



S A V O U R

KOMBUCHA & KIMCHI: FERMENTATION WORKSHOP with Wendy Nolan Joyce

Welcome! Today we're going to learn the basics of fermentation and make recipes that will create a happy home for your gut microbes, the foundation of good health.

About me (Wendy): I'm a self-taught fermentation convert who has learned through trial and error. I started making kombucha 8 years ago when a friend gave me a scoby and talked about the noticeable health benefits of fermented foods. Since then, my family and I have felt the energy- and immunity-boosting effects of drinking kombucha and eating kimchi daily.

Goals for today:

- 1) Teach you basics about fermentation in general and kombucha, fermented drinks, and kimchi.
- 2) discuss the health benefits of various ferments
- 3) make a kombucha flavour of your choice –FIRST FERMENT—discuss what to do with it when you get home (care and bottling and second fermentation) and discuss SCOBY care and the best conditions and safety guidelines for fermenting
- 4) discuss other fermented beverages (Jun and water kefir) and taste each.
- 5) make KIMCHI

SCOBY= Symbiotic colony of bacteria and yeast that looks like a jelly fish.

My 1st scoby has multiplied many times over and I now make many different flavours of kombucha on an ongoing basis, many with organic herbs and flowers from my garden (lemon verbena and rose, for ex). All of my current kombuchas are caffeine-free (many amateurs believe you need to use black or green tea but this is not the case). I also make water kefir and jun which have different flavour profiles and different requirements which I'll discuss.

PROBIOTICS: the good bacteria that are one of the keys to overall wellness. They add 'good' bacteria to your gut to outweigh the 'bad' bacteria. Most of us have heard of the fabulous and powerful benefits of probiotics:

- Eliminate waste and toxins from the colon
- Manage gastrointestinal issues and aid digestion*
- Enhance skin health
- Improve nutrient absorption*
- Regulate the immune system thereby reducing inflammation
- Improve mood and reduce stress (your gut is responsible for around 80-90 pc of the production of serotonin, the amazing feel-good hormone)

*Fermentation breaks down difficult-to-digest food compounds such as oligosaccharides & lactose. This is the reason why some lactose-intolerant individuals can tolerate fermented dairy products containing lactose. It's also the same reason why people struggling with IBS can sometimes tolerate cultured grains in sourdough. Other nutrients like proteins & fats are also made more digestible by fermentation. Many seeds, legumes, & grains contain phytic acid which binds important minerals like iron. This binding makes most of the iron content in a food unavailable for absorption. But when the food is cultured, fermentation breaks down the phytic acid therefore making it easier for your body to absorb sufficient iron from your meal. (source: SYMBIOTA)

Why Probiotics Capsules Can Never Be As Good As Taking Fermented Foods and Drinks?

Although probiotic supplements help, they generally only have selected strains of bacteria. With probiotic foods, you'll get natural and denser probiotic nutrients.

How the gut becomes unbalanced:

- * chemicals in food, water and air
- * Poor diet, especially too much sugar, gluten, processed foods
- * stress
- * medications, antibiotics

Pathogens such as bad bacteria and viruses can be overcome with a strong gut, which in turn should lead to fewer illnesses.

Once you start experimenting, you'll discover how easy it is to keep going! If you've been buying fermented products, chances are you're spending a lot of money and some of the so-called kombuchas on the market are actually diluted and far-too-sugary to provide the health benefits of natural, unpasteurized kombucha. It's also a delight to hear the bubbling and hissing of your elixirs fizzing away as the culture feeds off the sugars, and to taste the fizz on the tongue, the slightly acidic zing that results from the fermentation process. If you're trying to cut down on your alcohol consumption, brewing and making your own kombucha provides with you no- to low-alcohol beverages at little cost.

Be aware that, as with any unpasteurized product, caution is to be exercised when pregnant although not all doctors agree. Also it's important to keep in mind that too much kombucha could lead to tummy upset (because of its acidic nature) so pay attention to your body's signals if you find yourself drinking kombucha regularly. Sandor Katz addresses the 'potential danger' of kombucha on pages 168-9 of *The Art*. and concludes: 'I reject the idea that kombucha at home is random or dangerous. All of the ferments...involve creating selective environments to ensure success...Make sure you understand the parameters of the selective environment you need to create...Basic information and awareness are important. Empowered with them, you may ferment without fear.'

