

Safely Storing Breast Milk in the Refrigerator

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Hospitals have the responsibility of ensuring proper storage and handling of Expressed Breast Milk (EBM) for the safety of mother and baby. Breast milk may contain potentially harmful microbes. For this reason, organizations such as the US Centers for Disease Control and Prevention (CDC), have created storage and handling guidelines to help support best-practices. Proper storage, handling, and administration of breast milk can play an important role in supporting patient safety.

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 help reduce risk of infection and can maintain the safety and efficacy of expressed breast milk.

Proper Storage of Breast Milk

Safety of refrigerated milk can be evaluated through measuring the bactericidal properties of milk, or by measuring bacterial growth over time. Data has demonstrated that mother's milk stored at recommended temperatures can maintain low levels of bacteria for extended periods of time. In addition, studies indicate that immunologic factors can also be maintained when mother's milk is stored at refrigerated temperatures for specified periods of time.¹

According to CDC recommendations, mother's milk may be stored in a refrigerator (4°C) for up to 4 days, and in a freezer (-18°C or colder) for 6-12 months. A summary of CDC recommendations is listed in the table below. Please refer to the [CDC Proper Storage and Preparation of Breast Milk](#) website for updates to this information.

Human Milk Storage Guidelines

Type of Breast Milk	Storage Location and Temperatures		
	Countertop 77°F (25°C) or colder (room temperature)	Refrigerator 40°F (4°C)	Freezer 0°F (-18°C) or colder
Freshly Expressed or Pumped	Up to 4 Hours	Up to 4 Days	Within 6 months is best Up to 12 months is acceptable
Thawed, Previously Frozen	1-2 Hours	Up to 1 Day (24 hours)	NEVER refreeze human milk after it has been thawed
Leftover from a Feeding (Baby did not finish the bottle)	Use within 2 Hours after the baby is finished feeding		

Table 1 - Adopted directly from CDC Proper Storage and Preparation of Breast Milk Website¹

In addition to providing recommended storage conditions and times allowed at various temperatures, the CDC also includes other recommendations to help promote safety.

Examples include:

- Avoid storage in refrigerator or freezer doors to help maintain breast milk temperature stability.
- If breast milk won't be used within 4 days, it should be placed in a freezer.
- Include date breast milk was expressed to help ensure proper storage times in room temperature, refrigerated, or frozen environments.

Cold Storage for Breast Milk Storage

Refrigerators and freezers used to store breast milk play a major role in maintaining the milk's efficacy and safety. There are many different types of refrigerators and freezers available on the market. Food service or commercial refrigerators are not typically designed for clinical applications and may have temperature performance characteristics that make it challenging to keep products at recommended ranges.

For this reason, medical-grade cold storage units are commonly used across applications such as patient specimen storage, blood storage, pharmaceutical/vaccine storage, and breast milk storage to ensure that sensitive products are adequately safeguarded. Medical-grade refrigerators and freezers are designed to provide a stable, uniform environment meaning that all space inside of the refrigerator is safe for storage. In the case of expressed breast milk, using medical-grade cold storage helps ensure stored product will be maintained at appropriate temperatures regardless of where it is stored within the cabinet.

It is important to understand that there may be significant differences among various breast

milk refrigerators based on their quality and reliability, tight temperature control, and temperature uniformity throughout the cabinet.

Temperature Performance Data Examples

Although there is currently no industry standard for defining refrigerator and freezer performance for breast milk storage, there are standards designed for other sensitive, biological products, such as vaccines. The NSF/ANSI 456 Vaccine Storage Standard, released in 2021, provides a standard testing protocol that challenges refrigerators and freezers to maintain and recover temperatures during long and short duration door openings with loaded and unloaded cabinets.

Standards, such as NSF/ANSI 456, can help demonstrate that performance may vary across cold storage units. The NSF/ANSI 456 standard can also demonstrate that inconsistent temperatures within a refrigerator or freezer may only be observed with temperature mapping studies that include probes placed across multiple areas of the cabinet.

Breast milk, like other temperature-controlled products, relies on cold storage units maintaining accurate temperatures. Considering the quality of refrigerators and freezers should be considered for this reason.

Helmer Scientific GX Solutions for Breast Milk Storage

Helmer Scientific GX Solutions refrigerators and freezers have been designed specifically for clinical applications, such as breast milk storage. Helmer Scientific GX Solutions have also been tested and certified to new NSF/ANSI 456 standards to demonstrate performance even when challenged by varying load and door open scenarios.

