

Kefir and Fermented Foods and Drinks

Kefir

Kefir is prepared by culturing fresh milk, water, or other non-dairy milks with kefir grains which are composed of bacteria and yeasts that have been proven to be beneficial to the human digestive system. The end product is a creamy, slightly sour, refreshing milky beverage that is filled with beneficial bacteria. The fermentation process takes about 24 hours at room temperature and does not involve many of the sterilization techniques that go along with many other cultured products, such as yogurt.

Kefir originated in the Northern Caucasus Mountains centuries ago, and has been associated with numerous healing effects since the early eighteenth century. Claimed to have originally been a gift from Allah, it was passed from generation to generation for years before being exposed to the rest of the world. Kefir is full of bacteria beneficial and can be labelled as a probiotic, which is to say that it contributes to, enhances, and stabilizes the micro-organisms of the intestines. These microbes are part of an essential team of around 400 types of beneficial bacteria found in our intestines that assist in breaking down food and making the vitamins and minerals in the food accessible to the body. The thirty or so strains of bacteria and yeast found in Kefir band together to form complex ecology capable of digesting almost any food source and staving off harmful pathogens.

Kefir has been found to be an effective immune stimulant and antimicrobial against a wide variety of harmful gram-positive and gram-negative bacteria. Kefir has been used to treat metabolic disorders, atherosclerosis, allergic disease, tuberculosis, cancer and gastrointestinal disorders. It has also been associated with the longevity of peoples of the Caucasus. Kefir drinks provide highly absorbable calcium, highly absorbable protein, and are known for helping to protect the body's bones, teeth and gums and to invigorate the body's overall health. Kefir drinks help keep the body's temperature cool and well-adjusted in hot weather and strong in cold weather. Kefir drinks are good for children as well as adults. They are especially recommended for the elderly because their nutrients are so easy to absorb.

In addition to beneficial bacteria and yeast, kefir contains minerals and essential amino acids that help the body with healing and maintenance functions. The complete proteins in kefir are partially digested and therefore more easily utilized by the body. Tryptophan, one of the essential amino acids abundant in kefir, is well known for its relaxing effect on the nervous system. Because kefir offers an abundance of calcium and magnesium, which are important minerals for a healthy nervous system, having kefir in the diet can have a particularly profound calming effect on the nerves. Kefir's ample supply of phosphorus, the second most abundant mineral in our bodies, helps the body utilize carbohydrates, fats, and proteins for cell growth, maintenance and energy. Kefir is rich in Vitamin B12, B1, and Vitamin K. It is an excellent source of biotin, a B Vitamin which aids the body's assimilation of other B Vitamins, such as folic acid, pantothenic acid, and B12. The numerous benefits of maintaining adequate B vitamin intake range from regulation of the kidneys, liver and nervous system to helping relieve skin disorders, boost energy and promote longevity.

Kefir can be made from any type of milk; cow, goat, sheep, coconut, rice, soy, or nut milks will all work. It can even be made from water. Kefir is made by using particles called "grains." They look like pieces of coral or small clumps of cauliflower and range from the size of a grain of wheat to that of a hazelnut. The grains ferment the liquid by eating the sugars and increasing their own populations to

create the cultured product. The grains are then removed with a strainer and added to a new batch of milk.

Basic kefir making:

Milk kefir is generally fermented at a ratio of between 7 to 14 parts milk to kefir grains by volume. That means if you measure out one ounce of grains you may ferment 7 to 14 ounces of milk with those grains. How much milk (between 7 to 14 ounces) is determined eventually by you according to how active your grains are at the time, the temperatures in the fermenting environment, how you like your kefir to come out, etc. It might be good to start at a 10 to 1 ratio and see how it goes and how you like it like that and adjust from there.

