

Safely Storing Breast Milk in the Refrigerator

By: Miranda Allen, September 2017



ARTICLE

Hospitals have the responsibility to properly store and handle expressed breast Milk (EBM) for the safety of mother and baby. Breast milk is a bodily fluid meaning it can transmit infectious disease. For this reason, breast milk is often treated as a medication when handled in the hospital. Storage, handling, and administration of breast milk play an important role in keeping everyone safe and healthy.

Risks Related to Breast Milk Storage

Bacterial contamination and degradation of milk components are the two most concerning questions when it comes to breast milk storage. Bacterial contamination of breast milk may pose a significant risk of infection to infants whose immune systems are immature. Moreover, prolonged storage under improper conditions has proven to reduce milk's stability and nutritional value. Proper storage and handling can significantly reduce any risk of infection and is essential to maintain the safety and efficacy of expressed breast milk.

Proper Storage of Breast Milk

Studies show that storing EBM at 4°C significantly inhibits bacteria growth, and according to the Center for Disease Control guidelines, storage in a refrigerator extends the life of the EBM from 6-8 hours to five days, and storage in a freezer compartment of a refrigerator with separate door or stand-alone freezer can extend the life of the EBM to 3-6 months.

| Location | Temperature | Duration | Comments |
|---|---------------------------------------|-------------|--|
| Countertop, table | Room Temperature (up to 77°F or 25°C) | 6-8 hours | Containers should be covered and kept as cool as possible; covering the container with a cool towel may keep milk cooler. |
| Insulated cooler bag | 5-39°F or 15-4°C | 24 hours | Keep ice packs in contact with milk containers at all times, limit opening cooler bag. |
| Refrigerator | 39°F or 4°C | 5 days | Store milk in the back of the main body of the refrigerator. |
| Freezer | | | |
| Freezer compartment of a refrigerator | 5°F or -15°C | 2 weeks | Store milk toward the back of the freezer, where temperature is most constant. Milk stored for longer durations in the ranges listed is safe, but some of the lipids in the milk undergo degradation resulting in lower quality. |
| Freezer compartment of refrigerator with separate doors | 0°F or -18°C | 3-6 months | |
| Chest or upright deep freezer | -4°F or -20°C | 6-12 months | |

Reference: Academy of Breastfeeding Medicine. (4002) Clinical Protocol Number #8: Human Milk Storage Information for Home Use for Healthy Full Term Infants (PDF-125k). Princeton Junction, New Jersey: Academy of Breastfeeding Medicine. Available

Refrigerators used to store breast milk play a major role in maintaining the milk's efficacy and safety. Most household refrigerators produce dramatic temperature fluctuations causing EBM temperature to rise and fall, potentially putting the milk at risk. In addition, these small household refrigerators have a hard time recovering after door openings common with frequent newborn feedings. Medical-grade refrigerators provide a stable, uniform environment meaning that all space inside of the refrigerator is safe for EBM storage.

Although multiple brands of cold storage products are marketed as medical grade, purpose built or pharmaceutical grade, it is important to understand that there are significant differences among various breast milk refrigerators based on their quality and reliability, tight temperature control, and temperature uniformity throughout the cabinet.

Temperature uniformity plays a major role in ensuring that mother's milk is stored at the right temperature. Uniformity is defined as the variation of temperature between different areas in the cabinet. Refrigerators with poor temperature uniformity will have hot and cold spots throughout the cabinet making some areas unsafe for storage. Medical-grade refrigerators are designed to create a uniform environment meaning all areas of the cabinet are safe for storage.

We evaluated two compact refrigerators marketed for medical applications to assess differences in uniformity. This evaluation indicates that not all compact refrigerators provide the same levels of temperature stability and uniformity.

Evaluation

Helmer Scientific evaluated the MLR102 Countertop Refrigerator and a competitive unit using fifteen T style thermocouples to measure temperature in the front, middle, and back areas of each shelf. See the diagram below for thermocouple locations¹. Product temperature was simulated using 10ml glycol bottles.

