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- Exploring the history of fermented food
- Achieving optimal health by integrating fermented foods into your diet
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Chapter 1
In the Beginning: Fermenting Roots

Before the days of refrigerators, people had to do something to keep their foods from going bad. Fermentation is one of those incredible preservation methods still used today. You can preserve foods in so many different ways: You can freeze them, can them, dry them for storage, or ferment them. These days, few people know and love the art of fermentation, but it's an art that has existed for many years past and, when you discover it, a world of splendor opens up!

Fermented foods are returning to the modern kitchen. The art of fermentation precedes history and happens by capturing and controlling the growth of bacteria, molds, and yeasts, and falling in love with the presence of lactobacilli found on the surface of all things. You'll discover more about the importance of these healthy living microbes in fermentation as you read on.

Fermentation is a unique, natural, and fun way to preserve your food, discover new flavors and recipes, and go on a mind-bending adventure through various cultures and through an ancient history of food that has existed for centuries around the world. If you're lucky, fermentation can even act as a tool for self-discovery and a vehicle for self-exploration in health and healing.

Getting Familiar with Fermentation

Fermented foods are all around you. You may not realize it, but you're likely already a consumer of one or more fermented food products. Have you had any sourdough bread, soy sauce, tofu, yogurt, cheese, or a glass of cider or wine lately? Does your sandwich come with a salty pickle or some sauerkraut on the side? You can thank the process of fermentation for these items.

REMEMBER

Fermentation turns sugars to alcohol or other acids using yeast and bacteria. The chemical change often involves increasing the acidic environment and develops in places without oxygen (*anaerobic* conditions). It's a low-cost, highly efficient way of preserving foods.

Fermented foods have existed for centuries as populations around the globe learned how to capture the slow decomposition process of organic materials and preserve them by adding salts, sugars, or yeasts. They controlled mold and promoted good bacteria with the intention of maximizing the shelf life of their foods, enhancing flavors, or gaining health benefits.

Getting to know the art of fermentation also gets you familiar with the beauty of bacteria and its desirable presence in your food products. The changes caused by fermentation can be both good and bad. When fermentation occurs naturally, the food can smell or taste "off" (think of sour milk), but when you control the fermentation process, you can actually have some incredible results! When you execute fermentation processes properly, something that could have turned rotten instead turns into a consumable product. That's right — bacteria, yeasts, and molds will soon become your new best friends.

When fermenting foods, the key to developing the perfect environment and flavor and gaining all the great health benefits is to be confident, experiment, and do your best to create the utmost environment for fermentation, with proportional ingredients to support its growth. Some recipes are more challenging than others or require longer fermentation time, but plenty of fun and simple recipes are out there for beginners.

Fermentation throughout History

Food can give you insight into cultural and culinary traditions from around the world. Every part of the world has had a fermented food to be proud of. From beverages and breads to vegetables and fruits to meats and milk, there is often a whole culture and ritual behind these fascinating fermentations. This section

pulls back a historical veil and reveals some rhymes and reasons behind this unique food process.

Mesoamerica: Calling all chocolate lovers!

Fermentation is essential to making delicious and tasty chocolate. The history of chocolate began with the Mayan civilization. The cacao tree grows in the tropics and produces a long fruit pod that, when ripe, is yellowish in color and contains anywhere from 20 to 30 cacao beans, or seeds, surrounded by a delicious white, fruity pulp. The seeds are left inside the white pulp to ferment and begin changing the chemical compound and releasing the flavor of chocolate that you know and love into the beans. These seeds are what is harvested and processed to make chocolate. Some cultures used the fruit pulp alone to make a fermented, slightly alcoholic drink consumed by Aztec warriors and aristocrats. Although some chocolate is made using unfermented cacao beans, the most flavorful and least bitter chocolate is born from fermentation. Cacao beans were so valuable in Mayan civilization that they were even used as a form of barter and currency! (See Chapter 14 for a drink recipe that uses cacao.)

