



Gut Health

Part 2, Probiotic Foods and Fermenting

The 18th century English explorer, Captain James Cook, was recognized by the Royal Society for having conquered scurvy among his crew by sailing with large quantities of sauerkraut. His 60 barrels of kraut lasted for 27 months, and not a single crew member had scurvy, which previously killed large numbers of the crew member on a long sea voyage.

For thousands of years, people have been making fermented foods. By fermenting vegetables, breads, meats, dairy products, beverages and more, these ancient cultures preserved foods that would have otherwise spoiled. Apart from preventing spoilage, fermented foods have other wonderful health benefits. The nutrients in fermented foods are more easily digested than their raw counterparts because the beneficial bacteria present help pre-digest the foods. Additionally, fermented foods help boost our immunity by helping to neutralize the pH in the gut, remove toxins and improve nutrient absorption.

It is becoming widely known that 60-80% of our immune system is in our gut. The immune system deals with aging, infection, disease, and general health. Consuming these probiotic and enzyme rich foods helps build the immune system and aides in digestion. Having the proper balance of gut bacteria and sufficient amounts of digestive enzymes helps you absorb more of the nutrients in the foods you eat. More micronutrients from our foods means better health!

PROBIOTICS

We have a saying in nutrition: “you either eat it, or you take it.” For example, you can eat grass-fed liver, or you can take it in capsule form. Obviously, the natural food form is preferred, but some people just do not enjoy the taste of certain health foods, or do not have access to quality forms. In that case, taking it in capsule form can be helpful. The same holds true for probiotics.

The official definition of a probiotic is “a live microorganism which, when administered in adequate amounts, confer a health benefit on the host.”¹ There are three main forms of probiotics that you can and should be getting from natural foods sources. When consuming all 3 types in food forms is not possible, these probiotics can also be found in supplement form. There are health benefits to consuming small amounts of all 3 forms regularly. However, when faced with illness, consuming a therapeutic dose (a dose that is required for a therapeutic effect) may be necessary.

TYPE 1- TRADITIONAL PROBIOTICS

Traditional probiotics are the most researched category of probiotics with thousands of scientific studies having been published. The most recent research has found that these species don’t colonize in the gut permanently when taken orally. Instead, researchers have discovered that they help combat unfavorable microbes and have immune modulating effects as they pass through the system. This makes them a very important factor for gut health and overall health.

There are hundreds of different species of traditional probiotics, but the most common forms

are Lactobacillus and Bifidobacterium. These can be found in:

- Kefir- similar to yogurt, but is fermented with yeast and larger amounts beneficial bacteria which makes the final product higher in probiotics and lower in lactose than traditional yogurt products. Recommended- 4oz daily
- Sauerkraut- made from cabbage and other vegetables. Sauerkraut is high in vitamin C, digestive enzymes, and is a good source of natural lactic acid bacteria, such as lactobacillus. Recommended- 2 tablespoons daily
- Kombucha- is an ancient fermented beverage made from sweetened tea. This tonic is known for providing digestive support, increased energy and liver detoxification properties. Recommended- 8oz daily

If consuming probiotic rich foods daily is not your thing, you can take a traditional probiotic daily. The recommended dose for a traditional probiotics is 25-150 billion CFU's/day (adults and children), or as recommended by your healthcare professional. Start at a lower dose and increase gradually as tolerated.

TYPE 2- BENEFICLE YEAST

Several strains of yeasts have health benefits. However, to date, *Saccharomyces boulardii* is the only one approved for use as a probiotic in humans. *Saccharomyces boulardii* has been shown to be beneficial for addressing diarrhea along with delivering anti-inflammatory, antimicrobial and antitoxin effects. It is most commonly used to treat candida albicans and Clostridium difficile infections. There are not a lot of known food sources of *Saccharomyces boulardii*, except for lychee fruits,

which means taking it in capsule form is often required. The recommended dose for *Saccharomyces boulardii* is 3-6 billion CFU's/day (adults and children), or as recommended by your healthcare professional.

TYPE 3- SPORE FORMING PROBIOTICS

Also known as soil based probiotics. We have the least amount of research on this category of probiotics. What we do see from the research are benefits that include the ability to: help repair leaky gut, survive the harsh gut environment, stimulate the immune cells that line the gut and increase antioxidant activity.

Spore forming probiotics are found in abundance in the soil. Therefore, foods rich in this category of probiotics are vegetables grown underground. To get the maximum benefit of these probiotics, you should gently wash (but DO NOT scrub or peel) your vegetables before consumption. You can also benefit from spore forming probiotics by walking in the dirt barefoot, gardening and playing in the dirt!

The recommended dose for spore forming probiotics is 3-4 billion spore cells per day, or as recommended by your healthcare professional. Start at a lower dose and increase gradually as tolerated.

