Resource for Informed Breastmilk Sharing

Handling of Breastmilk

This document is not intended as medical advice.
It was created as a tool for informed choice.
Consult your health care provider if you have questions about sharing breastmilk.

Introduction

This document is more than a ‘how-to’ guide for the sharing of breastmilk. When working on this project, we realized that we could not present a ‘standard of milk sharing’ nor make statements, without also providing information as to why something is considered the standard, what that something means, and what the alternatives to that standard could be.

The result of our work is a resource document that offers information beyond the scope of what parents may want and/or need to know about sharing breastmilk. Nonetheless, we feel that the information can be important for making informed choices. We also hope that this document will help normalize wet-nursing and sharing breastmilk.

"It is dangerous for a scholar even to imagine that he might attain complete neutrality, for then one stops being vigilant about personal preferences and their influences —and then one truly falls victim to the dictates of prejudice. Objectivity must be operationally defined as fair treatment of data, not absence of preference.”
–Stephen Jay Gould

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With special thanks to Tracy Hydeman,
and gratitude to the many reviewers.

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Is breastmilk a biohazard?

According to the CDC\(^1\) breastmilk “is not considered a biohazard and no special precautions exist for the handling of expressed human milk, nor does the milk require special biohazard labeling. The Universal Precautions\(^2\) to prevent the transmission of human immunodeficiency virus (HIV), Hepatitis B virus, and other blood-borne pathogens do not apply to the handling of human milk.”

How can breastmilk be expressed?

Always make sure that supplies are clean and wash your hands before handling breastmilk

Breastmilk can be expressed by hand, manual pump or electric pump. Following are suggested steps for properly and safely expressing breastmilk:

- Before beginning, make sure that your supplies are clean and dry.
- Vigorously wash hands, fingers, forearms and under nails with soap and warm water for 20 seconds, dry hands with paper towel and then use paper towel to turn off faucet. Read these instructions for more information on proper hand washing techniques. http://www.cdc.gov/nceh/vsp/cruiselines/handwashing_guidelines.htm
- Inspect your breasts and make sure that the nipples are not cracked and bleeding and that there are no open sores, lesions or blisters on your breast. If so, do not donate at this time. Please read ‘Open sores, blisters, and/or bleeding cracks on the skin’ for more information.
- Follow the instruction manual for your pump or consider expressing by hand. Please read this link for expressing tips and pumping information: http://www.womenshealth.gov/breastfeeding/pumping-and-milk-storage/
  This video is a good tutorial on how to express breastmilk by hand:
  - Properly label the storage container with your name and date and place in the freezer or refrigerator.
  - After pumping and storing, wash and properly store your supplies.

Pumps can be bought or rented, either by the donor or by the recipient, depending on their arrangement with each other.

After the use of drugs, certain medications and alcohol, breastmilk may need to be expressed and discarded. For more information please read ‘Drugs, medication, alcohol and the decision to discard breastmilk?’.

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\(^{1}\) http://www.cdc.gov/breastfeeding/disease/hiv.htm
\(^{2}\) http://www.cdc.gov/mmwr/preview/mmwrhtml/00000039.htm

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How can breastmilk be stored?

Always make sure that supplies are clean and wash your hands before handling breastmilk

Breastmilk can be stored at room temperature, in the refrigerator, in the freezer or in coolers depending on how long it needs to be stored. It can be stored in capped glass or plastic containers, specialized ‘breastmilk storage trays’ or in specialized milk bags.³

For more information about storing breastmilk and which containers to use, please visit this page from the MayoClinic:
http://www.mayoclinic.com/health/breast-milk-storage/MY00926

Always handle breastmilk with clean hands and follow the manufacturer’s instructions for properly cleaning your pump.

- Pump into a sterilized bottle connected to the pump. For pumping information see:
  http://www.womenshealth.gov/breastfeeding/pumping-and-milk-storage/#a
- When you have finished expressing or the bottle is full, store directly in the bottle or transfer into an clean and approved breastmilk storage container.
- The MayoClinic⁴ states: “You can add freshly expressed breast milk to refrigerated or frozen milk you expressed earlier in the same day. However, be sure to cool the freshly expressed breast milk in the refrigerator or a cooler with ice packs for at least one hour before adding it to previously chilled milk. Don't add warm breast milk to frozen breast milk because it will cause the frozen milk to partially thaw. Keep milk expressed on different days in separate containers.”⁵
- Store expressed milk in small amounts, and increase amount as a baby eats more per feeding.⁶
- If you plan on freezing the breastmilk for storage, this should be done immediately after expressing.
- Freezing milk in small amounts (2-4 oz) is most convenient to avoid waste.

