

# Infant Feeding in Emergencies



## Module 2 Version 1.0

for health and nutrition workers  
in emergency situations

## Annexes

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Top right: Kent Page, UNICEF, DRC, 2003. Vertical strip, from top: Mother and child, Valid International, Guatemala/LINKAGES, Maryanne Stone-Jimenez. Mae La camp, Thailand, O.Banjong, 2001.

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# Annex 1

## Summary of breastfeeding and mother's medication

In general, if a drug can be taken by the infant or during pregnancy, it is acceptable for breastfeeding mothers. The exceptions are the few that affect breastmilk production.

Health workers may need to decide whether a mother who is breastfeeding and who needs treatment with drugs can take the necessary medication and still continue to breastfeed safely. There are very few kinds of treatment during which breastfeeding is absolutely contraindicated.

These questions may be helpful as health workers consider treatment of the breastfeeding mother:

- 1) Is the drug therapy really necessary?
- 2) Is this the safest drug available?
- 3) Might the timing be adjusted to minimize the dose to the infant, for example by taking the drug just after a breastfeed?

However, there are some drugs that a mother may need to take which sometimes cause side-effects in the baby. The health worker needs to be aware which drugs these are. The summary below gives a preliminary guide. A fuller listing of all the drugs is available from WHO ([http://www.who.int/child-adolescent-health/New\\_Publications/NUTRITION/BF\\_Maternal\\_Medication.pdf](http://www.who.int/child-adolescent-health/New_Publications/NUTRITION/BF_Maternal_Medication.pdf)).

### Stop breastfeeding:

Breastfeeding contraindicated	Anticancer drugs (antimetabolites). Radioactive substances. ( <i>Stop breastfeeding temporarily.</i> )
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### Continue breastfeeding with extra care:

Side-effects possible	Psychiatric drugs and anticonvulsants. ( <i>Monitor baby for drowsiness.</i> )
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Use alternative drugs if possible	Antibiotics: chloramphenicol, tetracyclines, metronidazole, quinolones (e.g. ciprofloxacin).
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Sulphonamides, cotrimoxazole, mefloquine, dapsone.  
(*Monitor baby for jaundice.*)

Oestrogens, including oestrogen-containing  
contraceptives, Thiazide diuretics, ergometrine  
(*These may decrease milk production.*)

### Continue breastfeeding:

Safe in usual dosage	Analgesics and antipyretics: short courses of paracetamol, acetylsalicylic acid, ibuprofen; occasional doses of morphine and pethidine. Most cough and cold remedies. Antibiotics: ampicillin, cloxacillin and other penicillins, erythromycin. Anti-tuberculars, anti-leprotics (but see dapsone above). Antimalarials (except mefloquine, see above). Anthelmintics. Antifungals. Bronchodilators (e.g. salbutamol). Corticosteroids. Antihistamines. Antacids. Drugs for diabetes. Most antihypertensives, digoxin. Nutritional supplements of iodine, iron, vitamins.
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# Annex 2

## How to cup feed

### How to feed a baby with a cup

- Hold the baby sitting upright or semi-upright in your lap.
- Hold the small cup of milk to the baby's lips. Tip the cup so that the milk just reaches the lips. The cup should rest lightly on the baby's lower lip and the edges of the cup should touch the outer part of the baby's upper lip.
- The baby will become alert and open his or her mouth and eyes. A low-birthweight baby will start to take up the milk with the tongue. A full-term or older baby will suck or sip the milk, spilling some of it.
- Do not pour the milk into the baby's mouth. Continue to hold the cup to the baby's lips, allowing the baby to take it.
- When the baby has had enough, the baby will close his or her mouth and refuse to take any more. A baby who has not taken enough may take more the next time or you may increase the frequency of feeding.
- Measure the baby's intake over 24 hours rather than at each feeding.

Adapted from WHO/UNICEF, 1993, Breastfeeding Counselling: A training course, Participants manual, p. 136 and UNICEF BFHI NEWS.



Fathers can cup feed, too.



It is easy to transport milk in a jar for feedings away from home. Be sure to use a wide-mouthed jar, so it can be easily cleaned.



*The use of bottles and teats should be actively discouraged.  
Use of cups should be actively promoted.*

Operational Guidance 6.1.6



Cup feeding is often used in hospitals for pre-term infants who are not ready to breastfeed. These infants are commonly able to swallow before they can suck. Those able to breastfeed may not have the strength to suckle long enough to obtain the optimum amount of milk and may not complete feeding with a cup.



Like a breastfed baby, a cup-fed baby of about five months will often take breaks from feeding, taking the feed in his or her own time.



Gently tilt the cup so that the baby may sip the milk at his or her own speed. Never pour the milk or let it gush.



Healthy, full-term babies can also be fed by cup when breastfeeding is not possible — such as when a mother is absent or has a condition, such as HIV infection, that might lead her to decide not to breastfeed. In these situations, a baby might be fed expressed mother's milk or some other kind of milk.



Cup feeding requires no special equipment: any open cup found in most households will do. Avoid cups with covers or those specially designed with straws or closed spouts, as these can be difficult to clean and may lead to infections. The cups displayed on this page include a hospital medicine cup, a teacup, 2 mugs with handles and an Indian bondla — a vessel with an open spout traditionally used for infant feeding.

# Annex 3

## Hand expressing breastmilk

### How to stimulate the oxytocin reflex

Help the mother psychologically:

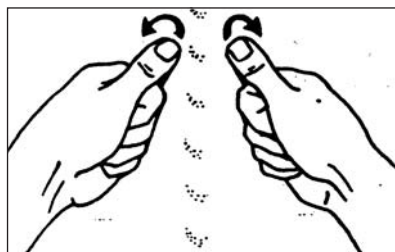
- Build her confidence.
- Try to reduce any sources of pain or anxiety.
- Help her to have good thoughts and feelings about the baby.

Help the mother practically. Help or advise her to:

- Sit quietly and privately or with a supportive friend.  
Some mothers can express easily in a group of other mothers who are also expressing for their babies.
- Hold her baby with skin-to-skin contact if possible.  
She can hold her baby on her lap while she expresses. If this is not possible, she can look at the baby. If this is not possible, sometimes even looking at a photograph of her baby helps.
- Take a warm soothing drink.  
The drink should not be coffee.
- Warm her breasts.  
For example, she can apply a warm compress or warm water or have a warm shower.
- Stimulate her nipples.  
She can gently pull or roll her nipples with her fingers.
- Massage or stroke the breasts lightly.  
Some women find that it helps if they stroke the nipple and areola gently with finger tips or with a comb.  
Some women find that it helps to gently roll their closed fist over the breast towards the nipple.
- Ask a helper to rub her back.  
The mother sits down, leans forward, folds her arms on a table in front of her and rests her head on her arms. Her breasts hang loose, unclothed. The helper rubs down both sides of the mother's spine. She uses her closed fist with her thumbs pointing forwards. She presses firmly making small circular movements with her thumbs. She works down both sides of the spine at the same time, from the neck to the shoulder blades, for two or three minutes.

#### Stimulating the oxytocin reflex

A helper rubbing a mother's back to stimulate the oxytocin reflex



Adapted from WHO and UNICEF: Breastfeeding Course 11ing: a training course. WHO/CDR/93.5

### How to express breastmilk

a. Place finger and thumb each side of the areola and press inwards towards the chest wall.



b. Press behind the nipple and areola between your finger and thumb.



c. Press from the sides to empty all segments.



### How to express breastmilk by hand

Teach a mother to do this herself. Do not express her milk for her. Touch her only to show her what to do. Be gentle.

