

Some Fermentation Basics

Introduction

There are four main reasons that I love and teach fermentation. 1. Health benefits. Although fermentation is certainly not a panacea, there seem to be almost daily findings on how important our microbiota is to our health, and how eating a ferment-rich diet can contribute to our bacterial health. 2. Easy and safe preserving. Once you understand the basic principles, fermentation is simple. When things go wrong, you KNOW it. It smells bad, and you can see and taste the stuff that is wrong, so you know not to eat it. 3. Eco-friendliness. Fermentation is a pretty great way to prevent food waste. You can use so many things that might normally hit the compost pile to make delicious food additions, and preserving food is a good way to eat locally. 4. Deliciousness. Fermented foods are just seriously tasty. For centuries or more, they brought the flavor to the table, condiments, beverages, and so much that we still find delicious today, was or is fermented.

Basics

Today we're going to cover three or four basic, easy-to-make ferments. We will be doing fermentation both with and without cultures, aerobic and anaerobic (with and without air) fermentation. You don't need to know the difference to know how they work but it's very interesting stuff. Fermentation is a way to use the bacteria and yeasts that are already around us to make food safer to consume and tastier. New fermenters often think of fermentation just as lactic acid fermentation. This is just one of many kinds, but it is the process through which we'll make sauerkraut and pickles today.

Lactopickles

yield 1 pint jar

These are the ultimate starter ferment! Nothing needed to get it going and it basically feels like magic when you get to taste that acidic deliciousness knowing there's nothing in there but salt, water and veggies. I personally think that lacto-fermented pickles have complexity and flavor that most vinegar pickles can only dream of.

The most important concept in pickling is submersion, or creating anaerobic conditions. The lactic-acid bacteria responsible for creating that flavor and preserving your veggies are active in airless conditions. Keeping your veggies away from air also prevents mold. After that, you just need a room temperature environment and fermentation will kick itself off.

Equipment

Widemouthed jar or bowl
Jar, plate or bowl small enough to fit inside your first jar or bowl
Cloth
Rubberband

Ingredients

Approximately 1 lb of your favorite fermentable veggies (more on that below)
Brine (I use 1 T of salt to 2 c of water)
Assorted seasonings (ginger, garlic) and whole spices

Process

1. Chop veggies of choice to your preferred size and shape
2. Mix a brine of 1 T sea or kosher salt to 2 cups of water (or to taste)
3. Pour over veggies and ensure that they are completely submerged.
4. Use ghetto jar or other method to make sure your veggies stay under water
5. Cover and put them in a warm place out of direct sunlight.

6. Taste after a week or so to see where the sour's at.
7. I stop mine at about 2 weeks, depending on mood, the type of veggie and my house temp

Tips and Troubleshooting

- Some hints on what to use:
 - Bad candidates:** squash, lettuces
 - Bad solo candidates:** bell peppers, cucumbers (both are doable)
 - Stink-up-your-house pickles:** cauliflower, broccoli,
 - Awesome pickles:** any kind of radish, carrots, cabbages, brussels, burdock root, garlic (might turn green), onions, kale/collard ribs, green beans and many more!
 - Great additions:** garlic, basil or other herbs (let's talk about how), hot peppers, red pepper flakes, mustard seeds, caraway seeds, whatever whole seasonings you have lying around (cardamom, clove, star anise, cinnamon sticks)
- Stick a plate under your jar so that when water is released from the veggies or they really get going with the bubbles, you can catch your overflow liquid
- If you want to avoid mold, make sure they stay submerged. Submerged veggies do not mold!
- They may stink up the joint, depending on your smell tolerance and which veggies you use. If you can't handle this, you can start them fermenting at room temp and finish it in the fridge. It will take way longer and I prefer doing it room temp, but that is a choice you and your nose will have to make

Resources

www.wildfermentation.com
Wild Fermentation by Sandor Katz
The Art of Fermentation by Sandor Katz
Real Food Fermentation by Alex Lewin
 My post about keeping things submerged: Phickle.com

Sauerkraut

yields 1 pint sauerkraut, recipe easily scales

Perhaps America's best-known-to-be a ferment ferment, sauerkraut is super healthful, delicious, versatile and just as easy to make as pickles. The only slightly more complicated element of kraut is the longer fermentation. Juices in a jar can dry out over the course of a month or longer, or fermentation can push the veggies upward out of the brine. This is the only thing to watch out for if you fear the mold.

