

Fantastic Fermented Foods

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Hippocrates...all disease begins in the gut...400 BC

For thousands of years, people around the world fermented foods as a way to preserve them, improve their flavor, and enhance their digestibility and nutrients. One of the quickest, easiest, and most effective ways to improve your health is by regularly consuming *traditionally* fermented foods. The fermentation process produces beneficial microbes that are extremely important for human health. These good bacteria help balance our intestinal flora and thereby improve overall health, including your immune system, and create a system of balance within our entire body.

Gut flora have a profound effect on our physical and mental health. A balance between the trillions of good and bad bacteria that live in our intestines is critical for a healthy immune system, for nutrient absorption, weight control, detoxification, mental well-being, and more. Although maintaining an ideal balance of bacteria is important, it is not easy. Intestinal microorganisms are affected by many things including the processed foods we eat, antibiotic and other drug use, acid-reducing medicines, toxins, and chronic stress. Learning how to deal with stress, avoiding processed foods, eating real, whole foods, and eating a wide variety of traditionally fermented foods can all help to maintain that balance.

Note: Modern methods of “fermentation” or pickling usually give little benefit because of heat processing, short-cuts, and the use of vinegar, preservatives, and other additives.

What is fermentation?

Fermentation is a process whereby beneficial yeasts, bacteria, and molds on foods break down the foods' sugars, starches, and proteins into acids, alcohol, carbon dioxide, and enzymes, producing beneficial microbes or probiotics. In other words, microorganisms break down food, and produce beneficial acids and/or alcohol.

Fermentation is a safe, low-tech, low-cost, incredibly simple method of preserving food that does not require expensive or unusual equipment, or precision in times, temperature, or ingredient ratios. And, it requires no heating, cooking, or freezer space. Fermented foods include krauts, pickles, fruits, cheeses, yogurt, meats, fish, sourdough breads, ciders, wine, and more.

Why make fermented foods?

Make fermented foods for the same reasons our ancestors did: to preserve foods, to make them taste better, and to make them more nutritious. Other reasons include the following:

- They are full of enzymes and help digestion; they digest enzyme-less foods eaten with them
- They are excellent chelators; their beneficial bacteria are potent detoxifiers capable of cleansing and detoxifying the body of a variety of toxins including mercury
- Their beneficial microorganisms help repair the lining of the gut, improve the immune system, and help control constipation, Candida, other yeasts, and internal parasites
- They are easy to digest (fiber, proteins, starches have been predigested or broken down)
- They are low-glycemic and low-carb (natural sugars have been predigested)
- They boost the neurotransmitter serotonin (for mood stabilization)
- They increase some vitamins (C, Bs, folic acid)
- They are alkalizing and they balance your body's pH; normalize stomach acid
- They help your body better absorb minerals (calcium, magnesium, zinc, copper, etc.) by reducing mineral-blocking substances such as phytates and oxalates (in grains, nuts, veggies, etc.)

What are fermented vegetables?

Fermented vegetables are raw vegetables—that remain *raw*—that have been salted, packed into an airtight container, and then left at room temperature for several days to allow the proliferation of lactobacilli. Lactobacilli break down the starches, sugars, and proteins in the vegetables into lactic acid, creating an acid environment where bad bacteria cannot grow but good bacteria can grow.

Is fermentation safe?

By keeping vegetables submerged under liquid, a near oxygen-free environment is created where oxygen-dependent pathogenic organisms cannot grow, and acidifying good bacteria is encouraged to grow. According to USDA microbiologist Fred Breidt, “Fermentation is one of the oldest and safest technologies we have. There has never been a documented case of food-borne illness from fermented vegetables.”

Why use salt?

Salt is anti-microbial in nature; it inhibits the growth of putrefying bacteria for several days until enough lactic acid is produced to preserve the vegetables for several months. Salt is also a powerful enzyme activator. Salt hardens the pectins in the vegetables leaving them somewhat crunchy and enhancing flavor. Salt-free ferments are possible, but can result in mushy vegetables.

What kind of salt, how much salt, etc?