Teach her to:

- Wash her hands thoroughly.
- Sit or stand comfortably, and hold the container near her breast.
- Put her thumb on her breast **above** the nipple and areola, and her first finger on the breast **below** the nipple and areola, opposite the thumb. She supports the breast with her other fingers.
- Press her thumb and first finger slightly inwards towards the chest wall. She should avoid pressing too far because that can block the milk ducts.
- Press her breast behind the nipple and areola between her finger and thumb. She must press on the lactiferous sinuses beneath the areola (see above). Sometimes in a lactating breast it is possible to feel the sinuses. They are like pods or peanuts. If she can feel them, she can press on them.
- Press and release, press and release.  
This should not hurt - if it hurts, the technique is wrong.  
At first no milk may come, but after pressing a few times, milk starts to drip out. It may flow in streams if the oxytocin reflex is active.
- Press the areola in the same way from the **sides**, to make sure that milk is expressed from all segments of the breast.
- Avoid rubbing or sliding her fingers along the skin. The movement of the fingers should be more like rolling.
- Avoid pinching the nipple itself. Pinching or pulling the nipple cannot express the milk. It is the same as the baby sucking only the nipple.
- Express one breast for at least 3 - 5 minutes until the flow slows; then express the other side; and then repeat both sides. She can use either hand for either breast, and change when they tire.

Explain that to express breastmilk adequately takes 20 - 30 minutes, especially in the first few days when only a little milk may be produced. It is important not to try to express in a shorter time.

# Annex 4

## Calculation of infant formula needs in early stages of emergency

Any appeal for emergency funding should include not only funds for infant formula to support those infants who meet the agreed criteria, but also money/funding for resources to support efforts to protect, promote and support breastfeeding.

### How to calculate amount of formula needed

1. Determination of numbers of infants who need to be supported by artificial feeding.

- Review existing information.
- If necessary, conduct a mini-survey (20-40 mothers) to obtain an approximate figure of infant feeding needs (see box).

#### Box: Mini infant formula needs survey

Determine numbers of infants 0-6 months (and 6-12 months, possibly) in the following categories\*:

- exclusive/full breastfeeding
- partial breastfeeding/mixed feeding
- artificially fed/not breastfed.

\*Based on a 24-hour recall in which the caregiver is asked to recall everything that the infant was fed since this time yesterday, classify the infants as follows:

- Exclusive/full breastfeeding: If the baby received **only** breastmilk (and not plain water, commercial infant formula, other milk, juice, other liquids, cereals/grains, fruits, vegetables, tubers, legumes, meats/fish/cheese/eggs, etc.), then the infant was exclusively breastfed. Infants who received sips of water or juice in addition to breastmilk are fully breastfed.
- Infants who receive other fluids and foods in addition to breastmilk are mixed feeders.
- Artificially fed/not breastfed: those infants who receive no breastmilk (i.e., receive infant formula, animal milk products, or other foods and fluids but no breastmilk).

2. Calculate infant formula requirements based on needs survey.

*Full breastfeeding infants receiving sips of water:* require no infant formula

*Infants partially breastfed (mixed feeders):* estimate time needed for the mother to relactate fully. This will depend, in part, on the resources available to support mothers who are relactating.

For mixed feeders whose mothers are still relactating, a two month supply of infant formula should be planned, to allow time to re-establish exclusive breastfeeding and to allow for a safety-net.

*Infants receiving no breastmilk:* sufficient formula is needed to support each infant having to be formula fed for the entire period until formula is no longer required (until six months of age at least. See Annex 5)

3. Resurvey: After a given time period (e.g. 6 weeks) infant feeding needs should be resurveyed, to correct or adjust projected need.  
The timing of resurvey may partly depend on the time needed for ordering more supplies.

<sup>1</sup> Decisions on how much infant formula to procure will partly depend on the regularity of supply and the supply chain in an emergency context.



# Annex 5

## Calculating daily and monthly requirements of breastmilk substitutes

Infants require 100 kcal/kg/day. The energy value of prepared infant formula is 65-70 kcal/100 ml. So an infant needs 150 ml of prepared formula per kg per day (150ml/kg/d).

Table A shows approximately how much prepared formula (commercial or home-prepared) an infant needs at different ages in the first six months. These are based on a requirement of 150ml/kg/d.

Age of infant in months	Weight in kilos*	Amount of formula per day	Number of feeds per day	Size of each feed in mls**
0-1	3	450ml	8	60ml
1-2	4	600ml	7	90ml
2-3	5	750ml	6	120ml
3-4	5	750ml	6	120ml
4-5	6	900ml	6	150ml
5-6	6	900ml	6	150ml

\*Always use the actual weight of the infant to calculate feed amounts, even if the infant's weight is very different to what you expect for their age.

\*\*Amounts rounded for ease of measurement, and therefore approximate. Differences between columns amounts to plus or minus 30 ml per day variation.

### Calculating monthly requirements

Infants requiring home-modified milk, based on fresh or prepared powdered milk, need, on average, 725 ml per day (0-6 months) and 500-600 ml per day (6-12 months).

Table B indicates the amounts of commercial formula, full cream dried milk (FCDM) or liquid cow's milk and sugar needed for each 30-day month to provide the required amount of prepared formula. When calculating requirements a little more should be added to allow for leakage.

Age of infant in months	Prepared formula ml/day	Commercial formula powder needed*	FCDM and sugar needed to make home-modified	Liquid cow's milk and sugar needed to make home-modified
0 - 1	450 ml	4 x 500 g tins (2 kg)	FCDM 1.2 kg Sugar 0.9 kg	Liquid milk 9 litres Sugar 0.9 kg
1 - 2	600 ml	6 x 500 g tins (3 kg)	FCDM 1.5 kg Sugar 1.2 kg	Liquid milk 12 litres Sugar 1.2 kg
3 - 5	750 ml	7 x 500 g tins (3.5 kg)	FCDM 1.9 kg Sugar 1.5 kg	Liquid milk 15 litres Sugar 1.5 kg
5 - 6	900 ml	8 x 500 g tins (4 kg)	FCDM 2.25 kg Sugar 1.8 kg	Liquid milk 18 litres Sugar 1.8 kg
Approximate totals for 6 months		40 x 500 g tins (20 kg)	FCDM 11 kg Sugar 9 kg	Liquid milk 90 litres Sugar 9 kg

\*Amounts rounded for ease of measurement, and therefore approximate. Differences between columns amounts are plus or minus 30 ml/day of variation.

\*\* In addition, specified amounts of water are needed to prepare safe home-modified milk from FCDM and liquid milk, and to prepare commercial formula.

# Annex 6

## Log frame exercises on artificial feeding in populations

Exercise A. Any planned intervention depends on a number of calculated assumptions, which may influence outcomes and need to be remembered. Devising a log framework may provide a useful tool to plan and account for activities.

Ask participants to define key activities and indicators for the following Goals and Purposes (objectives), where:

- The overall goal is to prevent excess morbidity and mortality
- The purpose of an intervention is to support safe and appropriate infant feeding.

	Description	Objective, verifiable indicator	Sources of information	Assumptions
Goal	To prevent excess morbidity and mortality.	Under 5 mortality rates to reach Sphere standards.  Infant mortality rates are equal to or less than the pre-emergency rate.	Mortality reporting and surveys.	High infant mortality rates are related to unsafe infant feeding practices, access is possible to sites and/or communities, a stable security and public health situation is maintained, and other complementary activities are in place or will be undertaken by other agencies, e.g. water and sanitation, shelter, transport infrastructure.
Purpose /Objective	To support safe and appropriate infant feeding.	Number of mothers accessing services.  Proportion of orphaned/ unaccompanied children accessing services.  Increasing proportion of mothers with infants <6m breastfeeding exclusively.  Decrease in incidence of diarrhoea in infants.	Programme monthly reports, focus group discussions, clinic records, interagency forums and surveys.	The starting proportion of mothers who do not breastfeed their infants will influence outcomes.  The offered service is acceptable to the community.  Sufficient amount of potable water is available for the programme and required staff is available.

