COLORADO STATE UNIVERSITY EXTENSION

Understanding and Making Kefir

Did you know...

- The International Scientific Association for Probiotics and Prebiotics defines probiotics as “live microorganisms which when administered in adequate amounts confer a health benefit on the host.”
- Kefir can contain up to 50 live, active species and over 20 billion Colony Forming Units (CFUs). In comparison, yogurt typically has 1-5 live, active bacterial species and around 6 billion Colony Forming Units (CFUs).
- Water kefir is a dairy-free option for getting some of the health benefits of kefir for people who are lactose-intolerant.

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What is Milk Kefir?

Milk kefir (pronounced kuh-feer) is a fermented beverage that originated centuries ago near the Caucasus Mountains in Eastern Europe. Kefir is the Turkish word for “good feeling,” appropriately named for its associated health benefits.

- The starter culture (called 'kefir grains') looks like small cauliflower florets. Kefir grains consist of lactose-fermenting and non-lactose fermenting yeasts as well as lactic- and acetic acid-producing bacteria, surrounded by a protein matrix called kefiran.
- Kefir can be considered a ‘functional food’ since it may provide health benefits beyond supplying nutrients and calories.
- Kefir is usually sold as a ready-to-drink beverage in both plain and flavored varieties. It can be enjoyed as a refreshing drink, added to smoothies, or used in recipes as a replacement for buttermilk, yogurt, or sour cream.

Kefir is similar to yogurt, with its slightly sour flavor and presence of probiotics. However, both yeast and bacteria contribute to kefir's fermentation, whereas only bacteria are involved in the making of yogurt.

- Dairy products are an excellent product to include or ‘be the vehicle’ for live probiotics as both are required to be stored at refrigerator temperatures and both dairy products and probiotics have a relatively short shelf life.

Milk Kefir vs. Water Kefir

This resource is focused on kefir made using milk, but kefir can be made using milk, non-dairy milk, or water as the main component. A specific type of kefir grains is used with each product, and milk grains cannot be used to make water kefir or vice versa.

- Milk kefir has a distinct rich and tangy flavor, whereas water kefir is much lighter and tends to have a sweeter taste.
- Water kefir resembles a fizzy soda since it is often fermented with fruit juice or sugar water.

Milk Kefir vs. Yogurt

While the nutritional value and health impacts of kefir and yogurt are similar, there are differences. Colony Forming Units (CFUs) is an indicator of the total number of beneficial microorganisms present in a product, i.e., those invisible collaborators responsible for the probiotic benefits. Yogurt contains anywhere from 1-5 live, active bacterial species and around 6 billion CFUs. However, kefir may contain up to 50 live, active microbial species and over 20 billion CFUs.

- The bacteria in yogurt and kefir contribute probiotic properties to each product, but it is the yeast population in kefir that adds additional health benefits.

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Kefir Nutrition and Health Benefits

- Milk kefir is abundant with live probiotics, including beneficial Lactobacillus bacteria strains and yeasts which ferment lactose.
    - These microorganisms produce byproducts, such as lactic acid and acetic acid, which not only give kefir its characteristic flavors, but also have been shown to promote gut health.

- Nutritional value is based on a one-cup serving (8 oz.) and varies among brands and types of kefir, but generally kefir is a good source of protein, calcium, potassium, and phosphorous.
    - Kefir is also a source of vitamin A and several B vitamins, including biotin, folate, riboflavin and B12.

- Due to the presence of vitamin D, calcium, and potassium in dairy products, the current Dietary Guidelines for Americans encourages most people to consume three servings per day. If you consume dairy, consider adding milk kefir to your diet!

Kefir and Lactose Intolerance

Milk kefir is a dairy product which may be tolerated by some people who are lactose-intolerant. Lactose intolerance arises when the body is unable to make lactase on its own. Lactase is the enzyme which breaks down lactose into galactose and glucose which the human body can digest.

- In the fermentation process, the bacteria release lactase to break down the lactose and use the glucose and galactose as substrate for fermentation.
- The result from this step in the fermentation process of kefir is the production of acetaldehyde and lactic acid, both of which lower the pH of the milk.
- This bacterial fermentation process has been shown to reduce the presence of lactose.

