

Making and Eating Fermented Foods: Why and How.

Humans have been fermenting foods for ages, using yeasts, molds and bacteria. The most useful bacteria for this are the lactic-acid forming bacteria, with which we create the lacto-fermented foods that are our topic today.

For thousands of years our ancestors used fermentation to create foods with nutritional value far superior to that of the things most modern peoples eat, and to preserve these foods without freezing or canning. Today, many of us pay both a high dollar price and a high health price to eat de-nutritified stuff that comes in cans, jars and boxes. It's a good time to change our ways. To buy, grow, even forage, some real food, and learn the miraculous secrets of fermentation. To watch our health improve and enjoy the satisfaction of being a true revolutionary, loosening the corporate ties that bind. I'm going to focus on food fermentation, not social fermentation, but eating is a definitely a political act.

We have evidence of humans fermenting foods for the last 12,000 years. Sumerians worshiped a goddess of beer. In the tropics, fruit is placed in a hole in the ground to ferment. In the Arctic, fish are fermented to the consistency of mush, and the natives claim it is their health secret. Africans drink sorghum beer and eat fermented millet porridge. The Swiss eat fermented dairy products. The Scotch ferment oak cakes. The French love wine and cheese. . Russians drink rye Kvass. and Kombucha, fermented tea. (Fermented tea is consumed in many countries, by different names.) Asians eat soy sauce, miso, sake, pickled ginger, daikon radish and other vegetables. The Japanese love umeboshi plums. (And so do I.) Indonesians eat tempeh. Koreans love spicy kimchi. Indians eat idli (fermented rice cakes), dosas (fermented lentil flatbread), chutneys and yogurt. Germans eat sauerkraut. And Americans used to make and eat live-ferment foods.

Only recently have modern peoples turned away from preparing and eating a wide variety of fermented foods, turning over their food choices and preparation to big corporations, for which it is neither convenient nor profitable to produce live-culture foods. Your great grandparents fermented foods and stored them in the stillroom,. Now, most of us are not even aware of that part of our culture (pun intended) having been lost.

For instance, Americans used to make lacto-fermented ketchup and relishes at home. Now Americans consume annually a half billion bottles of ketchup containing no live enzymes whatsoever, but distilled vinegar and lots of high-fructose corn syrup. Our pickles are not fermented but made with vinegar and our sauerkraut has been pasteurized. Our pickles and sauerkraut aren't even "ours" anymore. They're manufactured by the food industry.

I've brought a few resource books for you to look at, and would like to share a thought from each of the authors.

Bill Mollison, one of the founders of permaculture and author of *The Permaculture Book of Ferment & Human Nutrition*, wrote that we probably co-evolved with the micro-organisms used in culturing foods, which we have carried with us wherever we have migrated. Research now corroborates this belief.

In his book *Sacred and Herbal Healing Beers*, Stephen Harrod Buhner states that "human knowledge of fermentation arose independently through human cultures, that each culture

attributed its appearance to divine intervention and that its use is intimately bound up with our development as a species.”

Sandor Katz, author of the book *Wild Fermentation*, credits fermented foods with his survival of AIDS. He explains that we are in a symbiotic relationship with microbial cultures, that these single-cell life forms, microflora, digest the food we eat into nutrients we can absorb, protect us from potentially dangerous organisms and teach our immune systems how to function.

Sally Fallon, author of the great combination text/cookbook *Nourishing Traditions*, says that without culturing there is no culture. That the USA has no culture because we only eat food that has been canned, pasteurized or embalmed.

There is so much wonderful information about the effects of eating fermented foods and of the fermentation process itself that I've made a list of bullet point facts to share with you.

- Lactobacilli are present on the surface of all living things. You can easily learn the techniques of growing and using them to convert starches and sugars in vegetables and fruits into lactic acid, a natural preservative that inhibits putrefying bacteria.

- Lactobacilli contribute to the protection of the body against infections and stimulate the immune system. (Dr. James Mercola points out that 80% of our immune system is in our digestive system, in the form of microflora, and that these good-guy bacteria prevent allergies by training our immune system to distinguish between pathogens and non-harmful antigens, and to respond appropriately. But pasteurization of foods that used to contain these flora has cut off our natural supply of them. Hence the new popularity of probiotics.)

