

[Breastfeeding Info](#) Milk Issues

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## Milk Issues: Soapy, Metallic, Sour, or Spoiled Milk?

Being able to pump and store one's own milk has been an enormous benefit for many who go back to work after their babies arrive. However, for a small group of people, this boon comes with an extra challenge: changes in the aroma and possibly the taste of their milk after it has been stored for a while.

Some people describe a “soapy” smell or taste in their milk after storage; others say it is a “metallic” or “fishy” or “rancid” odor. Some detect a “sour” or “spoiled” odor or taste. Accompanying these changes are concerns that the milk is no longer good for the baby. In addition, while sometimes the baby doesn't seem to care and drinks a bottle of the expressed milk readily, other times the baby refuses to drink the milk. And sometimes, if it is actually spoiled, it isn't good for the baby. Let's figure out what's happening.

### What is going on, and what can be done?

There are several possibilities for the cause of odor or taste changes in human milk. Solutions depend on the root cause. The first step to finding a solution is to determine whether expression, handling and storage are the source of the issues, or whether highly active lipase or chemical

oxidation are the cause.

## **Issues related to pump parts**

First, pumping or expressing, handling, and storage practices should be examined to ensure that all hygienic precautions are being taken. Pump parts should be cleaned thoroughly between pumping sessions to ensure no bacterial contamination is conveyed to freshly pumped milk. The Centers for Disease Control and Prevention (CDC) provide cleaning instructions in both English and Spanish

(<https://www.cdc.gov/healthywater/hygiene/healthychildcare/infantfeeding/breastpump.html>).

Use storage containers that are specifically designed for storage of human milk. Lawrence and Lawrence recommend rigid polypropylene containers due to the fact that fewer nutrients and immunological components are lost compared to breast milk stored in other types of containers (p. 719). If polypropylene containers are not available, Pyrex is a next-best choice. While not ideal both because of nutritional and immunological losses as well as due to the bags being weak and splitting open, plastic storage bags for human milk may be used instead.

## **Excess Lipase Activity**

Second, some people have excess lipase activity. Previously, it was believed that some people have excess lipase in their milk, but recent research has shown that to be a misunderstanding (Lawrence and Lawrence, p. 137). There's nothing wrong with your milk!

Lipases are enzymes found in all milks. Two kinds are well known: lipoprotein lipase and bile salt-dependent lipase (Lawrence and

Lawrence, 2016, pp. 136-137). Each has positive roles to play in digestion and immunological effects for the baby. Lipase activity:

1. supports an infant's ability to digest fats (lipids; Lönnerdal and Atkinson, 1995, p. 361) by ensuring that the fat molecules remain well-mixed into the milk in a small, easily digestible form (Lawrence and Lawrence, pp. 136-137)
2. breaks down triglycerides to release fat-soluble nutrients (Lawrence and Lawrence, p. 137)
3. releases free fatty acids that provide immunological effects (antibacterial, antiviral, and antiprotozoan; Lawrence and Lawrence, p. 136)
4. protects against infection by intestinal parasites such as *Giardia* and *Cryptosporidium* (Lawrence & Lawrence, p. 463)

However, when lipase activity is unusually high in expressed milk, its work in breaking down the fats can result in a soapy or fishy aroma and/or taste that may be distasteful to the baby. The rate at which this occurs varies from one person's milk to another's; for some, it occurs in less than 12 hours, while others find little or no change for up to a few days.

Even when a soapy smell is detected, the milk is still safe and nutritious for your baby. However, if your baby won't take it, you might try mixing it half and half with freshly pumped or expressed milk. Often, babies are satisfied with the mixture if the soapy smell isn't too strong. Sometimes mixing it won't work, so let's talk about how to prevent the problem!

You can prevent the problem from occurring with future batches of pumped or expressed milk—no one wants to lose their precious liquid gold! Freezing will not prevent lipase activity from altering the aroma or

taste of your milk, but scalding will. Here are the steps to de-activate lipase activity:

1. Place the milk in a clean pan over low heat on the stove (or other heating device, but not a microwave).
2. Heat the milk just to the point that it is bubbling around the edges but not boiling, as boiling will reduce or destroy valuable immunologic properties (Lawrence and Lawrence, pp. 162, 721-722).
3. Place the pan in a larger bowl filled with ice water (use plenty of ice) to cool it quickly.
4. Store the milk in rigid polypropylene plastic or Pyrex containers (Lawrence and Lawrence, p. 719), either in the refrigerator if it is to be used within a day or two, or in the deep freezer if storage will be longer. For more info read our post on milk storage <https://lila.org/breastfeeding-info/storingmilk/>

## **Chemical Oxidation**

This third possible problem may be more challenging to resolve, and the milk is not salvageable once it has occurred. If the smell is sour or rancid, milk storage experts Jones and Tully suggest the cause is chemical oxidation rather than excess lipase activity (Mohrbacher, p. 461). Several factors may contribute to this problem, including a diet containing polyunsaturated fats or rancid fats, or drinking water with free copper or iron ions.

Possible solutions include:

1. avoiding fish-oil or flax-seed supplements, anchovies, old vegetable oils (a smell or taste test can help you determine whether an oil has

gone rancid), some nuts (Brazil nuts are especially likely to become rancid) or other foods that may contain rancid fats (Mohrbacher, p. 461; Vieira, McClements, and Decker, 2015, p. 313S – 315S).

2. drinking bottled water or water from a different source than usual to reduce the potential for iron or copper ions being a cause (Mohrbacher, p. 461).
3. increasing one's antioxidant intake may help prevent this problem, so you might try including beta carotene and vitamin E in your diet (Mohrbacher, p. 461) to see whether it helps.

When chemical oxidation occurs, the milk is spoiled and must be discarded, and scalding the milk will only make the problem worse. However, the above dietary changes should help you resolve the problem completely without the extra work of heat-treating your milk!

### **How can you find out which problem—high lipase activity or chemical oxidation—you have?**

Assuming that you've made sure your pump equipment is clean, after pumping or expressing some milk, smell it and taste it. Does it smell or taste sour, or does it smell fine and taste a bit sweet? If it does smell or taste sour, then it indicates the presence of rancid fats and chemical oxidation. Try changing your diet to eliminate the problem.

If it smells fine and tastes a bit sweet, put it in the refrigerator. Every few hours, do another smell and taste check. (Remember, milk may be safely stored in a refrigerator at 39°F/4°C for up to 8 days, though using it earlier is better. Mohrbacher, p. 461). You can also freeze a test batch, and conduct a smell and taste check after about a week. Most people find that their milk continues to be fine. However, if you're one of the few who find that your milk begins to smell or taste soapy, fishy, or metallic after a

period of time (which can range from a few hours to 24 hours or even longer periods), then you will need to follow the instructions for scalding your milk to de-activate the lipase and prevent future changes in the milk.

If your milk turns quickly (within a few hours) and you're pumping at work, you will want to figure out a way to scald it before you put it in the cooler to take home. If it seems to take longer for a soapy smell or taste to develop, then waiting until you get home to scald it may be fine. You might conduct a smell-and-taste test as described above on your first batch to be sure if you haven't already done so.

For more information about safe milk expression/ pumping and storage, please see our articles at:

<https://lli.org/breastfeeding-info/pumping-milk/>

<https://lli.org/breastfeeding-info/storingmilk/>

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