and a shaggy dough forms. Cover with a towel and let rest for 20 minutes.



3 Sprinkle salt evenly on surface and knead dough for 5 to 10 minutes or until a completely consistent dough is achieved.

4 Cover with a damp dish towel and let sit for 1½ hours. Every 30 minutes, fold dough in on itself from all four corners. Keep dough covered between foldings.

Every sourdough culture is a bit different and the **time to proof** (rise) can vary based on the **characteristics of the starter**. Try adjusting the proofing to improve your loaf.

Add some tension as you pull and fold the dough in on itself.





5 Cover dough with a damp towel and let sit, undisturbed, for 6 to 8 hours or until it has doubled in size.



6 Fold and shape dough into a ball, cover and then let rest for 20 minutes. (At this point, if using seeds or spices, spread them on a clean surface and roll dough over them to coat.)



7 Shape again, tightly this time, and transfer, upside down, to a bowl coated with olive oil. Cover and allow to rest for 1½ to 2 hours at room temperature.

8 Preheat oven and baking surface to 475°F (245°C). Transfer dough directly onto hot baking surface, score the top with a bread knife, and bake for 10 minutes. Lower heat to 400°F (204°C) and bake for another 25 minutes. Remove from oven and transfer to a cutting board or cooling rack. Allow to rest for 15 to 30 minutes before slicing.



The maintenance of your starter will affect the final flavor of your bread. For a **less sour** flavor, pour off the top half of the starter before feeding.



This pizza crust recipe yields enough dough for six small pizzas, so you can customize the toppings to suit every taste. Try the classic flavors of tomato, basil, and mozzarella.

Ferment Bacterial / Yeast **Prep** 3 hours **Time** 8 hours **Yield** 6 pizzas

SOURDOUGH PIZZA

Dough can be made through step 6 and frozen. Allow at least 2 hours for it to thaw and come to room temperature before stretching. Brushing the surface with olive oil will give it a nice shine and crisp texture.

YOU WILL NEED...

2½ cups (552g) water

1 cup (200g) sourdough starter

6½ cups (850g) flour

2 tsp. (15g) salt

Sauce and toppings of your choice

METHOD

1 In a large mixing bowl, combine water and sourdough starter. Add flour and mix until water is fully absorbed and a shaggy dough forms. Cover with a damp dish towel and let rest for 20 minutes.

2 Sprinkle salt evenly over surface and knead dough for 5 to 10 minutes or until a completely consistent texture is achieved.

3 Cover with a damp dish towel and let sit for 1½ hours. Every 30 minutes, fold dough in on itself from all four corners. Keep dough covered between foldings.

4 After the last folding, leave dough covered and let sit, undisturbed, for 6 to 8 hours.

5 Divide dough into 6 pieces. Fold and shape each piece into a ball and coat with flour. Place on a baking sheet and cover with a damp dish towel. Let sit at room temperature for 1½ to 2 hours or until balls have doubled in size.

6 Place a pizza stone or other baking surface in the oven and preheat oven to 500°F (260°C).

7 On a well-floured cutting board, stretch and spread each ball of dough to your desired size and thickness. The thinner you make your dough, the crispier your pizza will be. Add the sauce and toppings of your choice.

8 Slide the pizzas from the cutting board directly onto the preheated baking surface and bake for 12 to 15 minutes or until crust is lightly browned.

This sourdough recipe calls for amazake, a fermented rice porridge made with sticky black rice. It lends a light sweetness to the bread as well as a strikingly beautiful purple color.

Ferment Bacterial/Yeast/Mold **Prep** 12 to 24 hours **Time** 35 minutes **Yield** 1 loaf

PURPLE AMAZAKE SOURDOUGH

YOU WILL NEED...

- 1¼ cups (276g) water
- ½ cup (100g) sourdough starter
- 3½ cups (475g) flour
- 1½ tsp. (10g) salt
- 1 cup (200g) sticky black rice
Amazake, boiled, cooled, and strained
- 1 tsp. olive oil

METHOD

- 1** In a large mixing bowl, combine water and sourdough starter. Add 3¼ cups flour and mix until water is fully absorbed and a shaggy dough forms. Cover with a damp dishtowel and let rest for 20 minutes.
- 2** Sprinkle 1 teaspoon salt evenly over the surface and knead dough for 5 to 10 minutes or until a consistent texture is achieved.
- 3** In a small bowl, mix Amazake, remaining ½ teaspoon salt, and remaining ¼ cup of flour. Add Amazake and flour mixture to the dough, folding and kneading to combine.
- 4** Cover and let sit for 1½ hours. Every 30 minutes, fold dough in on itself from all four corners. Keep dough covered between foldings.
- 5** Cover and let sit for 6 to 8 hours or until it has doubled in size. Fold and shape dough into a ball, adding flour as needed to keep it from sticking to your hands. Cover and let rest for 20 minutes.
- 6** Lightly coat a large bowl with olive oil. Shape dough again and place in the bowl, seam side down. Cover and let sit for 1½ to 2 hours.
- 7** Place a baking surface (cast iron, baking stone, or ceramic baking pan) in the oven and preheat oven to 475°F (245°C).
- 8** Transfer dough directly onto preheated baking surface, score the top with a razor blade or bread knife, and bake for 10 minutes. Reduce heat to 425°F (218°C) and continue to bake for 25 minutes.
- 9** Remove from oven and transfer to a cutting board or cooling rack. Rest for 15 to 30 minutes before slicing.







BEVERAGES

One of the beautiful things about fermentation is the pure simplicity of the process—take a few simple ingredients, place them under the right conditions, and watch them transform into something new. Nowhere is this more evident than with the beverage ferments you'll find in this chapter.

A ginger bug is a cultivated wild yeast culture that can be used to start ferments. Use this in any beverage that needs yeast to carbonate or become alcoholic.

Ferment Wild Yeast **Prep** 15 minutes **Time** 5 to 7 days **Yield** 1 cup

GINGER BUG

YOU WILL NEED...

- ½ cup fresh ginger, grated with skin on
- ½ cup sugar
- 1 cup water

METHOD

- 1** In a small jar, combine 1 tablespoon grated ginger, 1 tablespoon sugar, and 1 cup water. Mix well.
- 2** Cover the mouth of the jar with a breathable fabric, such as muslin, and secure with a rubber band.
- 3** Let sit at room temperature for 4 to 6 days. Every day, add 1 tablespoon grated ginger and 1 tablespoon sugar to the jar, mix well, and cover again.
- 4** Once the ginger bug has a yeasty smell and is actively bubbling, it is ready for use. Store in the refrigerator and “burp” occasionally to release pressure. Ginger bug will keep for several months.

Ginger bug can be used as a **starter for any alcoholic beverage**. To use, strain a few tablespoons of liquid from the jar and add it to your fermentation vessel.



Herbal syrups impart flavor and medicinal benefits to fermented beverages. Any culinary or medicinal herb can be used to make herbal syrup. Experiment with combinations of fresh herbs, whole spices, and aromatics.

Ferment Boil **Prep** 5 minutes **Time** 30 minutes **Yield** 2 cups

HERBAL SYRUP

YOU WILL NEED...