**Exercise B.** Hand out exercise sheet - Artificial feeding in Populations Log frame (see below). Allow 20 mins to complete activities row.

Hand out exercise sheet answer guide (see below) and discuss activities not identified by the groups.

Artificial Feeding in Populations Log Frame			
Description of activities	Objective, verifiable indicator	Sources of information	Assumptions

Artificial Feeding in Populations Log Frame - Answer guide			
Description of activities	Objective, verifiable indicator	Sources of information	Assumptions
<p>Developing facilities to support mothers and infants, e.g. Mother Baby tents in a camp situation.</p> <p>Means of safely preparing artificial feeds, either at a household level or involving central preparation (see Part 9.C on institutional feeding).</p> <p>Training programmes for staff on infant feeding practice.</p> <p>Means of targeting and distributing infant formula supplies in accordance with the International Code (see Module 1, Part 3.1).</p> <p>Management strategy for infants identified as malnourished, e.g. referral to therapeutic feeding centre/hospital unit that can cater for young infants (see Part 8).</p> <p>The establishment of a system for the distribution of infant formula in accordance with the International Code.</p> <p>The establishment of a common monitoring and evaluation system for infant feeding.</p>	<p>Facilities for the preparation of artificial feeds meet safety standards and are regularly checked.</p> <p>A decrease in the amount of infant formula distributed per month.</p> <p>Targeted number of breastfeeding counsellors, health workers trained on breastfeeding support and principles of infant feeding.</p> <p>Targeted number of community groups trained in principles of infant feeding.</p>	<p>On site inspections by members of co-ordination agencies.</p> <p>Monthly formula distribution reports.</p> <p>Health professionals.</p> <p>Breastfeeding counsellors and community groups.</p> <p>Designated agency co-ordinating infant feeding monthly report on distribution.</p> <p>Weekly standard distribution reports collated and submitted monthly to the designated agency co-ordinating infant feeding.</p>	<p>Required materials and technical expertise are available and can be transported from (overseas) suppliers within the shortest of timescales.</p> <p>Appropriately trained staff are available, e.g. local UNICEF, MOH, and will remain available in sufficient numbers to fulfil programme requirements.</p> <p>No general distribution of infant formula and complementary infant foods.</p> <p>Baseline infant feeding indicators have been correctly measured.</p> <p>Orphaned/unaccompanied children are correctly identified.</p> <p>Areas of low HIV prevalence (e.g. in Iraq 1999, less than 0.01% of the adult population) makes wet nursing a relatively safe first option. Where HIV prevalence is high, wet nursing may not be appropriate and alternatives must be established.</p> <p>Incidence of diarrhoea is high related to poor sanitary conditions in the camp.</p> <p>Camp management agrees that infant feeding facilities are priority locations for the reception of potable water.</p> <p>A therapeutic feeding facility is provided, either as part of a hospital or as a therapeutic feeding centre in the camp.</p>

# Annex 7

## Guide to milks and recipes to prepare breastmilk substitutes

Milk Group	Information	Use
Fresh liquid animal milk	<p><i>Whole cow's milk</i> is the commonest, however buffalo or camel or goat's milk may be available. It may be available in cartons or bottles or people may collect it in their own containers. Sometimes the fresh milk available in the market has already been diluted or some of the cream removed.</p> <p><i>Home prepared animal milk</i> made with fresh or powdered full cream milk, diluted with water, and with sugar and micronutrients supplements added. These formulas contain most required nutrients but the proportions differ from breastmilk. Proteins and fats are inferior and protective factors are lacking.</p> <p>Home prepared formula have been used where animal milks are widely available. However there is no information on their health effects, no information on types of micronutrient supplements being promoted with this option, and whether they are consistently given, nutritionally adequate, appropriate or locally available. There is also concern regarding safe preparation, storage and feeding, and incorrect modification (extracted from Annex 9, HIV and infant feeding, A guide for health care managers and supervisors, UNICEF/UNAIDS/WHO/UNFPA. 2003).</p>	<p>Can be used if boiled and modified as suggested below (see Home-prepared formula from liquid milks).</p> <p>Home-prepared formula must be fortified with many micronutrients. However appropriate formulations may not be available in the field*. If micronutrients are not added, home preparations should be used only for a short time.</p> <p>Milk from sheep or buffalo is higher in fat, and therefore the modifications are different.</p>
	<p><i>Skimmed fresh milk</i> has the fat (cream) removed and therefore the energy level is low. Most of the vitamins A and D are also removed because they are in the milk fat.</p>	Do not use.
	<p><i>Semi-skimmed milk</i>, which contains 2% fat, is sometimes available. (Whole fresh milk normally contains more fat than this—about 3.5-4%.)</p>	Do not use.
Tinned liquid milks	<p><i>Evaporated milk</i> is sterilised, has some of the water removed and is sealed in tins. Sometimes the fat content is altered. Diluted with water, it has a similar composition to fresh milk.</p>	<p>The processing destroys vitamin C and folate. It can be used if extra vitamins are added. Dilute according to instructions and modify (see Home-prepared formula from liquid milks).</p>
	<p><i>Condensed milk</i> has some of the water removed but a lot of sugar is added. This extra sugar makes bacteria grow more slowly when the tin is opened. Also, the fat level may be reduced. This balance of fat and sugar in condensed milk make it very different from evaporated milk.</p>	Do not use.
Powdered milk	<p><i>Full cream powdered milk</i> is whole cow's milk that is dried to a powder. Much vitamin C and some B vitamins are lost, but the protein, fat, minerals and most of the vitamins A and D remain. It can be made up with water to the strength of whole fresh milk.</p>	<p>Can be used when reconstituted by adding the correct amount of water (following the instructions on the label) and then modified (see Home-prepared formula from liquid milks below).</p>
	<p><i>Dried skimmed milk</i> has the fat and fat-soluble vitamins (e.g. vitamins A and D) removed. Most modified powdered milks, such as "creamers" used for "whitening" tea or coffee or various filled milks, have had the milk fat removed and replaced with vegetable fat. Sugar may also be added to ingredients to make it dissolve easily.</p>	Do not use.
Infant formula	<p><i>Commercial infant formula</i> is made in accordance with the Codex Alimentarius standards** – this means minimum standards of nutrient composition must be met. There are many different brands of commercial infant formula. This is nutritionally the most complete breastmilk substitute and contains adequate micronutrients. However, both proteins and fats are inferior to those in human milk, it is less easily digested and protective factors are absent.</p>	<p>Commercial infant formula is expensive so can affect sustainability of supplies.</p>
	<p><i>Generic Formula.</i> The nutritional composition is the same as branded commercial formula. The only difference is in the way in which it is marketed and distributed. It is also labelled more simply.***</p>	<p>Instructions on tin must be followed (see Using commercial infant formula below).</p>

\*Micronutrients needed to fortify home-prepared formula - 150ml, (see p 13): manganese 7.5µg, iron 1.5mg, copper 100µg, zinc 205µg, iodine 5.6µg, vit A 300IU, vit D 50 IU, vit E 1 IU, vit C 10mg, vit B1 50 µg, vit B2 80µg, niacin 300µg, vit B6 40µg, folic acid 5µg, pantothenic acid 400µg, vit B12 0.2µg, vit K 5µg, Biotin 2µg.