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³ In ‘Nursing: The 3 M's of Breast-feeding the Preterm Infant’: “Studies measuring these factors [size, need to recycle, ease of cleaning/sterilizing, protection of nutrients, bacteriologic considerations, and ability to connect directly to the pump flange] conclude that glass and hard clear plastic (polypropylene) are the recommended choices for milk collection/storage. Plastic bags are a poor choice for milk storage [...] owing to their non-sterile condition, greater loss of fat (adherence to sides of bag), and difficulty in handling.” Plastic bags can however be more convenient. Plastic bags specially designed for freezing expressed human milk are available from many companies that specialize in products for breastfeeding mothers and babies.
http://www.nursingcenter.com/prodev/ce_article.asp?tid=747588#P2

⁴ http://www.mayoclinic.com/health/breast-milk-storage/MY00926

⁵ However, the CDC states: “Do not add fresh milk to already frozen milk within a storage container. It is best not to mix the two.”
http://www.cdc.gov/breastfeeding/recommendations/handling_breastmilk.htm


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• You can keep previously frozen milk in the refrigerator for 24 hours.\(^7\)
• Remember that breastmilk will expand when frozen, so do not overfill your container, especially if you use a glass container.
• Mark your name, the date, amount of milk, and age of your baby on the container.
• Storage bags should be stored carefully, away from other items in the freezer to avoid any damage.
• Do not refreeze previously frozen milk, unless it has been heat-treated.

Once you have expressed your breastmilk, it is important not to shake it, especially if you are also going to freeze the milk. Shaking denatures the shaped molecules of the protective proteins.\(^8\)

Please see the section ‘How long can breastmilk be stored?’ for information on length of storage.

**For recipients:**
Upon receiving the breastmilk, store it in the freezer or in the refrigerator as given to you, or use within 6-8 hours depending on your need.

How long can breastmilk be stored?

Breastmilk can be kept in the refrigerator or freezer, depending on the need. Per Women's Health and CDC guidelines,\(^9\) breastmilk can be kept for:

- 6-8 hours at room temperature
- 24 hours in an insulated cooler bag
- 5 days in a refrigerator
- 6 months in a freezer
- 12 months in freezer if set at -20ºC/-4ºF

Also, “Breastmilk can safely stand at room temperature for 6 to 8 hours and need not be discarded if the first feeding attempt is incomplete. In contrast, formula must be refrigerated and discarded after the first feeding attempt because it contains no antibodies or infection protection factors”.\(^10\)

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\(^7\) [http://www.womenshealth.gov/breastfeeding/pumping-and-milk-storage/#a](http://www.womenshealth.gov/breastfeeding/pumping-and-milk-storage/#a)
\(^8\) [http://www.bfrfc.com/ljs/breastfeeding/shakenot.htm](http://www.bfrfc.com/ljs/breastfeeding/shakenot.htm)
\(^10\) [http://www.cdc.gov/breastfeeding/recommendations/handling_breastmilk.htm](http://www.cdc.gov/breastfeeding/recommendations/handling_breastmilk.htm)


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How can breastmilk be shipped or transported?

Breastmilk can be shipped or transported in coolers.

Please follow these instructions for packaging and shipping your breastmilk: [http://newborns.stanford.edu/Breastfeeding/ShipNStore.html#packaging](http://newborns.stanford.edu/Breastfeeding/ShipNStore.html#packaging)

Please note that the information from the Transportation Security Administration (TSA) on this website is outdated. For current information see ‘Travel By air.’

For local transportation of breastmilk, keep the milk in a cooler and on ice, especially in hotter climates.

For shipping across country lines, please find the customs information of your country.

How can breastmilk be thawed?

Breastmilk can be thawed in the refrigerator, in a container of (warm) water or under running (warm) water. It is important not to shake breastmilk. Shaking denatures the shaped molecules of the protective proteins.\(^1\)

Please find proper thawing instructions at Woman’s health and the CDC.