- 3 cups water
- ½ cup whole spices or aromatics of your choice
- 5 to 8 sprigs fresh herbs of your choice
- 2 cups honey or sugar

METHOD

- 1** In a saucepan over medium-high heat, combine water and any sturdy aromatics you choose to use, such as ginger root or cinnamon. Boil for 15 minutes. (If using leafy herbs only, simply bring water to a boil.)
- 2** Remove from heat and add more delicate herbal additions, such as fresh leaves and flowers. Steep for 15 minutes.
- 3** With a fine mesh sieve, strain liquid into a jar or glass liquid measure, squeezing to extract all liquid from plant matter. Add honey or sugar and stir to dissolve.
- 4** Transfer syrup to a bottle or jar with tight-fitting lid. Herbal syrups will keep, refrigerated, for up to 2 months.

Fresh herbs to try include peppermint, rosemary, thyme, and basil. Add **spice** with ginger, cinnamon sticks, whole cloves, or cardamom. **Other additions** include citrus rind and orange blossoms.

BOTTLING & CARBONATING

Bottling and carbonating beverages is a simple process, and seeing your beverages transformed into bubbly, fizzy concoctions is well worth the effort.

BOTTLING

For small batches, bottles can be easily filled using a clean funnel. For batches of more than 3 gallons (11l) in volume, a siphon is more practical and can be made even more convenient with the use of a spring-loaded bottling wand.

When bottling for carbonation, use strong, thick bottles that can seal tightly, such as swing top, crown cap, or champagne-style bottles. The last two require special presses to cap or cork the bottles, while swing top bottles can be used and reused with no extra equipment.

CARBONATING

Once your fermented beverage is bottled, keep the bottles at room temperature for anywhere from 1 day to 2 weeks. To check the level of carbonation, unscrew the cap slightly or release the swing top momentarily and listen for the release of gas. If you hear gas escaping, it should be carbonated enough to refrigerate and enjoy. If not, quickly reseal it and give it more time. Every time you open a bottle, CO₂ is released and the pressurization has to start from scratch. For this reason, it is best to check only one bottle from each batch and to do this no more than once a day.

FACTORS THAT AFFECT CARBONATION

- The amount of sugar in the liquid when you bottle it directly affects the amount of carbonation that will build up. More sugar means more carbonation, which is why extra sugar is sometimes added before bottling. This is called *priming*.
- The type of sugar used can also affect carbonation. Yeast consumes some sugars more easily than others. For example, the sugars in pineapple, grape, and peach juices break down very quickly, while the sugars in blueberries and strawberries are slower to ferment.
- Ambient temperature has a significant impact on speed of carbonation. Yeast acts more slowly in the cold and will become dormant at temperatures below 40°F (4°C). On a hot summer day, carbonation may happen much more quickly than you'd expect, while in the winter months it can take longer.
- The amount of headspace in the bottle can help or prohibit carbonation. If the bottle is only half full, more fermentation is needed to pressurize and carbonate the liquid. When filling 750ml bottles, leave 2 to 3 inches (5–7.5cm) of headspace in the neck. For 12-ounce (350ml) bottles, leave about 2 inches of headspace.

**YEAST
CONSUMES
SUGARS**

When too much **pressure** builds up, carbonating beverages can **explode**. To avoid messy disasters, keep carbonating bottles in a **milk crate** lined with two trash bags. If a bottle does explode, this will contain most of the mess.

CREATING
CO₂
WHICH
BUILDS
UP AND IS
TRAPPED IN
THE BOTTLE

If you've ever opened a shaken can of soda, you know how **messy over-carbonated** beverages can be. Always open bottles **outside** or **over the sink** and have an empty glass ready to catch the **overflow** of foam.

FORCING
IT TO
DISSOLVE
INTO THE
LIQUID

This refreshing, non-alcoholic summer beverage can be enjoyed by kids and adults alike. The fermented ginger and citrus cleanse the palate and aid in digestion.

Ferment Yeast **Prep** 45 minutes **Time** 3 to 4 days **Yield** 2 quarts (1l)

GINGER BEER

YOU WILL NEED...

- 1 (1–3 in.; 2.5–7.5 cm) piece fresh ginger, grated or sliced
- 2 quarts (2l) water
- ½ cup sugar
- Juice of 1 small lemon or 2 limes
- 3 TB. **Ginger Bug**, strained
- 1 2-quart (2l) jar
- Bottles for bottling

METHOD

- 1 In a small pot, combine ginger and 1 quart (1l) water. Bring to a boil over high heat and boil for 15 minutes.
- 2 Place a mesh sieve over a 2-quart (2l) jar and strain the ginger infusion into it. Do not discard the ginger.
- 3 Return the ginger to the pot and add the remaining 1 quart (1l) water. Bring to a boil over high heat and boil for 15 minutes.
- 4 Strain the second batch of ginger infusion into the jar. Ginger can be saved for another use or discarded.
- 5 Add sugar to jar and stir to dissolve. Cool to room temperature.
- 6 Add lemon or lime juice and Ginger Bug to jar. Cover the mouth of the jar with fabric and secure with a rubber band. Ferment at room temperature until it is actively bubbling, about 1 to 3 days.
- 7 Transfer to bottles and seal. Let sit at room temperature for 1 to 4 days (depending on ambient temperature) before refrigerating. Ginger beer can be stored in the refrigerator for several months.

Ginger beer and ginger ale are not the same! While ginger beer is a **naturally fermented beverage**, ginger ale is simply carbonated water with ginger flavor added.



This sweet and sour beverage is often served over ice in a glass with a chile and salt rim. It's also a great mixer and pairs perfectly with rum and mescal.

Ferment Bacterial/Yeast **Prep** 10 minutes **Time** 2 to 3 days **Yield** 3 quarts (3l)

TEPACHE

The pineapple base can be varied and adapted using different fruit and spice combinations. Try adding tamarind, whole sugar cane pieces, guava, orange slices, or hibiscus flowers.



YOU WILL NEED...

- 1 whole pineapple
- 1 large piloncillo (solid unrefined cane sugar)
- 1 cinnamon stick
- 3 to 4 whole cloves
- 3 quarts (3l) water
- 1 1-gallon (4l) jar

METHOD

- 1 Remove the pineapple rind and cut the fruit from core. Save the rind and core, setting aside the fruit for another use.

Only the rind and core of the pineapple are used.

In Mexico, **beer** is often added to tepache, creating a refreshing alcoholic beverage. Try adding a **Mexican lager** to your tepache after the second day of fermenting.



2 Place pineapple rind and core in a 1-gallon (4l) glass jar or pitcher.



3 Add piloncillo, cinnamon, and cloves. Add water to cover, leaving 2 to 3 inches (5–7.5cm) of headspace at the top of the jar.

4 Cover mouth of jar with fabric and secure with rubber band. Ferment at room temperature for 2 to 3 days. Stir twice a day and taste. When satisfied with the level of fermentation, strain the tepache and refrigerate.



Naturally sweet amazake, a Japanese fermented rice, makes an excellent base for a sugar-free horchata. The flavor is light, delicate, and delicious.

Ferment Mold **Prep** 20 minutes **Time** 20 minutes **Yield** 4 cups

AMAZAKE HORCHATA

You can make your own amazake or buy it at a specialty store. Try adding a handful of cacao nibs to the blender for a flavor reminiscent of *chilate*, a cacao and rice beverage that is popular in the Mexican state of Guerrero.

