

Gathering Summary: Lacto-Fermentation, with Don Bates & Jeanette Cheney, August 17, 2011

Summary and photos by Catherine Haug
(photo of Cat's Bread & Butter Pickles, right)



Introduction

Presenters: Don Bates & Jeanette Cheney. [See sources and references for handouts.](#)

Vegetable Ferments

Don started the presentation with fermenting of vegetables, as a healthful method of food preservation without heat.

Why and when to lacto-ferment, by Don

Don started 4 years ago with a bumper crop of cabbage; his experience is limited to veggies. He is an avid fermenter because it is a great and tasty way to preserve food.

Why do this?

- cheap
- simple
- fast
- doesn't heat up the kitchen
- is a very low-energy method to preserve food through the off-season,
- does not destroy nutritional content with heat [Cat's note: It actually improves the nutritional quality of the food. For example, sauerkraut has more vitamin C than unfermented cabbage.]
- tastes good (but some are an acquired taste), and
- it's been used for 1000's of years all over the world

Basic process for veggies, by Don

Rinse your veggies, cut them up as desired, mix in the salt (use a stomper to get the veggies to give up their liquid, making a brine), put it all in a container, seal it and let it sit. Some veggies, like whole cucumbers, require added brine (instead of just salt) because they don't give up much liquid of their own.

Sealing the container is very important to get the right result, as it keeps air (oxygen) out. The bacteria require an anaerobic (without oxygen) environment to work best. Once air is introduced, bad bacteria and molds can take over.

See Don's recipe file (printable pdf): [Lacto-fermentation recipes, by Don Bates](#) (pdf) for specifics. He also brought several samples to view.

How to eat it, by Don

- Best eaten as a condiment with other things; they are salty, sour and may be spicy.
- Add lacto-fermented green beans or carrots to a cold potato salad (instead of salt).
- Kimchi is potent; Don serves it with unsalted rice.
- Serve it cold or room temperature. Do not cook it, as this kills much of the nutritional value. But you can add it as a condiment to cooked food.

Biology of lacto-fermentation, by Don

Foods rot/spoil due to putrefying bacteria & molds. You want to create an environment where those bad things cannot live. Because they need oxygen, and don't like acid nor salt, you deprive them of oxygen, and add acid and salt. You can add acid like whey, or juices from a previous batch, or you can add enough salt to keep the bad bugs at bay while the good bugs produce enough acid on their own. See [Sugar and Salt in Food Preservation](#) for more.

The primary acid produced by lacto-fermentation is lactic acid (so named because it is made from lactose, or milk sugar), but you do not need to add milk or lactose to the mix. The good bugs can also make lactic and other acids from other sugars, starches and fibers. Other acids produced by lacto-fermentation are acetic, butyric and glucuronic, but not all are produced in all end products.

Each bacterial species (or subspecies) has its own preferred pH (level of acidity), so some are more active at different times during the process. They also have their own preferred temperature. The fermentation process can produce a modest amount of heat that kicks warmth-loving bacteria into gear.

Where do they come from? They are in the air and on the food. For example, the blush on grapes and plums. You can also inoculate with whey or brine from an old batch to jump-start the process with bacteria.

These same bacteria also live in our gut, where they are a very important part of our immune system, help us to digest food we cannot otherwise digest, and provide important nutrients for us.

What to ferment, by Don and Jeanette

Just about any vegetable [and fruit] can be lacto-fermented. It should be:

- fresh, high-quality produce;
- picked early in the day (for maximum moisture content);
- washed well;
- removed of rotten or bruised spots; toss spoiled items.

Be reasonably clean, and use sterilized equipment.

Don't use vinegar in the brine. If you use vinegar, you will have to heat-treat the mix by canning, as vinegar will not preserve them long-term.

Time & Temperature, by Don

Veggies will ferment faster at warmer temperature, but the product will be more crisp, have better taste, and keep longer if fermented at cooler temperature.