Please note that it is not advisable to defrost breastmilk in the microwave. As per CDC guidelines:\(^2\)

- "Microwave ovens do not heat liquids evenly. Uneven heating could easily scald a baby or damage the milk. Microwave radiation also damages many of the anti-infective factors in human milk."
- "Bottles may explode if left in the microwave too long."
- "Excess heat can destroy the nutrient quality of the expressed milk."

Thawed milk can be kept in the refrigerator for 24 hours. Do not refreeze previously frozen milk, unless it has been heat-treated in between.

How can breastmilk be pasteurized at home?

When full screening is not available, donor health status is unknown, or to reduce the potential risks of exposure to HIV and/or other pathogens, breastmilk can be pasteurized at home.

**Holder pasteurization**

Holder pasteurization\(^3\) is considered the standard for human and cow's milk pasteurization. It

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2. [http://www.cdc.gov/breastfeeding/recommendations/handling_breastmilk.htm](http://www.cdc.gov/breastfeeding/recommendations/handling_breastmilk.htm)
3. [http://www.hmbana.org/index/processing](http://www.hmbana.org/index/processing)
has been shown to inactivate pathogens while maintaining adequate nutritious properties. However, given its longer time-temperature curves, this method damages more of the antimicrobial factors\(^\text{14}\) of breastmilk than would flash pasteurization\(^\text{15}\).

This method of pasteurization can be done by parents or caregivers with home pasteurizer kits for human milk. Some mothers may decide they want to buy commercial grade pasteurizers which are also available.

**Flash-heating (FH)**

Flash-heating is a low-tech method of pasteurizing breastmilk that was developed for HIV positive mothers in developing countries who had no safe or affordable alternatives for feeding their infants\(^\text{16}\).

Given the specific risks for women in developing country settings, research studies focused on determining the impact of flash-heat on HIV, bacteria and breast milk’s protective elements, such as immunoglobulins, vitamins and the immunoreactive proteins lactoferrin and lysozyme. Studies by a research team lead by Israel-Ballard\(^\text{17}\) have shown that FH breastmilk inactivates HIV and bacteria\(^\text{18}\) while retaining high levels of vitamins,\(^\text{19}\) lactoferrin,\(^\text{20}\) and immunoglobulin,\(^\text{21}\) which are important for the health of a baby and its immunity to infections. See ‘Why breastmilk’ for more information on the importance of the anti-infective components of breastmilk.

Please watch this YouTube video from UC Berkeley School of Public Health\(^\text{22}\) to have a visual of how flash-heating can work at home:

http://www.youtube.com/watch?v=NNw1odieIoI

To flash-heat at home, a simple how-to explanation can be found here:

http://www.qaproject.org/strat/Tanzania%20job

\(^\text{14}\) http://www.eatsonfeets.org/docs/Donor_Milk-What_s_in_It_and_What_s_Not.pdf  
\(^\text{15}\) http://www.latrobe.edu.au/microbiology/table7.html  
\(^\text{16}\) Please see ‘Human Immunodeficiency Virus (HIV)’ and ‘HIV and the global context of infant feeding’ for more information.  
\(^\text{17}\) http://berkeley.edu/news/media/releases/2007/05/21_breastmilk.shtml  
\(^\text{19}\) http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2896979/  
\(^\text{20}\) Lactoferrin is a globular multifunctional protein with antimicrobial activity (bacteriocide, fungicide) and is part of the innate defense, mainly at mucoses. Lactoferrin is found in milk and many mucosal secretions such as tears and saliva.  
\(^\text{21}\) Immunoglobulins are a class of proteins produced in lymph tissue in vertebrates and that function as antibodies in the immune response.  
\(^\text{22}\) http://berkeley.edu/news/media/releases/2007/05/21_breastmilk.shtml
Safety of flash-heating
When researchers designed the flash-heat method for women in developing countries, it was an attempt to replicate the flash-pasteurization methodology for a low resource setting. Flash-heating is a simplified in-home process and as such is not as controlled as the actual flash pasteurization method. Altitude, breast milk volumes, water volumes and human error could contribute to differences in the flash-heat process. Although researchers hypothesize that the temperatures achieved during flash-heat render it safe, it should be noted that its effectiveness to inactive all viruses and spores has not been thoroughly researched. Please see the section ‘Flash heating’ for more information.