The basic process is simple. Put the kefir grains in a jar. Add 10 oz or so of milk. Cover with a cloth or loosely with a lid and let sit. Within 24 hours fermentations will happen. Strain the grains out and drink the keifered milk. I like to mix it with fruit in the blender to make a smoothie or put it on my oatmeal in the morning. Use the grains to start the next batch. How long you ferment is up to you. Things to consider are: The different yeast and bacteria strains work in a certain order. The first reaction creates an acidic environment, the next start to digest the lactose, then the yeasts begin. The whole thing will thicken from the kefir being produced within. Don't forget to mix, shake or stir your fermenting kefir whenever you think about it. Dominic N Anfiteatro on his extensive informational site Dom's Kefir In-Site (<http://users.sa.chariot.net.au/~dna/kefirpage.html#copyright1999>) says:

“I find a good way to eliminate lactose even further is to ferment the kefir per usual (24 hours), strain, then keep the strained kefir in a bottle (at room temperature) for a further 2 -3 days before consuming (ongoing fermentation). I don't keep my strained kefir in the fridge any more, but keep it like this in a cupboard. The kefir is still good even after 6-7 days. One must give the bottle which the kefir is continuously fermenting in, a shake at least once daily. This is so that the microbes (mainly the yeasts) are mixed in well. Other wise one may find a film or colonies of yeast or the acetic acid forming bacteria on top of the kefir. This is safe, but some lactose digesting yeasts may be flourishing mainly in this top layer, shaking will help to distribute them into the kefir, where you want them to do their work (breaking down lactose). This continuous fermentation can also be done in the fridge, but I find that a more pleasant tasting kefir, with markedly reduced lactose is achieved this way, (at room temp.). One can also keep fermenting the kefir, like above, in an air tight bottle. After the second day or so, an effervescent kefir will be produced. But I must point out that the bottle must not be filled more that 3/4 full. Of course, one could also ferment the original kefir for 48 hours, then follow on with the suggestions above. This may further make sure that the lactose content would be eliminated to a greater extent, and possibly in a smaller amount of time.” Check out Dom's site for answers to any question you may have and probably many you hadn't even thought to ask.

Kefir with seed or nut milk

1 cup Seed or Nut Milk. (SNM)

1 to 2 Tbs milk kefir-grains.

2-cup glass jar with lid.

Add 1 cup SNM to kefir grains in clean 2-cup 16 oz glass jar. Seal jar but do not seal airtight. Let stand for 12 to 24 hours at room temperature. Strain the SNM-kefir. Put the kefir grains back into the jar after the jar is washed and repeat the process for the next batch. This will be good for 7-10 batches.

NOTES: Although SNM may be cultured with kefir grains, the native medium for milk kefir-grains is in any form of dairy milk (cow or goat). Because of this, kefir grains will stop growing when cultured in non-dairy milk. To keep your grains growing, there are a few options. Kefir grains will grow in a mixture of dairy and non-dairy milk (e.g. 50/50 SNM and dairy milk). The lactose in the milk is getting transformed by the kefir grains so if lactose intolerance is your reason for not using dairy this may be a workable solution for you.

Another option is to culture in dairy milk until you have enough kefir grains to split. Use half the grains (after rinsing them) for the SNM and keep the rest in dairy milk as back up, reserve supply. If you keep feeding the back-up supply with dairy milk it will continue to grow. You can give the strained kefir milk to friends or wash it down the drain.

Another alternative is to use some kefir milk as a starter. 2 Tbs of kefir milk added per cup of SNM left at room temperature for 12 to 24 hours works well. You can also use a powder commercial kefir starter but these contain some form of dairy element, so you should know this if you are a strict vegan.

Making Water Kefir with Milk Grains

You can also make kefir from water using the kefir grains you use for milk. However, making water kefir isn't as simple as making kefir from milk, but it isn't rocket science either.

For your first initial batches of water kefir your milk kefir grains will enter a "lag phase" leading to a longer fermentation time. Usually about 4-5 days initially but gradually shortening to 1-2 days. This lag phase happens due to the fact the kefir grains must adapt to a new medium, instead of milk it now has to use water and other kinds of sugars.

Here is a step-by-step recipe for making it..

