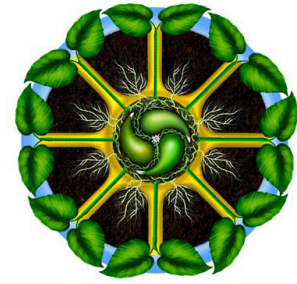


Introduction to Vegetable Fermentation
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"Microorganisms are our ancestors, and our allies." – Sandor Katz

"In the end, it's the microbes that will have the last word." Louis Pasteur

"We eat, thus we know." – Joel Kimmons

- **Fermentation** is a metabolic process that converts sugars into acids, gases or alcohols. Humans have long practiced fermentation of vegetables, milk products, grains, and meats for **preservation, flavor, and nutritional benefit**.

- Fermentation in food is controlled by a host of microorganisms. *Most* of the microbes working during the fermentation process are ***lactobacilli***. Lactobacilli are a group of anaerobic bacteria species that convert sugars to alcohol or lactic acid. They are ubiquitous in our bodies and in the bodies of plants, forming a symbiotic, mutualistic relationship with their host.

"Lactobacilli R Us"

- You are host to over 100 trillion bacteria, in your gastrointestinal tract. Bacteria 10 to 1 outnumber your own cells. *Did you think your body was yours?* We call this population of bacteria "gut flora." You are an ecosystem.

- Fermentation ensures the healthy support of your gut flora. It is a fun, flavorful, spiritual, and powerful defense against the inevitable health dangers of modern society. Anything can be fermented. Anything, anything.

- What fermentation/lactobacilli does to food:

- preserves nutrients
- creates nutrients (some examples: choline, niacin, biotin, thiamine, folic acid, riboflavin, Vitamin C.)
- creates antioxidants
- removes toxins (some examples: nitrites, phytic acid, oxalic acid, glucosides, nitrosamine)
- alters flavor, color, odor

- What fermentation/lactobacilli does for you:

- release energy, vitamin, minerals, and other nutrients from food that you would otherwise not be able to assimilate
- train your immune system by preventing growth of harmful bacteria
- regulate the repair of your intestinal tract

- produce vitamins
- produce hormones that instruct your body's metabolic processes

What you'll need:

- Jars, crocks, buckets, gourds, bungs, whatever. You'll need vessels.
- A kitchen scale capable of weighing up to 5 lbs (more is great)
- Weights (boiled rocks, brine-filled bags, jars, etc)
- Salt. Do not use iodized salt. It kills microbes. I use sea salt.
- Good WATER. Do not use overly chlorinated water. Chlorine kills microbes. Boil it or use filtered water.
- A cutting board
- Mixing bowls
- A sharp knife
- Organic veggies
- Whey, which is optional

- **Brine** is simply water with salt dissolved throughout. It can be enhanced with herbs, wine, ground seeds, seaweed, etc. Fermentation of vegetables uses creation of brine to provide a medium for the salt and to provide an anaerobic environment for the bacteria. Brine in your ferments can be made from water and salt, or from the extracted juices of the vegetables themselves, mixed with salt you add to them.

- **Whey** is the liquid remaining after milk has been curdled or strained. It is full of lactobacilli, and can speed fermentation. It is not necessary for fermentation, as lactobacilli is ubiquitous, and will introduce from the wild. I usually use it only with low-liquid or low-brine ferments, and pasty ferments such as condiments. **To make whey**- strain a quart of plain, whole-milk yogurt overnight, retaining the strained liquid. That bright liquid strained out is the whey. Leftover in the strainer will be greek yogurt. Eat it, make tzatziki, do whatever you want with it. The whey will store up to 1 month or so in the fridge, covered.

General "Rules":

- Make sure your vegetables are safe and organic
- Make sure the brine covers the veggies
- In general, 3 T of sea salt to each 5 lbs of veggies will make a great ferment
- Make sure you close jars tightly, or use a airlocked jar like Fido™
- Trust your nose
- Have fun!

RECIPES

★ Sauerkraut (the gateway ferment☺)

2 lb cabbage, as fresh as possible

1 T. + 1 t. sea salt

quart, wide-mouth mason jar

a weight

☛ Chop the cabbage as finely or coarsely as you like. Mix thoroughly with salt. In a deep bowl, punch and squeeze the cabbage with your fists to extract the cabbage's juices. You are creating brine. When you are confident you've gotten enough juice out to create sufficient brine (enough to cover the cabbage in the jar), stop punching and pack the cabbage tightly into the jar with hands or a tool. Weigh or airlock, allow to ferment. Some people un-crock their kraut as early as 2 weeks. I like to leave mine at least 1 month. Old world instruction would argue that real kraut is not ready until it has fermented until 6 months. You make your own rules.