When heat-treating breastmilk, especially when using the Holder Method, many important anti-infective factors are reduced. Also, lipase, an enzyme that helps with the break-down and absorption of fats, is significantly reduced by flash-heating and deactivated by Holder pasteurizing. Please also see ‘What about premature babies?’ for information about the effect of heat-treating on some important components of breastmilk. Wet-nursing and/or raw, fresh (not frozen) when possible, screened and properly handled breastmilk is a better option when available.

Cooling down heat-treated milk
Cooked foods have a 'danger zone,' a temperature range from 60°C/140°F to 4°C/39°F where bacteria like to grow. It is therefore important to cool milk down quickly after it has been heated. Cooling the container in ice water is the quickest way to cool milk. Depending on the amount of milk, cooling it in the refrigerator is generally not recommended as the milk will cool unevenly, leaving some milk too warm for too long. Please know that not all glass is suited for heating and rapid cooling.

Reusing heat-treated milk
After cooling “flash-heat was successful in completely eliminating bacteria in the majority of samples, and prevented substantial growth for up to 8 h when stored at room temperature.”

To date, the safety of reheating previously heat-treated milk has not, to our knowledge, been studied. It should be noted that most literature speaks in terms of heating expressed milk for feeding but that mothers generally warm the (thawed) milk under running warm water or set it in a container in warm water for a short while to get the chill out of it. Gently warming should not be considered heat-treating. For optimal properties of breastmilk, reheating (warming)

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23 Please see ‘Bacteria’ for more information.
26 http://www.tpub.com/content/armymedical/MD0181/MD01810097.htm

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milk should not be done directly in a pan on the stove top nor in a container set in boiling water on the stove top (which would be heat-treating it unnecessarily). It is suggested, however, that after a first feeding, milk that was heat-treated not be refrigerated and reheated again.

For more information on infant feeding and HIV, please see ‘HIV’ and ‘HIV and the global context of infant feeding.’

How do I feed the milk to my baby?

Always make sure that supplies are clean and wash your hands before handling breastmilk

Babies can be feed milk by at at-the-breast tube system, by cup feeding, saucer, spoon, dropper, or by bottle.

The act of nourishing a baby at one’s breast (breastfeeding) is ideally not separated from the sustenance the baby is receiving (milk). Therefore, when a mother does not produce (enough) milk, an already latching baby would preferably get all additional breastmilk via an at-the-breast system.28

Expensive equipment is not required for this. It does not have to be an official at-the-breast system that you purchase/use. All that is needed is a long length of No. 5 French feeding tube (can be purchased or ordered at your local pharmacy), and some sort of container (like a bottle) to hold the breastmilk in. This DIY version is perfectly adequate and keeps baby at his/her own mother’s breast, thus minimizing the risk of jeopardizing supply (as the breasts and supply of the woman are still being stimulated while baby is latched on and drinking).29


If this is not possible, and until breastfeeding and/or feeding with an at-the-breast system can be established, other methods are best used before giving a bottle, like using a cup. Avoiding bottle feeding is important in order to prevent nipple confusion if a mother hopes to fully

Please know that the company that manufactures one of the official at-the-breast systems is not WHO code compliant. More information on the ‘International Code of Marketing of Breast-milk Substitutes’:
http://www.who.int/nutrition/publications/code_english.pdf

29 Other important benefits of breastfeeding include proper jaw and facial development which reduces both ear infections and bite issues, by preventing malocclusion. The skin to skin contact that breastfeeding provides helps babies acquire the beneficial bacteria that protects them from diseases and builds their immune system. Skin to skin also provides relaxation for both mother and child due to the effects of oxytocin. Long term benefits are laid out in this WHO publication:
Please see ‘Why breastmilk?’ for references.