- Lactic acid does not acidify the body. While alcohol and acetic acid must be decomposed and eliminated by the body, lactic acid can in large part be used by the body. Lacto-fermented foods normalize the acidity of the stomach.

- Lacto-fermented foods improve the digestion process by regulating the level of acidity in the digestive tract and by stimulating the production of beneficial intestinal flora. The mucous membranes of our intestinal tract are protected by bacteria that create an acid environment in which pathogenic bacteria cannot multiply. Lactic-acid bacteria survive transit into the large intestine.. They can prevent the growth of coliform bacteria and prevent agents of cholera from establishing themselves in the intestine. They can even inhibit and inactivate certain carcinogens.

- Lacto-fermented cucumbers dissolve precipitates of uric acid and thus prevent the formation of stones.

- Lactobacilli act as anti-oxidants, scavenging cancer precursors known as free radicals.

- The culturing process generates superoxide dismutase GTF chromium, detoxifying compounds like glutathione, phospholipids, digestive enzymes and beta 2,3 glucans.

- Sauerkraut contains large quantities of choline, which lowers blood pressure. It also contains acetylcholine, which reduces blood pressure, slows the rate of the heartbeat and promotes calmness and good sleep. Acetylcholine also has a beneficial effect on the peristaltic movements of the intestine.

- Lacto-fermentation removes toxins from foods. For instance, it removes cyanide from cassava, rendering it edible and nutritious. Less dramatic, but more important for grain-based cultures, it removes phytic acid from grains, nuts and seeds, which otherwise would block mineral absorption and lead to deficiencies. Eating improperly prepared grains is a major cause of osteoporosis in our culture.

Virtually all pre-industrialized peoples soaked or fermented their grains before making them into porridge, breads, cakes and casseroles. The coatings of grains, nuts and seeds contain phytic acid that combines with calcium, magnesium, copper, iron, and particularly with zinc, in our intestinal tract, blocking their absorption, so that a diet high in grains poses great risk of mineral deficiencies and bone loss. Sour soaking and fermentation of grains, such as done by traditional cultures worldwide, allows lactobacilli and other healthful microorganisms and enzymes to break down the phytic acid. In addition, digestive enzyme inhibitors are neutralized, beneficial enzymes produced, vitamin levels increased and gluten and other difficult-to-digest grain proteins partially broken down for easier digestion and absorption.

Grains are severely damaged in the making of commercial making of breakfast cereals. Slurries of grain are forced through tiny holes at high temperatures and pressures in giant extruders, a process that destroys nutrients and turns the proteins in grains into veritable poisons. (An experiment was done using 3 groups of rats. One group was fed rat chow. A second group was fed commercial breakfast cereal. A third group was fed only the box the cereal had come in. the rat chow rats remained well. The rats eating the breakfast cereal began to have convulsions and to attack each other. Every one of the cereal-fed rats died before any of the rats eating only the box died.)

Although grains are the base of our culture's diet, many people simply do not do well with grains. A year and a half ago my husband and I did a 2-week no-grain experiment and liked the results so much that we simply stopped eating grains. We eat them occasionally "socially," but we don't purchase them and take them home. It happens that grains are not appropriate for our metabolic type.

(For both why-to and how-to information on proper preparation of grains, see www.westonaprice.org/foodfeatures/be_kind.html/, also my recipe for flatbread.)

- Fermentation also reduces or eliminates nitrites, prussic acid, oxalic acid, nitrosamines and glucosides. It also reduces aflatoxin and other toxins secreted by molds. (In a summer with little sunshine, nitrites formed in vegetables are broken down by lacto-fermentation.)

- Lacto-fermentation facilitates the synthesis of certain vitamins, such as vitamin C, and B12 (which can only be produced in the presence of lactic bacteria).

- Fermentation of primitive rice wine or beer in Indonesia increases lysine 15%, thiamine 300% and doubles the protein content. Natural cassava root contains 1 1/2% protein, but fermented cassava is about 8% protein.

- Brewer's yeast contains the highest glucose tolerance factor found in any food. It can reduce insulin requirement for diabetics, reduces serum cholesterol and triglyceride levels in the elderly.