NOTE:

- *If you are lactose-intolerant, a physician should be consulted before consuming any dairy products.*

- *Water kefir and non-dairy kefir (made using almond milk, oat milk, etc.) are options for adding some of the benefits of kefir to your diet without introducing a lactose digestion challenge.*

Health Precautions

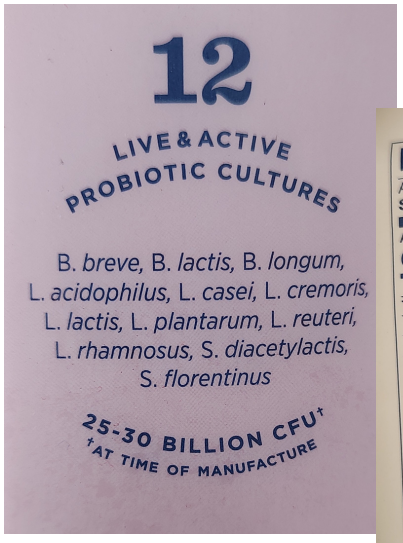
Like many dairy and probiotic-rich foods and beverages, kefir can cause intestinal cramps, nausea, gas, or other minor digestive issues at the beginning of use. Although research has indicated possible health benefits of consuming kefir, each batch varies in microbial composition making it challenging to determine specific health impacts.

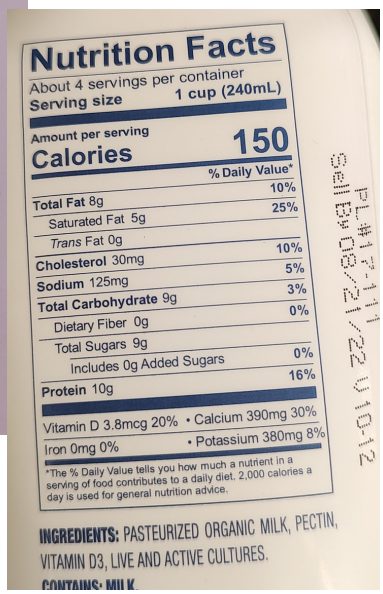
- It is recommended to start with small portions (4-6 oz. per day) and increase the amount over time, if desired.
- As always, consult your doctor if you have any questions regarding health and safety.

Selecting Kefir: Read the Label!

If you are purchasing kefir products for health benefits, check the nutrition panel and ingredients list.

- Fat, sugar, protein, calcium content will vary depending on the type of milk which was used to make the kefir and some types may have added sugar or other sweeteners.
- Kefir labels will also include a list of 'live active cultures' and may be included as part of the ingredients list.





Making Milk Kefir

Compared to many other fermented products, kefir is easy to make and requires minimal time, effort, and equipment. All that is needed is milk, a jar, a cheesecloth, a rubber band, and most importantly, some kefir grains.

- Select milk which has been pasteurized (heated to 161° F for 15-20 seconds) but not ultra-pasteurized (UP) or labeled UHT (ultra-high temperature treatment) because these products are heated to 275° or higher, denaturing certain proteins.
- Kefir grains may be shared between friends or purchased from online retailers or some health food stores. They will be either live or dehydrated. Live grains will need to be fermented or refrigerated very quickly, whereas the dehydrated variety will have a longer shelf-life. For this process, the steps using live grains will be outlined.
- Kefir can also be successively fermented, meaning part of your batch of finished kefir can be used to start another batch.

Ingredients to make 2 cups Milk Kefir

- 2 T. active milk kefir grains
- 2 cups pasteurized milk (not ultra-pasteurized or UHT)

Equipment & Supplies

- Two 1-quart standard canning jars
- Cheesecloth or coffee filters
- Rubber band or jar ring
- Plastic or wooden spoon
- Plastic, fine nylon mesh, or stainless steel strainer
- Cleaning supplies:
  - Dish soap (not anti-microbial)
  - White vinegar or other fermentation-specific equipment sanitizer

Steps for Making Kefir

1. Wash hands and clean all equipment with soap (not anti-microbial)
    - Optional: Sanitize equipment with white vinegar or fermentation-specific sanitizer

2. Add grains to jar.

3. Add milk to jar.

4. Gently stir.

5. Cover with 2 layers of cheesecloth or 2 or 3 coffee filters and secure with rubber band or jar ring.

6. Set in a dark place at a temperature between 65° and 85° F (18°-29° C).

7. Allow to ferment for 18-24 hours.
    - Kefir should be slightly thickened and have an acidic aroma.
    - If there is a yellow, watery layer, this is due to separation of the whey which has separated and can be strained off or remixed into the kefir. A shorter fermentation time or more milk may fix this problem.

8. Optional: Check pH using test strips (should be in the 4.0-4.5 range)

9. Strain the milk from the grains into another standard canning jar (with lid) or any air-tight storage bottle.

    - Drink immediately or refrigerate for up to 2 weeks.

10. Start a new batch!
    - Rinse out and clean the fermentation jar, put the grains back into it, and add milk.
    - Repeat steps 1-9.

References:

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