- Use only non-iodized salt (iodine can halt fermentation)
- Use unprocessed, unrefined salt; it contains many minerals and trace elements that help the good bacteria grow
- Less salt is required for vegetables grown organically; their higher nutrient content allows lactobacilli to speed fermentation
- Using too much salt can halt the fermentation process by killing the microorganisms
- Cabbage is the only vegetable that can be fermented with less salt because its leaves are very rich in nutrients and lactic acid bacteria
- For a salt-free (and somewhat mushy) ferment you can substitute celery juice or seaweed
- In general, use 1 ½ -2 teaspoons of salt per quart of vegetables
- The amount of salt can be reduced up to half if you use whey or other starter culture
- ¼ cup of sauerkraut (using 2 tsp. salt per quart) contains about 369 mgs sodium

What is whey or other starter culture, and why use them?

Whey is the watery part of yogurt, kefir, or clabbered (soured) milk. Rich in lactic acid, lactobacilli, vitamins, and minerals, whey supplies beneficial organisms to immediately establish good bacteria in your jar of fermented veggies to ward off the bad bacteria. It also supplies important nutrients necessary for consistently successful results and it is *essential* for all fruit fermentation.

Instead of whey, you can use 2-3 Tbs. of liquid from a previous jar of kraut or other fermented vegetable. Just substitute this liquid in all recipes calling for whey. Or, you can buy starter culture (see Resources).

The use of homemade whey or other starter culture is highly recommended for all vegetables. If you use cabbage for 80% of your recipe, however, you can omit whey or starter, but is still recommended. Other things to know about whey include the following:

- It is rich in lactic acid; it inhibits bad bacteria from growing during fermentation
- It reduces the need for salt in a recipe by one-half
- It supplies lactobacilli enhancing the vegetables' digestibility and vitamins
- It shortens fermentation time and results in a consistently successful product
- It is essential in recipes calling for fruit; its high sugar content makes fruit more susceptible to spoiling organisms and whey immediately helps crowd them out.

How do I get whey?

You can make whey by straining yogurt, kefir, or clabbered milk; use the liquid part. You can also use kefir grains, water kefir, and you can buy freeze-dried cultures (see Resources). Do *not* use commercial concentrated whey, whey protein, or powdered whey; they do not contain live cultures.

What kind of water should I use?

Use only filtered, distilled, or spring water; tap water contains chlorine, fluoride, and other chemicals unsuitable for fermentation or consumption. If you must use tap water, boil it to evaporate the chlorine.

Why use herbs and spices?

Use herbs in fermentation for their wonderful flavors and their rich mineral and trace element content. Equally important, use herbs for their ability to prevent decay and to keep vegetables crisp. Juniper berries, garlic, and caraway seeds add flavor as well as preserve your fermented vegetables. Horseradish keeps pickled cucumbers crisp as does the tannic acid in oak, grape, and tea leaves.

What fermentation equipment do I need?

Only a few basic things are necessary to begin fermenting: Knife, slicer, grater, chopping board, vegetable pounder, large bowl, large spoon, jars and lids, measuring spoons. Optional: food processor, and canning funnel.

Which vegetables can be fermented?

Virtually any vegetable can be fermented; however, cabbage is probably the most popular. Buy whatever vegetables are available locally, and use organic. Lactic acid bacteria need the higher vitamins, minerals, and trace elements that organically grown vegetables contain.

Experiment and be bold! Try carrots, beets, turnips, radishes, peppers, spinach and other greens, okra, beans, cucumbers, squash, sweet potatoes, cherry tomatoes. Add some spices and herbs like parsley, sage, thyme, garlic, onions, ginger, fennel seeds, peppercorns, but use them sparingly! Fermentation increases the flavor, so little spice goes a long way.

Note: Carrots and beets are very high in sugar and usually result in slimy ferments, so add them to other vegetables rather than ferment them alone. You can, however, cut them into cubes or slices (not grated) and they will usually be okay if fermented alone.

What is the basic fermentation process?