- Lactic acid and enzymes facilitate the breakdown of proteins and hence their assimilation. (Raw-food proponents tout the benefits of eating enzyme-rich raw foods. Raw foods can be difficult to digest, and are unsuitable for people of the Vata Ayurvedic constitutional type. That's us thin, chilly folks. Raw foods make poor full-time fare for those of northern climes in winter, too. However, everyone can eat enzyme-rich lacto-fermented foods, anytime.

- Fermentation preserves food. This is a biggie. It's one of the main ways traditional cultures preserved food. Fermentation organisms produce alcohol, lactic acid and acetic acid, all “bio-preservatives” that retain nutrients and prevent spoilage.

Preserve Vit. C. (Captain Cook was recognized by the Royal Society for conquering scurvy among his crews by sailing with large quantities of sauerkraut. 60 barrels of kraut lasted his crew 27 months on his 2nd round-the-world trip, and not a single sailor got scurvy. The last barrel of kraut was still perfectly preserved after 27 months. Humans have used lacto-fermentation to preserve foods before we had refrigerators and preservatives, and we may do so again.

- Lactic acid not only keeps vegetables and fruits in a state of perfect preservation but also promotes the growth of healthy intestinal flora. (For long-term preservation, a high lactic acid brine is needed.)

- Most fermented beverages contain Vitamin C in profusion, and preserve it.

- Lactobacilli produce antibiotic and anti carcinogenic substances

- Lacto-fermentation improves the bioavailability of minerals present in food.

- Lacto-fermentation creates new nutrients. Microbial cultures create K and B vitamins, including folic acid, riboflavin, niacin, thiamin and biotin.

- Lacto-fermenting can double the digestibility of starches.

- Lacto-fermentation can turn otherwise inedible parts of animals into nutritious foods. The Sudanese use 80 distinct fermentation processes to create an incredible array of ferments that utilize every bit of animal flesh and bone.

- Human inhabitation of some areas of the planet is possible only through the fermentation of local flora to increase the nutrient levels.

- Historically, populations in many areas of the world have had to make do with scarce nutrients, but it's no longer just "third world" countries that are experiencing food shortages. There have been food riots in many countries around the world in the past year, mostly ignored by our media. Ten percent of Americans are now using food stamps and growing numbers of us are experiencing “food insecurity” for the first time. Knowing how to put micro-organisms to work creating nutrients for us is an excellent skill to acquire.

- Making your own allows you to make fermented beverages not available elsewhere at any price. One of my favorite beers to make is ginger with lemon. I feed the yeast on organic sorghum syrup and sucanat and find the sound of the carbon dioxide blurping gently through the airlock both satisfying and reassuring. I have lots of little friends in my kitchen!

- Lactobacilli promote digestive health by inhibiting bacteria such as Shigella, Salmonella and E. Coli. Lactobacilli compete with pathogens for receptor sites at the mucosal cell surfaces of the intestines.

- Each of us is host to and in symbiotic (mutually rewarding) relationship with more than 100 million bacteria. We evolved from and with these organisms and cannot live without them. We live better when we maximize our mutual cooperation. By eating a variety of live fermented

foods, we promote diversity among microbial cultures in our bodies.

Sandor Katz points out that biodiversity is just as important at the micro level, that our bodies are ecosystems that function most effectively when populated by diverse species of micro-organisms. He points out that by fermenting foods and drinks with wild micro-organisms present in our home environment, we become more interconnected with the life forces of the world around us. “Your environment becomes you, as you invite the microbial populations you share the Earth with to enter your diet and your intestinal ecology.” [Eat that, Pasteur!](#)

- Food offers us many opportunities to resist mass marketing and commodification. “The time has come to reclaim the stolen harvest,” writes Indian activist Vandana Shiva, “and celebrate the growing and giving of good food as the highest gift and most revolutionary act.”

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HOW TO LACTO-FERMENT

You can get some good ideas from Fallon's recipes, which include relishes, fruit recipes, etcetera. However, note that a starter culture is not necessary. There are plenty of great micro-organisms hanging around just looking for a job. The salt holds “bad guy” bacteria back while your “good guy” bacteria get to work. You can use more salt in cold weather, less when it's warm. (It's common in France not to even use salt. Sally Fallon says whey is needed when fermenting fruit, but Sandor Katz' recipes use no starter culture.)