YOU WILL NEED...

- 2 cups **Amazake**
- 2 cups water
- ½ tsp. ground cinnamon
- ⅛ tsp. vanilla powder or extract (optional)

METHOD

- 1** In a blender, combine Amazake, water, cinnamon, and vanilla (if using). Blend for 3 to 5 minutes.
- 2** Allow to rest at room temperature for 20 minutes before serving.
- 3** Stir or shake well and serve over ice. Garnish with a sprinkle of cinnamon.

Horchata is often served as a **refreshing breakfast drink** and is considered by some to be a **remedy for hangovers**. Variations of this ancient beverage include using almonds, dates, and even lime zest.



Water kefir is an effervescent, probiotic beverage made from water kefir grains. Once you have activated your water kefir grains, you can use them to make this lacto-fermented beverage using fruit juice or coconut water.

Ferment Bacterial **Prep** 5 minutes **Time** 1 to 3 days **Yield** 4 cups

WATER KEFIR

YOU WILL NEED...

- ¼ cup hydrated water kefir grains
- ¼ cup unrefined sugar
- 4 cups filtered or spring water
- 1 2-quart (2l) jar
- Bottles for bottling

METHOD

- 1** Remove water kefir grains from their packaging. If they came in liquid, discard liquid and rinse grains.
- 2** In a 2-quart (2l) jar, dissolve ¼ cup sugar in 1 quart (1l) of warm water. Allow water to cool to room temperature and add kefir grains.
- 3** Cover jar with fabric and a rubber band and leave at room temperature, out of direct sunlight, for 1 to 3 days or until water kefir is effervescent and tastes pleasantly tart.
- 4** Strain water kefir, reserving the grains, and bottle. Water kefir will keep, refrigerated, for several weeks.
- 5** Use water kefir grains for another batch immediately or refrigerate in a jar with a small amount of water. Use within 1 month.

Water kefir grains are available from online sources and some natural food stores. They resemble clear jelly-like curds and may need to be hydrated before using.

A very effective digestive, coconut water kefir has all the benefits of coconut water, plus probiotics. Its light, tart flavor is distinctly different from dairy kefir.

Ferment Bacterial/Yeast **Prep** 5 minutes **Time** 1 to 2 days **Yield** 2 cups

COCONUT WATER KEFIR

YOU WILL NEED...

- 2 cups coconut water (canned or from whole young coconut)
- 2 TB. plain **Water Kefir**, or 2 TB. activated water kefir grains
- 1 1-quart (1l) jar
- Bottles for bottling

METHOD

- 1** Pour coconut water into a 1-quart (1l) jar. Add water kefir or water kefir grains and stir.
- 2** Cover mouth of jar with breathable fabric and secure with a rubber band.
- 3** Ferment for 1 to 2 days at room temperature. Bottle when satisfied with level of fermentation. (If using water kefir grains, strain out before bottling.) Coconut Water Kefir will keep, refrigerated, for several weeks.

Save and refrigerate $\frac{1}{4}$ cup Coconut Water Kefir to use as the **starter for your next batch**. You can use this starter to make water kefir out of almost any kind of fruit juice.



The digestive enzymes in pineapple and stomach-settling properties of ginger make this an excellent after-meal tonic. It is fresh, fruity, and spicy with a characteristic kefir tanginess.

Ferment Bacterial/Yeast **Prep** 5 minutes **Time** 2 to 4 days **Yield** 4 cups

PINEAPPLE GINGER KEFIR

Fermenting with pineapple juice requires care. Due to its high sugar content, carbonation can build up quickly in sealed bottles. Do not let the bottles sit at room temperature for more than 1 to 2 days.

YOU WILL NEED...

4 cups pineapple juice, store-bought or homemade
1 tsp. fresh ginger, grated
¼ cup **Coconut Water Kefir**
1 2-quart (2l) jar
Bottles for bottling

METHOD

- 1** Pour pineapple juice into a 2-quart (2l) jar. Add starter liquid and ginger. Stir well to combine.
- 2** Cover the mouth of the jar with a breathable material, such as muslin, and secure with a rubber band.
- 3** Let sit at room temperature, away from light, for 1 to 2 days. When satisfied with level of fermentation, transfer to bottles.
- 4** Keep bottles at room temperature to carbonate for no more than 1 or 2 days before transferring to the refrigerator.



STARTING & SHARING SCOBYS

SCOBY stands for “Symbiotic Colony Of Bacteria and Yeast” and is used to refer to the gelatinous disk that forms on the surface of an active batch of kombucha or jun. You need a SCOBY in order to make kombucha or jun, but luckily they are easy to grow, split, and share with others.

YOUR FIRST SCOBY

There are several ways to obtain your first SCOBY. The best and easiest option is to get one from a friend or acquaintance who makes kombucha. It’s also possible to purchase SCOBYS through specialty stores, or you can grow one yourself. All you need is a bottle of raw, unfiltered kombucha, some freshly brewed tea, sugar, and time.

If more than four weeks pass and your SCOBY hasn't formed, the starter kombucha may have been weak or old. Start fresh with a new batch.



Choosing a Tea

Any plain black or green tea will work well, but you can also use white, red, oolong, or pu-erh teas. Herbal teas are not recommended.

1 Brew 2 cups of green or black tea. Add 3 tablespoons sugar and stir to dissolve. Cool to room temperature.

2 Pour a 16-ounce (500ml) bottle of plain, raw kombucha into a 2-quart (2l) jar. Add cooled, sweetened tea to the jar and stir to combine.

3 Cover mouth of jar with fabric and secure with rubber bands. Ferment at room temperature, away from light, for 1 to 2 weeks.

In a few weeks, a SCOBY should begin to form on the surface of the liquid. The SCOBY that forms and the liquid that remains can then be used to start making kombucha.

The SCOBY will form on the surface of the tea after 1 to 2 weeks.

Keep an extra jar as a "SCOBY motel" to house **unnneeded** SCOBYs until you can share them.

A LIVING COLONY

SCOBYs form at the top of the fermentation vessel, where they take on the shape of the surface. They grow in layers, one on top of the other. The newer SCOBYs that form near the surface are called "daughters," while the original SCOBY at the bottom of the vessel is called the "mother."

WATCH FOR MOLD

As a growing organism, a SCOBY takes on a life all its on, and it may look a little strange at first. You may see small strands of yeast growing from the bottom of the SCOBY, which is normal. However, if you see mold growing on the surface of the SCOBY, you should discard the SCOBY and sanitize all of your equipment.

SPLITTING SCOBYs

Sometimes, the daughters form on top of each other in separate layers, making it very easy to separate them and give them away or use them to start more batches. Other times, they may be fused together. In this case, you may have to cut them into smaller pieces. Always use a wooden, plastic, or ceramic knife to split SCOBYs. Do not use metal for this.

SHARING YOUR SCOBYs

As long as they are submerged in kombucha and do not dry out, your SCOBYs can last for several months. When the time comes to share, cut off a piece of SCOBY and place it in a jar with some kombucha to cover. Once used, it will eventually take on the size and shape of its new home.

SCOBY Storage

Keep your SCOBYs in a covered jar at room temperature. Make sure the SCOBYs are completely submerged in the liquid.



This fermented tea drink is made and revered in Russia, China, and Japan. The unique symbiosis of yeast and bacteria makes a delicious and healthful tonic.