- * 1-2 tablespoons of washed milk kefir grains
- * 1/2 cup cane sugar (can also be refined white sugar, raw sugar, brown sugar, sugar cane juice, agave, sucanat or even muscavado)
- * 1-2 dried figs (can also be raisins, sultanas, dried prunes or any other fruit)
- * half a lemon
- * 1-1.5 liter water
- * 2 liter glass container
- * cloth or lid for container
- * plastic sieve

Steps

1. Dissolve sugar in water in your container.
2. Add kefir grains, dried figs and lemon.
3. Cover the container with a cloth or lid. Make sure it is not air-tight.
4. Place away from sunlight and leave at room temperature of (65 F – 77 F).
5. Let ferment for 24, 48 or 72 hours.

If you're using milk kefir grains for the first time in water, allow to ferment longer. The longer you allow it to ferment the stronger the taste and more carbonated it becomes. It will also have a very slight alcohol content.

6. Once fermentation is finished, squeeze the juice from the lemon into the mix.
7. Strain and separate kefir grains and everything else.

Separate the kefir grains from the figs or fruits. Use the kefir grains to start the next batch.

8. Drink your water kefir. You can enjoy it straight away or chill it. You can also use it for mixing with drinks.

Lacto-bacillus fermentation in Probiotic Sodas

The Water: Do not use chlorinated tap water, as this will inhibit fermentation. Filtered or bottled water works fine. If you must use straight tap water, boil it to evaporate off the chlorine.

The Sugar: We have gotten good results with cane sugar, agave, sucanat, brown rice syrup, and maple syrup. Most any form of sugar will work but the flavor from rapadura or molasses is too strong for most people. Honey is delicious but is best used as a flavoring rather than the main sugar source because honey naturally inhibits bacterial growth and slows the process down. Even at half strength, honey soda can take months to finish. You can use fresh fruit juice, but for some reason commercial canned fruit juice, even organic brands, do not produce good results. Fresh-pressed apple cider produces delicious soda, although it will probably be slightly alcoholic (1-2%) due to natural yeasts on the apples. Remember that most of the sugar will be converted into lactic acid in the fermentation process. Use about 1.5 cups of sugar per gallon of water. With juices you can use them without adding any sugar or water. What you do is according to experimentation and your own taste. You may want to start with two batches one diluted by half with water, one straight juice and see what happens. Fermentation times will likely be different as will the flavor. You can also make a syrup with less sugar using herbs or spices and then use juice for the other half of the liquid. The possibilities are endless. You can find many recipes on the web or just experiment on your own.

The Culture: Once you get going you can use a bottle of soda from your last batch of soda as culture, or you can make your own from scratch. To make the culture from scratch: Dice 1 tablespoon fresh ginger root and put it into a quart mason jar 3/4 full of water, along with 2 teaspoons sugar. Add another 2 teaspoons of sugar and 1 tsp. ginger every day for a week. After 5 -7 days the culture should be getting bubbly with a pleasant odor. If it gets moldy, dump it and start over. Even a small amount of culture will start a batch of soda going, but it's best to use at least a cup per gallon so that these beneficial lactobacilli can dominate before less desirable microorganisms have a chance.

Flavorings – the syrup: You can use any herbal infusion or decoction to make soda with the flavor or medicinal qualities you are seeking. For example, to make ginger beer, you will boil sliced ginger root in the water, about two thumb's-length (or more if you like it extra gingery) per half gallon of water (which will make 1 gallon of soda), for thirty minutes (see direction below). Peppermint, spearmint, or other mint can also be used to flavor soda as can other roots, berries or fruits. Lemon juice is a good addition to almost any soda flavor and seems to help preserve the syrup before fermentation gets going. Use approximately two lemons per gallon of soda. One of the favorite beverages in colonial America was root beer. Any roots can go into root beer, but the essential ones for flavor are sassafras and sarsaparilla. Sassafras in particular lends a pungent aroma and beautiful reddish color to soda, and is readily available online. Common medicinal roots like burdock, chicory, dandelion, and so forth tend to impart a strong mediciney "herbal" flavor to the soda. It's the sassafras or sarsaparilla that make people say "Yum!"

The Processing

The first step is simply to realize that it is very easy. The minimum equipment is a glass fermentation

container and the minimum ingredients are sugar, water and the culture. Mix them together and fermentation happens.