SELECTED ENVIRONMENT: Katz is referring to the best practice and environment used to create healthy ferments. Factors such as sanitation, temperature, oxygen, salt, water type (chemical-free and chlorine-free is best), type of jar (glass is best for kombucha) and lid, sunlight (avoid). Hotter temperatures will hasten fermentation while in cooler months, your fermentation will take longer. Other factors to consider are the source of your ingredients. I use organic fruits, flowers and teas as much as possible in my kombucha. For kimchi, chemical-free veg is best.

Cleanliness: as Katz and other experts agree, you don't need a hospital-grade sanitised environment to make these ferments (if anything, too much sanitation and chemical residue can kill the good bacteria.) Wash your equipment in hot water with dishwashing liquid, then rinse with hot water and allow to air dry or you may prefer to dry your jars in a low oven. Ensure your hands and utensils are very clean (I pour boiling water over mine and then let them air dry before use).

It's beyond the scope of this workshop (and my knowledge) to go into detail about the precise health benefits of every medicinal plant. I encourage you, if you're interested in learning more, to read up about it and look out for local workshops at places like the Apothecary on Cuba st.

DRINKS: Kombucha, Jun and Water Kefir

All three of these are what's known as 'CULTURED FERMENTATION' where you begin with an existing culture (vs. Wild which relies on wild yeasts in the air). Water kefir has the shortest fermentation time and, from my personal experience, is more delicate aka easier to kill. Jun is similar to kombucha—the scoby looks identical—but it can only feed on green tea and honey and you mustn't use any metal implements when making it. If you're interested in making either water kefir or Jun, I recommend buying supplies from Symbiota online who also supply instructions. Use reference books such as those mentioned to trouble shoot.

"Mae West was wrong: too much of a good thing is not wonderful. Kombucha fermentation can go too far (vinegar, anyone?). A tablespoon of yoghurt culture is good, but a cup of it is disastrous. Two weeks at the ocean is not necessarily better than one." Sandor Katz, *The Art of Fermentation*

References:

Sandor Katz, *The Art of Fermentation* and *Wild Fermentation*

Felicity Evans, *Kombucha & co*

Michael Murray and Joseph Pizzorno, *The Encyclopedia of Healing Foods*

RECIPES:

BASIC KOMBUCHA: to make 1 litre

4 tea bags (green, black, or fruit)

1/4 cup raw or white sugar

3 T kombucha starter

1 kombucha mother

1 litre of springwater

PRIMARY FERMENTATION:

Bring 500 ml of water to a simmer. Pour into heatproof bowl, add tea bags and steep for 3-5 minutes. Strain the tea into a large, heatproof glass jar. Add the sugar to the jar and stir. Pour in remaining water.

When the liquid has cooled to room temp, add the starter liquid and the scoby. Cover with a piece of muslin and secure with elastic band. Leave in a cool spot where it won't be disturbed for 4 days in hot weather and 14-20 days in cooler weather.

Bottling and SECOND FERMENTATION:

Gently remove the mother to re-use, retaining 3 T of the liquid for your next brew. Put a funnel over a glass bottle with lid and strain the kombucha into bottle. Tightly seal the bottle and leave on the bench to build carbonation, burping occasionally to release the pressure. When the kombucha is as fizzy as you like, store in the fridge to slow the fermentation process.

If you are infusing flowers or fruits or any other suitable flavouring, you add these in the SECOND STAGE to the bottle.

WENDY'S ROSE & GINGER KOMBUCHA

1. Pour 750 ml boiling water onto 4 tea bags (I use Nerada brand rose and ginger) mixed with 1/4c raw sugar

2. Let steep for a few hours, till cool.

3. When the mixture is cool, pour into a 1 litre jar. Add 200 more cool water. Place scoby on top of the liquid with 3 T of leftover liquid from last ferment.