Don prefers to ferment later in the season, starting at 70° F (in kitchen or pantry), then moves it to the basement at 60° F to finish.

Equipment, tools and ingredients by Don and Jeanette

Tools/equipment (You probably have all these in your kitchen):

- Knife or other slicer (such as a kraut board). A good, sharp chef's knife works great. Cut thicker to keep crunch, or thinner for a softer ferment.
- Digital scale to weigh ingredients (Don's method), or go by feel (Jeanette's method).
- Stomper: Don's is a section of a closet rod; Jeanette uses a potato masher.
- Bowls.
- Fermenting container. For large batches: Don uses a food-grade plastic containers; Jeanette uses a special German crock with lid (see Sources). For smaller batches, use glass jars; screw the lid on 'almost tight' to keep the air out but allow CO₂ to exit.
Important: use something to keep solids submerged.
- Lid/weight: to keep the contents submerged in a crock, Don uses a wood disc, about 1 1/2" thick and just the right diameter to fit into the crock with about 3/16" space all around. He covers the disc with plastic (or puts it in a plastic bag) to keep the contents from coming into contact with the wood, and to make a seal in the container. Then he weights it with a water-filled mason jar.

NOTE: The use of plastic is controversial: It is readily available and inexpensive, but the acids produced by fermentation can cause toxins like BPA in the plastic to leach into the food. The production of plastic is not sustainable.

Salt. Do not use iodized or free-flowing salt, nor any with anti-caking agents.

- Don uses Kosher salt. Remember that different salts have different densities, so always best to weigh the salt for accuracy.
- Jeanette uses fine-grind unrefined sea salt at rate of about 1 Tbsp per liter.

You can add a salt-water brine to cucs and other veggies that don't make much brine on their own.

Storage & maintenance

This is not a method for long-term storage (won't last 10 years), but it will last a season in cold storage, with some maintenance. If storing a long time, check every 3 - 4 weeks.

Don't despair to find mold on the top. This happens if the veggies rise above the surface of the brine, but only the exposed part is contaminated. Simply skim it off, then top off with more salt water brine to cover, and reseal.



Demonstration: Kraut & Traditional Brine, by Jeanette

(photo, left, of German Fermenting Crock from [Lehmans](#))

See Jeanette's Traditional Brine recipe in her printable recipe file: [Lacto-fermentation recipes, from Jeanette Cheney](#) (pdf).

Your crock should have even sides (not get narrow at the top) and be tall. Jeanette loves her German crock of the type pictured here (see Sources). They come in many sizes but are not inexpensive. You can find antique crocks at yard sales, but avoid any that might have a lead glaze.

1. Empty the crock: remove weights (stones, sterilized river rocks, plate, etc.). Then thoroughly clean the crock and weights.
2. Use long-handled tongs to stir the mix, to fill jars, and to empty the crock.
3. Chop or shred veggies into a large bowl; stir with tongs to mix.
4. Place a layer in bottom of crock, sprinkle with a bit of salt and use stomper to mix. Follow with repeated layers of veggies, sprinkle with salt, stomp until crock is filled (per crock instructions).
5. Add weights, then fill with enough salt brine to cover the weights (1 Tbsp salt/liter). Cover. The German crock has a moat that you fill with water before adding the lid.
6. It takes about 1 - 1 1/2 months to ferment.

Jeanette brought some from a previous batch for us to taste.

Other ferments, presented by Jeanette

See printable pdf recipe file: [Lacto-fermentation recipes, from Jeanette Cheney](#).

Kombucha

Kombucha has many benefits but here are a few (see Jeanette's recipe file for more):

- Alkalizing;
- Enzymes;
- Its bacteria are good for the small intestine;
- Can be used as a hair rinse.

A longer fermenting time (about 4 - 5 weeks) results in a stronger acidic flavor; a shorter fermenting time results in a sweeter flavor.