Ferment Bacterial/Yeast **Prep** 20 minutes **Time** 1 to 4 weeks **Yield** 2 quarts (2l)

KOMBUCHA

Kombucha ferments best at warmer temperatures, between 70°F and 85°F (20°C–30°C). In the colder months, it can take up to 4 weeks for kombucha to come to maturity. Be patient and move the vessel to a warmer location if needed.

↓ YOU WILL NEED...

- ½ cup loose leaf green or black tea, or 8 to 10 green or black tea bags
- 2 quarts (2l) hot water
- ½ cup cane sugar
- 1 SCOBY
- ½ cup plain kombucha
- 1 2-quart (2l) jar

↓ METHOD

- 1 In a large jar or pitcher, combine tea and water. Let steep for 5 to 10 minutes.

Use a heat-safe vessel for steeping.

Green or black teas are the best choices when making kombucha. **Avoid** using any teas that have **additives or flavorings**, which can impede the fermentation process.



2 Strain tea into a 2-quart (2l) jar, leaving at least 3 inches (7.5cm) headspace.

Save your spent tea leaves to make Lahpet!



3 Add sugar and stir until dissolved. (The sugar serves as the food for the SCOBY during the fermentation process.)

Continued 

Store-bought kombucha comes in many flavors and varieties, but purchase a plain kombucha for starting your homemade batch.



4 Add kombucha and stir. This addition will kick-start the fermentation process.



5 Place SCOBY on surface of liquid. (Don't worry if it sinks at first.)

6 Cover mouth of jar with fabric and secure with a rubber band. Place in a warm, dark location and let sit for 7 to 10 days.



Use a breathable fabric. The SCOBY uses oxygen and expels carbon dioxide during fermentation.



An air-tight seal will preserve the natural effervescence of kombucha.



Have fun experimenting with different ingredients and techniques, but always brew a **simple "safe" batch** along with your experiment so that you don't lose your starter.

7 Bottle and keep at room temperature for 1 to 2 days to carbonate. Refrigerate bottles when carbonation is sufficient. Open carefully and have a glass ready to catch foam in case of over-carbonation.



This rosy-hued beverage combines the delicate fruit flavors of cherry and bergamot with the sour effervescence of kombucha for a unique and refreshing drink.

Ferment Bacterial/Yeast **Prep** 1½ hours **Time** 1 to 4 weeks **Yield** 2 quarts (2l)

EARL GREY CHERRY KOMBUCHA

Other tea varieties can be used in this recipe, but it's best to avoid teas with added flavors or spices that could inhibit or weaken the yeast and bacterial cultures. Additional flavoring can be added in the bottling stage without compromising the SCOBY for future batches.

YOU WILL NEED...

- 3 TB. loose Earl Grey tea leaves, or 5 to 8 Earl Grey tea bags
- 2 quarts (2l) boiling water
- ½ cup cane sugar
- 1 SCOBY
- ½ cup plain kombucha (purchased or homemade)
- 2 cups unsweetened cherry juice
- 1 2-quart (2l) jar
- Bottles for bottling

METHOD

- 1** Place tea in a large, heatproof vessel with a wide mouth. Pour boiling water over the tea. Let steep, uncovered, until cooled to room temperature. (This releases much of the bergamot oil, which can inhibit fermentation.)
- 2** Strain tea into a 2-quart (2l) glass jar, leaving at least 3 inches (7.5cm) of headspace. Add sugar and stir until dissolved. Add kombucha and stir to mix.
- 3** Place the SCOBY on the surface of the liquid. Cover the mouth of the jar with fabric and secure with rubber bands. Set in a warm, dark place and ferment for 1 to 4 weeks, depending on ambient temperature.
- 4** Once satisfied with the level of fermentation, transfer kombucha to bottles, filling each only up to the neck.
- 5** Top off each bottle with cherry juice, leaving 1 inch (2.5cm) of headspace.
- 6** Let sit at room temperature for 1 to 3 days (longer in colder environments) to carbonate before refrigerating. Kombucha will keep, refrigerated, for several months.

Prickly pears give this refreshing Mexican fermented beverage a bright red color as well as a sweet, berry-like flavor with notes of cucumber.

Ferment Bacterial **Prep** 15 minutes **Time** 3 to 5 days **Yield** 3 quarts (3l)

COLONCHE (FERMENTED PRICKLY PEAR)

YOU WILL NEED...

- 8 to 10 ripe prickly pears
- 1 piloncillo (solid unrefined cane sugar), or 1 cup honey
- 3 quarts (3l) water
- 1 1-gallon (4l) jar
- Bottles for bottling

METHOD

- 1** In a large bowl, soak prickly pears in water for 1 hour to soften thorns. Pour off water and tumble in bowl to loosen thorns. Rinse prickly pears thoroughly and slice in half.
- 2** Add prickly pears and piloncillo (or honey) to a 1-gallon (4l) jar. Add water to cover. Cover mouth of jar with breathable fabric and secure with a rubber band.
- 3** Let sit at room temperature, away from direct sunlight, for 3 to 5 days. Stir twice a day to encourage wild yeast activity.
- 4** When happy with level of fermentation, strain liquid through muslin (to remove any lingering thorns) and bottle.

Piloncillo (also known as *panela*) is sugar that is commonly sold in **cones or blocks**, and can usually be found in Mexican markets.

Jun is a fermented tea with a pleasantly sweet-and-sour taste and slight effervescence. Like kombucha, each new batch of jun is made using a small amount of jun from a previous batch.

Ferment Bacterial/Yeast **Prep** 20 minutes **Time** 1 to 4 weeks **Yield** 2 quarts (2l)

JUN (FERMENTED TEA WITH HONEY)

YOU WILL NEED...

- ½ cup loose leaf green tea, or 8 to 10 green tea bags
- 2 quarts (2l) warm water (170°F; 49°C)
- ½ cup honey
- ½ cup plain jun (homemade or purchased)
- 1 SCOBY
- 1 2-quart (2l) jar
- Bottles for bottling

METHOD

- 1** Place tea in a large, heatproof vessel with a wide mouth. Pour warm water over the tea and steep for 15 minutes.
- 2** Strain tea into a 2-quart (2l) glass jar, leaving at least 3 inches (7.5cm) headspace. Add honey and stir until dissolved. Once the sweet tea has cooled to lukewarm, add jun and stir to mix.
- 3** Place SCOBY on the surface of the liquid. Cover the mouth of the jar with fabric and secure with a rubber band. Set in a warm, dark place and ferment for 1 to 4 weeks, depending on ambient temperature.
- 4** Once satisfied with level of fermentation, transfer to bottles and seal.
- 5** Let sit at room temperature for 1 to 3 days (longer in colder environments) to carbonate before refrigerating. Jun will keep, refrigerated, for several months.

Raw honey can introduce yeasts and bacteria that may cause the fermentation to go awry. If using raw honey, mix it with a small amount of boiling water and allow to cool before adding it to the tea.

This Eastern European tonic has a ruby color and an earthy, slightly salty flavor. It is an amazing digestive and delivers the blood-cleansing benefits of beets.