- Wash vegetables thoroughly, then chop, shred, slice, grate, or keep whole (e.g., broccoli florets, green beans, celery, carrot sticks, spines of collard and other greens).
- Place vegetables into bowl, add salt and whey, and pound (unless using whole vegetables) with a meat hammer, flat wood spoon, etc., to release natural juices. Add water if needed.
- Place vegetables in quart-size jar, and press down firmly with large spoon until juices come to the top of the vegetables. Add salt water if necessary to cover vegetables.
- The vegetables and the liquid should be about one inch below the top of the jar.
- Close lid tightly and place jar in bowl (to catch oozing juice) and keep at 68-72 degrees (cover with a towel to keep from light) for about 3-7 days before transferring to refrigerator.
- Vegetables can be eaten immediately, but improve with age.

Note: Do not heat, can, or freeze jars of fermented vegetables! After sufficient fermenting time at 68-72 degrees, the jars are stored in the refrigerator where they can last up to a year.

When is my vegetable “done” fermenting?

When it's tart and tangy tasting (or 4.1 pH), and sometimes fizzy and bubbly. Generally it takes about 3-7 days at 68-72 degrees to complete the first part of fermentation. Refrigeration (up to 12 months) further ferments the food, greatly improving its flavor. The length of time it takes to ferment depends on several factors including the use of whey or other starter (speeds up the process), amount of salt (greater amount slows process), temperature (cooler temp slows process, warmer temp speeds process). Fermentation is somewhat tolerant of time and temperature variations. Experiment and see.

How often should I eat fermented foods? (At every meal!)

The positive effects of fermented foods lie in their *regular* use. Consuming 2-3 tablespoons of sauerkraut, yogurt, kombucha, etc., several times throughout the day is far more beneficial and easier for your body to adjust to than, for example, eating a half-cup at one time, three times a week.

Are store-bought fermented vegetables just as good as homemade?

Not usually. Most commercially available foods such as sauerkraut are pasteurized (check the label) to improve shelf life, and therefore kill the health promoting benefits of enzymes and probiotics. Also, most are made with vinegar making the product too acidic. Bubbie's brand fermented veggies *do* contain live enzymes and probiotics (I emailed the company).

How do I use fermented vegetables?

Eat fermented vegetables cold or *slightly* heated to protect their enzymes and probiotics. Use them in small amounts as a condiment or use in salads, on wraps, in sandwiches, with meats, with eggs, on toast, etc. They are great ways to add variety, a spicy kick, some unique flavors, and color into your meals. Experiment and have fun trying new ways to include raw fermented vegetables into your diet.

Here are a couple of ideas for using sauerkraut:

Kraut with Carrot and Dates

1-2 cups sauerkraut, drained
1 carrot, shredded
Parsley sprigs
¼ cup dates, cut up
1-2 Tbs. olive oil

Mix all ingredients together. Serve with toasted walnuts.

Apple, Kraut, and Fennel Salad

1-2 cups sauerkraut, drained
1 apple, sliced or diced
1 cup fennel, julienned
¼ cup toasted sunflower seeds, coconut, sliced almonds, or walnuts
2 Tbs dried cranberries, cherries, or currants
1-2 Tbs olive oil

Mix all ingredients together.

Recipes

Basic Sauerkraut (Makes 1 quart)

1 medium cabbage (about 2 lbs.), shredded, sliced, or chopped

1/2 tsp caraway or cumin seeds, 5-6 juniper berries (optional)

1 1/2 - 2 tsp salt if using whey or leftover kraut juice or other starter

2-3 tsp salt if not using whey or starter

2-3 Tbs homemade whey or leftover kraut juice (optional)

Optional: add grated carrots, beets, daikon, kale, kohlrabi, garlic, onion, parsley, etc., for added color and flavor.

Mix all ingredients in a bowl. Pound with a wooden pounder for 5-10 minutes to release juices. Place in a wide-mouth mason jar, and press down firmly with a large spoon until juices come to the top of the cabbage. Cabbage should be about 1 inch from top of jar. Add salt water if liquid does not cover cabbage. Put lid on jar tightly. Keep at 68-72 degrees for about 5-7 days before putting in refrigerator. Can be eaten right away, but flavor improves over time.