\*\*For information on Codex Alimentarius requirements, see [www.codexalimentarius.net](http://www.codexalimentarius.net)

\*\*\*For information on sources of generic formula contact ENN at [office@ennonline.net](mailto:office@ennonline.net)

## Home-prepared formula from liquid milks

Recipes using fresh milk (or milk reconstituted to be equivalent to fresh milk)

To make 150 ml of prepared formula using fresh (or reconstituted) cow's, goat's or camel's milk, mix:

100ml boiled milk  
50 ml boiled water  
10g (2 levelled teaspoons) sugar

To make 120 ml of prepared formula using fresh sheep or buffalo milk, mix:

60 ml milk  
60 ml water  
6 g (1 rounded teaspoon) sugar

Milk and water can be measured, mixed and then boiled together. Or the milk can be boiled separately and boiled water added according to convenience.

Then add the sugar and micronutrients (see p 12). Stir well and pour into feeding cup.

Table A in Annex 5 shows the volume and number of feeds required by infants of different ages and weights.

## Using commercial infant formula

All commercial infant formula used should be labelled in the appropriate language. Infant formula must be prepared according to the instructions on the label.

- Over-dilution results in decreased nutrient and energy intake.
- Under-dilution results in an over-concentrated formula that places heavy demands on the infant's immature metabolism.

**Always follow instructions on the tin or packet.**

An infant formula available in an emergency may not be the one a mother has normally used for her infant. Advice on preparation must take this into account. In particular:

- **Checking the volume of water needed per scoop of formula.**  
Commercial infant formula usually comes with a special measure (called a scoop) in the tin or packet of powder. This should be used only for that brand of infant formula. Standard commercial infant formulas use one level scoop of powder to each 30 ml of water. Always check the instructions of the particular product you are using as some brands use different size scoops.
- **Measuring water.**  
To prepare most commercial infant formulas, you first measure the water and then add the powder. However, check the manufacturer instructions as these can vary.
- **Measuring milk powder.**  
Each scoop of powdered milk must be levelled for accurate measuring. Do this by drawing the back of a clean knife or the straight handle of a spoon across the scoop, so the powder is level with the edges of the scoop. Do not round, heap or press down the milk powder in a scoop.

See Annex 9 for details on safe preparation of a breastmilk substitute feed and Annexes 2 and 8 for how to cup or bottle feed an infant.



# Annex 8

## How to feed with a bottle

- Before beginning to feed, test the heat and flow of the milk in the bottle by letting milk drip onto your wrist.  
The temperature of the milk on your wrist should be barely warm.  
The hole in the teat should be large enough to let the milk flow in a stream of several drops per second when the bottle is turned upside down.
- Make yourself comfortable.
- Hold the infant half sitting with the head in the inside bend of your elbow to give skin contact. Interact warmly with him or her throughout the feed by smiling, talking, singing and making eye contact, making feed time as pleasant as possible.
- Hold the bottle at an angle so that the baby does not swallow air with the milk and the teat is filled with milk.
- Gently stroke the baby's nearest cheek to start the sucking reflex. Carefully put the teat into the mouth. Do not push it too far back as this may make the baby choke.
- If the baby is having difficulty getting the milk, gently remove the bottle from the mouth so that air can enter the bottle, then continue as before.
- If you want to release the bottle, gently slide your little finger into the corner of the baby's mouth. This will break the suction on the teat.
- 'Winding' releases any air that the baby has swallowed. Swallowing air is more common in bottle fed babies than breastfed babies. But it can be reduced by tilting the bottle more as the baby empties it, so that the teat is full of milk and not air. To wind mid way through a feed or after it, hold the baby upright and pat or rub his/her back.
- Offer the whole feed to the baby. Babies vary in how much they take at each feed, in the same way as breastfeeding babies do.
- Never leave a baby with a bottle propped up on a pillow or cushion. This is very dangerous as the baby may choke on the feed. Also babies need the cuddling and stimulation they get when a person feeds them.

For *How to feed with a cup*, see Annex 2

# Annex 9

## Ten steps for safe preparation of a breastmilk substitute feed

Step	Description
Wash hands.	Always wash your hands with soap and water before preparing feed.
Keep it clean.	Carefully clean the utensils, sterilise them if needed. Countertops and tables also should be very clean. Use a clean cloth to cover counters/surfaces if necessary.
Check the date.	Check the expiration date on the formula can. Discard expired formula.
Boil.	Boil water to prepare the feed. Bring to a rolling boil. If water was boiled in advance for making up feeds, store it in a container used for this purpose for only up to 24 hours. The container should be clean and have a cover. Pour correct amount of cooled boiled water into calibrated cup /bottle.
Measure it.	Measure the required amount of formula powder, using the scoop from this tin or packet. (Do not use scoops from other brands of formula.) Level the powder off with a clean straight spoon handle or knife. Follow the mixing instructions on the label carefully. (Usually two scoops are needed for each 60 ml of water, but it may only be one. See Using commercial infant formula, Annex 7).
Mix it up.	Most commercial formula advise adding the dried powder to the measured water – but check the preparation details for the particular product you are using. Add the scoops of formula powder <b>to</b> the measured water, and, if a cup is used, mix the powder in thoroughly with a spoon. If a bottle is used, put the cap and cover on and shake to mix. The amount of formula, once mixed up according to instructions on the label, will be slightly more than the measured amount of water.
Test the temperature.	Place a drop of warmed formula on your wrist; if it feels comfortable and just barely warm, it's safe to feed baby. Feeds can be given at room temperature and do not need to be heated. If a feed is being warmed prior to the feed, place the bottle or cup in a bowl of hot water and test before feeding.
Store it.	Keep prepared formula refrigerated until feeding time. If refrigerated, use reconstituted formula within 24 hours of preparation. Never put a warmed bottle back into the refrigerator. If there is no refrigerator, then prepare milk before each feed.
Use it or lose it.	Give the prepared milk to the baby within, at most, an hour of preparation (if not refrigerated). Give as much as s/he wants. It is important that an infant receives a minimum amount per day or he/she may become malnourished. See Annex 5 to guide you on how much you can expect an infant to drink at a feed and over 24 hours. Give any leftover milk to an older child or the caregiver can drink it herself, otherwise throw away. For how to give a cup feed or bottle feed, see Annexes 2 and 8.
Finish up.	See Part 9.7 on how to clean a feeding bottle. Store utensils in a special container with a lid or leave covered with a clean cloth on a clean surface, ready for the next feed in three or four hours. If sterilising solution is used, leave bottles, teats and caps soaking until the next feed (minimum 1 hour).

# Annex 10

## Additional methods of sterilisation

In addition to boiling or chemical sterilisation (see Part 9.7), sterilisation can be carried out using steam under pressure (autoclave), dry heat, e.g. in an “oven” or a terminal heating method.

Autoclave: The recommended temperature for sterilisation is 121 degrees C for:

- 15 minutes: bottles, teats, rings, caps, utensils, measures, cloths
- 30 minutes: 0.5 litre water containers, clothing, face masks, cloths (to drape over sterilised equipment).

Sterilising using dry heat is carried out by placing equipment in an “oven” for 1 hour at 170 degrees celcius, or for 35 minutes at 180 degrees celcius.

### Terminal heating

Terminal heating means heating formula after preparation to kill micro-organisms. It is not recommended as a common method of preparation of formulas due to the potential alteration of the nutritive and physical characteristics of the formula.

