

INFANT FORMULA PREPARATION

Proper Handling, Storage, and Amounts by Age

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TYPES OF INFANT FORMULAS



3 Main Types of Formula

- Ready-To-Use
- Liquid Concentrate
- Powdered

Different Formula Compositions

- Cow's Milk
- Soy Based
- Hydrolysed
- Hypoallergenic
- Lactose Free

WHO INCIDENCE RATES

In the US, *E. sakazaki* infection affects 1 per 100,000 infants. This incidence rate increases to 9.4 per 100,000 in infants of very low birth weight

The US also reported a salmonellosis incidence rate of 139.4 cases per 100,000 infants in 2002. The incidence rate for infants was more than eight times higher than that of the general population



HANDLING AND STORAGE FACTS

In a study examining powdered infant formula from 13 European countries **Enterobacter strains were found in 53% of 141 samples. E.sakazaki, which poses the greatest health risks, was found in 14%.**

Enterobacter contamination can lead to rapid multiplication in prepared infant formula, which serves as **an excellent medium for bacterial proliferation, especially at temperatures of 25°C to 45°C**

Salmonella is typically not found in infant formulas during the manufacturing. It's contamination occurs primarily in the ***PREPARATION ENVIRONMENT.***



HANDLING AND STORAGE FACTS

Proper storage as well as handling are
ESSENTIAL to help minimize
contamination of all infant formulas
(particularly powdered and condensed)

PROBLEMS OF HANDLING AND STORAGE



Many mothers do NOT follow safe practices when it comes to bottle feeding

In AAP Study:

1. 77% of mothers received no instruction on proper handling of formula
2. 73% of mothers received no instruction on proper storage of formula
3. 30% don't read safe instructions on labels
4. 38% thought powdered and ready to feed formulas had no germs
5. 55% did not always wash hands prior to preparing infant formula

HANDLING AND STORAGE FACTS

What *DO* Mom's Need To Know?

HANDLING OF INFANT FORMULA



Step 1

Clean and disinfect a surface on which to prepare the feed.



Step 2

Wash your hands with soap and water, and dry with a clean or disposable cloth.



Step 3

Boil some safe water. If using an automatic kettle, wait until the kettle switches off. If using a pan to boil water, make sure the water comes to a rolling boil.



Step 4

Read the instructions on the formula's packaging to find out how much water and how much powder you need. Adding more or less formula than instructed could make infants ill.



Step 5

Taking care to avoid scalds, pour the correct amount of boiled water (that has been allowed to cool to no less than 70°C) into a cleaned and sterilized feeding bottle. Use a clean, sterile thermometer to check the temperature.



Step 6

Add the exact amount of formula to the water in the bottle.



Step 7

Mix thoroughly by gently shaking or swirling the bottle.



Step 8

Immediately cool to feeding temperature by holding the bottle under cold running tap water, or by placing in a container of cold or iced water. So that you do not contaminate the feed, make sure that the level of the cooling water is below the lid of the bottle.



Step 9

Dry the outside of the bottle with a clean or disposable cloth.



Step 10

Label the bottle with information such as formula type, infant's name or ID, date and time made and preparer's name.



Step 11

Check the temperature of the feed by dripping a little onto the inside of your wrist. It should feel lukewarm, not hot. If it still feels hot, cool some more before feeding.



Step 12

Feed infant.



Step 13

Throw away any feed that has not been consumed within two hours.

Warning: Never use a microwave to prepare or warm-up feeds. Microwaves heat unevenly and may cause 'hot spots' that could scald the infant's mouth.



HANDLING OF INFANT FORMULA

If formula is handled properly, the growth of bacteria is controlled and poses little threat to the infant.

USE PREPARED FORMULA SAFELY



Store for up to 24 hours in a fridge at 4°C.

Remove from the fridge and warm immediately before feeding.

Warm bottles for no more than 15 minutes to prevent bacteria from growing.

Avoid using a microwave to warm formula. Uneven heat can create "hot spots" that can burn baby's mouth.

Bottles your baby has started should be used within two hours.

HealthyCanadians.gc.ca

Canada

How to re-warm a bottle



Why are these guidelines so important?

- *E. sakazakii* is implicated in cases of infant NEC, meningitis, and sepsis
- Rate of NEC in FF infants is 10X greater than BF infants
- Mortality rates (for NEC and meningitis) are improved with proper handling

PROPER STORAGE OF INFANT FORMULA

Remember, bacterium like an environment between 25°C to 45°C

When preparing formulas for storage at home:

1. Store all premade formula in BPA free plastic or glass bottles at a maximum of 5°C for no more than 30-48 hours before serving
2. Store all infant formula at the back of the refrigerator to maintain constant temperature
3. Make sure there is a clean, sterilized nipple on each bottle covered with a nipple cap
4. Label all formulas with the baby's name, date, and time of preparation



PROPER STORAGE OF INFANT FORMULA

Average length of time to generate Enterobacter bacteria is approximately 5 hours at 10°C and only 40 minutes at 23°C

When preparing to use or transport formula:



1. Best practice is to use all feeds, powdered or liquid, within 2-4 hours of removal from refrigeration
2. Avoid using formula that has been placed in a baby bag for several hours or been sitting in a hot car
3. It is best to take cooled, sterilized water (previously boiled) pre-measured to the appropriate volume, and preparing it at the destination or time of feeding. Consider single serve packets of infant formula or sterilized ready made formulas.

PROPER STORAGE OF INFANT FORMULA

Preventing potential microbial contamination also lies in the storage of liquid formula and powdered formula canisters

How to store unprepared formula:

1. Each time formula is prepared, it is important no other water or liquids infiltrate the formula container
2. The canisters should always be sealed with a tight lid and stored in a cool, dry space for optimal safety. Never store formula containers in the refrigerator. Temperature extremes can result in rusted cans and deteriorate the quality of the formula.
3. Routinely check expiration dates on formula containers. Once opened, it is best to discard powdered formulas that have been opened after 4 weeks, and liquid formulas should be discarded by their labeled expiration date



FORMULA REQUIREMENTS BY AGE

Infant Age	Formula Recommendation by Weight	Approximate Daily Allowance
Days 1-4	60ml/kg body weight	6-10 ounces
0-3 Months	150ml/kg body weight	16-24 ounces
3-6 Months	120ml/kg body weight	28-45 ounces
6-12 Months	100ml/kg body weight	28-32 ounces

Special Considerations

1. Some infants may require more than 150ml/kg body weight especially if premature
2. Number of feedings per day may change depending on age of infant. Most newborns feed 6-8 times per day whereas 8-12 month olds typically feed 3-4 times per day with more ounces at each feeding.
3. As infants are introduced to new foods, their needs for formula will decrease

EDUCATING ON INFANT FORMULA

Mom's NEED education on formula
feeding correct practices

Parent Resources:

<https://wicworks.fns.usda.gov/infants/bottle-feeding>

http://www.babycenter.com/0_bottle-feeding-basics-for-formula-fed-babies_14286.bc

Video on How to Prepare Infant Formula:

https://www.youtube.com/watch?v=zmUrbGz0i5U&ebc=ANyPxKrSHat2q5AhX98B-KswrOlifU-tfhOKt_eC785D2qCKUaNb9Cgy0Mzkhlc4x2RCPAM_z0rP9bAnj1rKMIzTECy82aTA

<https://www.youtube.com/watch?v=AAqvroxx6V4> (Play for class)

QUESTIONS?

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