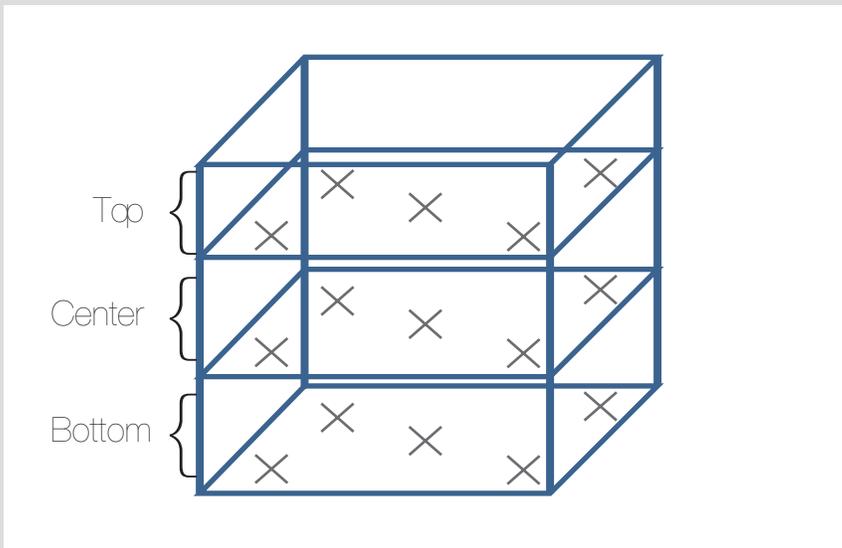
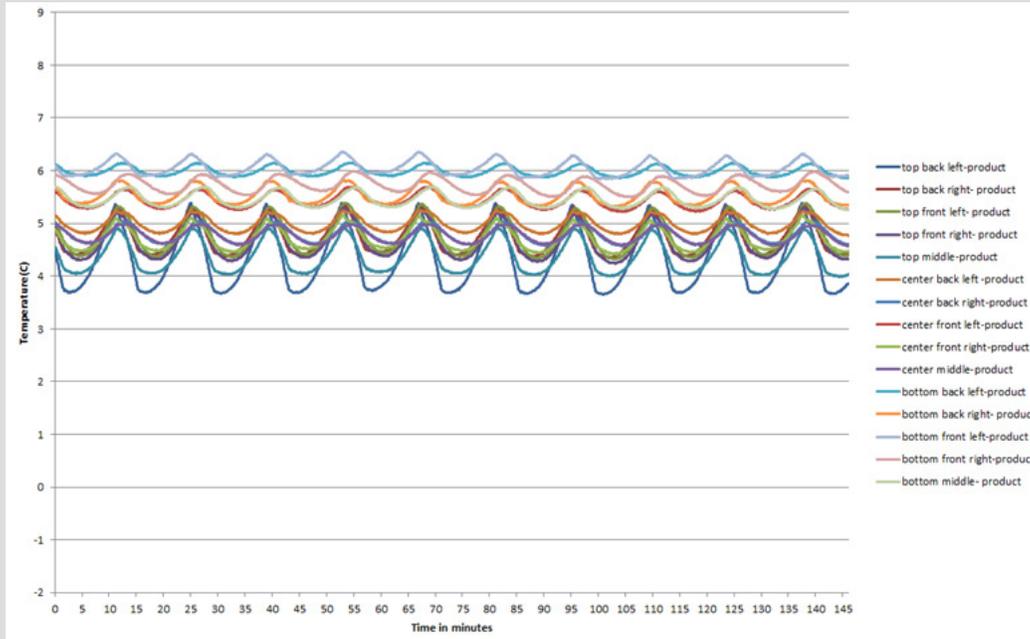
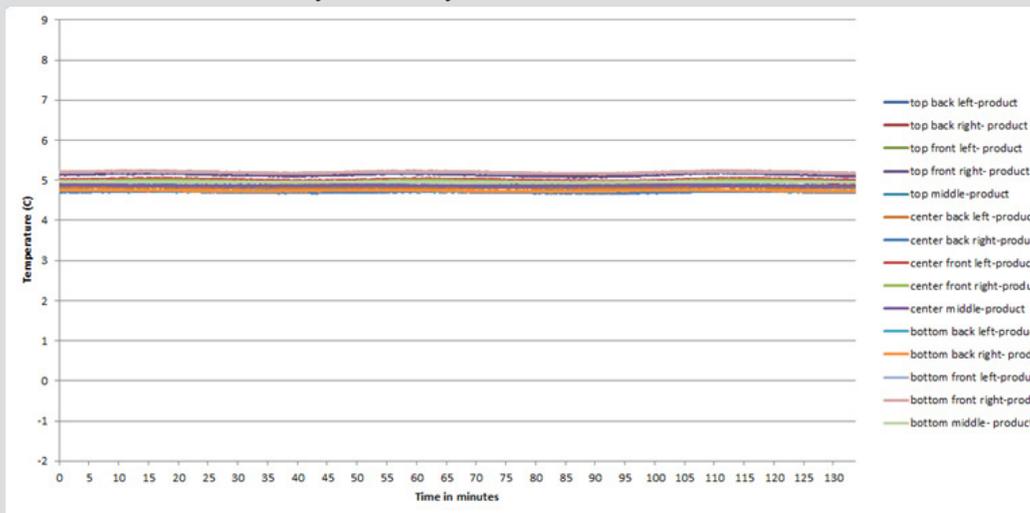


Exhibit 1. Location of 15 thermocouples used to measure temperatures

Competitive Unit Uniformity - 10ml Glycol Bottle



Helmer MLR102 Uniformity - 10ml Glycol Bottle



The Helmer Scientific MLR102 has been designed specifically for clinical applications, such as breast milk storage. By incorporating AdvanceCore™ thermoelectric cooling technology and an internal forced-air fan, the MLR102 unit is able to maintain set temperature within a very tight range and meet medical-grade uniformity performance criteria. The refrigerator's unique cooling system also provides minimal heat output and near silent operation, making it the perfect solution for storing EBM conveniently, quietly and safely inside of patient rooms or in the NICU.

¹ Data on file, Helmer Scientific