- Start with organic black tea (not green, white nor herb tea, as they can go bad). You can use flavored black tea such as Earl Gray, Peach, etc..
- Add sugar (refined white sugar works best) until dissolved, then strain the tea.
- Add a bit of left-over kombucha from last batch, and distilled (or boiled, cooled) water.
- Float freshly rinsed "mushroom" (mother) on top, then cover with a paper towel.
- Ferment at least 7 days, until desired flavor is reached.

About water: if you use distilled water, boil only enough to brew the tea, adding the rest at room temperature. If you don't use distilled water, you need to boil the entire amount, take out enough to brew the tea, and let the remainder cool to room temperature.

About the mushroom: It isn't really a mushroom, but looks a bit like one. It is actually a colony of bacteria and yeast, with a rubber-like texture. As it ferments, it will form a second mushroom on top, which can be shared with a friend or used for additional batches.

Always save a bit of the last batch to start the next one.

Jeanette brought a sample of a batch with a longer fermenting time: quite sour; and another of a batch with a shorter fermenting time: sweet, barely tart.

Rejuvelac

Jeanette did not demonstrate this, but brought samples of the tonic to taste. Barely tart and pleasantly sweet (from the soft wheat used to make it -- soft wheat is sweeter than hard wheat). Then she made dehydrated crackers from the grain mash left in the strainer. See [Jeanette's recipe file](#) for lots more. See also [Lacto-Fermentation Recipes: Vegetable Condiments & Tonics](#) for a slightly different version from *Nourishing Traditions*.

[Cat's note: Two other traditional tonic beverages are included in the [Condiments & Tonics file](#): Kvass (traditional beverage of Russia originating 8000 BC, and made from stale sourdough bread), and Beet Kvass (from Ukraine).]

Q: Could fermented grain be OK for someone with gluten issues?

A: Without knowing the nature of the gluten intolerance, it is not possible to answer this question. However, there is a possibility that fermenting the grain might help.

Yogurt & kefir, by Jeanette

Jeanette brought samples of soy-milk yogurt and coconut kefir (made with canned coconut milk). But traditionally, these delicious foods are made from dairy milk: cow, goat, sheep, buffalo, water buffalo, donkey, mare and so on. Yogurt has a more pudding-like consistency to be eaten with a spoon; kefir is more of a beverage.

- ▶ **Yogurt:** Jeanette uses powdered yogurt starter, either Natren or Yogourmet brands. But it can also be made from plain, unsweetened commercial yogurt, or from a previous batch (before sweetening or adding fruit).

Yogurt must be cultured at a warmer temperature than room temperature. Jeanette uses her pilot-light warmed oven. And you must first heat milk (dairy or vegan) to 180° F to sterilize it; heating also produces a thicker yogurt. Then cool it to culturing temperature (105° - 115° F) before adding the yogurt starter.

- ▶ For **kefir**, she uses Yogourmet brand powdered kefir starter, but it can also be made from plain, unsweetened commercial kefir. [Cat's note: Other brands of kefir powder, such as Body Ecology or from cheesemaking.com, can make several batches by using

a bit of a previous batch to start a new one. However, traditional kefir is made using kefir 'grains' which grow with each batch.]

Kefir cultures at room temperature (ideally about 70° F). If using pasteurized milk, you must sterilize it first by heating to 180° F (same as for yogurt), then cool to culturing temperature. If using fresh (raw) milk, you do not need to sterilize it first; simply warm it to culturing temperature.

NOTE: Ultra pasteurized or UHT milk are not recommended for either yogurt or kefir - they will not culture properly.

Q: Why are the fermenting temperatures so different for yogurt and kefir, and why must dairy milk be sterilized?

A: Cat answered this question. Yogurt is made by two types of bacteria working together, one of which is only productive at the warmer temperature. Kefir is made by a colony of several bacteria and yeasts that are most productive at room temperature.

Yogurt is a very fussy culture; it doesn't like crowding (too much starter) and it is not as strong as the bacteria that may be in raw or even pasteurized milk. It is unable to compete with these stronger bacteria for the sugars in milk.