You do get a different culture when you when you go with the bacteria in the air/on the veggies rather than using whey. I like the idea of eating locally!

To make your brine add about 2 tsp salt to each cup of pure water. Maybe less in hot weather, a bit more in winter. Use pure sea salt. No iodine, no aluminum silicate, no super-heated salt. Just sea salt.

If you use kosher salt you will need 1.5 times the volume, as the large crystals take up more space. You may also need to boil the water to dissolve kosher salt.

You can use less or even no salt if you add whey, which is rich in lactic acid and lactobacilli.

To obtain whey full of live bacteria, strain organic yogurt through several layers of very fine mesh cheese cloth or an undyed piece of cotton with a weave that will allow you to strain through it. (I use 7 layers.) Twist the dampened cloth above a “ball” of yogurt, then squeeze. Very gently at first, then harder as the yogurt gets drier and drier. Let it sit a minute or two between squeezes for the remaining whey to come to the surface of the gradually thickening ball. You don't want globs of yogurt in your whey! Set your cheesecloth in a fine mesh strainer over a bowl, to catch the whey. If a blob of yogurt falls onto the strainer, just quickly shake it off before it falls into your whey.

The more salt you use, the slower the fermentation will take place and the more acidic the result will be. (Many folks make salty kraut that takes weeks to ferment, but you can be eating low-salt ferments in 3-4 days.)

Use well water, spring water, distilled water, reverse osmosis water or purified water. Do not use city tap water.

You can use any kind of jar that has a lid you can secure. I get wide-mouthed pickle jars at our recycling center. Use glass, enamelware or gourds. Not plastic or metal.

Don't scrub the surface of the fruits/veggies you wish to ferment, or use anything to “decontaminate” them. (Why eat anything that needs decontamination?)

Organic produce will supply more nutrients for the fermentation process. Trace minerals must be present in sufficient amounts for enzymes to function.

Cut the veggies or fruits into pieces thin enough for the bacteria to get at them. Cukes can be cut into the standard sizes you are used to seeing sold in stores.

You may want to spread a thin layer of coconut oil on the non-gasket part of the jar lid that will be exposed to the acid brine, to make the lid last longer and avoid metal contamination.

When fermenting cucumbers, adding some slices of carrot helps keep the cukes crispy. I ferment cukes year round, so in the winter I am just using slicing cukes from the co-op, not pickling cukes. They are still pretty crisp, if I add some carrot. (Something to do with giving the bacteria some sugars, I have read.)

Pack as many cut-up veggies in a glass jar as you can, adding spices if you want. Fill up the remaining space with the brine, set a small hard stone (Soft stone will come off in the brine as it becomes acid.), piece of smooth glass or non-toxic pottery on top of the veggies to hold them down. You want to keep the fermenting foods under the protection of brine.

Fill the jar up to within 1/2 inch of the top and screw the lid on, leaving it just loose enough for carbon dioxide that will bubble up to escape, but snug enough to keep out air, as lacto-fermentation is an anaerobic process. The CO₂ will force air out of the jar, as it is heavier than air.

Keep the jar at room temperature to facilitate the lacto-fermentation process. Don't open the jar for 3 days, to keep oxygen out during the first part of the lacto-fermentation process. (If the weather is really hot, check after 2 days.) Then do a nibble test daily till the vegetables taste pickled. If they go too long, they will get soft. When done, stick the jar in the refrigerator, which will bring the fermentation process almost to a stop. After several hours in the fridge. cucumbers will become translucent. (Don't leave them out fermenting waiting for them to do this, or they will get too soft most of the time.)

Below 72 degrees, the fermentation process slows down. Above 72, it speeds up. But do not purposely keep your fermenting jar warmer. If you have to go on a trip and won't be back till after the food will probably be fermented, just set the jar of the partly-pickled veggies in the fridge and take it out to finish fermenting when you get back.

There is often a coating of what looks like white dust on the top of the brine by the time the veggies are pickled. This is Kahm yeast. It is OK to eat it, but I usually skim it off.

If left fermenting too long, the pickles will become soft. Still fine nutritionally, but not appetizing. I had this happen once and I ran the whole works through the blender and used it to drink and in salad dressing.