Equipment

Large bowl
 A jar/crock
 Some kind of weight to keep veggies submerged
 A spoon
 A cloth
 A rubber band

Ingredients

1 lb cabbage (after core and skanky outer leaves have been removed and reserved)
 salt
 Seasonings of choice (I prefer mustard and caraway seeds. Juniper berries are traditional)

Process

1. Slice your cabbage according to preference. By hand is fine, the slicer blade of my food processor is my preferred method. Some people like even smaller pieces. If so, you can use the grater blade. Remember that your cabbage is going to release water and pieces will shrink during fermentation.
2. Pour salt into cabbage, mix it in.

3. At this point, you can choose to start massaging your cabbage or just let the salt do some of the hard work and give it a rest for 10 minutes or so (then come back and massage it until the cabbage is relatively soft and there is a good amount of juice in the bottom of your bowl).
4. Mix in your spices, if any.
5. At this point, you want to pack your jar. Put some in using your hands and then pack it down as tightly as possible. Repeat until your jar is full and there is a thin layer of liquid covering your kraut.
6. Time to bring back that skanky outer leaf. Use the hard rib to push your kraut down. This will act as a shelf for your weight and a canary in the coal mine for mold.
6. Weight it down, make sure there is a liquid layer at the top and wait a month!

Tips and Troubleshooting

- As with pickles (it's the same thing, really) submersion is essential. Since kraut has a longer fermentation time than pickles, it is easier for your jar to dry out, depending on what method of submersion you use, so you need to check in on the liquid levels every so often.
- You can use any kind of cabbage to make kraut. The bacteria are what make the flavor and texture, and they stay the same.
- Salt is an important element, but it is not essential to fermentation. If you are avoiding salt for dietary reasons, please let me know. I can give you some tips and tricks for saltless fermenting. It won't taste as good, and it won't last as long, but it can work.
- The type of salt you use is both important and unimportant. You can ferment with even the crappiest salt. Some have reported difficulty with table salt and say it has something to do with the iodine content. I have never had trouble with table salt, but I have started to use more mineral-rich sea salts in my ferments, because a key health benefit of fermentation is making minerals more bioavailable.
- Use only whole spices, powdered spices tend to get slimy. I don't recommend fermenting your kraut with herbs.

Resources

www.wildfermentation.com - They don't call him SandorKraut for nothin'

Wild Fermentation by Sandor Katz

The Art of Fermentation by Sandor Katz

Real Food Fermentation by Alex Lewin

My post about keeping things submerged: <http://phickle.com/?p=761>

Kombucha

Kombucha has become a popular and well-known ferment in recent years. It enjoys a reputation as one of the healthiest things you can put in your body, and while I can understand why that is, it doesn't seem so much better than other ferments to me. Still, it's delicious, an amazing hangover cure and a great substitute for people trying to kick a soda habit (IMO).

One thing to remember is that you want to use unflavored tea from the camelia sinensis plant. That will be plain black, green or white tea. No herbal or flavored teas (that means no earl grey!) until secondary fermentation.

