

My expressed breastmilk doesn't smell fresh. What can I do?

Human milk that has truly soured has a very distinct sour taste and odor – much like soured cow's milk. If your milk doesn't smell distinctly sour or rancid, then it should be safe to give to your baby.

If you repeatedly notice that your stored milk doesn't smell or taste fresh, it might help to go through your storage procedures to see if there is something you could do to improve the smell/taste of your milk:

- **Storage containers:** Standard glass or plastic bottles (or any type of leak-proof food storage containers) are acceptable for storing mother's milk, as are disposable bottle liners or "mother's milk" bags. The best materials are glass or food-grade polypropylene or polybutylene (hard) plastic. Polyethylene bags (bottle liners) do not preserve nutrients and immune properties as well as glass or hard plastic. (Jones & Tully 2005)
 - If you're using standard plastic bottle liners, instead try using bags specifically designed for storing human milk.
 - If you're storing in plastic, try glass instead.
- **Storage conditions:**
 - Do you plan to freeze the milk? If you're not expecting to use refrigerated milk within 5-8 days of expression, then freeze as soon as possible after expression. Use as soon as possible after thawing (but always within 24 hours).
 - Make sure that all packages in your refrigerator or freezer are sealed well, so that your milk cannot absorb odors from other foods. A box of baking soda placed in the refrigerator or freezer may help to absorb odors.
 - Store your milk in the BACK of the refrigerator or freezer, not in the door. Don't store your milk against the wall of a self-defrosting freezer.
 - Is your freezer cold enough? If your freezer keeps ice cream hard, then the temperature is right.

A few mothers find that their refrigerated or frozen milk begins to smell or taste soapy, even though all storage guidelines have been followed closely. Per Lawrence & Lawrence (p. 781), the speculation is that these mothers have an excess of the enzyme **lipase** in their milk, which begins to break down the milk fat soon after the milk is expressed. Most babies do not mind a mild change in taste, and the milk is not harmful, but the stronger the taste the more likely that baby will reject it.

Lipase is an enzyme that is normally present in human milk and has several known beneficial functions:

- Lipases help keep milk fat well-mixed (emulsified) with the “whey” portion of the milk, and also keep the fat globules small so that they are easily digestible (Lawrence & Lawrence, p. 156).
- Lipases also help to break down fats in the milk, so that fat soluble nutrients (vitamins A & D, for example) and free fatty acids (which help to protect baby from illness) are easily available to baby (Lawrence & Lawrence, p. 156).
- The primary lipase in human milk, bile salt-stimulated lipase (BSSL), “has been found to be the major factor inactivating protozoans” (Lawrence & Lawrence, p. 203).

Per Lawrence & Lawrence (p. 158), the amount of BSSL in a particular mother’s milk does not vary during a feed, and is not different at different times of day or different stages of lactation. There is evidence that there may be a decrease in lipase activity over time in mothers who are malnourished.

Many mothers who need to store their expressed milk but have problems with excess lipase sometimes wonder whether changing their diets may help. This post to the LLLI forums discusses some ideas from human milk researcher Leon Mitoulas about this question: [Can diet changes help with the Lipase issue?](#)

What can I do if my storage problem is due to excess lipase? Once the milk becomes sour or rancid smelling/tasting, there is no known way to salvage it. However, newly expressed milk can be stored by heating the milk to a scald to inactivate the lipase and stop the process of fat digestion. Scald the milk as soon after expression as possible.

To scald milk:

- Heat milk to about 180 F (82 C), or until you see little bubbles around the edge of the pan (*not* to a full, rolling boil).
- Quickly cool and store the milk.

Scalding the milk will destroy some of the antiinfective properties of the milk and may lower some nutrient levels, but this is not likely to be an issue unless all of the milk that baby is receiving has been heat-treated.

Per Lawrence & Lawrence, bile salt-stimulated lipase can also be destroyed by heating the milk at 144.5 F (62.5 C) for one minute (p. 205), or at 163 F (72 C) for up to 15 seconds (p. 771).

What if your milk tastes/smells sour, or even rancid, rather than soapy?

If your milk tastes/smells sour or rancid rather than soapy, the cause may be chemical oxidation rather than lipase (Mohrbacher, p. 461). Mom's intake of polyunsaturated fats may be involved, or free copper or iron ions in her water. When this happens, Mohrbacher has a few suggestions to try:

- avoid your usual drinking water (either drinking it or having milk come into contact with it)
- avoid fish-oil and flaxseed supplements, and foods like anchovies that contain rancid fats
- increase your antioxidant intake (including beta carotene and vitamin E).