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breastfeed her baby eventually.\textsuperscript{30} On AskDr.Sears\textsuperscript{31} it is stated that “research has shown that not only is it possible for preemies to drink from a cup, but they also maintain a more stable blood-oxygen level during cup-feeding than during bottle-feeding.” The participant’s manual of the WHO’s Breastfeeding counselling\textsuperscript{32} (p.124) states:

- “Why cup feeding is safer than bottle feeding:
  - Cups are easy to clean with soap and water, if boiling is not possible.
  - Cups are less likely than bottles to be carried around for a long time, giving bacteria time to breed.
  - A cup cannot be left beside a baby, for the baby to feed himself.
  - The person who feeds a baby by cup has to hold the baby and look at him and give him some of the contact that he needs.
  - A cup does not interfere with suckling at the breast.

- How to feed a baby by cup:
  - Hold the baby sitting upright or semi-upright on your lap.
  - Hold the small cup of milk to the baby's lips.
  - Tip the cup so that the milk just reaches the baby's lips.
  - The cup rests lightly on the baby's lower lip, and the edges of the cup touch the outer part of the baby's upper lip.
  - The baby becomes alert, and opens his mouth and eyes.
  - A LBW [Low Birth Weigh] baby starts to take the milk into his mouth with his tongue.
  - A full term or older baby sucks the milk, spilling some of it.
  - DO NOT POUR the milk into the baby’s mouth. Just hold the cup to his lips and let him take it himself.
  - When the baby has had enough, he closes his mouth and will not take any more. If he has not taken the calculated amount, he may take more next time, or you may need to feed him more often.
  - Measure his intake over 24 hours –not just at each feed.”\textsuperscript{33}

Please see the AskDr.Sears website for more alternative feeding options (spoon, saucer, dropper).

If choosing to use a bottle, there are some very important things to consider:

\textsuperscript{30} From AAP’s Promoting and Supporting Breast-Feeding: “Nipple confusion occurs when a baby has not had the opportunity to establish the correct mouth movements for proper breast-feeding. Early and subsequent use of pacifiers, water, glucose water and formula supplementation have been shown to promote early weaning and nipple confusion. The frequent use of an artificial nipple early in life has been shown to promote a less effective mouth movement; this was demonstrated with ultrasonography over a decade ago. For this reason, the physician should encourage the staff and the patient to address breast-feeding problems first, with direct observation of breast-feeding, before considering the use of supplementation.”

http://www.aafp.org/afp/20000401/2093.html

\textsuperscript{31} http://www.askdrsears.com/html/2/T026000.asp


\textsuperscript{33} See ‘How much expressed milk does my baby need?’

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Watch the baby. Babies will cue us when they are hungry. Hunger cues include (but are not limited to) rooting, chewing on their fists, and rapid eye movement as they are about to wake. Respond to baby's hunger cues and not the clock.

Hold the baby in an upright, seated position. It is very important that baby not be fed from a bottle while lying on their back. Having a baby in a more upright position allows them to better control the flow of milk into their mouths.

Just as a breastfeeding mom would switch sides while nursing, switch baby from one arm to the other. It is important that baby has the opportunity to develop both eyes and both sides of their bodies.

Never push or force the bottle nipple into the baby's mouth. Allow them to explore and draw the nipple in on their own.

Pace baby's feeding. Even with a low-flow or slow-flow nipple (preferable for all babies), the milk can enter the baby's mouth much quicker than they are able to take it in. If a nursing session would take 20 minutes, expect that a bottle feeding session would take the same amount of time.

Baby's breastfeed with a certain suck and swallow rhythm. Often they suck 2 or more times before swallowing. We can mimic this by encouraging frequent pauses. Allow the baby to suck and swallow according to their rhythm and then tip baby forward a bit (to empty milk out of the bottle nipple) to simulate the pause. Tip them back slightly and allow the suck and swallow rhythm to happen again.

Watch the baby. By allowing them control over the feeding rhythm, we allow them to let us know when they are finished. Never force a baby to finish a bottle. Allow them to dictate when the feed is over.

It is critically important that babies and their care givers are able to engage together in a feeding. **It is never safe to ‘prop’ a bottle for a feeding.** It is not only unsafe, but contrary to our human nature.

For support with implementing any of these alternative feeding options, please find a professional lactation consultant or look in ‘Local resources’ for referral suggestions.

Please see 'Handling of breastmilk' for information on handling and storing.