I've never seen one, but I have heard it's possible to have a pickling failure. If “bad guy” bacteria won out, (Because the vegetables are nutrient-deficient or your salt or water contains impurities, including too many minerals), your vegetables would smell terrible, because they would be rotting, not fermenting. So you'd definitely know!

The acidic or alcoholic environments created by fermentation are inhospitable to bacteria that cause food poisoning. Any funkiness is usually limited to the top layer which is contact with microbe-rich air, and is easily discarded. Trust your nose and taste buds.

If you are not sure whether the veggies are pickled enough, stick them in the fridge. and try them the next day. If you want to pickle them some more, the process will continue again if you leave the jar out at room temp. any time in the future.

Fermented veggies will keep for months in the refrigerator, though they will continue to ferment just a bit so they become more pickled/sour/soft over time. Our ancestors kept them in the root cellar. (If you own a home with a basement, I heartily suggest you create a root cellar there for storing veggies and fruits through the winter. Ask me how to make one.)

Be sure to use the brine, too! You can drink it, or put it in salad dressing. We use it that way, instead of vinegar.

When introducing lacto-fermented foods to your diet, do it gradually, as there may be die-off of “bad guy” bacteria in your gut that could lead to gas, etcetera for a while. Try a couple of tablespoons full a day a first, then at each meal. Some folks go to a half cup at each meal.

Eggshell will neutralize acidity of lacto-fermented drinks. One shell per gallon.

When fermenting grains or legumes, cooking, mashing, sprouting or denaturing improves efficient fermenting.

If you are using ground grains, grind them fresh yourself, as they rapidly lose nutrients through oxidation and can become rancid.

Note:

The fermentation process transforms the sugars naturally found in root vegetables like beets into more easily assimilated forms. Diabetics can eat sweet root vegetables after they have been fermented.

The lactic acid produced by the lactic bacteria is not acidifying to our body. It is very helpful, in fact, to those who have arthritis and other over-acid conditions. It's alkalizing in its effect.

People with candida will benefit greatly from fermented foods.

There is no lactose in fully lactofermented foods. The lactobacteria convert lactose into lactic acid. Thus a lactose-sensitive person can safely eat milk that has been allowed to lacto-ferment till it is very sour. (It does get very sour.)

The "good guy bacteria" in lactofermented foods act to kill off the bacterial and fungal infections that so often plague people with Irritable Bowel Syndrome.

Citrus fruits naturally have a bacteria on their skins that inhibits mold. Don't wash them until you are ready to eat them.

Research indicates that humans evolved eating lacto-fermented foods and need them in order to have optimal health.

RESOURCES

Nourishing Traditions by Sally Fallon

Nutrition and Physical Degeneration, by Weston A. Price (See long excerpts at Soil & Health website.)

www.WestonAPrice.org

Wild Fermentation by Sandor Katz

E-mail him with fermentation questions at: sandorkraut@wildfermentation.com

www.wildfermentation.com

The Permaculture Book of Ferment & Human Nutrition, by Bill Mollison. Out of print but I think it's available for download at the Soil and Health Library website: www.soilandhealth.org. This book

contains priceless information on preservation, storage, and processing techniques from around the world. Areas covered include nutrition and environmental health; Beers, wines and other beverages; preserving meat and dairy products; and preserving fruits, vegetables and grains ...with the aim of empowering people and communities to retain the ability to grow, prepare, and store our own foods.

Sacred and Healing Herbal Beers, by Stephen Harrod Buhner

Handbook of Indigenous Fermented Foods, by Keith Steinkraus

Stolen Harvest: The Hijacking of the Global Food Supply, by Vandana Shiva (social and political issues)

RECIPES

Ginger/carrots

1 cup of firmly-packed grated carrot, a bit less than one tsp. of finely-grated ginger, 1 1/2 tsp. of salt. Pound the carrots a bit to release enough juice to cover them, then set a few small hard stones on top before closing the jar.

Beet Kvass

To make 2 quarts of beet kvass, chop up 3 medium beets, add 1/4 cup whey and 1 tbsp. salt, adding pure water to fill the container. Keep at room temperature for two days, then keep in frig. When most of the liquid has been drunk you can refill with fresh water and repeat the process. You can save some of the kvass to make more, instead of using whey. (Chopping is recommended vs. grating, which can result in too-rapid fermentation that creates more alcohol than lactic acid.)