When carefully carried out, terminal heating can be used as an extraordinary control measure under emergency circumstances, e.g. a diarrhoea epidemic, when there is a strong suspicion that an outbreak is infant formula related.

#### *Equipment needed*

Bottles made of appropriate plastic or glass with nipples, caps and rings.

Bottle steriliser, deep kettle with lid, or simple container with tight fitting lid.

Wire rack to keep bottles from touching the bottom of container.

Bottle brush.

#### *Method for terminal heating*

Scrub bottles, nipples, caps and rings with bottle brush, soap and hot water.

Squeeze water through nipple holes during washing and rinsing. Rinse everything well.

Measure appropriate amount of prepared formula into each clean bottle.

Put nipples, caps and rings on bottles loosely.

Place bottles in rack on bottom of steriliser. Add three inches of water to steriliser. Bring to the boil.

Cover and boil for 25 minutes, then turn off the heat. Let the steriliser cool to touch before uncovering. If bottles are cooled too quickly, a film may form that could clog nipples.

When bottles are cooled enough to handle, remove them from the steriliser. Tighten the caps, label and put in the refrigerator.

Adapted from: Preparation of formula for infants: guidelines for healthcare facilities. The American Dietetic Association, 1991.

# Annex 11

## Guiding principles for complementary feeding of the breastfed child

### 1 . Duration of exclusive breastfeeding and age of introduction of complementary foods

Practice exclusive breastfeeding from birth to 6 months of age, and introduce complementary foods at 6 months of age (180 days) while continuing to breastfeed.

### 2 . Maintenance of breastfeeding

Continue frequent, on-demand breastfeeding until 2 years of age or beyond.

### 3 . Responsive feeding

Practice responsive feeding, applying the principles of psychosocial care. Specifically, a) feed infants directly and assist older children when they feed themselves, being sensitive to their hunger and satiety cues, b) feed slowly and patiently, and encourage children to eat, but do not force them, c) if children refuse many foods, experiment with different food combinations, tastes, textures and methods of encouragement, d) minimize distractions during meals if the child loses interest easily and e) remember that feeding times are periods of learning and love - talk to children during feeding, with eye to eye contact.

### 4 . Safe preparation and storage of complementary foods

Practice good hygiene and proper food handling by a) washing caregivers' and children's hands before food preparation and eating, b) storing foods safely and serving foods immediately after preparation, c) using clean utensils to prepare and serve food, d) using clean cups and bowls when feeding children and e) avoiding the use of feeding bottles, which are difficult to keep clean.

### 5 . Amount of complementary food needed

Start at 6 months of age with small amounts of food and increase the quantity as the child gets older, while maintaining frequent breastfeeding. The energy needs from complementary foods for infants with "average" breast milk intake in developing countries are approximately 200 kcal per day at 6-8 months of age, 300 kcal per day at 9-11 months of age, and 550 kcal per day at 12-23 months of age. In industrialized countries these estimates differ somewhat (130, 310 and 580 kcal/d at 6- 8, 9-11 and 12-23 months, respectively) because of differences in average breast milk intake.

### 6 . Food consistency

Gradually increase food consistency and variety as the infant gets older, adapting to the infant's requirements and abilities. Infants can eat pureed, mashed and semi-solid foods beginning at six months. By 8 months most infants can also eat "finger foods" (snacks that can be eaten by children alone). By 12 months, most children can eat the same types of foods as consumed by the rest of the family (keeping in mind the need for nutrient-dense foods, as explained in #8 below). Avoid foods that may cause choking (i.e., items that have a shape and/or consistency that may cause them to become lodged in the trachea, such as nuts, grapes, raw carrots).

### 7 . Meal frequency and energy density

Increase the number of times that the child is fed complementary foods as he/she gets older. The appropriate number of feedings depends on the energy density of the local foods and the usual amounts consumed at each feeding. For the average healthy breastfed infant, meals of complementary foods should be provided 2-3 times per day at 6-8 months of age and 3-4 times per day at 9-11 and 12-24 months of age, with additional nutritious snacks (such as a piece of fruit or bread or chapatti with nut paste) offered 1-2 times per day, as desired. Snacks are defined as foods eaten between meals - usually self-fed, convenient and easy to prepare. If energy density or amount of food per meal is low, or the child is no longer breastfed, more frequent meals may be required.

## **8 . Nutrient content of complementary foods**

Feed a variety of foods to ensure that nutrient needs are met. Meat, poultry, fish or eggs should be eaten daily, or as often as possible. Vegetarian diets cannot meet nutrient needs at this age unless nutrient supplements or fortified products are used (see #9 below). Vitamin A-rich fruits and vegetables should be eaten daily. Provide diets with adequate fat content. Avoid giving drinks with low nutrient value, such as tea, coffee and sugary drinks such as soda. Limit the amount of juice offered so as to avoid displacing more nutrient-rich foods.

## **9 . Use of vitamin–mineral supplements or fortified products for infant and mother**

Use fortified complementary foods or vitamin-mineral supplements for the infant, as needed. In some populations, breastfeeding mothers may also need vitamin mineral supplements or fortified products, both for their own health and to ensure normal concentrations of certain nutrients (particularly vitamins) in their breast milk.

## **10 . Feeding during and after illness**

Increase fluid intake during illness, including more frequent breastfeeding, and encourage the child to eat soft, varied, appetizing, favorite foods. After illness, give food more often than usual and encourage the child to eat more.

Source: Guiding Principles for Complementary Feeding of the Breastfed Child, Pan American Health Organisation 2003, World Health Organisation, <http://www.paho.org>



# Annex 12

## Feeding the non-breastfed child 6–24 months of age

*Extracted from: Informal Working Group on Feeding Nonbreastfed children. Feeding of nonbreastfed children from 6 to 24 months of age. Conclusions of an informal meeting on infant and young child feeding organized by the World Health Organization, Geneva, March 8–10, 2004. Food and Nutrition Bulletin (in press).*

According to current UN recommendations, infants should be exclusively breastfed for the first six months of life, and thereafter should receive appropriate complementary feeding with continued breastfeeding up to two years or beyond. However, there are a number of infants who will not enjoy the benefits of breastfeeding in the early months of life or for whom breastfeeding will stop before the recommended duration of two years or beyond. A group that calls for particular attention is the infants of mothers who are known to be HIV-positive. To reduce the risk of transmission, it is recommended that, when acceptable, feasible, affordable, sustainable and safe, these mothers give replacement feeding from birth. Otherwise, they should breastfeed exclusively and stop as soon as alternative feeding options become feasible<sup>1</sup>. Another group includes those infants whose mothers have died, or who for some reason do not breastfeed.

Recommendations for appropriate feeding of breastfed infants from six months onwards have been summarized by PAHO<sup>2</sup>. Some of these guiding principles are not applicable to non-breastfed children, while others need adaptation. WHO convened this informal meeting to identify an analogous set of guiding principles for feeding of non-breastfed children after six months of age.

### Summary of Guiding Principles for feeding the non-breastfed child 6–24 months of age

#### 1. Amount of food needed

**Guideline:** Ensure that energy needs are met. These needs are approximately 600 kcal per day at 6–8 months of age, 700 kcal per day at 9–11 months of age, and 900 kcal per day at 12–23 months of age.

