

Food Safety During Pregnancy & Infancy

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Pregnancy

Pregnant women are a high-risk population for foodborne illnesses because of changes to the mother's immune system. Pathogens can cross the placenta and harm the developing baby. A serious pathogen known as *Listeria monocytogenes* is especially a threat to women who are pregnant. According to the Centers for Disease Control and Prevention (CDC), pregnant women are 10 times more likely to get *Listeria* infection (called listeriosis) than other adults (CDC, 2022c). Listeriosis may lead to miscarriage, stillbirth, premature delivery, or a serious infection of the newborn. To prevent a foodborne illness from *Listeria* or other harmful pathogens during pregnancy, avoid foods such as:

- Soft cheeses
- Unpasteurized (raw) milk
- Deli and lunch meats
- Hot dogs
- Raw or undercooked eggs, meat, poultry, or fish
- Raw or undercooked sprouts

Additional tips to prevent foodborne illness during pregnancy:

- Wash your hands for 20 seconds using warm water and soap prior to handling food.
- Cook hot dogs and deli meats to 165 °F.
- Avoid cross-contaminations by keeping ready-to-eat foods separate from raw meat, poultry, and seafood.



- Store all perishable foods at 40 °F or below within 2 hours.
- If leftovers cannot be eaten within 4 days, discard them.

Infancy

Infants are at an elevated risk for foodborne illness because their immune system is underdeveloped, and they do not have the ability to produce the necessary stomach acids needed to fight off harmful bacteria. They also have an increased risk of becoming dehydrated if they vomit and have diarrhea. Handwashing and safe food practices are especially important for vulnerable populations such as infants. Food safety for infants depends on the behaviors of their parents and caregivers.

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Breast Milk

Expressing

Express breast milk manually or use an electric breast pump. Prior to pumping, wash your hands for at least 20 seconds using warm water and soap. If using an electric pump, check the pump kit and tubing for cleanliness prior to pumping. Use, refrigerate, or freeze breast milk within 4 hours of expressing.

Freezing

Place breast milk in storage bags designed for breast milk or use moisture-vapor-resistant food-grade containers with tight-fitting lids. Clearly label with the date the breast milk was expressed. For best quality, use within 6 months, but never past 12 months.

Thawing

Use oldest breast milk first. You may thaw in the refrigerator, in a container of warm water, or under running warm water. You should use thawed breast milk within 24 hours. Do not use a microwave to thaw. Microwaving may destroy nutrients and create hot spots. Never refreeze breast milk.



Formula

Handling

Use only water from a safe source to mix with formula. Follow infant formula directions to prepare properly and safely. If you are not sure about the safety of your tap water, contact your local health department or use bottled water. Only use the scoop provided by the manufacturer when measuring the correct amount of formula. Measure the water first, then the formula. Mix the formula by swirling or shaking the bottle.

Do not make homemade baby formula, water down formula, or buy formula from questionable sites or outside the U.S.

Storing

Once you mix the formula, use it within 2 hours, or keep it cold in the refrigerator (40 °F or below) for no more than 24 hours. Store powdered formula in a cool, dry area and keep the lid tightly sealed. *Always use by expiration date on package, or within 1 month of opening powdered formula.* The U.S. Food and Drug Administration (2022) does not recommend freezing formula as this will cause the formula's components to separate.



Table 1. Storage Guidelines

Breast milk type	Refrigerator 40 °F (4 °C)	Freezer 0 °F (-18 °C)
Freshly expressed or pumped	4 days	Best within 6 months, safe within 12 months
Thawed, previously frozen	1 day	Do not refreeze
Left over from a feeding	Use within 2 hours or discard	

(Table 1 adapted from *Breastfeeding: Proper Storage and Preparation of Breast Milk* by the Centers for Disease Control and Prevention, 2022a)

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Warming formula or breast milk

You do not need to warm formula or breast milk prior to feeding. If you do want to warm it, place it in a sealed container or bottle, and set in a bowl of warm water or under running warm water, ensuring not to leak water inside. Prior to serving, test the temperature of the milk on the back of your hand or wrist. The milk should feel *warm*. *Never* serve hot formula or breast milk to a baby.



Cleaning infant feeding items

Using a dishwasher

Separate the parts of the bottle and thoroughly rinse. Place in the dishwasher on the highest heat setting. Before removing the bottle from the dishwasher, wash your hands for a minimum of 20 seconds using soap and warm water. If the bottle and the bottle parts are still wet, place them on clean paper towels to let fully air-dry. Store in a dry, clean area.

Washing by hand

Before washing infant feeding items, wash your hands for at least 20 seconds using soap and warm water. Separate the parts of the bottle and thoroughly rinse. Use a clean wash basin (such as a plastic tub) specifically for infant feeding items, as the sink may contain pathogens that could contaminate the items. Fill the basin with hot water and soap. Scrub the items clean using a brush you use only for cleaning infant feeding items. Rinse again and allow to air-dry. Wash the basin and brush, and allow to air-dry following every use.



Sanitizing

You can sanitize infant feeding items using one of these methods: heat sanitation or chemical sanitation. The CDC (2022b) recommends daily sanitizing for infants under 2 months of age or for infants with compromised immune systems (those born prematurely, diagnosed with HIV, or undergoing cancer treatment or other treatments). It is not required daily for older, healthy babies.

For heat sanitizing, use the highest heat setting on your dishwasher. You may also disassemble the parts and place in a pot of boiling water. Boil for 5 minutes and remove with tongs. Allow to air-dry.

For chemical sanitizing, you can use bleach. Make a bleach solution of 2 teaspoons of unscented bleach per gallon (16 cups) of water in a clean wash basin. Place all the items inside the solution. Ensure they are all covered by the water. Squeeze the solution through the nipple holes. Soak for 2 minutes and remove. Allow to air-dry.

