

THE BREASTFEEDING ANSWER BOOK



MILK STORAGE

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Update

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Expressed human milk is better than formula

Put another way, formula exposes babies to risks that breastfed babies do not face (Bartick 2010). Current evidence does not address every specific question about milk storage that arises when a mother is expressing and storing milk for her baby. The evidence does show that breastmilk keeps many of its nutritional and immunologic benefits even when stored (Pardou 1994, Rechtman 2006). Breastmilk remains the preferred feeding choice (World Health Organization (WHO) 2002). The WHO recommends that babies be breastfed for a minimum of two years. Expressing and storing human milk not only enables but also is necessary for many women to reach that goal (WHO 2002).

Hand washing reduces bacterial contamination

It is a good idea when possible for a mother to wash her hands before breastfeeding, just as she would wash her hands before eating or preparing food. Washing her hands before expressing her milk is an important way to reduce the chances of her breastmilk becoming contaminated with bacteria from her hands (CDC 2010). She does not need to wash her breasts before expressing milk (ABM 2010). If she has used a medication or ointment on her breasts that is compatible with breastfeeding, there is no need to remove it before expressing.

Breastmilk is not sterile

It has lots of components including beneficial or nonpathogenic bacteria. These bacteria work to inhibit the growth of pathogenic or infection-causing bacteria (Heikkilä 2003). During expression bacteria from a mother's skin and her nipples enter the expressed milk (Heikkilä 2003). The factors that discourage the growth of bacteria in a baby's intestines also guard against bacterial growth when the milk is stored in a container (Rechtman 2006).

Use a clean container to collect expressed milk

It is important that the container for collecting expressed milk is clean. The container can be washed with hot soapy water or in the dishwasher. Some containers used for expressing and storing milk that are available for purchase have been sterilized during production and can be used directly out of the package. Instructions are included in the package insert (ABM 2010).

Choosing a storage container

Many options exist in storage containers: glass, metal, various types of hard plastic and flexible plastic bags. Each type of container has different advantages and disadvantages (ABM 2010). The mother will need to take into account many factors when choosing a storage container including: cost, ease of use, reusability, disposability, storage space, need for transport, breakability, contamination risk, and effect on milk quality. She should only use containers that are meant for food usage and that meet the newest safety recommendations. This will eliminate, for example, glass or pottery that contains lead and plastics that contain chemicals such as bisphenol A (BPA). BPA is an endocrine disrupter and there is concern it might have effects on the brain, behavior, prostate and mammary glands in children (National Toxicology Program 2007). Plastics labeled with the recycling symbol and #1,2,4 or 5 and/or PP are BPA and phthalate free. Plastics labeled #3,6 or 7 should not be used (Caring for Our Children

(CFOC) 2011). Mothers might use different types of storage containers for different uses. Her childcare center may have policies that dictate disposable or reusable storage containers or she might prefer bags when traveling and glass at home.

Volume of milk to store per container

Suggest a mother put only 2–4oz (60–120 ml) of expressed milk in each container, as that is the amount her baby is likely to eat in a single feeding. Small quantities are easier to thaw, reduce waste and discourage caregivers from overfeeding. She can adjust her milk storage volume as her baby's needs change. If container cost or storage space is an issue, an alternative approach is to “fill” each container. When using bags, squeeze as much of the air out as possible. Milk will expand as it freezes so allow about 1 inch (2.5 cm) of room for expansion at the top of the container (LLLGB 2010).

Milk Smell

Some milk has a soapy or rancid smell after cooling or freezing. This is likely due to lipase in the milk. Lipase is an enzyme that helps in the digestion of breastmilk by breaking down the fats. There is disagreement on what to do in this situation. Some babies are not bothered by the smell. If a baby refuses the milk, it can be scalded before freezing to deactivate the lipase (Lawrence 2005). To scald expressed milk before freezing, warm the milk in a pan on the stove until tiny bubbles form around the edge of the pan (Lawrence 2005). Some experts do not recommend heating breastmilk over 104°F (40°C) because it can reduce the nutritional and immunologic benefits (ABM 2010).

Label the milk

Label the expressed milk with the date of collection, including year if freezing. If the mother is expressing and planning on breastfeeding for the recommended minimum duration of two years, she might have expressed milk from the same month in more than one year. She will need to know if the bag found at the back or bottom of the freezer was from this December or last December. If her baby is cared for outside the home or with other babies, she will need to add her baby's name to the label.

Should a mother refrigerate or freeze her expressed milk?