Africa: Turning toxins into edible tubers

The *cassava root* is consumed in many parts of the world but has a strong presence in Africa. It is very rich in starch, a great calorie filler, and a relatively cheap market item. This staple food is abundant locally and cooked in many different ways. Deep-fried, steamed, boiled, or fermented, cassava can be sweet or savory. It needs to be fermented or cooked because it contains an amount of cyanide that's unpalatable and toxic to human consumption. *Gari* is the name for the common fermented cereal made from cassava, which could be compared to North American oatmeal, only fermented. (See Chapter 10 for notes on how to prepare cassava.)

Asia: Thirst-quenching and candied culture

Kombucha is one of the strangest looking fermentations, as it is done using a *SCOBY* (symbiotic colony of bacteria and yeasts) and appears rubbery in nature when growing. When placed in the correct environment, the combination of a SCOBY with tea and sugar creates an ancient health drink, *kombucha,* a fermented tea that is said to have originated in Central Asia. When drunk in moderation, kombucha has a wide range of health benefits. In some cases, the SCOBY alone is even candied by adding lots of sugar. Today, kombucha is becoming widely recognized among health food shops and within new-age environments. (See the nearby sidebar, as well as Chapter 14, for more on kombucha.)

ALLEVIATING DIGESTIVE DISCOMFORT

The exciting thing about being a culinary nutritionist is that I (Marni) get to inspire people and help them improve their health. Every client presents a different challenge, and we work together to find unique solutions to suit that individual's body and lifestyle needs.

Many of my clients come to me with digestive issues, and one client in particular had been suffering from digestive discomfort for years. She had a list of common symptoms: bloating, gas, and irritability. What was happening to her gut? I suggested she be daring and try something new. I suggested she try making her own kombucha or at least buy some to include in her diet every day.

The results were incredible! After sipping just a half cup every day with lunch for a week, her bloating subsided, her energy increased, and she felt significantly better. As you can see, just a small amount of fermented foods can have a profound effect on the body!

Eastern Europe and Russia: Bubbly fruit kvass

Kvass is the Eastern European version of Asian kombucha. It's a fermented beverage that's most commonly made from rye, though other yeasts and fruits can be used. It has a low alcohol percentage and has been a common drink in Eastern Europe, and especially Russia, for centuries. In many cases throughout their patriotic history, people have chosen kvass over Coca-Cola! (See Chapter 14 for a kvass recipe.)

Japan: The sensational soybean

The soybean has become a widely cultivated and commonly distributed fermented food product. Tofu, tempeh, miso, and soy sauce are among the most recognized fermented soy goods, which originated in East Asia. The soybean itself has been cultivated around the globe and is a major industrialized food that serves populations worldwide. Although many people have problems with soy allergies, in moderation the fermented soybean (covered in Chapter 9) can actually enhance digestibility, reduce gas and bloating, and add beneficial flora to a person's diet.

North Africa and Morocco: When life gives you lemons

Morocco tells a different story of the lemon. Lemons may be the last thing you thought of putting into your mouth whole, but with the magic of fermentation, you can eat them rind and all. When lemons are quartered, salted, and stuffed into jars left to ferment, they transform into a zesty treat. You can leave them in salt-water brine for years (see a recipe for preserved lemons in Chapter 6) and then use them in stews and sauces or to add a zesty kick to any recipe.

How Can Something Rotten Be Good for Me?

In her book *Nourishing Traditions,* Sally Fallon says that the proliferation of *lacto-bacilli* in fermented vegetables enhances their digestibility and increases vitamin levels. These beneficial organisms produce numerous helpful enzymes, as well as antibiotic and anti-carcinogenic substances. Their main byproduct, *lactic acid,* not only keeps vegetables and fruits in a state of perfect preservation but also promotes the growth of healthy flora throughout the intestine.

Fermented food helps turn those hard-to-digest substances into digestible ones and even comes chock-full of vitamins and minerals.

It may be deceiving that a food that has seemingly started to ferment can be good for you. Yes, the line can seem quite thin between rotting and fermenting, but as you get to know the art of fermentation, you'll quickly discover the difference. Food that is rotten has already become useless and inedible. It can smell bad, be moldy, and can certainly harm one's health. Fermented foods actually prevent rotting, can even be safer to eat than fresh food, and last much longer before they're considered truly spoiled. Fermenting foods can enhance the foods' flavors — you'll grow to love the new smells, strange fizzes, and interesting looks.