Equipment

Large pot

1 gallon vessel with large opening

Wooden Spoon

Plastic fine-mesh strainer

Sealing jar for secondary fermentation

Coffee filter or cloth

Rubber band

Ingredients

Makes one gallon, recipe easily scales

- 1 cup sugar (best to use cane sugar unless you have a spare SCOBY hanging around)
- 2.5 T tea of your choice (or 9 tea bags)
- SCOBY

Process

1. Boil 13 cups of water.
2. Dissolve sugar in water while it's still warm.
3. Add your tea, and allow it to steep
4. Once tea is room temperature (really), strain out tea leaves and pour liquid into your fermenting vessel
5. Add SCOBY and ~2 cups finished kombucha tea (from last batch)
6. Cover and secure a cloth to the top of your container
7. Let it sit in a warm place for 3 days to 2 weeks.
8. The longer you let it sit, the less sweet it will be. It's done when you like the way that it tastes.

Tips and Troubleshooting

- Use tea (black, green, white, not herbal) that is unflavored. Flavor oils can mess things up.
- Make sure tea is completely cooled before you add your SCOBY and starter tea. Too much heat can damage your SCOBY.
- Use a vessel that has a relatively wide mouth so your SCOBY is allowed to grow in diameter.
- Kombucha likes a slightly warmer environment (above 70 degrees). My house is generally cooler than that in the winter, so I culture my kombucha relatively close to my heat vents
- Bubbliness sometimes occurs during the first fermentation, sometimes you need to seal it for a day or two to get there. BE CAREFUL NOT TO LEAVE IT TOO LONG. GLASS EXPLODES UNDER PRESSURE.
- You can add flavor and carbonation after fermentation (during secondary fermentation) by adding fruit, dried fruit, juices or seasonings after you've removed your SCOBY. Put your flavor agent and finished kombucha into a jar and seal it. Let it sit for a few days and you have a bubbly, flavored beverage.
- Use 10%-20% starter tea, more in the winter, less in the summer.
- Don't be a maniac about the sugar. It's fine, sugar and tea are the food of the SCOBY. They eat most of it so you don't have to. The longer it ferments, the less residual sugar there will be.
- Do not allow metal to touch your SCOBY at any time. It can damage your SCOBY.

Resources

<http://shop.kombuchabrooklyn.com> - A SCOBY worth buying

<http://www.kombuchafuel.com> - Some good info for the novice and the more experienced alike. One of many excellent kombucha-specific resources you'll find on the internets.

General Troubleshooting and FAQs

Temperature - Temperature is one of the most important aspects of fermentation. Different cultures need different temperatures and when they're outside of their comfort zone, things start to happen. Too cool, and fermentation might become sluggish or completely stop. Too warm and you end up with a rapid fermentation that can throw the balance of yeast and bacteria out of whack in some ferments, and speed up the pectin-destroying enzymes, giving you a bowl of mush instead of the crispy delicious you expected.

Water - There are things chemicals in city water that are bad for fermentation, but that doesn't mean they aren't there in bottled water, too. Chloramine is chlorine + ammonia and it is in Philly water. You can't boil it out and it can impact fermentation. I have used Philly water for virtually all of my ferments, much of it

run through a charcoal water filter (Mavea) and some of it not. I've never had batch that failed to ferment. Here's a link to what the city puts in our water, if you're interested:
http://www.phila.gov/water/Fact_Sheets.html#fact13

Is this going to kill me? - Yes, definitely. I kid, I kid. No! There has never been a case in recorded history of a human even getting sick from vegetable, grain or dairy fermentation.

A note on inspiration: Sandor Katz is awesome. Just about every ferment I've made, I started with his suggestions or his recipes. He is hugely inspirational and I highly recommend his books, *Wild Fermentation* and *The Art of Fermentation*.

Questions? Concerns? I always respond to email, and I sometimes have extra cultures laying around. Email me if stuff isn't working or if you want a culture you didn't get today. I'd also love to hear suggestions for future class topics.

Like the class? Feel free to tell your friends, tweet about it or leave comments on my blog! Something you weren't crazy about? Please email me and let me know what didn't work for you.

If you want to be informed about future classes, send me an email and tell me you want to be added to my mailing list. I use MailChimp, and it's just me. No spam and infrequent mailings.