Ferment Bacterial/Yeast **Prep** 10 minutes **Time** 3 to 14 days **Yield** 4 cups

BEET KVAASS

Beet kvass can be consumed on its own as a tangy and nutritious tonic or added to dressings and dips for a nutrient boost and reddish hue. It will also brighten both the color and flavor of *borscht*, a traditional Ukrainian beet soup.

YOU WILL NEED...

- 3 medium beets
- 2 to 3 tsp. salt
- 4 cups water
- 1 2-quart (2l) jar

METHOD

- 1** Chop beets into ½-inch (1.25cm) cubes and place in a 2-quart (2l) jar.
- 2** Add salt and enough water to completely cover all beets.
- 3** Cover loosely with a lid and ferment at room temperature for at least 3 days before tasting. The longer you let it ferment, the tangier the kvass will become.
- 4** When happy with the level of fermentation, transfer the kvass to bottles and seal, reserving the beets in the jar for additional batches.

To make additional batches of kvass, add **more salt and water** to the same beets. Beets will be spent after three batches.



This tangy and creamy fermented beverage is made from coconut milk. It's an excellent dairy-free alternative to milk kefir, with all the same probiotic benefits.

Ferment Bacterial/Yeast **Prep** 30 minutes **Time** 1 to 3 days **Yield** 3 cups

COCONUT MILK KEFIR

↓ YOU WILL NEED...

- 3 cups hot water
- 2 cups unsweetened shredded coconut
- ¼ cup **Water Kefir**
- 1 1-quart (1l) jar

Coconut milk, which is extracted from the white flesh of the coconut, is different from coconut water, the liquid found in the center of the coconut. When extracting the milk, process it as finely as possible to ensure that all of the liquid is captured.

↓ METHOD

- 1 In a blender, combine hot water and shredded coconut. Blend on high for 4 to 5 minutes.

The **coconut pulp** left over from making coconut milk is a wonderful by-product that can be used for **baking** or making **raw cookies**.





To expel as much liquid as possible, gather the corners of the fabric into a tight ball and squeeze.

2 In a colander lined with muslin or cheesecloth, strain coconut mixture, pressing to extract all the liquid. Set aside pulp to use fresh elsewhere or dehydrate for future use.



3 Transfer fresh coconut milk to a 1-quart (1l) jar and cool to room temperature. Add water kefir and stir to combine.



4 Cover mouth of jar with fabric and secure with a rubber band. Ferment for 1 to 3 days, depending on ambient temperature. When kefir is tart and creamy, refrigerate. Kefir will keep, refrigerated, for several weeks.





ALCOHOL

Alcoholic beverages are some of the earliest and most ubiquitous forms of fermentation. Take part in this tradition by brewing your own Hard Cider, Hard Ginger Beer, Mead, and much more at home.

This bracing ginger beer has the same spicy, citrusy flavor as the non-alcoholic version, but the larger quantity of sugar and longer fermentation time result in an alcoholic beverage.

Ferment Yeast **Prep** 45 minutes **Time** 2 weeks **Yield** 3 22-ounce (650ml) bottles

HARD GINGER BEER

The world of botanically brewed ginger beer is a vast one, and there are many herbs you can add to the boiling water along with the ginger. Some delicious options include lemongrass, allspice, cinnamon, clove, kaffir lime leaf, citrus peel, juniper berry, and dandelion root.

YOU WILL NEED...

- 1 to 3 inches (2.5–7.5cm) fresh ginger root, grated or sliced
- 8 cups water
- 1 cup sugar, plus $\frac{3}{4}$ teaspoon for bottling
- Juice of 1 small lemon or 2 limes
- 3 TB. **Ginger Bug**, strained
- 1 1-gallon (4l) carboy and airlock
- 3 22-ounce (650ml) bottles

METHOD

- 1** In a saucepan, bring ginger and 4 cups water to a boil over high heat. Boil for 15 minutes.
- 2** Using a funnel and sieve, strain and transfer ginger infusion to a 1-gallon (4l) glass carboy. Do not discard ginger.
- 3** Return the ginger to the saucepan and add the remaining 4 cups water. Bring to a boil over high heat and boil for 15 minutes.
- 4** Strain the second batch of ginger infusion into the carboy. (Ginger can be saved for another use or discarded.)
- 5** Add 1 cup sugar to carboy and swirl to dissolve. Cool to room temperature.
- 6** Add ginger bug and lemon or lime juice to carboy. Attach airlock and ferment at room temperature for 2 weeks. The ginger beer should begin bubbling within 24 hours.
- 7** Bottle ginger beer in 22-ounce (650ml) bottles, leaving 2 inches (5cm) of headspace at the top of each bottle. Add $\frac{1}{4}$ teaspoon sugar to each bottle and seal.
- 8** To carbonate, keep bottles at room temperature for 2 to 4 weeks (depending on ambient temperature) before refrigerating.





Like its namesake, this kefir beverage is tart, dry, and highly effervescent. It's perfect for celebratory toasts or as a stand-in for sparkling wine in mimosas and other cocktails.

Ferment Lacto & Yeast **Prep** 5 minutes **Time** 5 to 7 days **Yield** 2 quarts (2l)

KEFIR CHAMPAGNE

Any type of fruit juice can be used in this recipe, but juices with a high sugar content, like pineapple, will ferment more readily. Water kefir can create powerful carbonation, so use thick, high-quality glass bottles that can handle the pressure. Be careful when opening bottles, and don't let them carbonate for more than two weeks.

YOU WILL NEED...

- 2 quarts (2l) pineapple juice
- ½ cup **Water Kefir**
- 1 1-gallon (4l) carboy and airlock

METHOD

- 1** Pour juice and water kefir into a 1-gallon (4l) glass carboy. Swirl to combine. Attach airlock and let sit at room temperature for 5 to 7 days.
- 2** When kefir only has a slight amount of sweetness left, transfer to bottles, leaving behind the lees, or yeast sediment, in the carboy. (Lees can be discarded.) Leave 2 inches (5cm) headspace.
- 3** Let bottles sit at room temperature for 1 to 2 weeks, depending on the ambient temperature and the sweetness at time of bottling. If it is warm or you have bottled it while still quite sweet, it could carbonate more quickly than expected.
- 4** Transfer bottles to the fridge and keep refrigerated for 1 to 2 months to allow flavors to balance. Make sure the bottle is well-chilled before opening.

This crisp and tart alcoholic beverage is a perfect fall fermenting project. It can be made with juice from any variety of apple, or use pear juice to make perry.

Ferment Yeast **Prep** 15 minutes **Time** 2 months **Yield** 3 quarts (3l)

HARD CIDER

The champagne yeast called for in this recipe is a strain that can be purchased online or at any homebrewing supply store. Do not use baker's yeast, which is not intended for brewing.

YOU WILL NEED...

- 1 gallon (4l) freshly pressed sweet cider, or unfiltered apple juice
- ¼ package champagne yeast (about ¼ tsp.)
- 2 1-gallon (4l) carboys and airlocks
- Bottles for bottling

METHOD

- 1 In a small jar, mix yeast with ½ cup room temperature apple juice. Cover and set aside for 30 minutes.



Mixing the yeast with a small amount of apple juice will activate it.

At each stage of the cider brewing process, be sure to **clean and sanitize** any equipment that comes into contact with the juice or cider, including **funnels, carboys, and bottles.**

A metal funnel is less likely to harbor bacteria than one made from plastic.