Step 1: Making the flavor syrup:

Bring 50 percent of your water to a boil. Add 1.5 cups of sugar for each gallon of soda you plan to make stir to dissolve.* So, if you are making 1 gallon of soda you start with ½ gallon of water and 1.5 cups sugar. If you are making ½ gallon of soda then you start with ¼ gallon (1 quart) of water and ¾ cup sugar. * Note: Roots simmer for 30 minutes. Strain them before adding sugar.

Add in your herbs or fruit. Start with about 2 cups chopped fresh herb or 1 cup dried herb steep for 10 – 20 minutes depending on strength desired. If you are using fruit add 6 cups of it to the pot (these can be fresh or frozen berries or other kinds of fruit such as peaches, cherries, etc.) and bring the water back to a boil. Allow them to simmer in the water for about 10 minutes.

Taste what you've created. Does it taste fruity or herby enough? If not maybe you want to add more berries or herbs or steep a bit longer.

When you have the flavor where you want it, the sweet liquid you have created now is called "syrup."

Step 2: Pour the syrup and the other half of the water into your fermentation vessel. I like to use the scalding hot syrup to sterilize my vessel, but be careful not to pour it in too fast or it could crack. Heating the container first with hot water helps to bring it up to temperature and decreases the likelihood of cracking especially in winter when the room temperature is lower. Using a funnel is helpful if the top of the jar or bottle is narrow. This diluted syrup is still too hot for the culture. Let this cool to room temperature before adding culture.

Step 3: Add any other flavorings, such as lemon juice to the diluted syrup.

Step 4: Making sure the syrup has cooled to room temperature, add about a cupful of the strained ginger sugar culture for each gallon of water. You could add less or more culture. The more you add, the greater the head start your beneficial bacteria have over any opportunistic invaders, such as alcohol-producing yeasts.

Step 5: Cover the vessel (it need not be completely airtight, but it can be) and let it ferment. Shake or stir it daily. Fermentation rate is highly variable. If you like a sweeter soda, four or five days might be sufficient. If you want to ferment out most of the sugar, allow 10 days. Some additives such as mint and honey tend to inhibit bacteria and drastically slow fermentation.

Step 6: Time to bottle! Pour your fermented soda into bottles using a funnel, or scoop it in with a glass measuring cup. You must have some way to seal the bottles, either with screw tops or stoppered bottles (available at brewing supply stores). Do not bottle the thick layer of sediment at the bottom of the fermentation vessel.

Step 7: Carbonation. The soda continues to ferment in the bottles, giving off carbon dioxide gas. Since the bottles are sealed, the gas has nowhere to go. It stays in the bottle and makes the soda fizzy. Depending on how fast it is fermenting, 2-5 days is usually enough time to create the optimum level of carbonation. You can always open a bottle and check.

Step 8: Stopping fermentation. Now we have a problem, because if the soda continues to ferment the bottles will foam over or spray when opened. The bottles might even explode if left out long enough. So when carbonation is sufficient, it is time to stop fermentation by putting the bottles in the refrigerator. Not enough room? A cold basement will work too, slowing down fermentation but not quite stopping it. Usually soda will keep just fine in the basement for a month or more.

Step 9: Drink it! Lacto-fermented soda is an excellent thirst quencher and contains beneficial lactic acid, vitamins, enzymes and beneficial lactobacilli that can inhabit your gut, where they protect you against pathogenic bacteria and yeast.

Further notes on lacto-fermented sodas:

You can use any fruit juice that is freshly squeezed or juiced. Pineapples and soft fruits can be crushed. You can ferment the pulp with the juice and strain it out before you bottle the brew. While it is fermenting you may need to stir in any pulp that floats to prevent mold from growing on the surface.

Most traditional cultures fermented beverages from plants that grew around them. We are all familiar with fermented grains in the form of beer, and grapes in the form of wine, but there are other less well known fruits such as the noni from the Pacific Ocean area that are fermented for a healing beverage. The noni fruit is allowed to fully ripen on the tree, and as soon as the fruit is ready to drop it is sealed in a container and left to ferment for 4-5 weeks before being strained and consumed. The process of lacto fermentation makes the fruit more healthful and produces antioxidants.