Beets are highly nutritious. Sally Fallon says that 4 oz. of beet kvass twice a day is a great blood tonic: "promotes regularity, aids digestion, alkalizes the blood, cleanses the liver and is a good treatment for kidney stones."

Kombucha is another delicious, refreshing and salutary beverage, made from tea, sugar and a culture or "mushroom." Please see a highly-informative article about it at: www.westonaprice.org/foodfeatures/kvass.htm/.

The following recipe and others can be found at: www.rejoiceinlife.com/recipes/starter.php

Basic Recipe for Sauerkraut

- * 1 litre glass jar with plastic lid
- * Cabbage
- * Beetroot
- * 1 1/2 teaspoons salt
- * 2 tablespoons of Kefir whey

Grate beetroot with a hand grater, process cabbage in a food processor, then mix equal quantities (grated) of each in a large bowl with the salt and Kefir whey. You may wish to add some ground Juniper berries or a sprig of sweet basil or dill for additional flavour and nutrients. You are advised to keep your recipes simple at first, so that you may learn about the smells and tastes of fermented foods. Once you have some experience, you may wish to incorporate vegetables and fruits such as onions and green papaya.

Our forbearers would have chopped the ingredients and pounded them with a wooden mortar in a large crock to bruise the cell walls. Graters and food processors make the task easier, but maybe not as much fun.

Press the mixture into a clean glass jar with a wooden spoon, removing all air bubbles and making sure that juice covers the mixture. Leave at least one inch or more of space at the top of the jar to allow for expansion. Screw on a plastic lid tightly and place the jar on a saucer, in case the fermentation process causes the juice to overflow.

Store the jar in a cupboard for 3-5 days (depending on the ambient temperature) before transferring to the refrigerator. Keep an eye on the sauerkraut because the mixture needs to be kept wet with its juice, otherwise the top layer may dry out and go off. If any mould develops on the surface (which it shouldn't in a lactic acid environment) just scrape it off. If it smells putrid or you have any doubts about the quality, then discard the sauerkraut and start again. The sauerkraut may be consumed after a couple of weeks, though if you allow the fermentation process to continue for a month or so in the refrigerator you will be

well rewarded with a most delicious flavour (and probably never eat commercially made coleslaw or sauerkraut ever again).

Orangina

Take a 2 litre flagon and add a 1/4 teaspoon of Celtic sea salt, the juice of a couple of oranges and a lime, 2 cups of herbal tea such as green tea, and 2 teaspoons or more of freshly ground ginger. Half fill the flagon with filtered water, add a 1/4 to 1 cup of Kefir whey, add a few teaspoons of raw honey if you wish and fill the flagon to within 3 inches from the top. Cap tightly and store in a cupboard for 2 days before transferring to the refrigerator. The beverage should be gently effervescent.

Ginger beer

Traditional ginger beer uses a starter. To a 250 ml jar add 1 cup of water, 1 teaspoon of ground ginger, 1 teaspoon of honey and 2 teaspoons of Kefir whey. Add 1 teaspoon of ginger and raw honey each day for 7 days.

Strain the starter culture through cheese cloth into a glass bowl. Add 500m of water, 150mls of fresh lemon juice, 3/4 teaspoon of salt and 5 tablespoons of honey. Stir well and divide the slurry equally between three 750 ml beer bottles. Top up the bottles with filtered water to within 3 inches from the top and cork with clamp down wine corks. Leave to ferment at room temperature for a week before transferring to the fridge.

To start a new culture, add a teaspoon of the ginger grounds from the cheesecloth to a clean jar. Add one cup of water and a teaspoon of ginger and honey.

Modify the recipe to suit your taste buds

Sweet Potato Fly - Light and fruity with mild tartness.

1 tsp./5ml powdered mace [I'd skip the mace, myself. Suit your own taste.]

2 large sweet potatoes

2 cups/500 ml. sugar

_ cup/125 ml. whey

1 gallon pure water

2 lemons

cinnamon

nutmeg

1 eggshell

Boil the water with mace. Cool. Grate the sweet potatoes and rinse well through strainer to remove the starch.

