

Handling and storage of expressed milk



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Introduction

General guidelines exist for the storage of expressed breast milk. These are based on assumptions that people will store their milk either at room temperature, or in the fridge, or in the freezer.

But does this reflect what people actually do?

Expressed milk goes through multiple steps, that can be represented in a user flow: after expressing the mother need to cool the milk, bring it home and prepare it for longer storage. For using the milk, some planning is required. This can involve transport of milk to a daycare, where the milk will be temporarily stored again.

Storage guidelines as published by La Leche League

(https://www.lalecheliga.de/images/Infoblaetter/LLL_Muttermilch_gewinnen_und_aufbewahren.pdf)

Storage location	Temperature	Optimal	Acceptable
Room	16 – 29 °C	3-4 hours	6-8 hours
Refrigerator	4 °C	72 hours	5-8 days
Freezer	< -18 °C	6 months	12 months

⚠ Warning: Hygiene is very important. Use clean devices and storage containers. Do not touch the milk with your hands.

⚠ Warning: Thawed milk should stored in the fridge and used within 24 hours.

User flow



Approach

We performed social listening on blogs, and found out that:

- There are many questions and uncertainties about the guidelines
- Even when parents are aware of guidelines, they 'stack' (for example: after 4 days in the fridge you can still freeze it for 6 months)
- Unfinished bottles are stored and offered a second time
- Also when stored according to guidelines, changed milk quality upon storage and bottle refusal is relatively common

I know the rules regarding how long the milk can be at room temperature and in the fridge and such but can you leave the milk out at room temperature and THEN refrigerate it and likewise can you max out the fridge time and THEN freeze it?

Know its 6 days in the fridge and 6 hours at room temperature, but how long does it last when its been in the fridge for a few days and is taken out?

I know the general guidelines for keeping expressed breastmilk, but I'm a little confused. Today at work I pumped 6oz* and kept it between ice packs in my cooler bag, got home 3hrs later and immediately put it in the fridge. It's been there for 5hrs. I don't foresee using it tomorrow, so can I put it in the freezer? If I were to leave it in the fridge, how soon do I need to use it? * 1oz = 29.6 ml

Omg I thought defrosted breastmilk would keep in fridge for 5 days like fresh breastmilk. I gave dd* a bottle of milk and she kept pulling faces so when I smelled/tasted it, it was clearly off as smelled like sick. She drank an oz** of it, do you think she will be ok? I feel terrible and a crap Mam
* dear daughter ** 1oz = 29.6 ml

My question is does anyone know if it's safe to mix the cold milk with the newly pumped milk?

Basically if I warm a bottle, and if baby doesn't finish it within 20-30 mins of being out room temp, I put it back in the fridge for later & feed at the next feeding (including re-warming). I've done this 2-3 times per bottle, and kept leftover milk overnight in the fridge for up to 12 hrs and served it the next morning when baby woke up.

All the books said to freeze a stash to extend BF'ing. So I pumped and pumped, bought sterile breast milk bags and froze. Tucked into the stash by defrosting them in the fridge for 24hrs two bags at a time, and she hates it.

Breastmilk is ok out of the fridge for 6 hours and can be warmed twice. Therefore it sounds like the milk will be fine... If you won't use it within 6 hours pop it back in the fridge and use within 24 hours



Summarizing remarks

People struggle to implement the guidelines into their way of working. While doing so, they adopt habits that can cause risks for the infants.

It is known by many that the quality of stored breast milk declines due to lipolysis and bacterial spoilage. Chemical oxidation is hardly known.

Guidelines should reflect better the real life situations of and more research is needed to know the quality decline of stored breast milk.

Milk quality change

Milk is known to change during storage due to lipolysis, chemical oxidation and bacterial spoilage¹⁻³. This will lead to changes in odor and taste^{4,5}. Infants will notice this change, but not in all cases refuse a bottle of milk^{6,7}. More research is needed to fully understand the changes upon storage of expressed breast milk.

Human milk odor changes upon storage⁸ These can influence acceptance

Fresh milk	Stored milk
Hay	Soapy
Metallic	Metallic
Sweet	Sweaty
Fatty	Rancid
Cooked milk	Fishy
Soy bean	Unpleasant
Slightly buttery	Nauseating

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