Fermented foods offer some amazing health benefits. They can

- Improve your digestibility
- Help you better absorb more vitamins and minerals
- Lower your risk of eating spoiled foods or getting food poisoning
- Reduce your risk of cancer and other diseases

For more information on how fermenting foods increases the nutrients in the food and the digestibility of your gut, see Chapter 3.

Fermenting Essentials

The fundamental things you need to ferment foods are often the same, but there are many variations of those ingredients that can change your results.

- **Fermenting containers:** Fermented foods must be made without the presence of oxygen or spoilage will occur. A good fermenting container is essential to your success. Use a sturdy container that's large enough to hold your fermented goods. Containers are best made from glass, like Mason jars, or nonreactive materials, such as a crockpot made from ceramic or a well-cleaned plastic bucket. The key to fermentation is creating an anaerobic, or oxygen-free, environment by sealing out any outside air.

  
  TIP

  Look for fermentation jars with an airlock seal that allows gas to escape but no air to get inside, though in some recipes a weighted lid will do the trick.

- **Lactobacilli:** These naturally occurring bacteria are essential to the fermentation process. These good bacteria have been proven to fight intestinal inflammation and help create a healthy gut. They also enhance the flavors and digestibility of fermented foods — they're the invisible workers that make your food ferment!
- **Salt:** Salt can kill any bacteria that may cause illness. It does this by creating a less inhabitable environment by removing water from the plant cells. Salt also helps enhance the flavors of food. It can reduce sweetness or bitterness in foods, a desirable thing for your recipes!
- **Spices and herbs:** You add herbs and spices to your fermented foods to create unique recipes. Think of adding ginger to your kombucha, cranberries to your sauerkraut, or caraway seeds to your pickled goods!
- **A starter or a culture:** Many fermented recipes ask for a starter or a culture. No, we're not looking for you to adopt a new way of life; this type of culture is one full of existing microbial life. A fermentation starter can come in the form of a dried powder, yeast, or a wet substance and is essentially used to boost the food's flavor and the digestion process. You can get good results using a kick-start from a previous batch to accelerate the fermentation process. You can purchase starters or, depending on the product, reuse them from other food products like sourdough or yogurt.

- **Sugar:** You use sugar to help preserve foods when salt would be undesirable. (Imagine making jam or kombucha with salt. Yuck!) Most commonly used in wet brine, sugar can include cane sugar, honey, or maple syrup. (Refer to Chapter 6 for info on sugar substitutes.)
- **Time:** Every good fermented food product needs time. The tiny microbes will work to turn those starches into sugars and alcohol and will only slow down if you place them in cooler temperatures. Depending on the end product, you'll leave your ferments anywhere from two to seven days, or longer! Check your recipe and taste your food according to the flavors you desire.

Pickling (and How It Differs from Fermenting)

There are so many different kinds of pickles! Pickles are generally associated with the traditional cucumber in brine, but you can pickle all kinds of things, from fruit and vegetables to meat, fish, and eggs. In India, some of the most popular pickles are made from mango and lime. In Europe, you'll find pickled herring, olives, and beets. From Asia to Europe, the world of pickling is vast and varied.

Pickling is the process of preserving food using a brine (saltwater) solution. The salt in pickling acts on the food by drawing out the water from its cells and kills any bad bacteria that may spoil the food. Pickles are often added to a meal to help aid with digestion, giving your body that extra bit of *Lactobacillus acidophilus* it needs to restore some healthy gut and intestinal flora.

So, what's the difference between pickling and fermenting? Fermenting and pickling can seem very similar, but they're not the same thing. The process that occurs inside the brine is called fermentation, but the act of making brine and placing food into the saltwater solution is called pickling. Pickling also usually requires added heat through a canning process, whereas fermented goods can sit out on your shelf and don't require heat. Fermented foods thrive in anaerobic conditions and make use of naturally occurring "good" bacteria submerged under the saltwater. Fermented foods have a bit of a tangy flavor, while pickled goods taste salty or vinegary all the way through.