In large bowl, combine the potatoes, water sugar, whey, juice and grated peel of the lemons and a pinch each of cinnamon and nutmeg. Add the cooled mace water. Stir, cover to keep insects and dust out, and leave it to ferment in warm spot for about 3 days. Strain into a glass container, refrigerate and enjoy.

Shivani's Flatbread

If you can get whey from raw organic milk, that makes a wonderful culture for lacto-fermenting grains. If you don't have access to that, you can buy some organic yogurt and strain it through multiple (7 or more, no kidding) layers of very small mesh cheesecloth to get whey. (Look for unflavored, unsweetened organic yogurt that has not had thickeners added to it to make it firmer and dryer. You want it as juicy as possible. Most natural yogurt is about 1/2 whey.)

Alternatively, you can just soak some organic whole grain in pure water for a couple of days and "grow" yourself a culture, as lactobacilli are present in small amounts on all grains. When the soaking water gets a few bubbles in it, is just a bit thicker and tastes a bit sour, you have got a culture. You can now use your living culture to soak any grain to reduce the phytic acid.

You can soak the whole grain or you can crack it up some first. Cracking rice, for instance, lets the liquid soak into it more so it cooks up more quickly and is easier to chew. With rolled oats, of course, no need to do anything more to them but lacto-ferment or sour soak them. (You can soak them in water to which lemon juice has been added. Genuine lemon juice, not "Real" lemon in a plastic bottle. If you press out and reuse the liquid from this for a few days, it should grow a living culture from the lactobacilli present on the oats.)

Whole oat groats, however, will ferment better if cracked open first. I have a great grinder I can set to different settings that I use to do this, the Family Grain Mill. You might try a quick whiz in a coffee or spice grinder. Or just use the whole goats and let them sit a whole day instead of overnight.

Once a grain is cracked or rolled it oxidizes, so starting with whole grains and grinding, cracking or rolling them as needed is definitely preferable. Also, organic grains are far superior to others.

The grains I use for my flatbread "cakes" are short grain brown rice and oat groats. They are good nutritionally, and the mixture gives a good consistency to the flatbread, too. (Wheat is terribly overused in our culture. Good to try some other grains. I am wheat sensitive, as many of us are, even though we may not realize it. Also, wheat breaks down into sugar faster than any other grain, so has a disruptive effect on our insulin metabolism. If you do use wheat, it should be sprouted or sour soaked, as it is very high in phytic acid.) Using rice alone will give a bread that is dry and grainy. Oats alone would be heavy and gummy. Together they are great.

You can experiment with the proportions. I like about 3 parts oats to 4 parts rice, but 2/4 or even 1/4 work, too, depending on what consistency you like.

Lacto-ferment (or, sour soak in water to which some lemon juice has been added) oats at least 8 hours at room temperature. With rice it's not so crucial to do it that long as they don't have nearly as much phytic acid that needs to be neutralized.

At the end of the fermenting time, dump the grain and the liquid it has been in into a fine mesh strainer, over a bowl to catch the liquid. You want a mesh fine enough to catch all the grain, and just let the liquid through.

I use a wooden spoon to push the grain against the strainer and get most of the liquid out. Then I pour a little fresh water on top of the mash in the strainer, stir it around a bit, and press again, to rescue as much of the living culture as possible. Then the lactobacillus culture liquid back into the soaking jar to be used for the next batch of grain, and the grain goes into the blender. (There is no benefit from adding the soaking liquid to what you are going to cook, as the beneficial organisms and enzymes are destroyed by cooking. If you have an infinite supply of whey and like a more sour taste, you can use your fermented grain along with its soaking liquid and start a fresh culture each time.)

I like to ferment oats in one jar, and rice in another. I discovered that blending up the rice first by itself, then adding the oats after the rice is blended to a smooth batter means much less blending time is needed than when both are blended together. For some people, soaking and blending them together might feel easier.

Be aware that as the grains ferment carbon dioxide is formed. You want to leave some space in the jar for the fermenting grains to move upward, as sometimes the carbon dioxide actually pushes the grain up enough to make the liquid overflow if you have your jar too full. When you see those bubbles, you can really appreciate how hard those little lactobacilli are working for you.