Unless you require a higher dose of probiotics, getting these beneficial microbes from your food is preferred. If you choose to use probiotics in capsule form, you need to use caution when purchasing them. Like most supplements on the market, the regulations for probiotics is incredibly loose. When purchasing probiotics, make sure the type you purchase has third party data to confirm their purity, potency, and viability (on delivery and as it travels through the GI tract).

HISTORY OF FERMENTATION

Fermentation is the process of converting carbohydrates to alcohol or organic acids using yeasts or bacteria. It is one of the oldest forms of food and beverage processing and preservation known today. This tradition has been documented back to the Neolithic Era and to multiple cultures around the world. This practice started with alcoholic beverages made from fruit, rice, and honey, then expanded to other foods like breads, vinegars, vegetables and dairy products.

There are several different types of fermentation practices that have been used for thousands of years in multiple cultures around the world:

Alcoholic fermentation which is possibly the most well known of the three types. Its byproducts include alcoholic beverages and bread, which have been enjoyed by human civilization for millennia.

Acetic acid fermentation is the process that begins where alcoholic fermentation ends. The most common result of this fermentation process is vinegar.

Lactic acid fermentation is thought to be the oldest fermentation method, and produces products such as yogurt and sauerkraut. This type of fermentation practice has been found in nearly every culture world-wide, and evidence of its consumption goes back thousands of years.

With the invention of modern refrigeration in the early 1800's, global shipping and year-round harvesting of crops, this age-old preservation method has been all-but pushed aside. But with its simple, safe, economical, and health promoting benefits, it is time to revisit these ancient traditions!

FERMENTATION AT HOME

Fermenting at home is easy. For most vegetable ferments, it only takes a few ingredients (vegetables, water and salt), and about 5-10 minutes to prepare (and a few days-weeks to patiently wait). Most fermentation happens at room temperature and requires no electricity- so no special room or equipment is required. It is an incredibly economical way to keep your body healthy. Not only are homemade ferments cheaper than both commercial ferments or probiotics, but home fermenting is also an amazing way of preserving vegetables at the end of a growing season!

Fermenting can be intimidating at first. But rest assured that it is incredibly safe. According to Fred Breidt, a microbiologist with the USDA, “properly fermented vegetables are actually safer than raw vegetables.” The beneficial bacteria present when you ferment foods are strong and typically kill off any unfavorable bacteria, such as E. coli. It is very rare, but occasionally, you will have a batch of fermented food go bad. When this happens, you will know it! It will typically smell so terrible that you will not be able to get your nose close to it. In this case, you should discard the batch and start a fresh one. This incredibly stinky bacteria is known as *botulism*. The risk of *botulism* in a homemade ferment is incredibly low when following proper fermenting techniques. *Botulism* is exacerbated when a plastic container is used for fermenting beverages and foods. *Clostridium botulinum* bacteria thrive in the anaerobic conditions created by the air-tight enclosure in plastic. The bottom line is: follow the instructions for your homemade ferment and trust your senses with the final product. It is incredibly hard to mess up a homemade fermentation recipe!

REFERENCES

1- Sanders, M.E. Probiotics: Definition, sources, selection, and uses. *Clinic Infect Dis*. 2017 Feb 1;46 Suppl 2:S58-61.

HOMEWORK

Part 1: Ferment Something!

A beginner's guide to fermenting foods by Alana Holloway, founder of subscription box

1. Choose a suitable vessel. There are a few different types of fermenting vessels, but by far the most convenient is a glass jar. Choose one with a well-pronounced 'shoulder' so that you can wedge the vegetables underneath, stopping them from floating to the surface during fermentation. I prefer clip-top jars - they allow for the gasses produced during fermentation to be released slowly (they are self-burping), reducing the need to 'burp' (release the gasses by quickly popping the lid) the jars manually. Recycled jars can be used but will need to be burped every few days to release the build up of gasses.

2. Wash the jar in hot soapy water and rinse before use. There is no need to sterilize.

3. Choose your vegetables (and fruit if using). Most vegetables ferment brilliantly. There are no hard and fast rules - have fun and experiment. You can opt for a single vegetable ferment or a combination of a few. Organic is best (the chemicals used on non-organic vegetables can inhibit the growth of good bacteria), but if you can't get hold of organic, just wash thoroughly, peel and/or remove the outer layers before fermenting.

4. Choose your herbs and spices. Again, there are no rules here... experiment!

THE BASICS

Ingredients

- Vegetables of choice - beetroot, radish, onions and cauliflower all work really well
- Spring/filtered water
- Sea/Himalayan salt @ 2% salt to water. E.g. 100ml of water = 2g salt. You may have some excess brine as it's a guess as to how much you'll need to fill the jar once all the veg are inside, but it's best to have too much than too little.