#### 2. Food consistency

**Guideline:** Gradually increase food consistency and variety as the infant gets older, adapting to the infant's requirements and abilities. Infants can eat pureed, mashed and semi-solid foods beginning at six months. By 8 months most infants can also eat "finger foods" (snacks that can be eaten by children alone). By 12 months, most children can eat the same types of foods as consumed by the rest of the family (keeping in mind the need for nutrient-dense foods, as explained in #4 below). Avoid foods in a form that may cause choking (i.e., items that have a shape and/or consistency that may cause them to become lodged in the trachea, such as nuts, grapes, raw carrots). Such foods should be mashed, pureed or juiced before being fed to young children.

#### 3. Meal frequency and energy density

**Guideline:** For the average healthy infant, meals should be provided 4–5 times per day, with additional nutritious snacks (such as pieces of fruit or bread or chapatti with nut paste) offered 1–2 times per day, as desired. The appropriate number of feedings depends on the energy density of the local foods and the usual amounts consumed at each feeding. If energy density or amount of food per meal is low, more frequent meals may be required.

#### 4. Nutrient content of foods

**Guideline:** Feed a variety of foods to ensure that nutrient needs are met.

- Meat, poultry, fish or eggs should be eaten daily, or as often as possible, because they are rich sources of many key nutrients such as iron and zinc. Milk products are rich sources of calcium and several other nutrients. Diets that do not contain animal source foods (meat, poultry, fish or eggs, plus milk products) cannot meet all nutrient needs at this age unless fortified products or nutrient supplements are used.

<sup>1</sup> UNICEF UNAIDS WHO UNFPA. HIV and Infant Feeding. Guidelines for decision-makers. Geneva, WHO, 2003. Available at: [http://www.who.int/child-adolescent-health/New\\_Publications/NUTRITION/HIV\\_IF\\_DM.pdf](http://www.who.int/child-adolescent-health/New_Publications/NUTRITION/HIV_IF_DM.pdf)

<sup>2</sup> PAHO. *Guiding Principles for Complementary Feeding of the Breastfed Child*. Washington: Pan American Health Organization, World Health Organization, 2003. Available at: [http://www.who.int/child-adolescent-health/New\\_Publications/NUTRITION/guiding\\_principles.pdf](http://www.who.int/child-adolescent-health/New_Publications/NUTRITION/guiding_principles.pdf)

- If adequate amounts of other animal source foods are consumed regularly, the amount of milk needed is ~200-400 mL/d; otherwise, the amount of milk needed is ~300-500 mL/d. Acceptable milk sources include full-cream animal milk (cow, goat, buffalo, sheep, camel), Ultra High Temperature (UHT) milk, reconstituted evaporated (but not condensed) milk, fermented milk or yogurt, and expressed breast milk (heat-treated if HIV-positive).
- If milk and other animal source foods are not eaten in adequate amounts, both grains and legumes should be consumed daily, if possible within the same meal, to ensure adequate protein quality.
- Dairy products are the richest sources of calcium. If dairy products are not consumed in adequate amounts, other foods that contain relatively large amounts of calcium, such as small fish that include the bones (dried or fresh, with the bones crushed or otherwise processed so that they are safe to eat) and lime-treated maize tortillas, can fill the gap. Other foods such as soybeans, cabbage, carrots, squash, papaya, green leafy vegetables, guava and pumpkin are useful additional sources of calcium.
- The daily diet should include Vitamin A rich foods (e.g. dark coloured fruits and vegetables; red palm oil; vitamin A fortified oil or foods); vitamin C rich foods (e.g. many fruits, vegetables and potatoes) consumed with meals to enhance iron absorption; and foods rich in the B vitamins including riboflavin (e.g. liver, egg, dairy products, green leafy vegetables, soybeans), vitamin B6 (e.g. meat, poultry, fish, banana, green leafy vegetables, potato and other tubers, peanuts) and folate (e.g. legumes, green leafy vegetables, orange juice).
- Provide diets with adequate fat content. If animal source foods are not consumed regularly, 10-20 g of added fats or oils are needed unless a fat-rich food is given (such as foods or pastes made from groundnuts, other nuts and seeds). If animal source foods are consumed, up to 5 g of additional fats or oils may be needed.
- Avoid giving drinks with low nutrient value, such as tea, coffee and sugary soft drinks. Limit the amount of juice offered, to avoid displacing more nutrient-rich foods.

#### 5. Use of vitamin-mineral supplements or fortified products

**Guideline:** As needed, use fortified complementary foods or vitamin-mineral supplements (preferably mixed with or fed with food) that contain iron (8-10 mg/d at 6-12 months, 5-7 mg/d at 12-24 months). If adequate amounts of animal source foods are not consumed, these fortified foods or supplements should also contain other micronutrients, particularly zinc, calcium and vitamin B12. In countries where vitamin A deficiency is prevalent or where the under five mortality rate is over 50 per 1000, it is recommended that children 6-24 months old receive a high-dose vitamin A supplement (100,000 IU once for infants 6-12 months old and 200,000 IU bi-annually for young children 12-23 months old).

#### 6. Fluid needs

**Guideline:** Non-breastfed infants need at least 400-600 mL/d of extra fluids (in addition to the 200-700 mL/d of water that is estimated to come from milk and other foods) in a temperate climate, and 800-1200 mL/d in a hot climate. Plain, clean (boiled, if necessary) water should be offered several times per day to ensure that the infant's thirst is satisfied.

#### 7. Safe preparation and storage of foods

**Guideline:** Practice good hygiene and proper food handling by a) washing caregivers' and children's hands with soap before food preparation and eating, b) storing foods safely and serving foods immediately after preparation, c) using clean utensils to prepare and serve food, d) using clean cups and bowls when feeding children, and e) avoiding the use of feeding bottles, which are difficult to keep clean (for additional details, see WHO Complementary Feeding: Family foods for breastfed children, 2000 and Five Keys to Safer Food [www.who.int/foodsafety/publications/consumer/5keys/en/](http://www.who.int/foodsafety/publications/consumer/5keys/en/)).

#### 8. Responsive feeding

**Guideline:** Practice responsive feeding, applying the principles of psycho-social care (Engle et al., 2000; Pelto et al., 2002). Specifically: a) feed infants directly and assist older children when they feed themselves, being sensitive to their hunger and satiety cues; b) feed slowly and patiently, and encourage children to eat, but do not force them; c) if children refuse many foods, experiment with different food combinations, tastes, textures and methods of encouragement; e) minimize distractions during meals if the child loses interest easily; f) remember that feeding times are periods of learning and love - talk to children during feeding, with eye to eye contact.

#### 9. Feeding during and after illness

**Guideline:** Increase fluid intake during illness and encourage the child to eat soft, varied, appetizing, favorite foods. After illness, give food more often than usual and encourage the child to eat more.