By incorporating OptiCool™ refrigeration technology, GX Solutions refrigerators and freezers maintain set temperature within a very tight range, provide uniform temperatures across all storage locations within a cabinet, and recover quickly after door openings. These are all system characteristics that can help support safe and effective breast milk storage. The unique cooling system also provides minimal heat output and quiet operation, helping avoid noise distractions in patient care areas or staff work areas.

Figure 1: Helmer Scientific GX Solutions are designed with temperature stability to maintain temperatures near set point.

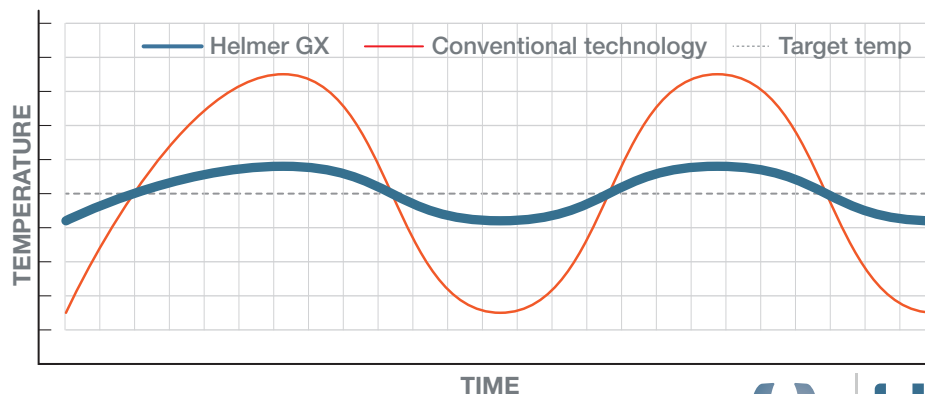


Figure 2: Helmer Scientific GX Solutions are designed to maintain tight uniformity across all locations throughout the cabinet.

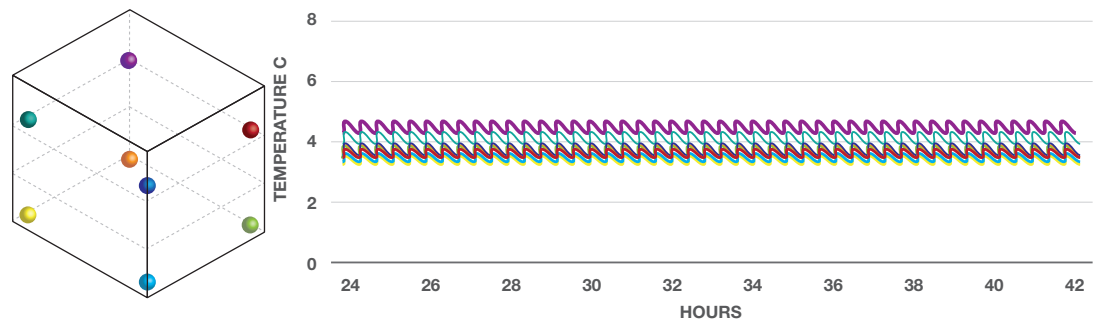
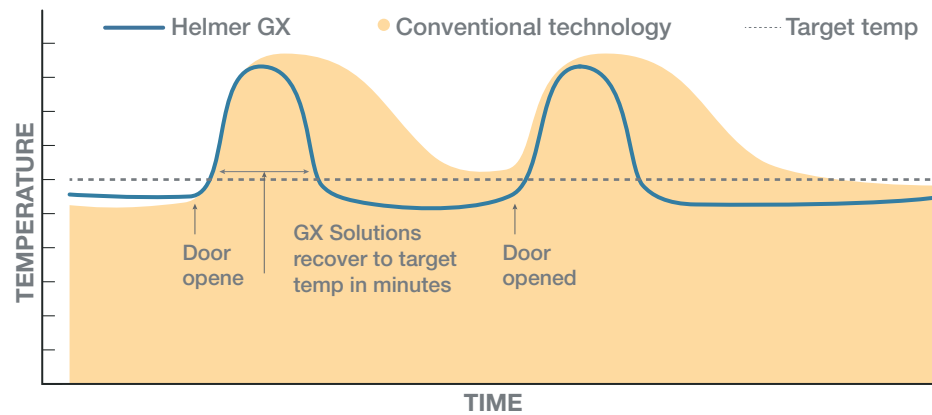


Figure 3: Helmer Scientific GX Solutions are designed to allow for fast temperature recovery after door openings.



Maintaining cold storage recommendations for breast milk can support patient safety - choosing appropriate refrigerators and freezers can help healthcare facilities meet this important goal.

ACKNOWLEDGMENTS

1. https://www.cdc.gov/breastfeeding/recommendations/handling_breastmilk.htm