

Breast feeding mothers may encounter unforeseen reasons for separation from their infants.

But more often women express and store milk for planned events, life style flexibility, and returning to work. Knowledge of appropriate human milk handling and storage is essential for breast feeding success in these situations.

Human milk is a fresh, living food with many antioxidant, antibacterial, prebiotic, probiotic, and immune boosting properties in addition to nutrients. Although some of these nutrients and health properties change with storage, there is good evidence that the human milk storage can be safe, allowing provision of optimal nutrition to the child, when breast feeding, or immediately expressed breast milk is not available. When direct breast feeding is not possible, stored human milk maintains unique qualities, such that it continues to be the gold standard for infant feeding.

Preparation for human milk storage

1. **Washing:** women should wash their hands with soap and water, or waterless hand cleanser if their hands don't appear dirty, before milk expression. Unclean hands may transmit viruses and bacteria, some of which can cause illness. Additional hand hygiene and cleaning of the breasts before expression are not necessary
2. **Hand or breast pump:** Milk expression can be achieved successfully by hand or by a breast pump. Hand expression is usually gentler than a breast pump and hand expression produces a better oxytocin response and milk ejection reflex, leading to higher amount of milk collection. There is no need to discard the first few drops of milk while initiating milk expression.
3. **Hand Expression of Breast Milk:** Exactly How To Perform This Technique

Step 1

Massage your breast in a circular motion, working your way all the way around your breast. If needed, hold your breast with your hand on opposite side of your body for easy access to your

areola and nipple. Your areola is the coloured area around your nipple.

Step 2

With your hand on the same side of your body as the breast you are expressing, place your thumb and index finger on the outside edge of your areola. Your fingers should be directly across from each other as if they were at “12 and 6” or “3 and 9” on a clock.

Step 3

Press firmly, but gently, into your breast with those fingers, toward your chest.

Step 4

As you press into your breast, without lifting your fingers off your breast, spread your fingers slightly.

Step 5

Squeeze your fingers back toward your nipple without sliding them down onto your nipple. This should be a circular, massaging motion back toward your chest and out toward your nipple.

Things to keep in mind during the hand expression of breast milk:

If your fingers end up squeezing your nipple, they have slid too far down. Place them back to the outer edge of the areola.

It may take several repetitions before milk comes out so remember to be patient.

You can rotate the position of your fingers around your areola to stimulate different milk ducts.

Do not pinch down on your nipple or areola, as this will cause pain and could stop milk flow.

Remember it is a circular, massaging motion in toward your chest, then out toward your nipple.

If you only express a few drops, you can catch your milk in a spoon or medicine cup. However, if you plan to express a greater amount, you may need a bigger container.

For video showing the correct and incorrect breast milk expression visit

- a) <https://youtu.be/Vf82C1s-o6g>
- b) <https://introwellness.com/baby/hand-expression-breast-milk>

4. **Storage:** choice of container.

Better to use plastic containers, which shows the number, either 2(made of HDPE- high density polyethylene), 4(made of LDPE- low density polyethylene) or 5(made of polypropylene) in the bottom. The plastic should be BPA(bisphenol A) free. Please select products from Medella, Pigeon, or Philips AVENT. Hard containers are better than pouches. If you don't want to use plastic, other option will be Glass containers. Avoid stainless steel containers, as the live cells in the breast milk don't survive for long due to oligodynamic effects of the metal.

5. **Care of the containers:** containers and breast pump parts should be washed in hot soapy water and rinsed, or washed in a dish washer and should always be thoroughly air dried or dried with paper towels. They do not need to be sterilized. If soap is not available boiling water is preferable. Chemical disinfection is not ideal.

Storage of human milk

1. **Room temperature:** Freshly expressed human milk may be stored safely at room temperature for 4 hours.
2. **Refrigeration:** Refrigerated breast milk at 4°C can be used within 4 days.
3. **Freezing expressed human milk:** Freezing expressed breast milk (- 4°C to – 20°C) can preserve the nutrients and prevent bacterial contamination and can be used till 6 months since collection. It should be stored in the back of the freezer and away from the walls to prevent temperature fluctuations.
4. **Smell of stored milk:** refrigerated or frozen milk may have an odour different from fresh milk due to chemical reactions, releasing fatty acids, which has antimicrobial effects preventing growth of the bacteria in thawed refrigerated milk. Babies will not reject milk due to this odour and can be given.

5. **Expansion while freezing:** when filling the container with human milk, space should be left at the top to allow for expansion with freezing.
6. **Mixing milk:** Freshly expressed warm milk should not be added to already cooled or frozen milk, to prevent rewarming of the already stored milk. It is best to cool down the new milk first before adding it to older stored milk

Using stored human milk

1. **Cleaning of feeding devices:** Containers and feeding devices like cup and spoon, paladai should be cleaned with soap and water and air dried, dried with paper towel before and after every use.
2. **Using fresh milk first:** Whenever possible use fresh milk first, and use frozen and refrigerated milk only if fresh milk is not available.
3. **Thawing of frozen milk:** Is best done in a slow manner in the refrigerator.
4. **Warming human milk:** most infants drink cool milk, at room temperature, or warmed. Warming thawed human milk to body temperature is best done over a period of 20 minutes in luke warm water.
5. **No microwave** to be done.
6. Once frozen milk is brought back to room temperature, it should not be left in the room temperature for more than 2 hours.
7. **Using previously fed milk:** once an infant begins drinking expressed milk, some bacterial contamination occurs in the milk from the infant's mouth. It seems reasonable to discard the remaining milk within 1 hour after the infant has finished feeding.
8. **Handling:** expressed human milk does not require special handling. It can be stored in the workplace refrigerator where other workers store food, although it should be labelled with name and date.
9. **Infections:** if a mother has breast or nipple pain from a bacterial or yeast infection, there is no evidence that her stored expressed milk needs to be discarded. Human milk that appears stringy, foul, or purulent should, however, be discarded and not be fed to the infant.

For additional resources please visit

- a) <https://youtu.be/Qn1-vrOmZ8> breast feeding when you go back to work-nutrition series , copyright@ UNICEF 2018
- b) https://youtu.be/_z1G8a1dXsE storing breast milk safely-breast feeding series by global health media project.
- c) <https://youtu.be/gDai2XrPpQc> storing breast milk safely-breast feeding series by global health media project in **Tamil**.