Basic vegetable recipe

Almost *any* organic vegetable can be fermented using the above Basic Sauerkraut recipe. You can ferment one vegetable or a mix of vegetables and herbs. The combinations are endless!

Note: If not using whey, leftover kraut liquid or other starter, using about 80% cabbage in your recipe will help ensure a successful product.

Some suggestions include the following:

- Cabbage, celery, kale, daikon, ginger, caraway seeds
- Cabbage, beets, carrots, Fuji apple, lime juice
- Cabbage, sweet potato, onion, ginger, turmeric, red pepper flakes, whole grapes
- Cabbage, cuke, collards, dill, parsley, red bell pepper, carrot, garlic
- Cabbage chunks, sliced daikon, carrots, green onions, ginger, whole cranberries
- Cabbage, kale, daikon, cherry tomatoes, parsley
- Carrot sticks, ginger
- Kohlrabi, celery, garlic, ginger, Fuji apple

Cukes/Pickles (Makes 1 quart)

2-3 lbs. thick-skinned, whole small pickling cucumbers

1 quart filtered water (less if using whey, and/or apple cider vinegar (1/2 -1 cup) for crunchy pickles)

3 tsp salt

Garlic, dill, or any other spices (optional)

2 Tbs whey, leftover kraut liquid or other starter

Add a few oak, bay, grape, black tea leaves, several whole grapes, apple cider vinegar, and/or cloves as a source of tannic acid which helps to keep pickles crunchy. Pickling Spice might work also.

Trim the blossom end off cukes (enzymes here can speed decay) and place in jar. Add leaves and pickling spices. Mix salt, water, vinegar, and whey together and pour over cukes to within one inch from jar top. Put lid on jar tightly. Keep at 68-72 degrees for about 2-3 days before putting in refrigerator. Can be eaten right away.

Cuke Mix (Makes 1 quart) (**Note:** I've had better success with this recipe than with the above one)

Cucumbers, sliced (make 50% of the total veggie mix)

Daikon radish, sliced

Carrot, sliced

Ginger

Dill

Juniper berries

Grape leaves

2-3 Tbs leftover kraut liquid, whey, or other starter

In bowl, mix all veggies gently. Put into jar; pour brine over (1 ½ - 2 tsp salt dissolved in 2-3 cups water); put lid on tightly; keep at 68-72 degrees 3-4 days; refrigerate.

Cabbage, Kale, Daikon Mix (Makes 1 quart)

Cabbage (80% of mix), shredded or sliced

Kale and or other greens, cut up

Daikon, sliced

Yellow squash, sliced

Cherry tomatoes, whole

Ginger, grated

1-2 tsp salt

2-3 Tbs whey, leftover kraut liquid, or other starter (optional)

In bowl, pound cabbage, kale, greens until juices are released, then add sliced daikon, squash, tomatoes, ginger, whey, salt and mix well. Pack into jar. Cover tightly, keep at 68-72 degrees 3-4 days, then refrigerate.

Cultured Daikon Radish and Carrot/Beet (Makes 1 quart)

2 pounds daikon radish

1-2 carrots or beets or both (can omit and use all daikon instead)

1-2 tsp salt

2-3 Tbs whey or other starter

Lightly peel and grate daikon and carrot. Put all ingredients in a bowl. Mix well and pound lightly with wooden pounder to release juices. Put mixture in quart jar and press down lightly with pounder until juices come to the top. Top of mixture should be at least 1 inch below the rim of the jar. Cover tightly and keep at 68-72 degrees for about 3 days before putting in refrigerator.

Fermented daikon is especially high in lactobacilli and vitamin C. It is valued as a digestive aid, a diuretic, a decongestant, and an anti-carcinogenic. Folklore says daikon rids the body of accumulated fats.