# Annex 13

## Feeds (including breastmilk and infant formula) that can be used for the therapeutic feeding of infants under six months of age

Milk feed	Properties	Indications
Breastmilk/ Breastfeeding	Sodium and protein levels are slightly higher than F75, less than F100-D and infant formula. Energy level similar to F75, F100-D and slightly more than infant formula (65 kcal/100 ml). Immunological and other health benefits. Lactose content higher than F75, F100-D, F100 and infant formula.	<ul style="list-style-type: none"> <li>- Suitable for initial re-feeding <b>but</b> only a limited quantity may be available if breastfeeding has been interrupted and infant not suckling. Can combine expressed breastmilk and appropriate therapeutic milk initially.</li> <li>- Suitable for continuing catch-up growth in infants under 6 months if adequate milk production has been re-established, and if infant feeds often enough day and night.</li> </ul>
Commercial F75	Sodium and protein contents are slightly lower than breastmilk. Renal solute load safe. Energy concentration 75 kcal per 100 ml. Percent energy from fat is lower than that in breastmilk (32% v 55%). Less phosphorus, calcium and lactose than breast milk.	<ul style="list-style-type: none"> <li>- Safe for initial re-feeding of severely malnourished infants under 6 months (and all ages) during stabilization phase. It is essential to use commercially prepared F75. Home-made F75 is higher in osmolarity.</li> <li>- Necessary if infant has oedema.</li> <li>- Not suitable for catch-up growth at any age.</li> </ul>
F100	Sodium, protein and lactose high. Solute load high. Energy concentration 100 kcal per 100 ml.	<ul style="list-style-type: none"> <li>- <b>not suitable for infants under 6 months. Solute load too high</b></li> <li>- Suitable for catch-up growth after 6 months of age.</li> </ul>
F100-D (F100 + one-third extra water)	Sodium and protein concentration lower than F100, higher than breastmilk and F75, similar to infant formula. Solute load (mOsm/L) less than F100, slightly higher than infant formula and higher than F75 and breastmilk. Energy concentration similar to breastmilk.	<ul style="list-style-type: none"> <li>- Safe to use for initial re-feeding under 6 months if appetite appears to be reasonable, especially if infant is breastfeeding.</li> <li>- Suitable for catch-up growth of infants under 6 months.</li> </ul>
Infant formula (as specified in Codex Alimentarius)	Sodium and protein content higher than breastmilk and F75, similar to F100-D. Solute load similar to F100-D. Energy concentration similar to breastmilk and F75 and F100-D. Designed as breastmilk substitute.	<ul style="list-style-type: none"> <li>- Safe to use in initial re-feeding under 6 months if reconstituted accurately and hygienically.</li> <li>- Suitable for catch-up growth of infants under 6 months.</li> </ul>
Home-made milk based feeds	Higher sodium and protein than F75 and breastmilk; dilution only compensates partially, accurate preparation difficult. Sugar and micronutrients must be added, as well as water for dilution.	<ul style="list-style-type: none"> <li>- <b>not suitable</b> except as a last resort if no alternative available, and then should be used only for a short time.</li> </ul>

**Notes:**

For details of composition of F75 and F100, see Reference Document 1-appendix 3 and document 2- p14 in Part 8.11.

*Diluted F100 (F100-D):* F100-D is used for initial re-feeding (Stabilisation phase) and catch-up growth (Rehabilitation phase) by agencies working in the field. It is prepared by adding one-third extra water to full strength F100, or by adding 35ml of water to each 100ml of prepared, full strength F100. Using the same milk in both initial re-feeding and catch-up avoids changes in flavour. Some infants reject supplementary suckling if the flavour of the feed changes.

The choice between using F100-D and infant formula depends on availability and the context. In emergency operations where F100 is more readily available than infant formula, then F100-D may be a more practical option. It may be more convenient to use the same preparation (F75 or F100) that is being used for older children, rather than an alternative that requires different handling. Also, using infant formula may convey a confusing message, because it is not seen as medical treatment and therefore may interfere with re-establishment of breastfeeding.

*Infant formula:* (This refers to infant formula which is industrially produced in accordance with the relevant Codex Alimentarius standards and is formulated as a suitable breastmilk substitute.) There is much experience of using infant formula as a breastmilk substitute, but there is little experience of using it for therapeutic feeding. However, in smaller units, infant formula may be available locally, or more easily sourced and less expensive than F100.

It can be used for initial re-feeding and for catch-up growth, as a substitute for breastmilk until breastfeeding is re-established, or for infants who will never be able to breastfeed.

If commercial infant formula is needed, buy it from normal channels, and use it according to the provisions of the International Code.

# Annex 14

## Breastfeeding corners

### Breastfeeding corners

A breastfeeding corner is an area with seats or mats which is set aside for mothers who are breastfeeding, and who need support and help. This may be near to a TFC, or in part of a ward or an MCH clinic, or another suitable place. Help may be given by health or community workers who have received some training in breastfeeding, and who can give skilled attention to the mothers. Mothers may attend only for day care, and return to the community at night.

The advantage for staff is that it enables them to get experience in helping with breastfeeding problems and to become more skilled. Special assistants/helpers can be trained to care only for this group of infants, and to look after any apparatus/equipment they use. The advantage for mothers is that being together gives them some privacy and they can help and support each other.

Breastfeeding corners can also be useful for mothers with malnourished infants who are being treated with supplementary suckling (see Part 6.3). Mothers can be asked to show each other how to do the supplementary suckling. This is often more successful than a health worker telling them what to do.



# Annex 15

## WHO/TALC materials on the management of severe malnutrition

Item	Date	Title	Type material Authors	Description	Distributor Approximate price Language**
1	1999	<i>Management of severe malnutrition: a manual for physicians and other senior health workers</i>	Manual 60 pages. WHO	Internationally agreed guidelines on the management of severe malnutrition in young children (and briefly in adults and adolescents) for health staff working at central and district level.	NHD/WHO US\$20.70 or SwFr 23.00 (16.10)* Eng, Fre, Span, Port
2	2000	<i>Management of the child with a serious infection or severe malnutrition</i> WHO/FCH/CAH/00.1	Manual with 20- page chapter 'Severe Malnutrition' + appendices. WHO-IMCI	IMCI guidelines for senior health staff responsible for the care of young children at the first referral level in developing countries.	CAH/WHO SwFr 15.00 (10.50)* Eng, Fre, Rus TALC £3.50 +pp, Eng
3	2000	<i>Treatment of severely malnourished children</i>	Slides + notes for facilitator. Schofield/ Ashworth/Burgess	Set of 24 teaching/learning slides for staff in health centres, hospitals and emergency feeding programmes.	TALC From £5.50+pp Eng
4	2001	<i>Improving the management of severe malnutrition</i>	Training modules (300 pages) on CD-ROM. Ashworth/Schofield (LSHTM) & Puoane/Sanders (UWC)	Trainers' Guide for those running training workshops. It tells how to plan a workshop and contains course materials, handouts and transparencies that participants can use to train their own staff, especially nurses. Clinical setting not required.	LSHTM & UWC Free TALC (see item 7 below) Eng
5	2002	<i>Training course on the management of severe malnutrition</i> WHO/NHD/02.04	Training guides and 7 modules with support material including a video. WHO	Instructor and Participant Guides (with exercises and photos) for 3-day orientation course for instructors and 6-day training course for senior health workers.	NHD/WHO Eng, Span (Fre/Port under prep.)
6	2003	<i>Caring for severely malnourished children</i>	Book 82 pages. Ashworth/Burgess	Based on items 1, 2 and 4 and written for nurses and other health professionals working in resource-poor settings. Sets out the 10 steps and briefly explains the rationale for each one. Includes how to involve mothers in care.	TALC £3.15 +pp Eng
7	2003	<i>Caring for severely malnourished children</i>	CD-ROM. TALC	Contains items 3, 4, 6 and a list of related websites.	TALC, £4.50 +pp (includes hard copy of item 6 – CD-ROM not sold separately), Eng
8	2003	<i>Guidelines for the inpatient treatment of severely malnourished children</i>	Handbook 48 pages. Ashworth/Khanm/ Jackson/Schofield NHD/WHO	Practical 10-step treatment guidelines similar to the malnutrition section of item 2. Support material for item 5.	NHD/WHO US\$ 9.00 or SwFr10.0 (7.00)* Eng (Fre/Span under prep.)

\*Prices: where two are given, the first applies to industrialised and the second to developing countries.