Method

1. Make the brine. Dissolve a good quality salt (sea/Himalayan) in spring or filtered water. It's best not to use water straight from the tap as the added chlorine and fluoride inhibit the growth of good bacteria during fermentation.
2. Wash, chop (and peel if non-organic) your chosen vegetables. Pack into the washed jar(s), leaving 1 inch of room at the top, wedging the veg underneath the shoulder of the jar. Add your chosen herbs and spices (or layer as you go). Fill the jar with brine, not to the top but so it covers the vegetables by about 1cm.
3. Secure the lid. Leave on your kitchen worktop out of direct sunlight and away from any heat producing equipment (oven, kettle, etc.). Burp jar when necessary. Normally every few days is a good measure to go by. If it seems really gassy when you burp it, increase burping to every 1/2 days.
4. Taste after 10 days and continue to taste until they've reached the desired flavor. Refrigerate when you're happy with the taste, where it will keep for 3 months.

JUN TEA

The “Champagne” of Kombucha

Ingredients

- 8 cups filtered water
- 2t organic, loose leaf green tea (or 4 tea bags)
- 1/2c local, raw honey
- 1/2c Jun starter tea
- 1 Jun SCOBY



Brewing Directions

1. In a large stainless steel pot over high heat, bring 8 cups of filtered water up to 170F. Remove from heat, and add 2t loose leaf green tea in a tea infuser to the hot water. Allow to steep for 2 minutes. Remove tea infuser. Allow the infused tea to drop to 115F.
2. Once the temperature of the tea has dropped to 115F, add raw honey. Stir. Allow tea temperature to drop to room temperature.
3. Pour 7c sweetened tea into fermenting jar. Add 1/2c jun starter tea and 1 jun tea SCOBY.
4. Cover fermenting jar with filter and secure with a rubber band.
5. Store fermenting jar undisturbed in a dark cupboard between 68-77F (20-25C) for 3-6 days.
6. After 3-6 days, remove SCOBYs (there should be 2). Store Jun Tea in clean glass jars in the refrigerator. Reserve 1/2 cup of fermented Jun Tea and 1 SCOBY to use as a starter for your next batch.

If you want your Jun Tea to have a different flavor and/or some fizziness, you can do a second fermentation.

Directions for Secondary Fermentation

1. After 3 days of the original fermentation, remove the SCOBYs from the fermenting jar (store or use for an additional batches).
2. Add secondary flavor(s) (fruit, herbs and/or spices) to fermented tea.
3. If you want your final product to be slightly fizzy, seal the fermenting jar with a tight fitting lid. Make sure to “burp” the fermenting jar 1-2x daily. If you do NOT want your final tea to be fizzy, cover fermenting jar with a filter and secure with a rubber band.
4. Store the tea in a cupboard between 68-77F (20-25C) for 3 additional days.
5. After 3 days, filter out the secondary flavor and store the tea in 8oz glass jars in the refrigerator.

Storing Your SCOBYs

Each time you brew a batch of Jun Tea, you will end up with 2 SCOBYs (the original SCOBY and a “baby” SCOBY. Both SCOBYs can be used to brew additional batches of tea, stored for future batches, given to friends, fed to your dogs, used to make a probiotic face cream, or thrown away.

How to create a storage container that holds extra SCOBYs (also called a “SCOBY hotel”):

1. In a large jar, place any extra SCOBYs after the fermentation is complete. Fill the jar with enough sweet green tea/honey mixture to completely cover all the SCOBYs.
2. Cover the jar with a filter and rubber band so the SCOBYs can breath.
3. Store the jar in the refrigerator.
4. Feed the SCOBYs 1x per month with any extra sweet green tea/honey mixture.



BASIC KRAUT

dry salt ferments

Ingredients

- organic cabbage (green or purple)
- unrefined sea salt @ 2% salt to weight of cabbage
- caraway seeds, to taste (optional)

Directions

1. Remove the outer leave(s) from the cabbage and set aside (you will need these later).
2. Using a sharp knife, shred the cabbage into a clean ceramic bowl.
3. Add the salt and caraway seeds.
4. Using clean hands, massage the cabbage mixture for 3-5 minutes until liquid begins to extract from the cabbage.
5. Cover the bowl with a tea towel and set aside for 20-30 minutes.
6. Using clean hands, pack the cabbage tightly into a clean jar. Fill the jar leaving at least 2 inches at the top.
7. Pour the brine over the cabbage. The brine needs to completely cover the cabbage. If it doesn't, you will need to make extra brine with filtered water and salt.
8. Place the outer cabbage leaf on top of the shredded cabbage mixture. Place a heavy weight on top of the leaf to weigh it down.
9. Secure the lid onto the jar. Leave the jar on your kitchen counter out of direct sunlight and away from any heat sources.
10. Burp the jar every day.
11. After 5 days, begin to taste the kraut. Once the desired flavor is reached, store the jar in the refrigerator where it will keep for up to 3 months.