Root Veggie Mix (Makes 1 quart)

3-4 cups root vegetables, cubed or sliced (try carrots, turnips, kohlrabi, beets, fennel, daikon)

Fresh herbs or spices of your choice (dill, basil, parsley, cilantro, fennel sprigs, thyme)

2-3 Tbs starter (leftover kraut liquid, whey, or other starter)

Brine (1 ½- 2 tsp salt dissolved in 2-3 cups water)

Mix veggies and herbs in a bowl; put into quart jar; add brine. Cover tightly; keep at 68-72 degrees 3-4 days; then refrigerate.

Broccoli Mix (Makes 1 quart)

Broccoli florets, whole
Chard and/or other greens, torn
Celery sliced
Beet, cubed
Yellow squash, sliced
Green onions, sliced
Juniper berries, dill, parsley, oak or grape leaves, (optional)
1-2 tsp salt mixed with 2-3 cups water
2-3 Tbs whey, leftover kraut liquid or other starter

Mix veggies and herbs in a bowl; put into jar; add brine. Cover tightly; keep at 68-72 degrees 3-4 days; then refrigerate.

Green Beans and Garlic (Makes 1 pint)

2 cups of either raw or slightly steamed and cooled green beans
Garlic, minced
Parsley, basil, dill, whatever you have (optional)
1-2 tsp salt mixed in about 2 cups water
2-3 Tbs whey, kraut liquid or other starter
Put beans and herbs in jar, add salted water. Keep at 68-72 degrees 3-4 days, then refrigerate.

Salsa (Makes 1 pint)

2-3 fresh tomatoes (can also use canned, organic)
1 small onion, several green onions, or leeks, finely chopped
¼ cup chopped chili peppers and or bell peppers
3 cloves garlic, mashed
Fresh cilantro and/or parsley
Dried or fresh oregano, dill, parsley
Juice of one lemon or lime
1 tsp salt
2 Tbs whey or leftover kraut liquid
Water if necessary

Mix all ingredients and place in pint jar leaving 1 inch head space, adding water if necessary. Cover jar tightly with lid and leave at 68-72 degrees about 2 days, then refrigerate.

Fermented Papaya (Makes 1 pint)

1 ½ - 2 cups chopped ripe papaya and several seeds
¼-½ tsp turmeric
¼- ½ tsp cinnamon
¼ tsp salt
1 Tbs. whey or other starter (leftover kraut liquid)
1 ½ - 2 tsp Sucanat (sugar)
Juice of half a lemon or lime
Fresh ginger, cilantro or parsley

Combine all ingredients well in a bowl, then put into pint jar. Ferment at 68-72 degrees for 2 days, then refrigerate. This is bubbly, fizzy and delicious! Eat within 2 months.

This is a potent antioxidant, anti-inflammatory, and digestive aid.

Fermented Vegetable Drinks

In traditional cultures, lactic acid drinks were valued as medicine for relieving intestinal ailments and constipation. These drinks also increased lactation, gave strength to the sick and promoted stamina and well-being. They were also considered superior to water to relieve thirst. We now know that we can assimilate the electrolytes from these drinks faster and retain them longer than from plain water. In addition, like fermented veggies, drinks supply live enzymes and probiotics.

Vegetable drinks are made similarly to fermented vegetables, but instead of packing the vegetables very tightly in the jar, loosely fill the jar with whatever vegetables you want, add brine (1 ½ tsp salt per quart of water), starter culture (whey, or juice from leftover kraut, or previously made fermented juice); put the lid on tight, keep at 68-72 degrees for 3-4 days, then refrigerate. Strain, then drink.

To get double-duty from your cultured drink, save your strained veggies and keep about 2-3 Tbs of the juice to use as the starter for another jar; don't add as much water this time.

Vegetable drinks can also be made from the leftover liquid brine from any vegetable ferment. Just take the leftover juice from your last batch of kraut, or daikon, or pickles, dilute with water, and drink. Your glass will be loaded with live enzymes and probiotics!

Suggestions for fermented vegetable drinks (enough for 1 quart)

To each quart jar, add any of the following vegetable mixes, brine (1-2 tsp salt per quart of water), 2-3 Tbs whey or leftover fermented kraut juice, mix, cap tightly, keep at 68-72 degrees 3 days, then refrigerate.