Kefir is a very strong colony and will out-compete the good bacteria in raw milk, but there could be some bad bacteria in pasteurized milk with which it could not compete, so it is best to sterilize pasteurized milk.

Seed cheese

Start with either yogurt or kefir made from a seed or nut milk. Then allow to strain through cheesecloth or muslin at room temperature overnight or until desired texture and flavor are reached.

[Cat's note: this same method can be used to make cream cheese from dairy yogurt, kefir, or buttermilk.]

Sources

Local

- Mountain Valley Foods, 756-1422, 25 Commons Way, Kalispell (culture powders)
- Wellness Education Center, 755-8423, 103 Ponderosa Lane, Kalispell; www.juicefast.info (Fermenting crock, culturing powders)
- Withey's, 755-5260, 1231 S Main St, Kalispell (culture powders)

Web

- Body Ecology Kefir Starter (bodyecology.com/kefir-starter.html)
- Lehmans (German Fermenting crock): [www.lehmans.com/store/Kitchen Canning and Preserving Crocks and Lids German Fermenting Crocks germanferment?Args=](http://www.lehmans.com/store/Kitchen_Canning_and_Preserving_Crocks_and_Lids_German_Fermenting_Crocks_germanferment?Args=)
- New England Cheesemaking Supply Co. (www.cheesemaking.com)

For more information

Books

- *Wild Fermentation*, by Sandor Ellix Katz (see [Amazon](#) for a peak inside; www.amazon.com/Wild-Fermentation-Flavor-Nutrition-Live-Culture/dp/1931498237)
- *Sproutman's Kitchen Garden Cookbook*, by Steve Meyerowitz (see [Amazon](#) for a peak inside; www.amazon.com/Sproutmans-Kitchen-Garden-Cookbook-Temperature/dp/1878736868)
- *Nourishing Traditions*, by Sally Fallon & Mary G. Enig, PhD. (see [Amazon](#) for a peak inside; www.amazon.com/Nourishing-Traditions-Challenges-Politically-Dictocrats/dp/0967089735)

Recipes Handouts

- [Lacto-Fermented Vegetables](#), by Don Bates (6 pages)
- [Lacto-Fermentation Recipes](#), from Jeanette Cheney (Revised) (13 pages)
- [Lacto-Fermentation Recipes: Vegetable Condiments & Tonics](#) (5 pages)

Related printable pdf files on The EssentialList

- [Culturing Milk: Making Yogurt at Home](#)
(essentialstuff.org/wp-content/uploads/2011/07/Yogurt-photoEssay_EsL.pdf)
- [Yogurt & Kefir](#), from Powdered Culture
(essentialstuff.org/wp-content/uploads/2009/02/yogurt-kefir_esl.pdf)
- [Using Kefir Grains](#) (essentialstuff.org/wp-content/uploads/2009/02/kefir-advanced_esl.pdf)
- [Cheese & Tofu Making](#)
(essentialstuff.org/wp-content/uploads/2009/02/cheesemaking_fwade1b_esl.pdf)

Related articles on The EssentialList

- [Culturing and Fermentation Files](#)
(essentialstuff.org/index.php/files/files-culturing-fermentation/)
- [Cultured Dairy \(Yogurt, Kefir, etc.\)](#)
(essentialstuff.org/index.php/2011/08/20/Cat/cultured-dairy-yogurt-kefir-etc/)
- [Preserving Produce without Heat](#)
(essentialstuff.org/index.php/2010/09/04/Cat/preserving-produce-without-heat/)
- [Sugar and Salt in Food Preservation](#)
(essentialstuff.org/index.php/2009/07/08/Cat/sugar-n-salt-food-preservation/)
- [Making Yogurt, Kefir & Whey at Home](#)
(essentialstuff.org/index.php/2009/07/11/Cat/making-yogurt-kefir-wheyat-home/)
- [Lacto-Fermentation or Live Culture](#)
(essentialstuff.org/index.php/2011/06/20/Cat/lacto-fermentation-or-live-culture/)