2 Using a funnel, pour $3\frac{1}{2}$ quarts apple juice into a 1-gallon (4l) glass carboy. Freeze the remaining 2 cups apple juice. (This will be used for bottle conditioning.)

3 Add activated yeast liquid to the carboy.





4 Cork carboy with an airlock and let sit in a cool place out of direct sunlight for 2 weeks. During this time, the cider will bubble with active fermentation.

5 After fermentation slows, gently transfer the cider to another clean, 1-gallon (4l) glass carboy, leaving behind the settled yeast particulate. Try not to disturb the settled yeast during the transfer. Insert airlock and let sit at room temperature for 4 weeks.

If you juice your own apples, **strain out the pulp** before transferring the cider to the **second carboy**. A large muslin or nylon "brew bag" can be used for straining.



The spent yeast will form a yeast cake at the bottom of the carboy.

Be sure to leave adequate headspace for the reserved apple juice addition.



6 Once the active fermentation (bubbling) has completely stopped, transfer the cider to glass bottles, leaving 3 inches (7.5cm) headspace.

7 Top off each bottle with defrosted reserved apple juice, leaving 2 inches (5cm) headspace and seal. Let bottles sit at room temperature for 2 weeks to carbonate before transferring to the refrigerator.



Using unprocessed (unpasteurized) apple juice will result in a cloudy cider.

Cider can be aged; however, fermenting for **longer than a month** will result in a **less sweet** and **more wine-like** beverage that may have off flavors.



This winter favorite combines the fragrant, warming spices of cinnamon, clove, and allspice with hard cider. Serve warm and enjoy around an open fire.

Ferment Yeast **Prep** 30 minutes **Time** 2 months **Yield** 3 quarts (3l)

SPICED HARD CIDER

YOU WILL NEED...

- 1 gallon unfiltered apple juice, or freshly pressed sweet cider
- ¼ package champagne yeast (about ¼ tsp.)
- 1 cinnamon stick
- 3 whole cloves
- 2 allspice berries
- 2 1-gallon (4l) carboys and airlocks
- Bottles for bottling

METHOD

- 1** To activate yeast, mix it with ½ cup apple juice (at room temperature). Cover and set aside for 30 minutes.
- 2** Using a funnel, pour 3½ quarts apple juice into a 1-gallon (4l) carboy. Freeze the remaining 2 cups apple juice. (This will be used for bottle conditioning.)
- 3** Add activated yeast to carboy. Cork with an airlock and let sit in a cool place, away from light, for 2 weeks. After a few days, signs of fermentation (bubbling) should be evident.
- 4** Once fermentation slows, transfer the cider to a second clean, 1-gallon (4l) glass carboy, leaving behind the settled yeast. Attach an airlock and leave for 4 more weeks or until bubbling has ceased.
- 5** In a saucepan, combine reserved 2 cups apple juice (defrosted), cinnamon stick, cloves, and allspice. Bring to a simmer over medium-high heat and simmer for 15 minutes. Cool to room temperature.
- 6** Transfer fermented cider to clean glass bottles, filling just up to the neck. Top off each bottle with the spiced reserved apple juice, leaving 2 inches (5cm) headspace.
- 7** Seal bottles and let sit at room temperature for at least 2 weeks to carbonate.

Mead, or honey wine, dates back to ancient times. The honey used for mead will affect the final flavor profile, so select a honey you enjoy. The long fermentation time will yield a lightly sweet, straw-colored wine.

Ferment Yeast **Prep** 15 minutes **Time** 6 to 12 months **Yield** 1 gallon (4l)

MEAD

YOU WILL NEED...

- ¼ tsp. champagne yeast
- 3 cups honey
- 3 quarts (3l) water
- 2 1-gallon (4l) carboys and airlocks
- Bottles for bottling

METHOD

- 1** To activate yeast, mix it with 1 cup water (at room temperature) and let sit for 15 minutes.
- 2** In a 1-gallon (4l) glass carboy, combine honey, water, and activated yeast. Swirl or shake to dissolve honey.
- 3** Attach airlock to carboy. Let sit at room temperature, away from light, for 1 to 2 months or until bubbling has stopped and active fermentation has ceased.
- 4** Gently transfer mead to another clean, 1-gallon glass carboy, leaving behind the yeast sediment, which can be discarded.
- 5** Attach airlock to the new carboy and allow it to ferment for another month or until all signs of fermentation have ceased.
- 6** Bottle and store in a cool place. Allow mead to age for at least 6 months. Longer aging will yield better results.

Traditionally, mead was made by **mixing raw honey and water** and allowing the **wild yeasts** in the honey to proliferate.

This ruby-colored mead includes the raspberry leaf as well as the fruit, delivering the flavor and medicinal qualities of the whole plant.

Ferment Yeast **Prep** 1 hour **Time** 6 to 12 months **Yield** 1 gallon (4l)

RASPBERRY MEAD

YOU WILL NEED...

- 3 quarts (3l) plus 1 cup water
- 2 ounces (55g) dried raspberry leaves
- ¼ tsp. champagne yeast
- 3 cups honey
- 1 cup fresh raspberries
- 2 1-gallon (4l) carboys and airlocks
- Bottles for bottling

METHOD

- 1** In a large pot, combine 3 quarts (3l) water and dried raspberry leaves. Bring to a boil over high heat and boil for 15 minutes. Set aside and cool to room temperature.
- 2** To activate yeast, mix it with remaining 1 cup water (at room temperature) and let sit for 15 minutes.
- 3** Strain raspberry leaf tea and combine with honey and raspberries in a 1-gallon (4l) glass carboy. Cool to room temperature.
- 4** Add activated yeast to carboy and attach airlock. Let sit at room temperature, away from light, for 1 to 2 months or until active fermentation has ceased.
- 5** Rack raspberry mead by straining out the fruit and transferring the liquid to a clean 1-gallon (4l) glass carboy. Attach airlock and allow it to ferment for another month or until there are no signs of fermentation.
- 6** Bottle and store in a cool place. Allow raspberry mead to age for at least 6 months. Longer aging will yield better results.



CUSTOMIZING YOUR BREWS

Once you have the basics of making fermented beverages, you can add your own unique expression to them by varying colors and flavors.

Coloring and flavoring additions can be added at different points in the fermentation process, depending on the result you desire. Add to the

fermentation vessel during primary fermentation for maximum extraction, or during secondary fermentation for a lighter infusion.

COLOR ADDITIONS

Depending on the coloring agent, there are many ways to incorporate color. Try using juices, powders, concentrates, and/or whole ingredients.

Green

- Chlorella • Spirulina • Spinach
- Matcha • Wheatgrass

Adding Green

Greens can turn to brown in an acidic environment, so add them at the end of fermentation or just before serving for the most vibrant results.

Orange

- Carrot
- Calendula
- Paprika

Yellow

- Turmeric
- Chrysanthemum

Purple

- Blueberry
- Blackberry
- Mulberry
- Red cabbage

Red

- Hibiscus
- Pomegranate
- Beet
- Raspberry



FLAVOR ADDITIONS

Fresh or dried herbs and spices added during secondary fermentation are said to be “dry hopped” and will produce a more aromatic result. You can also use herbs and spices

to make an herbal syrup, which can be added to your brew before bottling. This will also help to prime the bottles for carbonation.