Carrot Ginger

1 cup carrots, cubed; grated ginger, optional cinnamon.

Mixed Veggie Delight

1 ½ cups total of any combination of the following: cherry tomatoes, cucumber, cubed carrot and beet, celery, cabbage, kale, parsley.

Super Root Veggie Drink

1 ½ cups total of any combination of the following: cubed beets and carrots, fennel root, ginger, daikon or watermelon radish, turnip, kohlrabi, turmeric.

Great Greens!

1 ½ cups total of any combination of the following: cabbage, kale, fennel, chard, parsley, dill, cilantro, lime juice.

Cabbage Juice Tonic (Makes 1 quart)

1 ½ cups shredded cabbage

1-1 ½ tsp salt

2 Tbs whey or other starter (optional)

Water

Place cabbage in jar with salt, whey, and enough water to fill jar. Put lid on jar tightly. Keep at room temperature for about 3 days, then strain and refrigerate. Start a new batch by using the same procedure but adding ½ cup of the previous batch of fermented juice to the jar and proceed as before. The second batch will only have to ferment for 24 hours before being ready because of the starter added.

Drink ½ cup of the juice diluted with an equal part of water 2 or 3 times each day. Many cultures value cabbage juice as a remedy for digestive and skin disorders, as an immune booster, and a general detoxifier.

Beet Kvass (Makes 1 quart)

Beets are a powerhouse of nutrients; they are rich in calcium, iron, magnesium, phosphorus, carotene, B vitamins and vitamin C. Beets also cleanse the blood and liver, and stimulate the flow of bile.

1 large or 1 ½ medium beets, peeled and coarsely chopped (*not* grated)

2 Tbs whey or other starter

1 ½ tsp salt

Filtered water

Put beets, whey, and salt into quart jar. Add filtered water to fill container. Stir well. Cover securely. Keep at 68-72 degrees for 2-3 days. Then refrigerate.

Optional: To get a second batch of Beet Kvass after you have drunk the first batch, leave all the beets and about 2-3 Tbs. of liquid kvass in the bottom of the jar, and then add water to within an inch of the top of the jar. Leave at room temperature about 2 days. This batch will be a bit weaker than the first.

Beet Kvass is excellent as a general detoxifier, blood cleanser and alkalizer, digestive aid (promotes regularity), and it is a good treatment for kidney stones and other ailments. Drink ½ cup of the juice diluted with an equal part of water 2 or 3 times each day.

Resources

Books

Fallon, Sally *Nurturing Traditions*, 2001. Highly recommended book on eating real food including fermented foods.

Gates, Donna, *The Body Ecology Diet*, 2011. Has lots of information on the health benefits of fermented foods.

Harmon, Wardeh, *The Complete Idiot's Guide to Fermenting Foods*, 2012. An excellent book!!

Katz, Sandor, *The Art of Fermentation*, 2012. A more complex, detailed book on fermented foods. Not an easy read. For the experienced fermenter.

Katz, Sandor, *Wild Fermentation*, 2003. Excellent book.

Lewin, Alex, *Real Food Fermentation: Preserving Whole Fresh Food with Live Cultures in Your Home Kitchen*, 2012. Good, basic, how-to information and recipes.

Schoneck, Annelies, *Making Sauerkraut and Pickled Vegetables at Home* (no date). Excellent book on sauerkraut and cabbage.

Websites

Bodyecology.com. Excellent information from Donna Gates.

Culturesforhealth.com Excellent information on cultured foods of all kinds.

Fireflykitchens.com has good info on fermented veggies. See resource page for books and articles.

Immunitrition.com. Excellent information from Caroline Barringer.

Wildfermentation.com Good website!

Online vegetable starter cultures

Amazon.com. Search for vegetable cultures.

Bodyecology.com/control-weight-vegetable-culture-starter.

Culturesforhealth.com/caldwell-starter-culture-for-fresh-vegetables.

Immunitrition.com/Organic_Cultured_Veggies.

Wildernessfamilynaturals.com/category/culturing-products-veggie-culture-starter.