4. Cover the kombucha mix with muslin cloth. Secure with an elastic band.

5. After 5 days, taste to check that some fermentation/bubbles have developed.

6. The kombucha will be ready in 7-14 days. When the weather is hotter, fermentation will occur faster.

7. Once it's ready, remove the scoby to use for a new batch. Close the lid and leave the kombucha for another 24 hours for extra fermentation. Then place kombucha in the fridge.

Different uses of kombucha:

You can make fabulous hair rinse from kombucha that will leave your hair soft and silky! Allow fermentation to continue till the vinegar stage so that no sugar is left—the kombucha will smell a bit acidic. Bottle it and use it as a hair rinse.

You can also make 'fruit' leather out of leftover scobys.

The Different Uses of Water Kefir

Water kefir is a highly nutritious drink that is highly loaded with easily digestible sugars, beneficial enzymes, valuable acids, minerals, and vitamins. However, apart from being a great drink, water kefir also has several other uses.

- Some people use water kefir to nurture and fertilize house plants, their lawns, or flowers in their garden. The acidity and bacteria in the beverage help convert soil nitrogen into an edible form for plants.

- Water kefir can easily replace a yeast packet or sourdough starter when making pizzas and breads. The nutritional benefits make the drink a better and healthier starter.

- Just like vinegar, kefir can be used to soften rice, soak grains, or added to stocks and soups to help bring out the juicy nutrients of bones. - It can serve as a substitute for salt when fermenting vegetables like sauerkraut.

- The drink can be made into mouth-watering popsicles. - Kefir can be used as a ph stabilizer and clarifying conditioner for hair. The alkalinity of soap causes it to dry up the scalp and skin but kefir doesn't do that because it is acidic.

- Kefir is sometimes a part of the ingredients used to make natural lotions and exfoliants.



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What is kimchi?

Kimchi is a staple in Korean cuisine, a traditional side dish of salted and fermented vegetables such as napa cabbage and Korean radish, made with seasonings including gochugaru (chilli powder), leek, spring onions or chives, garlic, ginger and fish paste. It is a staple of every Korean meal and is also used in many recipes such as kimchi fried rice. The craft of kimchi making in Korea is many thousands of years old, but the kimchi in the past looked and tasted different to the ones we enjoy today because chillis, for example, weren't introduced into Korea until the 17th century. Shellfish was also introduced in kimchi around the same time.

KIMCHI = spicy Korean pickle made by fermenting cabbage, radish, and other vegetables

Eating kimchi helps to improve your overall and digestive health, just like eating any other fermented food due to the high number of 'good' bacteria present that help to combat pathogens. I grew up smelling and eating sauerkraut which is similar in that it uses cabbage (but less time soaking in salt) because my granddad was Polish. There was also a large German immigrant population in my birth state of Pennsylvania where my grandparents settled and where I spent my teen years. Kimchi tends to be spicier than sauerkraut which is why I prefer kimchi.

Ingredients in kimchi such as ginger, garlic, cabbage and radish are high in antioxidants and have anti-inflammatory properties which can help prevent cancer and even slow down the aging process! Garlic contains selenium and allicin, both of which are helpful in decreasing the 'bad' cholesterol reserves in the body and increasing 'good' cholesterol, a protective factor against heart disease.

The word 'kimchi' is derived from the Chinese characters for 'salted vegetables', but it actually involves four stages: brining, seasoning, fermenting, and storing. Brining creates an environment inhospitable to harmful microorganisms, while encouraging the growth of good lactobacillus bacteria. Those friendly bacteria eventually convert the natural sugars in the vegetables into lactic acid, a preservative that is also responsible for kimchi's distinctive tang. The salt in the brine also helps absorb the seasoning, which is applied after the brining step either by smearing the vegetables with a seasoning paste or submerging them in a highly seasoned solution. The kimchi is then left to ferment in airtight containers to mitigate the risk of contamination by airborne microorganisms.