★ Kimchi

4 C. water + 4 T. salt (for brine)
1 lb. napa cabbage, quartered and chopped into 2 in. pieces
2 bunches red radish, or 1 large daikon, julienned
2 carrots, grated
tops of 1 bunch spring onion or scallion
3-4 cloves of garlic, minced, or 3-4 garlic scapes, minced (or more)
3 thai red chiles, dried and crushed (or more)
3 T. grated ginger (or more)
1 T. (or more) fish sauce (optional) make sure it is pure (no chemical preservatives)

☛ Place the cabbage, carrot, and radish (and any other veggie you want to add) in the brine in a bowl or bucket overnight, covered with a plate or something that fits down inside the vessel, and a weight overtop. The next day, drain the brine but retain it. Taste the vegetables. They should be rather salty. If they taste overly salty, rinse them. If they do not taste salty at all, add a couple teaspoons of salt. Prepare the aromatics (onion, garlic, ginger) and spices, mixing them into a paste. Massage the paste gently into and mix thoroughly with the vegetables. Pack tightly into a quart mason jar or airlock liter jar, ensuring they are covered in brine. If not, add some of your retained brine to cover. Allow to ferment at least one week.

★ Salsa

2 lb salsa tomatoes, washed and diced
2 small onions, or one whole spring onion (tops included)
¾ C chopped pepper (sweet or hot, your choice) or ¼ t cayenne powder
6-8 cloves garlic, minced
½ C cilantro, chopped
5 leaves fresh basil, chopped
2 T. fresh oregano, chopped
1 T sea salt
1 t. ground cumin
juice of one lime
4 T. whey
¼ C. water

☛ Mix all ingredients and pack into a quart jar. Add additional water, as necessary, to cover the salsa. Cover jar. Allow to ferment 2 days before refrigerating.

★ Fig Chutney

4 C. figs, stemmed and quartered

½ t. ground coriander

½ t. whole cloves

grated rind and juice of one orange

1/8 C. rapadura, or maple syrup

1-2 inches fresh ginger, peeled and grated on a zester or micro-plane grater

10-12 mint leaves, chopped fine

¼ C. whey

2 t. sea salt

½ C water

☛ Mix all ingredients and pack into a quart jar. Cover. Allow to ferment 2 days before refrigerating.

★Ketchup

3 C. organic tomato paste (get it canned or make your own)

¼ C whey

1 T. sea salt

½ C. maple syrup

¼ t. cayenne powder

3 cloves garlic, grated on a zester or micro-plane grater

1 T ground allspice

☛ Mix all ingredients and pack into a quart jar. Cover. Allow to ferment 2 days before refrigerating.

★Mustard

1-1/2 C ground mustard

½ or more C water

2 T whey

2 T sea salt

2 T lemon juice

2 cloves garlic

maple syrup or honey to taste

☛ Blend all ingredients in a food processor, adjusting water and sweetener to taste. This recipe is very spicy inherently, and your water and sweetener will adjust for you. Pack into pint jar and allow to ferment 3 days before refrigerating.

★Mayonnaise

1 whole egg, at room temperature

1 egg yolk, at room temperature

1 t. Dijon mustard
1-1/2 t. lemon juice, or more, to taste
1 T. whey
3/4- 1 C. sunflower oil (or something neutral)
sea salt, to taste

☛ Mix all ingredients except oil and process until well blended. Stirring all the while, add the oil so slowly that you think you might collapse. No kidding. Drop by drop. A food processor with an emulsification tool will help with this. Taste and check seasoning. You will find or stray from your favorite mayo flavor mostly based on how you adjust the salt and lemon juice content. Place in a pint jar and cover, ferment overnight before refrigerating.

★Kombucha

14 oz. black tea (about 3 standard tea bags)
14 oz. green tea (about 3 standard tea bags)
1 C. raw sugar or rapadura
1 gallon water

☛ Make sweet tea. Boil the water, then turn it off. Add the tea bags. Allow to steep, adding sugar before the tea has cooled. Place your scoby, or kombucha “mother” in the bottom of a clean, gallon-size glass jar. Once the tea has cooled and the sugar has dissolved, pour the tea over your kombucha scoby and cover the jar with two clean washcloths, secured with a rubberband. Allow to ferment at least 2 weeks.

Rules: You can experiment with adding less sugar, but the scoby needs the sugar to ferment the tea, so you will slow or void the process the more militant you are... The longer you ferment, the more sour it gets... Don't use earl grey tea, and in general, avoid adding herbs or flavorings until AFTER you've strained the kombucha from the scoby. This will avoid the risk of fruit juices, herbs or aromatics that you add killing the scoby... Don't let your scoby contact metal. It will kill it... Keep fruit flies out.

★Red Wine Vinegar

☛ Pour red wine over your vinegar mother and cover with washcloths and secure with rubberband. Allow to ferment at least 1 month.

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