Add just enough water to the blender to get a nice batter consistency. I have got the feel of how much water to add and put that amount all in with the rice, as I feel it blends the rice better if it can move easily in the blender. Then when that batter is smooth, I blend in the oats. I like to blend the oats less, to give a bit of texture to my flat bread.

I store this batter in glass, enamel or stainless steel in the refrigerator. (Never in plastic or aluminum, as the acidity would leach toxins into the batter. And not in stainless steel that has been cleaned with a metal scrubber, as that will leach nickel.) The batter will keep well in the frig for several days. The slight acidity adds to its keeping quality, as other, harmful bacteria do not grow well in it. (This is why lacto-fermentation has traditionally been used worldwide as a means of preserving food.) Similarly, once your grains are fermented you can just set the fermenting jar in the fridge if you are not going to get to blending it for a day or so.

To lacto-ferment your next grain, just add it to the remaining ferment liquid, adding additional fresh water as needed. (Oats soak up a lot more liquid than rice does.) You can use the "same" culture liquid for years, as long as you keep feeding it by using it frequently. If you use it daily, there is no need to ever refrigerate it. (You need room temp. for the lactobacilli to work on your grains.) If you are not going to use it again immediately, however, put it in the refrigerator. It will keep all right there for a few days. (If it goes icky you will know from the smell. If your "smeller" is not too good, just taste a few drops. It should taste like whey, or like yeast. If the taste is foul, you need to begin with a new culture.)

When I want to make something with the batter, I melt a bit of clarified butter in a Corelle bowl first, on a very low gas flame, then quickly stir in the desired amount of refrigerated batter. (Room temp. butter is

too chilled by refrigerated batter and lumps up.)

Never set a hot Corelle bowl on a metal surface. I did this just once. There was a cracking sound, then the bottom of the bowl fell out when I picked it up.

If you don't have a Corelle bowl, you can heat a bit of butter in the skillet you are going to cook the flat bread in.

Add a pinch of baking soda for each flat bread you are going to make. I don't actually measure, so cannot tell you exactly how much. Less than 1/8 tsp. per cup of batter. If your cake cooks with too many bubbles, you've used too too much, and vice versa.

Add a bit of water if your batter is too thick. Add a bit of Celtic Sea Salt. (Ordinary table salt is toxic, not nutritious.) Add herbs, etc. if you wish.

I brush a thin coat of clarified butter on the bottom of a fairly hot Le Creuset skillet, then pour the batter, moving circularly from the edge in to the center (which pushes extra butter into the center of the pan where it becomes part of the cake, vs. pushing it up the sides of the skillet where it will burn as the cake cooks), to just cover the bottom of the skillet. My skillet is a bit under 7 1/2 inches across the bottom. I make 3 flat breads with about 1 1/4 cup of batter.

If the batter is too thick, your "cake" will tend to burn on the outside before the inside is done. (When I get one too thick, I cook it a bit, then turn down the heat to try to get the inside to finish cooking. In winter, I set these doughy ones on a rack on our wood stove, which finishes them nicely. A higher percentage of oats also makes for a doughy cake.) If it is too thin, it tends to break.

If you have a good cooking surface, the outer edges of the cake will start to lift from the skillet when it is ready to turn over. If you try to turn it over too soon, it will break. You can turn up an edge and check the color if you are not sure if it's ready to turn. There will be some golden when it's time to turn it.

I've tried a variety of skillets, and Le Creuset is the one that works the best for making these flat breads, which tend to stick to other skillets. (Le Creuset is iron with a baked-on enamel finish.)

Of course "nonstick" cookware will work, but all of these products are coated with toxic materials that eventually come off bit by bit into your food!

If you are going to make these flat breads regularly, a Le Creuset or similar skillet is a wonderful investment. They are also great for cooking eggs, fish, sautéing veggies.... I love mine. You can order one online and have it delivered to your door. Be sure to get the original enamel finish, not their new nonstick coating.

Flat breads made from fermented grains have satisfied and nourished countless generations of traditional peoples. They are wonderful with just about any meal, and make a great dessert too. Try spreading clarified butter and a bit of raw honey, sorghum syrup, preserves, or lacto-fermented cream on one! Mmmmm.

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