The role of salt in fermentation is to help draw out water from foods and make a salty living environment so bad bacteria have little chance of survival. A brine is created in fermented recipes to preserve fruits and vegetables or other food products. Making brine can be a bit of an experiment, and the salt measurements

sometimes depend on your personal preference. Remember that a little salt goes a long way! Some brine even contains a bit of sugar to balance out the salty flavor.

TIP

Here are some general tips on pickling:

- Use the firmest, freshest vegetables or fruit possible.
- Scrub your veggies well before using them; any dirt or bacteria can affect them.
- Make sure you clean and sterilize all your pickling supplies.
- Choose unrefined salt for the highest-quality and best-tasting pickles.
- Keep your vegetables submerged under the brine (salt solution).
- Wait the recommended period of time before eating your pickled goods.

A Quick and Easy Intro to Fermenting: Making Sauerkraut

Before we end this chapter, we want to show you just how easy it is to experience the wonders of fermented food. One of the most popular forms of fermenting and pickling is done with the common cabbage. For centuries, cabbage has been made into kimchi in Korea and sauerkraut in Germany. There are many different types of sauerkraut. Sauerkraut is an incredible recipe that uses the process of wild fermentation, meaning that no starters are needed. The natural bacteria living on the plant life are responsible alone for the ferment. It doesn't get any easier than that, which makes sauerkraut a perfect recipe for fermentation beginners!

Here are the items you need:

- One head of cabbage (any color your heart desires)
- Sea salt
- A well-sharpened knife and a cutting board
- Cleaned and sterilized fermenting containers; a glass bowl, wide-mouth Mason jars, ceramic bowls, or plastic buckets will all work just fine

TIP

Sometimes people use a weighted object to cover sauerkraut as it ferments. Whether you use one depends on the fermenting container you're using. For sauerkraut, large ceramic bowls or wide-mouth jars are certainly handy. Keeping your cabbage submerged under the wet brine is most important. A weight, something as simple as a heavy plate or a plate with a stone on top, helps to put pressure on the top of your container and pack down your cabbage.

Try to ensure that the plate fits snugly around the circumference of any vessel you use. You want to allow the gas to escape but minimal oxygen to get inside that may cause mold to build on your sauerkraut. If you notice mold, you can scrape it off and still eat the cabbage below. The fermentation process and all the salt will kill off any unwanted microbes.

After you gather your materials and equipment, here's how you make sauerkraut:

1. **Chop the cabbage into fine, thin slices.**
2. **Place the cabbage into a large bowl or plastic bucket and add an even amount of salt to cover the cabbage.**

   Two to four tablespoons should suffice, but feel free to add according to your taste and preference.
3. **Mix the salty cabbage and squeeze the vegetable until liquid begins to emerge from it.**

   The act of salting the cabbage draws out enough water. You'll get to see this over time.
4. **Place the squeezed-cabbage tightly into a Mason jar or other fermenting container.**

   Press it forcefully down into the bottom of the container so it's packed well. You don't want to have any air bubbles. Ensure that the brine (saltwater) is covering the cabbage.
5. **Leave the cabbage submerged under the brine.**

   If you want to add a small amount of water you can, but this isn't necessary.
6. **Seal the jar or cover your fermenting container with a heavy weighted object.**

   A comfortable fermentation environment is at or just below room temperature. Some people suggest covering the top of your sauerkraut with several full cabbage leaves before placing the lid on top. Try this for yourself and see what works best. Leave your jar sitting in a room slightly colder than room temperature for three to five days.

7. **Check on your fermented goods daily.**

   Pressure will begin building on the inside of your container, and you may see some water overflowing. You can taste the changes over time and adjust the salt or water content as needed (add some water if you find the brine isn't covering the cabbage). If the cabbage you use to ferment isn't fresh, the water content is naturally going to be less.

8. **After several days, your sauerkraut should be ready to eat.**

   When you've achieved the softness and salty flavor you desire, serve it as a side dish or just eat it alone. It will last for months in your refrigerator.