Basically you can ferment most, if not all fruits, vegetables, herbs, edible flowers, edible seaweed's , greens, grains, spices, and so on, if they are prepared correctly. Some brewers suggest using green or black tea (organic) as a matter of course in beer type recipes as it provides tannins which give the brew body. But as always you should do some research first and look around for various recipes to see how it has been done before.

Other fermented foods

In his book, *Wild Fermentation*, Sandor Ellix Katz highlights the following benefits of eating fermented foods:

- Nutrient Preservation – fermented foods can store longer
- Makes foods more easily digested by breaking down complex proteins or components like lactose that can be difficult to digest
- Creates new nutrients, especially B vitamins
- Some fermented foods function as antioxidants
- Some toxins are removed from foods through the fermentation process

And, finally, the benefit of eating live, fermented foods which supplies our digestive tracts with living cultures essential to breaking down food and assimilating nutrients. Sauerkraut is one of these foods.

For this sauerkraut recipe you will need a large bowl, a glass jar or crock, some kind of pounder, a

plastic lid or something flat that fits inside your crock or jar), a weight (could simply be a jar of water or rocks), cabbage, and sea salt.

Sandor Katz recommends 3 Tablespoons of salt for 5 pounds of cabbage, but also says that he uses more salt in the summer and less in the winter. So, look at the 2 tablespoons as a place to start experimenting. Only normal kitchen hygiene is required.

To start this sauerkraut recipe, remove the outer leaves of the cabbage and set aside.

Sauerkraut:

1 Fresh Medium Cabbage (red or green)

2 Tablespoons Pickling or Kosher Salt (Please no iodine, it will kill the bacteria)

Distilled Water (or filtered, non-chlorinated)

Shred the cabbage. In a large bowl, mix shredded cabbage and salt together. Pound the cabbage mixture to expel the juices. Place pounded cabbage and juices in a medium sized glass jar or crock. Press down firmly on the cabbage. Add distilled water until cabbage is fully submerged. The liquid should be at least one inch above the cabbage and close to the top of the jar. Cover the top of the kraut with the outer leaves from the cabbage. It may be necessary to use a weight to keep the shredded cabbage submerged in the water. Cover the jar with cloth or loose fitting lid and let sit for 3 to 7 days at room temperature. Alternatively, one can use Kefir grains to ferment the cabbage, just eliminate the use of salt.

Taste it every few days. When it is as sour as you like it put it in the refrigerator to stop the fermentation. The sauerkraut will last for months in your refrigerator. Enjoy! Once you've got the process worked out you can make many variations. Try adding onion, carrot, beet radish, seaweed, or juniper berries. Spice with garlic, ginger, chili, caraway, dill, curry or any other spice you like.

Things to be aware of that may happen in the process:

Sometimes a white, velvety or powdery looking yeast or scum, called Kahm yeast, develops on the surface. It is not harmful, but does not improve the flavor. If it develops, skim it off the surface of the liquid. Discard any solid matter that has it. As usual, your senses are the test, if it the kraut smells and tastes OK, it probably is OK.

Kahm yeast is likely to develop if:

- * your brew is insufficiently acid, especially when you start it (add lemon juice in the pounding phase to make it more acidic)
- * there is not enough salt
- * it is too warm
- * over exposure to the air
- * from poor hygiene

If black or blue mold forms, throw the brew away. It usually smells horrible, and you wouldn't want to eat it anyway. Mold forms for the above reasons, or because there was not enough liquid which means that the solid matter got exposed to the air and light, before sufficient acidity built up.

Sources:

<http://users.sa.chariot.net.au/~dna/kefirpage.html> – interesting site with lots of info

http://nutrition.suite101.com/article.cfm/kefir_its_history_and_benefits by Trevor Ellestad

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<http://www.yourkefirsource.com/water-kefir/water-kefir>

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<http://www.rejoiceinlife.com/recipes/homewine.php>

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There are many sites on the web with recipes for fermented foods have a look around and try out some recipes. It's easy to incorporate fermented foods into your diet and fun to make variations of your own. Your digestive system and your overall health will be happier for it.