While the fermentation process is often begun at room temperature, it's typically continued in a colder environment like a fridge which helps the kimchi keep for longer. Traditionally, this was accomplished by placing the kimchi in storage pots, called onggi, either underground or in the shade. Kimchi was stored in large earthenware to prevent it from being frozen during the cold winter. As kimchi ferments, its lactic acid content increased, though the speed of fermentation is dependant on temperature—in higher temperatures the kimchi will ferment faster.

Making kimchi takes a couple of weeks but don't let that scare you! The actual prep is quick and the techniques are easy. The most difficult part is having the patience to wait! Remember not to open the container unless necessary. The fermentation process works best if it's left alone. The longer you leave your kimchi, the more complex flavours will develop.

Traditionally kimchi was made in the autumn, but today there are lots of varieties to eat all year round and you can use whatever produce is in season. There are literally hundreds of foundational recipes as well as many regional varieties.

Today we are making Baechu or Napa kimchi. This is the most popular of all the kimchi varieties.

Steps to perfect kimchi:

Salting: So much depends on salt when it comes to kimchi. A saline environment encourages the development of the lactic acid bacteria that drives the fermentation process while also eliminating the harmful microorganisms. Not enough salt can cause your veg to rot, while too much will kill off the good bacteria. Most kimchi recipes call for an initial brining that's roughly as salty as sea water; after this step, it's important to thoroughly rinse off the salt. Coarse sea salt or flaky salt is best. **DO NOT USE IODIZED SALT:** not only is it saltier by volume, the iodine can inhibit fermentation.

Flavouring: The second step is to make the paste that will flavour the kimchi. For a vegan version, you can replace the fish paste with tamari or kombu or shitake. This paste is easy to make in a food processor. Then you spread the paste between the leaves with your hands. Make sure to cover as much of the surface of the vegetables as possible. Then you pack them tightly in a jar, press down, and close the lid. Kimchi ferments best with little or no oxygen in the jar, so you may need to add a bit of water and/or a weight on top of the veg to keep them submerged. Always leave some room at the top of the jar as kimchi will rise as it ferments.

Fermentation: The last step is to ferment. I usually place my jars in a cool dark cupboard for between 3 days to 2 weeks (you will need to play around with yours to figure out how tart you like it; once it's reached a flavour you enjoy, place in the fridge where fermentation will continue but at a slower pace). Do not open the jar for the first few days!

Health benefits of consuming kimchi:

1. Supports good digestion. Kimchi contains high levels of lactic acid bacteria that are formed during the fermentation process. These bacteria are extremely beneficial for our gut and overall health. Lactobacilli help us digest the food we eat. They also help fight off common food borne pathogens in our digestive tract. Kimchi's antimicrobial properties are sure to ward us against uncomfortable gastrointestinal diseases.
2. Improves immunity. More than 70% of our immune system is in our gut. Because of this, probiotic rich foods like kimchi can help increase our overall immunity. Kimchi causes the immune cells to be more active and the antibodies to be more abundant. Kimchi also contains gochugaru. Red pepper, just like any other type of pepper, is known to have anti-carcinogenic and antioxidant properties, just like cabbage, which has also been scientifically proven to have anti-inflammatory properties that helps boost our immunity.
3. Provides antioxidants to help fight cancer. Kimchi is filled with ingredients and spices that are well known for their anti-inflammatory properties. The various vegetables used to make kimchi can help prevent certain cancers including colorectal and stomach cancer. Kimchi also contains thiocyanate and bactericides, which have antibiotic and anti-carcinogenic properties. Capsaicin found in gochugaru have been shown to aid our body's defense against lung cancer. Cabbage, garlic, radishes, scallions and ginger are also high in components that are antioxidants and anti-inflammatory in their nature.
4. Slows down the ageing process. Kimchi is rich in anti-oxidants which decrease the rate of ageing of the skin. It also inhibits cell oxidation. The selenium found in garlic keeps your skin and hair healthy; selenium is also a relevant part of glutathione, a booster that reconstitutes vitamic C and preserves it, thereby making it stronger and more effective in the body.
5. Lowers cholesterol. The garlic found in kimchi contains allicin and selenium—both of which are helpful in decreasing the cholesterol reserves of the body. These substances indirectly help you prevent chances of developing stroke and other cardiovascular diseases of any kind, due to its prevention of plaque build-up in the walls of your arteries. The dietary fibers in kimchi are especially beneficial to people suffering from diabetes and obesity, as they activate intestinal functions and reduce cholesterol and sugar levels.