Bittering

- Dandelion (flower, leaf, and root)
- Artichoke leaf
- Gentian root
- Oregon grape root
- Burdock
- Calamus

Bitter herbs such as dandelion can aid in digestion.



Sweetening

- Licorice root
- Anise seed
- Cinnamon
- Stevia

Sweetening agents like cinnamon will balance bitter flavors.



Floral

- Orange blossoms
- Chamomile
- Rose
- Jasmine
- Lavender

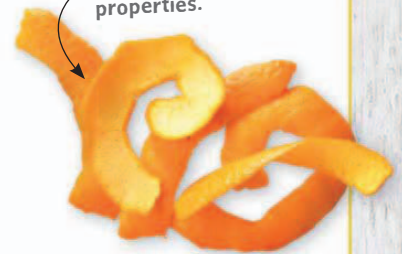
Use delicate floral additions like lavender in lighter brews.



Aromatic

- Coriander seed
- Cardamom
- Juniper berry
- Orange peel
- Lemon peel
- Clove
- Allspice
- Nutmeg

Orange peel and other aromatics have preservative properties.



Spicy

- Dried chiles
- Black peppercorns
- Ginger

Warming spices like chiles can increase circulation.



Fresh

- Spearmint
- Peppermint
- Rosemary
- Lemon balm
- Lemon verbena
- Lemongrass

Rosemary adds a refreshing note to summer beverages.





This country wine is very similar to sherry in its sweetness and mouthfeel. It is delicious as a dessert wine or can be used in craft cocktails.

Ferment Yeast **Prep** 45 minutes **Time** 2 to 4 weeks **Yield** 3 quarts (3l)

MANDARIN WINE

If you have access to fresh orange blossoms, adding them to the fermentation vessel will impart a heavenly aroma to the brew. If orange blossoms are not available, you can experiment with any fragrant edible flower.

YOU WILL NEED...

¼ tsp. champagne yeast, or
3 to 4 TB. **Ginger Bug**
3 quarts (3l) mandarin or
tangerine juice
4 cups sugar
2 1-gallon (4l) carboys and
airlocks
Bottles for bottling

METHOD

- 1** In a small jar, mix yeast with 1 cup mandarin juice (at room temperature). Let sit for 15 minutes.
- 2** Combine the remaining mandarin juice and sugar in a 1-gallon (4l) glass carboy.
- 3** Add activated yeast to carboy and attach airlock. Let sit in a cool place, away from light, for 2 weeks.
- 4** After active fermentation has subsided, rack wine by transferring it to a clean, 1-gallon (4l) glass carboy, leaving the lees (yeast sediment) behind. (Lees can be discarded.)
- 5** Attach an airlock and ferment for another 2 weeks or until all signs of fermentation have ceased.
- 6** Bottle and age for at least 1 month. Longer aging will result in a richer, more balanced wine.

Sato is the Thai word for rice wine, a beverage that exists in many forms throughout Asia. It has a strong, somewhat fruity flavor and is best served cold.

Ferment Yeast **Prep** 30 minutes **Time** 1 to 2 months **Yield** 4 cups

SATO

Jiuqu, or Shanghai yeast balls, contain both the yeast that aids fermentation as well as mold that breaks down the starches in rice to simple sugars. They can be found in almost any Asian market.

↓ YOU WILL NEED...

- 8 cups cooked glutinous, sticky, or sweet rice
- 4 jiuqu (Shanghai yeast balls, Chinese rice wine starter)
- 1 1-gallon (4l) jar
- Bottles for bottling

↓ METHOD

- 1** With a mortar and pestle or the back of a spoon, crush yeast balls into a powdery consistency. (You may need to run it through a fine sieve.)
- 2** Add rice to a 1-gallon (4l) wide-mouth jar in thin layers, sprinkling yeast ball powder evenly through a sieve over the surface of each layer. Cover mouth of jar with fabric and secure with a rubber band.
- 3** Let sit at room temperature, away from light, for 1 to 2 weeks. Stir at least once a day, until the rice begins to take on a liquid-like consistency.
- 4** Strain and bottle immediately for a light sato, or transfer to a carboy with an airlock to further ferment for another 1 to 2 weeks before bottling.
- 5** For best flavor, refrigerate the bottles and let sato age for another month in the refrigerator.





This strong, full-bodied sweet wine is reminiscent of port or sherry. It can be sipped in small amounts after a meal or mixed with sparkling water or spirits.

Ferment Yeast **Prep** 5 minutes **Time** 6 to 12 months **Yield** 2 quarts (2l)

DATE WINE

Give this wine time. The strong flavors created during fermentation may not be appealing right away. After 1 to 2 years of aging, however, the flavor will become balanced and smooth.

YOU WILL NEED...

¼ tsp. champagne yeast, or 3 TB.

Ginger Bug

1½ lb. (750g) pitted dates

2 quarts (2l) water

1 1-gallon (4l) jar

1 1-gallon (4l) carboy and airlock

METHOD

1 If using yeast, mix it with 1 cup water (at room temperature) in a small jar. Let sit for 15 minutes.

2 Loosely pack dates into a 1-gallon (4l) jar, leaving at least 2 inches (5cm) headspace.

3 Add activated yeast or ginger bug to jar, followed by enough water to cover dates. Cover the mouth of the jar with fabric and secure with a rubber band.

4 Let sit at room temperature, away from light, for 2 weeks. Stir once a day or until it stops bubbling and active fermentation ceases.

5 Rack date wine by straining it and transferring all the liquid to a clean 1-gallon (4l) glass carboy with an airlock.

6 Ferment 1 month and then bottle. Date wine will be drinkable immediately, but benefits from at least 1 year of aging.





VINEGAR

Fermented vinegars are healthful, versatile creations that are limited only by the ingredients in your kitchen. This chapter includes simple vinegar recipes that use everyday ingredients, as well as instructions for making your own herbal vinegars and a health-boosting Fire Cider tonic.

Use this strong and flavorful vinegar as you would apple cider vinegar. It's an excellent tenderizer and well suited for marinades and dressings.

Ferment Bacterial/Yeast **Prep** 10 minutes **Time** 2 to 3 weeks **Yield** 1 to 2 quarts (1–2l)

PINEAPPLE CIDER VINEGAR

Much like alcohol, vinegar benefits from at least a few months of aging. To age, seal vinegar bottles tightly and keep in a cool dark place. For longer aging, use bottles made of dark glass and dip the sealed top of the bottle in wax.

YOU WILL NEED...

Core and rind of 1 pineapple
1 cup sugar (optional)
2 quarts (2l) water
1 1-gallon (4l) jar
Bottles for bottling

METHOD

- 1** Coarsely chop pineapple core and rind and place in a 1-gallon (4l) jar. Add sugar (if using) and enough water to cover.
- 2** Cover mouth of jar with fabric and secure with a rubber band. Let sit at room temperature, away from light, for 2 to 3 weeks. Stir daily to aerate.
- 3** When the ferment becomes strongly acidic and vinegary, strain liquid into bottles and store in a dark place. Vinegar will keep for 1 to 2 years. For longer aging, make sure the bottles are filled to the top and completely airtight.

This method works with other types of fruit, too. Save the cores and peelings from apples or pears and use in place of the pineapple.