**How much expressed milk does my baby need?**

It is best to follow the baby’s lead. Volume needs change day-to-day and from baby to baby. Learning a baby’s unique communication style is an important part of the early bonding process.

According to ‘The participant’s guide of WHO’s Breastfeeding counselling’34 (p. 127), the amount of milk to give is:

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• “Babies who weigh 2.5 kg or more:
  ▫ 150 ml milk per kg body weight per day.
  ▫ Divide the total into 8 feeds, and give 3-hourly.

• Babies who weigh less than 2.5 kg (Low-birth-weight):
  ▫ Start with 60 ml per kg body weight.
  ▫ Increase the total volume by 20 ml per kg per day, until the baby is taking a total of 200 ml per kg per day.
  ▫ Divide the total into 8-12 feeds, to feed every 2-3 hours.
  ▫ Continue until the baby weighs 1,800 g or more, and is fully breastfeeding.

Check the baby’s 24-hour intake. The size of individual feeds may vary.”

This calculator can be used as a general guideline for babies that are receiving feeding from an at-the-breast system, a cup, or a bottle:
http://www.fourfriends.com/cgi-bin/milk.pl

Can donated breastmilk be reused?

With proper care and timely use, donated breastmilk can be reused as follows:

Fresh milk
Regarding raw and fresh milk, Lawrence writes: “Breastmilk can safely stand at room temperature for 6 to 8 hours and need not be discarded if the first feeding attempt is incomplete.” 35

After feeding
Regarding reusing milk after a feeding, Dr. Ruth Lawrence writes: 36 “Whether you can use the remaining milk really depends on how long it sits around. Once the baby takes the bottle, there is a certain amount of saliva that gets in the bottle that creates bacteria and gets saliva enzymes in the milk. This is why it isn’t good to give milk that has been sitting around. But, if it sits for only a half hour or so, this is fine.” 37 There can be confusion as to what ‘sits around’ means. Eats on Feets assumes that in this context ‘sits around’ means ‘stand at room temperature.’

See ‘How do I feed the milk to my baby?’ for cleaner and thus safer feeding options.

After refrigeration
For raw and fresh (not frozen) breastmilk after refrigeration, this summary states: “[...] When infants do not finish a bottle of expressed breastmilk, doctors recommend unfinished portions be thrown away. This [small –ed.] study examined bacterial levels in expressed, partially consumed breastmilk that was stored for 48 hours at 4-6° C [bold –ed.]. A portion of

35 http://www.breastfeeding.com/all_about/lawrence_anwers1_pumped.html
37 Eats On Feets recommends using alternative feeding options to a bottle and/or using small amounts at a time to avoid waste and contamination. Please see ‘How do I feed the milk to my baby?’ for more information.
unconsumed milk was examined as a control. Samples were taken every 12 hours for bacterial analysis. Tests were performed to identify total colony counts, pathogenic Staphylococci, coliforms and b-hemolytic Streptococci. This study showed no significant difference between bottles that were partially consumed and those that were not exposed to the baby’s mouth for 5 out of 6 participants. All milk samples had colony counts in the acceptable range of < 105 colony forming units per milliliter (CFU/ml). Although this project provides evidence that it may be safe to re-feed a child a bottle of breastmilk, due to the small sample size, further tests should be performed.”

Most mothers reheat leftover and refrigerated milk. Dr. Ruth Lawrence writes: “If the milk is warmed up but not used, it is OK to reheat the milk once. But the more you reheat the more you decrease some of the valuable immunologic properties of the milk.”

After freezing
Regarding previously frozen raw milk, it is generally accepted that thawed milk can be kept in the refrigerator for up to 24 hours. Please see ‘How can breastmilk be thawed?’ for thawing instructions. Most mothers reheat (warm) previously frozen raw milk as well (after a first feeding). There is no research on whether this practice is safe or not. Do not re-freeze previously frozen breastmilk.
However, breastmilk that was frozen can be re-frozen after it has been heat-treated. This is the process that milk banks follow: frozen donated breastmilk is pasteurized, after which it is stored in the freezer.

Re-using heat-treated milk
In the study 'Bacterial Safety of Flash-heated and Unheated Expressed Breastmilk during Storage,’ the researchers discuss that after cooling “flash-heat was successful in completely eliminating bacteria in the majority of samples, and prevented substantial growth for up to 8 h when stored at room temperature.”