BAECHU KIMCHI (Chinese Leaf Kimchi)

2 kg Chinese leaf cabbage

1 cup sea salt

1 ½ cups chopped leek

3 spring onions, finely sliced

1 cup shredded daikon

Glutinous rice powder paste: 1 T glutinous rice powder + 1 cup water, warmed over a stove, blended, then cooled

Kimchi paste:

1 cup gochugaru

3 T minced garlic

2 T minced ginger

¼ cup salted shrimp or ¼ fish sauce or fish paste

1 T sugar

THE DAY BEFORE :

1. Cut the cabbage in half and then the half into quarters. Salt the cabbage layer by layer (but not too meticulously), making sure the part closest to the bottoms is well salted.
2. Pour over water. Place a weight or a couple of plates on top to make sure the cabbage is completely submerged. Leave to stand overnight. You may need to use 2 bowls as these cabbages tend to be quite big.
3. The next morning before you come to the workshop, drain and rinse the cabbage 2-3 times with cold water making sure you wash off all the salt. Shake off the excess water. Set aside, cut-side down, and let it dry properly for about 30 mins. This is what you will have to bring with you to the class.
4. **Also you will have to sterilise the 2-3L jar that you are bringing to the class. The way you do this is:**
 - 1 - Preheat the oven at 100-120 degrees celsius.
 - 2 - Wash the jar and the lid with really hot water for a minute or so (no need for soap). Then place it in the oven upside down for about 15 minutes. Make sure you take the rubber seal off before putting in the oven.
 - 3 - After 15 mins they'll be ready. Just get them out and place them in a clean spot in your kitchen ready to use.

THE NEXT DAY:

- 3 Put all the ingredients for the kimchi paste in a food processor, then blitz until smooth. Add the glutinous rice paste. Add a little more water to loosen it up if it's too thick.
- 4 Add the daikon, spring onions and leek. Mix well.
- 5 Grab your cabbage. You can leave the sections as is, or chop the cabbage into smaller pieces which makes it easier to squeeze tightly into the jar later.
- 6 If you opt to leave the cabbage in quarters, using your hands, grab some paste and spread it between the cabbage leaves. Repeat until all the cabbage is evenly coated.
- 7 If you opt to chop the cabbage into smaller chunks, just mix in the paste with your hands until all the pieces of cabbage are well-coated.
- 8 Place the cabbage-kimchi-mix into the sterilized jar, pressing it down firmly to get rid of any air and space in between. Leave a gap at the top of the jar. Put on a tight lid. Leave in a dark place for anywhere from 3 days (don't open the lid!) to 2 weeks if you like it quite tart. The longer you leave it, the more sour it will taste. After this time, transfer it to the fridge. Kimchi is ready to eat in 7-10 days and will last in the fridge for about 6 months to a year.

Troubleshooting tips

Pack it in. One of the most frequent mistakes that kimchi newbies make is leaving in lots of air-filled gaps and bubbles after they've put the mix in the jar. This is a big no-no. Too much air will increase the risk of there being unwanted bacteria, produce off-flavors, and result in an unevenly seasoned and fermented kimchi. Ideally there should be brine covering the top.

Do not disturb. The span between when you pack your kimchi and when it's ready to eat can be days or even weeks, during which time you'll more than likely be tempted to open up the container to check on how things are going. Try to keep peeking and poking to a minimum. Introducing too much air into the jar will oxidize things and increase the risk of off flavors. If you do steal a nibble, make sure to pack the top layer down again and ensure that it's fully submerged in the brine.

Be patient. Like a fine wine, the longer you let your kimchi sit and ferment, the more complex and interesting it will be.

Can you see mold on the surface? If it's just a thin film, it's ok, just scrape it off. If it's black and furry, then discard everything. If in doubt, throw it out.