Guidance for health professionals on safe preparation, storage and handling of powdered infant formula

Powdered infant formula is not a sterile product and may be contaminated with pathogens that can cause serious illness. Correct preparation and handling reduces the risk of illness.

The Department of Health and the Food Standards Agency have issued revised guidance on the preparation and storage of powdered infant formula milk. This guidance covers the home and other care settings, including nurseries and child minders.

The risks

The European Food Safety Authority's Scientific Panel on Biological Hazards has issued an opinion in relation to the microbiological risks in powdered infant and follow-on formulae. The panel concluded that *Enterobacter sakazakii* and *Salmonella* are the micro-organisms of greatest concern. Younger infants are likely to be more susceptible to these organisms than older infants.

Although infections with these micro-organisms from formula milk are rare, the risks can be reduced by following the guidelines below.

For high risk infants (pre-term, low birth weight and immunocompromised) using ready to feed liquid formula, which is sterile, in place of making up powdered formula is considered the safest option.

The Department of Health and the Food Standards Agency advise all health professionals, particularly nurses, midwives and health visitors, to change/revise/ update their advice to parents and carers on the preparation and storage of infant formula milk in the home and in other care settings.

Health professionals should re-emphasise to parents and carers:

- that powdered infant formula is not sterile and good hygiene practices are essential in preparing and storing feeds made from powdered formula
- failure to follow the manufacturer's guidelines may increase the chances of a baby becoming ill

In order to reduce the risk of infection it is recommended that the following steps are taken:

Cleaning and sterilising feeding equipment

It is very important that all equipment used for feeding and preparing feeds has been thoroughly cleaned and sterilised before use.

- Wash hands thoroughly before cleaning and sterilising feeding equipment
- Wash feeding and preparation equipment thoroughly in hot soapy water

- Bottle and teat brushes should be used to scrub inside and outside of bottles and teats to ensure that all remaining feed is removed
- After washing feeding equipment rinse it thoroughly under the tap
- If using a commercial steriliser, follow manufacturer's instructions
- If your bottles are suitable for sterilising by boiling: fill a large pan with water and completely submerge all feeding equipment, ensuring there are no air bubbles trapped; cover the pan and boil for at least 10 minutes, making sure the pan does not boil dry. Keep the pan covered until equipment is needed.
- Wash hands thoroughly and clean the surface around the steriliser before removing equipment.
- It is best to remove the bottles just before they are used.
- If the bottles are not being used immediately, they should be fully assembled with the teat and lid in place to prevent the inside of the sterilised bottle and the inside and outside of the teat from being contaminated.

Guidance for Preparing Feeds in the Home

Preparing a feed using powdered infant formula

Important Normally each bottle should be made up fresh for each feed. Storing made-up formula milk may increase the chance of a baby becoming ill and should be avoided.

1. Clean the surface thoroughly on which to prepare the feed
2. Wash hands with soap and water and then dry.
3. Boil fresh tap water in a kettle. Alternatively bottled water that is suitable for infants can be used for making up feeds and should be boiled in the same way as tap water.
4. **Important:** Allow the boiled water to cool to no less than 70º C. This means in practice using water that has been left covered, for less than 30 minutes after boiling.
5. Pour the amount of boiled water required into the sterilised bottle.
6. Add the exact amount of formula as instructed on the label always using the scoop provided with the powdered formula by the manufacturer. Adding more or less powder than instructed could make the baby ill.
7. Re-assemble the bottle following manufacturer's instructions.
8. Shake the bottle well to mix the contents.
9. Cool quickly to feeding temperature by holding under a running tap, or placing in a container of cold water.
10. Check the temperature by shaking a few drops onto the inside of your wrist – it should feel lukewarm, not hot.
11. Discard any feed that has not been used within two hours.

Guidance for the Use of Powdered Infant Formula Feeds in Care Settings

When it is not practical to make up feeds just before feeding:

It is best to make up infant formula fresh for each feed but, there are times when this may not be practical and feeds need to be prepared in advance. For example, when taking an infant to a **nursery** or to the **child minder** or when **leaving the house** for a prolonged period of time.

Ready to use liquid feeds are sterile and are the safest option. However, they are a more expensive option and therefore may not suit all parents.

Preparing powdered feeds for later use

It is the length of time for which the reconstituted formula is stored that increases the risk of bacterial growth. Reducing the storage time will therefore reduce the risk. For example, when taking an infant to the nursery it is best to make up the feed(s) on the same morning before leaving home rather than on the night before.