To date, the safety of reheating previously heat-treated milk has not, to our knowledge, been studied. It should be noted that most literature speaks in terms of heating expressed milk for feeding but that mothers generally warm the (thawed) milk under running warm water or set it in a container in warm water for a short while to get the chill out of it. Gently warming should not be considered heat-treating. For optimal properties of breastmilk, reheating (warming) milk should not be done directly in a pan on the stove top nor in a container in boiling water on the stove top (which would be heat-treating it unnecessarily). It is suggested however that after a first feeding, milk that was heat-treated not be refrigerated and reheated again.

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39 This can be the case if a donor heat-treats the milk because of high lipase or after a recipient heat-treats the milk and there is milk left over after a feeding for instance.
41 Per the same study “Flash-heated and unheated samples were stored at 2–8°C [35ºF–46ºF –ed.] overnight to be processed for microbiology assays the next morning, 18–24 h after collection. At this time, both flash-heated and unheated aliquots were placed at room temperature (23°C) [73ºF –ed.] and allowed to stand, in capped vials, for up to 8 h.”

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How do I clean and sterilize supplies and pump parts?

AskDr.Sears\textsuperscript{42} writes: “When you are pumping milk for a full-term, healthy baby, you do not need to worry about sterilizing storage containers or pump parts. Wash your storage containers in hot soapy water, and wash your hands thoroughly with soap and water before you pump. Check the manufacturer's instructions for information on washing parts of the pump. Storage containers and parts of some pumps can be washed in a dishwasher. Mothers who are pumping milk for a sick or hospitalized baby will need to be more careful about milk handling and sterilization procedures.”

From Food Smart: Safe feeding for infants:\textsuperscript{43} “To reduce the risk of contamination, all bottles and feeding equipment must be sterilized until your baby is three months old. Equipment can be sterilized with boiling water, with sterilizing solution, or with a steam-sterilizing unit. Please note that a dishwasher does not sterilize bottles or feeding equipment [It sanitizes. –ed.]. After three months of age it is sufficient to wash bottles and feeding equipment with hot soapy water and then rinse.”

We encourage recipients to discuss their and their baby’s needs with potential donors.

The above website proceeds to explain the steps involved in cleaning and sterilizing:

- “To clean:
  - Always thoroughly wash and dry your hands with soap and water before leaning and sterilizing bottles and feeding equipment.
  - Make sure the area used to clean and sterilize your baby’s bottle and feeding equipment is clean.
  - Wash bottles and feeding equipment thoroughly in hot soapy water. If using feeding bottles, use clean bottle and teat brushes to scrub the inside and outside of the bottles and teats to ensure all remaining feed is removed.
  - Rinse the bottles and feeding equipment well in hot water and air dry it, or wash it in a dishwasher.

- To sterilise by boiling:
  - Place the bottles, feeding equipment and preparation utensils in a pot if you use glass bottles, a clean cloth in the bottom of the pot may stop bottles from chipping.
  - Fill the pot with water, high enough to cover everything.
  - Bring the water to boil and boil for five minutes, turn off element, and keep pot covered until feeding equipment is needed.
  - Use clean tongs to lift the bottles out and place them on a clean dry surface.
  - If equipment is not used immediately cover and store in a clean place. Store bottles with the teat upside-down in the bottle, or cover the teat with the sterile cap.

\textsuperscript{42} http://www.askdrsears.com/html/2/t026900.asp
\textsuperscript{43} http://www.foodsmart.govt.nz/information-for/babies-toddlers/safe-feeding-for-infants/

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• For other methods of sterilisation follow the manufacturer’s instructions carefully. These methods include:
  ▫ Chemical sterilization using sterilizing solution in a plastic container.
  ▫ Microwave sterilization using a special microwave steam-sterilizing unit. This is not suitable for glass bottles.
  ▫ Steam sterilization.

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When using #5 French feeding tubes for at-the-breast feeding or finger feeding, rinse the tubes with hot, soapy water and use a syringe to force soapy water through the tubes, followed by clear water after each feeding. Dry the tubes by pushing air through the tubes.

The longevity of these tubes is not known. The tubes should be replaced when they become gummy, discolored, brittle, etcetera.