COCONUT YOGURT

instant pot recipe

Ingredients

- 2 cans full-fat coconut yogurt
- probiotic capsules (totaling 50 billion active cells)
- 1 tsp gelatin (like Great Lakes RED container), optional

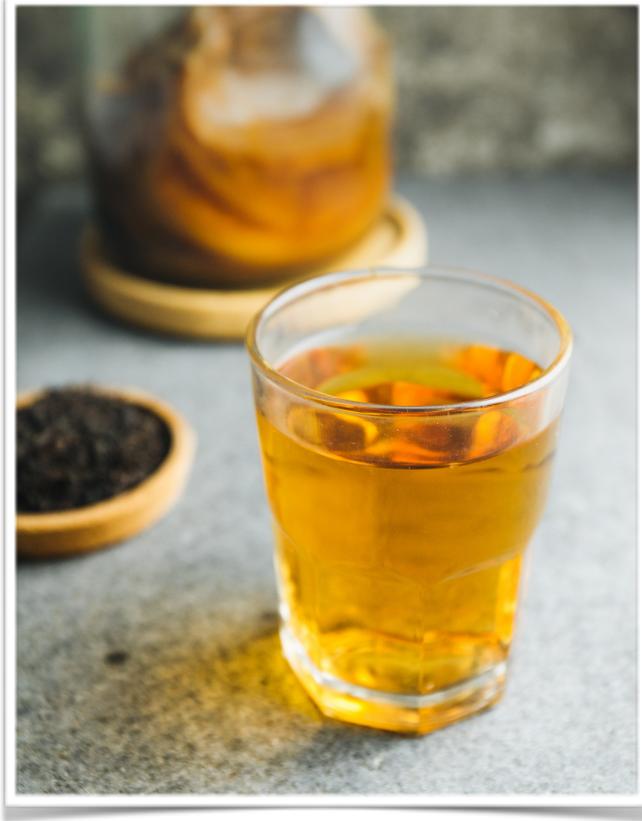
Tools

- Instant Pot with a yogurt function
- Glass storage jars

Directions

1. Pour the coconut milk into your instant pot.
2. Carefully open the probiotic capsules and pour over the coconut milk.
3. Add the gelatin. Whisk all ingredients together until well combined.
4. Press the YOGURT button on the Instant Pot. Use the "+" or "-" button to set the machine to 18 hours.
5. Allow the machine to complete the entire cycle. Once complete, open the lid and transfer the yogurt to clean, glass containers.
6. Store in the fridge for 2 days before consuming (to allow the yogurt to thicken).
7. Serve with your favorite toppings.

*Natural separation can happen as the yogurt sits in the refrigerator. Just stir the yogurt before consumption.



Fire Cider

to boost immunity

Ingredients

- 1 onion, coarsely chopped
- 7" ginger root, grated
- 7" horseradish root, grated
- 2 jalapeños, coarsely chopped
- 10 cloves of garlic, crushed
- 1 lemon, sliced
- 1/4 cup rose hips
- 3 sprigs fresh rosemary
- 1" turmeric root, coarsely chopped
- 1/4 tsp cayenne papper
- raw apple cider vinegar
- 1/4 cup raw honey (or more to taste)

Tools

- 1/2 gallon jar
- plastic lid

Directions

1. Prepare your roots, fruits, vegetable and herbs and place them in a 1/2 gallon jar. **
2. Pour the apple cider vinegar in the jar until the jar is full and all of the ingredients have been covered.
3. Use a plastic lid, or a piece of parchment paper under the metal lid to prevent the vinegar from touching the metal. Shake well.
4. Store the jar in a cool, dark cupboard for 1 month. Shake daily.
5. After 1 month, use a cheesecloth to strain out the pulp while reserving the vinegar in a clean jar.
6. Add the raw honey to the vinegar, and stir until incorporated.
7. Taste your cider and add more honey until you reached the desired sweetness.

** If you have never grated horseradish before, you are in for an experience! Be prepared for a powerful sinus opening. To lesson the impact of the horseradish on your sinus, grate the root in a well ventilated area with plenty of air flow.

Fire cider was developed by an herbalist in the 1970s. She started with apple cider vinegar, a fermented ingredient proven to have antibacterial and antioxidant properties, as the base, adding other ingredients such as horseradish (for decongestion), ginger (for warmth), garlic and onion (for antibacterial properties), cayenne (to boost metabolism and immunity), and honey to tie everything together and make the drink more palatable. Fire cider is said to restore and invigorate one's system, and additionally, many claim it has benefits that include boosting energy, warding off colds and flus, easing sinus congestion, lowering blood sugar, curbing cravings, and aiding digestion.