Do not rinse after sanitizing using the bleach solution. The bleach (mixed at the recommended amount) will evaporate and will not hurt your baby. Rinsing may re-contaminate items.

Introducing solids

Infants may start to eat pureed fruits and vegetables around 6 months of age if they are developmentally ready. Once your baby is ready for solid foods, introduce one new food at a time and wait a few days between new foods to watch for reactions such as rash, diarrhea, vomiting, coughing, breathing difficulty, or stomach pain. If you feed your baby a new food

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item and your baby has difficulty breathing, call 911. Always talk to your pediatrician first before making changes to the baby's diet or introducing solids.

Feeding

The Academy of Nutrition and Dietetics (2021) does not recommend feeding food to babies directly from the jar as their saliva can contaminate the food, causing potential for illness. If you do feed from the jar, discard any remaining food not finished serving within 2 hours. You may feed the baby store-bought baby food or puree your own fresh produce to make homemade baby food.

Making homemade baby food

Before making homemade baby food, wash your hands for at least 20 seconds using soap and warm water. Clean and sanitize your countertops and other food contact surfaces. Prepare fresh produce by rinsing under cool, running water using a vegetable brush on tough-skinned produce, then peeling, slicing, and removing seeds. You may need to cook some produce items. Cook the produce by boiling in a small saucepan with a small amount of water until tender. The less water, the more nutrient retention. You may then puree in a blender, food processor, or baby food grinder, or use a spoon or fork. You may add liquids such as breast milk, formula, or water to thin out the puree as needed. Do not add salt or other seasonings to homemade puree.

Freezing homemade baby food

Place the homemade baby food into a clean ice tray and freeze. After frozen, transfer the cubes to an airtight, moisture-vapor-resistant freezer container or freezer bag. If multiple types of purees are made, place each type of puree in its own container. Clearly label the container with the type of food and the date it was made. Remove a cube or cubes for each meal from the freezer.

Thawing

You may thaw baby food using the refrigerator, stove top, or microwave oven. For the stove top, place the food directly in a saucepan and slowly warm over low heat while stirring. For the microwave oven, place the baby food in a



microwave-safe dish. Test it before feeding to the baby. Food should be lukewarm prior to serving to the baby. Never refreeze baby food.

Storing

Homemade baby food can last for up to 2 days in the refrigerator and 1 month in the freezer.

If using store-bought baby food, *always use by the expiration date.*

Avoiding certain foods

Avoid feeding infants:

- Honey
- Common allergen foods*
- Cow's milk
- Sweets or candy
- Fruit juices
- Caffeinated beverages
- Raw or undercooked eggs, meat, poultry, or fish

*There may be some benefit to introducing common allergens such as eggs or peanut butter by 12 months of age to decrease the chance of developing food allergies. However, prior to introducing common allergen foods to your infant, consult with your baby's healthcare provider especially if there is a family history of a severe food allergy.

Avoiding choking hazards

Avoid foods that may cause choking such as nuts, grapes, raw vegetables, and popcorn until your baby is developmentally ready.

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References:

- Academy of Nutrition and Dietetics. (2021, March). *Do's and don'ts for baby's first foods*. <https://www.eatright.org/food/nutrition/eating-as-a-family/dos-and-donts-for-babys-first-foods>
- Centers for Disease Control and Prevention. (2022a, January 24). *Breastfeeding: Proper storage and preparation of breast milk*. https://www.cdc.gov/breastfeeding/recommendations/handling_breastmilk.htm
- Centers for Disease Control and Prevention. (2022b, June 15). *How to clean, sanitize, and store infant feeding items*. <https://bit.ly/3ta3yDL>
- Centers for Disease Control and Prevention. (2022c, October 25). *Listeria (Listeriosis): People at risk – Pregnant women and newborns*. <https://www.cdc.gov/listeria/risk-groups/pregnant-women.html>
- U.S. Food & Drug Administration. (2022, May 31). *Infant formula: Safety do's and don'ts*. <https://www.fda.gov/consumers/consumer-updates/infant-formula-safety-dos-and-donts>

Resources:

- Academy of Nutrition and Dietetics, *Food Safety Tips for Young Children*: <https://www.eatright.org/homefoodsafety/safety-tips/food-poisoning/food-safety-tips-for-young-children>
- Australasian Society of Clinical Immunology and Allergy (ASCIA), *How to Introduce Solid Foods to Babies for Allergy Prevention: Frequently Asked Questions (FAQ)*: <https://www.allergy.org.au/patients/allergy-prevention/ascia-how-to-introduce-solid-foods-to-babies#:~:text=When%20introducing%20solid%20foods%20to,%2C%20fish%2C%20and%20other%20seafood>
- Centers for Disease Control and Prevention, *Listeria: Prevention*: <https://www.cdc.gov/listeria/prevention.html>
- Centers for Disease Control and Prevention, *When, What, and How to Introduce Solid Foods*: <https://www.cdc.gov/nutrition/infantandtoddlernutrition/foods-and-drinks/when-to-introduce-solid-foods.html>
- U.S. Department of Health & Human Services, *Food Safety for Baby and Me*. <https://www.foodsafety.gov/sites/default/files/2019-05/food-safety-infographic-pregnant-women.jpg>
- U.S. Department of Health & Human Services, *People at Risk: Children Under Five*: <https://www.foodsafety.gov/people-at-risk/children-under-five>
- University of Maine Cooperative Extension, *Bulletin #4309, Making Your Own Baby Food*: <https://extension.umaine.edu/publications/4309e/>