Use this versatile vinegar in salad dressings or add a splash to soups and stews for brightness and flavor. Any red wine can be used, but each variety will lend its own flavor.

Ferment Bacterial **Prep** 5 minutes **Time** 1 to 2 weeks **Yield** 4 cups

RED WINE VINEGAR

The gelatinous disk that forms on the surface of the liquid during fermentation is the vinegar “mother.” It can be reused indefinitely to make more batches of vinegar and will grow and multiply with each batch.

YOU WILL NEED...

- 1 bottle red wine (any variety)
- ½ cup raw apple cider vinegar
- 1 1-quart (1l) jar
- Bottles for bottling

METHOD

- 1 Combine wine and apple cider vinegar in a 1-quart (1l) jar. Cover mouth of jar with breathable fabric and secure with a rubber band.
- 2 Ferment at room temperature, away from light, for 1 to 2 weeks. Stir daily to aerate.
- 3 Once all traces of alcohol are gone and only the taste of vinegar remains, remove the mother and bottle the vinegar.
- 4 Store in a dark cupboard. Vinegar will keep for 1 to 2 years in a completely airtight bottle.

Always use **unpasteurized**, or “raw,” **vinegar**. Pasteurized vinegar has been heated to kill any **bad bacteria**, but the process also kills all good bacteria, and pasteurized vinegar will not ferment.

MAKING HERBAL VINEGARS

Not only does raw, unpasteurized vinegar have its own healthful benefits, it's also an amazing solvent for making herbal vinegars, which have long been used in traditional herbal medicine to lessen the symptoms of many common ailments.

MAKING AN ACTRACT

To make an herbal vinegar, or *acetract*, simply pack the herbs tightly into a jar and add enough vinegar to fully submerge them. After 2 to 4 weeks, the acetract will be ready. Strain the liquid and store it in a dark-colored bottle and in a dark place. It will keep at room temperature for 1 to 2 years.

MAKING AN OXYMEL

To soften the flavor of an acetract, make an *oxymel* by adding honey to the finished acetract. Both acetracts and oxymels can be consumed in 1 to 3 tablespoon portions, or added to juice or sparkling water.

NOTE: Herbs may or may not help relieve symptoms. Consult with a healthcare professional concerning the treatment of any illness.

TRADITIONAL HERBS FOR COMMON AILMENTS

Cold and Flu

These herbs may help boost the immune system and lessen cold and flu symptoms, such as sore throat and congestion.

- Echinacea
- Elderberry
- Oregano
- Lemon
- Loquat leaf
- Cayenne
- Yarrow
- Oregon grape root
- Hyssop
- Thyme

Digestive

For relief for minor digestive disorders such as indigestion or sour stomach, try a vinegar tonic with these herbs.

- Ginger
- Coriander
- Orange peel
- Dandelion
- Peppermint
- Calamus
- Chamomile
- Cardamom
- Clove
- Fennel
- Wormwood



Elderberry



Peppermint



Echinacea

Echinacea is believed to be effective in treating colds and urinary tract infections.

Beet greens

Beet greens may lower blood pressure and reduce inflammation.



Clove

Clove contains beneficial antioxidant compounds.

Allergy or Inflammation

These herbs may offer temporary relief from allergy symptoms, such as sneezing or itchy eyes, or reduce general inflammation in the body.

- Nettles
- Turmeric
- Milk thistle
- Licorice
- Eyebright
- Feverfew
- Yarrow
- Local honey
- Local bee pollen

Cleanse

These plants have detoxifying properties that help to cleanse the liver and gallbladder, and promote overall health.

- Beet greens
- Cilantro
- Parsley
- Dandelion
- Burdock
- Yellow dock
- Milk thistle
- English plantain
- Red clover

Stress Relief and Relaxation

To reduce stress and promote an improved state of relaxation, try a tonic with these herbal additions.

- Valerian
- Passionflower
- Chamomile
- Lemon balm
- Lavender
- Damiana
- Motherwort
- Mugwort
- Hops



Tumeric



Dandelion



Hops

Infused vinegars are easy to make and impart the flavor of the herbs and spices to the finished product. In this version, the mild sweetness of fennel and tarragon pair with the savory notes of garlic and onion.

Ferment Bacterial **Prep** 15 minutes **Time** 2 to 8 weeks **Yield** 2 cups

INFUSED VINEGAR

The aromatic herbs and spices can remain in the vinegar for a year or more. You can also remove them and use them as a tasty pickled flavoring for soups, stews, or other savory dishes.

YOU WILL NEED...

- 2 cloves garlic
- ¼ bulb fresh fennel root
- 1 stalk fresh lemongrass
- 4 to 5 green onions
- 2 TB. black peppercorns
- 4 to 5 sprigs fresh tarragon
- 1½ cups raw apple cider vinegar
- 1 1-quart (1l) jar



METHOD

1 Slice garlic, fennel root, lemongrass, and green onions into uniform pieces.

2 Place peppercorns and garlic in a 1-quart (1l) jar.



3 Add fennel, tarragon, lemongrass, and green onions to jar.



4 Pour vinegar over vegetables to cover, leaving 1 inch (2.5cm) headspace at the top of the jar.



The aromatics will become pickled and can be used to flavor soups or salads.

5 Cover jar tightly with lid. Let sit at room temperature, away from light, for at least 2 weeks before using. The herbs can be left in or removed and used for another purpose.

White wine vinegar and Champagne vinegar can also be infused. Avoid using balsamic vinegar as its strong flavor may not mix well with the herbs.

This boldly spiced infused vinegar has many restorative health benefits. Sprinkle over salads, rice, or meats for a peppery kick, or get your daily dose by consuming a tablespoon straight as a “shot.”

Ferment Bacterial **Prep** 15 minutes **Time** 6 to 8 weeks **Yield** 2 cups

FIRE CIDER

This is an extremely adaptable recipe that can be modified to suit your tastes and available ingredients. Replace the thyme with oregano, marjoram, or mint. Add fresh horseradish root for a spicier infusion that targets the respiratory system. If fresh turmeric is not available, substitute with turmeric powder or more ginger.

Fire cider has long been believed to **strengthen the immune system** and fend off numerous ailments. Taken straight, it **packs a powerful punch** to clear congested sinuses.

YOU WILL NEED...

- 1 lemon, quartered with peel
- ¼ yellow onion, chopped
- 6 cloves garlic, sliced
- 1 (2-in.; 5cm) piece fresh ginger, chopped
- 1 (2-in.; 5cm) piece fresh turmeric root, chopped
- ¼ cup fresh thyme or 2 TB. dried thyme
- 1 to 2 sprigs fresh rosemary
- 1 to 2 chiles, such as jalapeño, cayenne, or habanero (optional)
- 1½ cups raw apple cider vinegar
- 2 to 4 TB. raw honey (optional)
- 1 1-quart (1l) jar

METHOD

- 1** Pack lemon quarters, onion, garlic, ginger, turmeric, thyme, and chiles (if using), into a 1-quart (1l) jar.
- 2** Add apple cider vinegar to jar, leaving 1 inch (2.5cm) headspace at the top.
- 3** Cover tightly with lid and allow to infuse at room temperature, away from light, for 6 to 8 weeks.
- 4** Strain vinegar and bottle. For a milder flavor, add honey (optional) before bottling and mix well to dissolve. Fire cider can be stored at room temperature.



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