The steps below outline the safest way to prepare and store feed for later use:

- Prepare feeds in separate bottles, not in one large container (e.g. a jug)
- Follows steps 1 to 9 of the section above 'Preparing a feed using powdered infant formula'
- Store the feed in the fridge at **below 5º C**. Prepared bottles are best kept in the back of the fridge and not in the door.
- The temperature of the fridge should be checked regularly using a fridge thermometer. A fridge that is opened frequently may need to be set at a lower temperature to ensure that it does not rise above 5 ºC during times of frequent access. The thermostat in older fridges without temperature settings may need to be adjusted to ensure that the temperature is **below 5º C**.
- The risk of infection to a baby will be lower if the feed is only stored for a short time. Feeds should never be stored for longer than 24 hours and this length of time is no longer considered ideal especially for young babies.

Alternatively, you may:

- Put boiling water in a sealed vacuum flask and use this to make up fresh formula milk when needed.
- Care should be taken to avoid scalding when making up the feed

Re-warming stored feeds

- Only remove stored feed from the fridge just before it is needed.
- Re-warm using a bottle warmer, or by placing in a container of warm water.
- Microwaves should never be used for re-warming a feed.
- Never leave a feed warming for more than 15 minutes.

- Shake the bottle to ensure the feed has heated evenly.
- Check the feeding temperature by shaking a few drops onto the inside of the wrist - it should be lukewarm, not hot.

Transporting feeds

Because of the potential for growth of harmful bacteria during transport, feeds should first be cooled in a fridge (below 5º C) and then transported.

- Prepare feed(s) and place in the fridge as outlined in section 'preparing feeds for use later'.
- Ensure feed has been in the fridge for at least one hour before transporting.
- Only remove feed from the fridge immediately before transporting.
- Transport feeds in a cool bag containing a frozen ice brick.
- Feeds transported in a cool bag should be used within 4 hours.
- Re-warm at the destination as in section 'Re-warming stored feeds'.
- Alternatively if you reach the destination within 4 hours, feeds transported in a cool bag can be placed in a fridge and kept for up to a maximum of 24 hours from the time of preparation - this is not ideal as the risk of illness increases the longer it is stored.

Preparation of infant formula in hospitals and Special Feed Units

Detailed advice about the safe preparation and storage of powdered infant formula for health professionals in hospitals, especially intensive care units, will be published seperately.

Further Information

Further information on the Safety Guidelines issued by the European Food Safety Authority's (EFSA) Scientific Panel on Biological Hazards can be found on: http://www.efsa.eu.int/science/biohaz/biohaz_opinions/691_en.html

Question and Answers

What is the safest option for feeding babies?

Breastmilk is the safest way to feed a baby. Ready to use liquid feeds are sterile until opened and are the safest option if using infant formula. Powdered infant formula is not sterile and should be made using water that is hotter than 70° C.

Why is powdered infant formula not sterile?

The bacteria *Enterobacter sakazakii* is ubiquitous in the environment and may contaminate powdered infant formula during manufacture. It is impossible to be sure of avoiding this contamination. The bacteria may also be present on work surfaces in homes and nurseries and can contaminate feeds while they are being prepared by parents or carers.

Why should the water be 70 degrees Celcius?

Water at 70° C will kill most of the bacteria present in the powdered formula. This is the most important step in making up powdered infant formula as powdered infant formula cannot be guaranteed to be free of bacteria

Why should made up formula be cooled quickly?

Bacteria multiply most quickly between 7 and 63° C. The longer formula is at this temperature, the greater the increase in the bacterial content and so the risk of infection for the baby will increase.

Why should storage times of made up formula be minimised?

Even when formula is made up with water at more than 70° C it may still contain some bacteria which will continue to multiply during storage. At less than 5° C the rate of multiplication of the bacteria will reduce but will not completely cease.

How long can made up formula be stored in a fridge?

Made up formula can be stored for a maximum of 24 hours but this is no longer considered ideal particularly for young babies because the bacterial content continues to increase during storage. This increases the risk of infection for the baby.

Once a feed is ready for feeding, how long before it should be discarded?

Discard any feed that has not been used within 2 hours. All left-over feed should be discarded and never saved for later.

If you are out and cannot boil water how do you make up a feed?

Mothers should be advised to fill a vacuum flask with boiling water. If the flask is full and sealed the water will stay above 70° C for several hours. This flask can be safely transported and used to make up a feed when necessary.

Do vacuum flasks need to be sterilised if they are used to store boiled water for making up a feed later?

No, the vacuum flasks do not need to be sterilised but they should be washed thoroughly and rinsed with boiling water before being filled with boiling water intended for the feed. The boiling water should kill bacteria present in the vacuum flask.

If water is boiled and put into the sterilised feeding bottles can it be stored in the fridge like this until the powder is added?

No, the water must be above 70° C when the powder is added otherwise the bacteria in the powder will not be killed.