The answer depends on how much milk the mother is expressing and on how much expressed milk her baby is consuming. Milk does lose some nutritional and immunological benefits during refrigeration, freezing, and reheating (ABM 2010). The preferred feeding order would be: at the breast, fresh expressed human milk, previously refrigerated human milk, previously frozen human milk. Try to take into account her baby's intake and balance that with her expressed volume. Refrigerate expressed milk that will not be consumed immediately. Freeze milk as soon as possible if it will not be consumed within 8 days (Pardou 1994). Consider donating to a milk bank if you are likely to have milk that will not be used within one year.

Mixing previously and newly expressed milk

The safest way to mix previously expressed and newly expressed milk is to cool the newly expressed milk to the same temperature as the previously expressed milk, then add cold milk to cold milk (ABM 2010). If adding freshly expressed milk to frozen milk, cool the expressed milk before adding to frozen milk and make sure there is less fresh milk than frozen milk.

Ideal and safe storage times

The following guidelines apply to mothers who have healthy, full-term babies. Hospital staff can provide information on stricter storage guidelines for premature or sick babies in hospital. Conflicting opinions exist about ideal and acceptable safe storage limits for expressed human milk (Hands 2003). Research has not answered all the questions about appropriate storage times for expressed breastmilk for all temperatures. Storage temperature determines storage time. Ideal and acceptable storage times in various conditions are listed in the table (ABM 2010). When longer storage times are anticipated it is best to store milk at cooler temperatures (Silvestre 2006).

Research clearly demonstrates that human milk stored for shorter periods of time (ideal) is preferable to that stored for acceptable times. Anti-infective properties and nutrients, such as vitamin C, decline with storage time. Ideal storage times coincide with points where research has shown a significant drop in anti-infective properties, associated with increased growth of any bacteria added to the human milk for testing.

Human milk is definitely better than formula and still safe, when stored longer. All babies will benefit by having fresher milk whenever possible, particularly if there is illness in the family or if babies are getting mostly or only expressed milk.

Temperature

ROOM TEMPERATURE 60°–85°F (16°–29°C)

ICE PACKS IN COOLER 50°–59°F (10°–15°C) *Replacing icepacks to keep as cool as possible*

REFRIGERATED <39°F (<4°C)

FREEZER COMPARTMENT OF REFRIGERATOR <5°F (<-15°C)

FREEZER <0°F (<-17°C)

Storage Time

ROOM TEMPERATURE 4 hours ideal, 8 hours acceptable

ICE PACKS IN COOLER 10 hours ideal, 24 hours acceptable

REFRIGERATED:

- Fresh milk 72 hours ideal, 8 days acceptable
- Previously frozen milk 24 hours

ICE PACKS IN COOLER 2 weeks

FROZEN 6 months idea, 12 months acceptable

Using expressed milk

If the baby prefers warm milk, it is best to warm the milk by holding the container under warm running water or immersing the container in a bath of warm water for several minutes. For ideal warming, heat milk for less than 5 minutes, to a temperature of up to 98.6°F (37°C) in warm water at a temperature below 120°F (48.9°C) (CFOC 2011). Breastmilk should not be heated in the microwave or directly on the stove (CFOC 2011). Microwaving can lead to uneven heating that could burn the baby and significantly decrease the anti-infective properties of human milk (Hands 2003). Warming milk directly on the stove can lead to overheating and also denature proteins in the milk (Hands 2003). If the milk was previously frozen it is best to thaw it in the refrigerator and then warm in hot water.

Re-feeding partially consumed milk

Bacteria in the baby's mouth can enter the bottle during feeding and multiply in the milk. Antibacterial components in milk hamper bacterial growth. Although we have not found any formal studies to provide recommendations for this situation; based on related evidence, it seems reasonable to discard the remaining milk within 1–2 hours after the baby has finished feeding. Use a fresh bottle of milk if the next feed is more than a couple of hours later (ABM 2010, LLLI 2008). Milk that has been previously frozen will have lost some of its antibacterial properties and should be discarded soon after feeding.

Re-cooling expressed milk

Once stored expressed milk has been warmed to room temperature or above, it is best not to return it to either refrigerator or freezer temperatures (ABM 2010). Frozen milk cooled to refrigerator temperatures for less than 8 hours is safe to refreeze (Rechtman 2006).

Maternal breast infection and storing milk

If a mother has a bacterial or fungal infection of her breast she can continue to breastfeed. There is debate about whether or not she should store expressed milk for use at a later date (LLLI 2008, ABM 2010). If a mother has breast or nipple pain from what is considered to be a bacterial infection, there is no evidence that her stored expressed milk needs to be discarded unless it appears stringy, foul or contains pus (ABM 2010). With a fungal infection, the safest course of action would be to discard any milk expressed during the infection until the full course of treatment is completed (LLLI 2008).

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