Approximate exchange rates (these may change) UK£1 = US\$1.77, Swiss Franc (SwFr)1 = US\$ 0.77

Additional materials are also available from several other organisations; ENN has recently published an interagency workshop report *Community based approaches to managing severe malnutrition* see [www.ennonline.net](http://www.ennonline.net)

\*\* Language: Eng=English, Fre=French, Rus=Russian, Span=Spanish, Port=Portuguese.

**Abbreviations, Addresses and Websites**

- CAH - Child and Adolescent Health and Development, WHO, 1211 Geneva 27, Switzerland.  
Fax: +41 22 7914857, email: [cah@who.int](mailto:cah@who.int),  
<http://www.who.int/child-adolescent-health/publications/pubIMCI.htm>.
- IMCI - Integrated management of childhood illness
- LSHTM - London School of Hygiene and Tropical Medicine, Nutrition and Public Health Intervention Research Unit, Keppel Street, London WC1E 7HT, UK. Fax: +44 20 7 958 8111, email: [ann.hill@lshtm.ac.uk](mailto:ann.hill@lshtm.ac.uk),  
<http://www.lshtm.ac.uk/nphiru>
- NHD - Nutrition for Health and Development, WHO, 1211 Geneva 27, Switzerland. Fax: +41 22 791 4156,  
email: [khanums@who.int](mailto:khanums@who.int), <http://www.who.int/nut/publications.htm>
- pp - post and packing
- TALC -Teaching-aids At Low Cost, P O Box 49, St Albans AL1 5TX, UK. Fax: +44 1727 846852,  
email: [info@talcuk.org](mailto:info@talcuk.org), <http://www.talcuk.org>
- UWC - University of Western Cape, School of Public Health, Private Bag X17, Bellville 7535 Cape, South Africa. Fax: +27 21 959 2872, email: [tpuoane@uwc.ac.za](mailto:tpuoane@uwc.ac.za) or [dsanders@uwc.ac.za](mailto:dsanders@uwc.ac.za),  
<http://www.soph.uwc.ac.za>
- WHO - World Health Organisation; Marketing & Dissemination, 1211 Geneva 27, Switzerland.  
Fax: +41 22 791 4857, email: [publications@who.int](mailto:publications@who.int), <http://bookorders.who.int>

# Annex 16

## Therapeutic milk feeds for initial feeding in the stabilisation phase for breastfed and non-breastfed infants

- Check infant's weight and look up the volume or feed needed for 24 hours and for the expected feed frequency.
- Do not make any adjustment for oedema.
- Try very hard to give very small infants at least 8 feeds per day.  
However, it is better to give the total volume of feed needed over the 24 hours with less frequent feeds, than to miss feeds because the ideal feed frequency is not possible (see Box 8.3, Frequency and number of feeds).

Weight of infant	Total feed volume in 24 hours	Volume of feed according to feed frequency (per 24 hours)					
		12 feeds	10 feeds	8 feeds	7 feeds	6 feeds	5 feeds
Kg	mls	mls	mls	mls	mls	mls	mls
1.2	240	20	20	25	30	35	45
1.3	240	20	25	30	30	35	45
1.4	240	20	25	30	35	40	45
1.5	240	20	25	30	35	40	45
1.6	300	25	30	35	40	45	55
1.7	300	25	30	35	40	45	55
1.8	300	25	30	40	40	45	60
1.9	300	25	30	40	45	50	60
2	300	25	35	40	45	50	65
2.1	300	25	35	40	45	50	65
2.2	360	30	35	45	50	60	70
2.3	360	30	35	45	50	60	70
2.4	360	30	35	45	50	60	70
2.5	420	35	40	50	55	65	75
2.6	420	35	40	50	55	65	75
2.7	420	35	40	50	55	65	75
2.8	420	35	40	55	60	70	80
2.9	420	35	40	55	60	70	80
3	480	40	45	60	65	75	85
3.1	480	40	45	60	65	75	85
3.2	480	40	45	60	65	75	85
3.3	480	40	45	60	65	75	85
3.4	480	40	45	60	65	75	85
3.5	480	40	50	65	70	80	95
3.6	480	40	50	65	70	80	95
3.7	480	40	50	65	70	80	95
3.8	480	40	50	65	70	80	95
3.9	480	40	50	65	70	80	95
4	540	45	55	70	75	85	110
4.4	540	45	55	70	75	85	110
4.5	600	50	60	80	90	95	120
4.9	600	50	60	80	90	95	120
5	720	60	70	90	100	110	130
5.4	720	60	70	90	100	110	130
5.5	720	60	80	100	110	120	150
5.9	720	60	80	100	110	120	150
6	840	70	85	110	120	140	175

**How total feed volumes are calculated for initial feeding**

The lower the weight of the infant, the higher the volume of feed per kg required.  
As a guide, the average volume of feed /kg, according to weight in the stabilisation phase is:

Weight	Feed ml/kg/24 hours*
1.2 - 1.5 kg	180 ml/kg
1.6 - 1.9 kg	170 ml/kg
2.0 - 3.0 kg	155 ml/kg
3.1 - 3.5 kg	145 ml/kg
3.6 - 6.0 kg	130 ml/kg

\*average rounded to nearest 5ml therefore absolute volumes per kg body weight may vary a little, these are guidance volumes.

# Annex 17

## Therapeutic milk feeds in the transition phase for infants who are not being breastfed

During transition phase, infants should be switched from F75 to infant formula or diluted F100.

Weight of infant	Total feed volume in 24 hours	Volume of feed according to feed frequency (per 24 hours)					
		12 feeds	10 feeds	8 feeds	7 feeds	6 feeds	5 feeds
kg	ml	ml	ml	ml	ml	ml	ml
1.2	300	25	25	35	40	45	60
1.3	300	25	30	40	40	45	60
1.4	300	25	30	40	45	50	60
1.5	300	25	30	40	45	50	60
1.6	360	30	40	45	50	60	70
1.7	360	30	40	45	50	60	70
1.8	360	30	40	50	50	60	80
1.9	360	30	40	50	60	65	80
2	360	30	45	50	60	65	85
2.1	360	30	45	50	60	65	
2.2	480	40	45	60	65	80	90
2.3	480	40	45	60	65	80	90
2.4	480	40	45	60	65	80	90
2.5	540	45	50	65	70	85	100
2.6	540	45	50	65	70	85	100
2.7	540	45	50	65	70	85	100
2.8	540	45	50	70	80	90	105
2.9	540	45	50	70	80	90	105
3	600	50	60	80	85	100	110
3.1	600	50	60	80	85	100	110
3.2	600	50	60	80	85	100	110
3.3	600	50	60	80	85	100	110
3.4	600	50	60	80	85	100	110
3.5	600	50	65	85	90	105	125
3.6	600	50	65	85	90	105	125
3.7	600	50	65	85	90	105	125
3.8	600	50	65	85	90	105	125
3.9	600	50	65	85	90	105	125
4	720	60	70	90	100	110	145
4.4	720	60	70	90	100	110	145
4.5	780	65	80	105	125	125	155
4.9	780	65	80	105	125	125	155
5	960	80	90	115	130	145	170
5.4	960	80	90	115	130	145	170
5.5	960	80	105	130	145	155	195
5.9	960	80	105	130	145	155	195
6	1080	90	110	145	155	180	225



**How total feed volumes are calculated for the transition phase (non-breastfed infants)**

The lower the weight of the infant, the higher the volume of feed per kg required.  
As a guide, the average volume of feed /kg, according to weight in the transition phase is:

Weight	Feed ml/kg/24 hours*
1.2 - 1.5 kg	225 ml/kg
1.6 - 1.9 kg	205 ml/kg
2.0 - 3.0 kg	200 ml/kg
3.1 - 3.5 kg	180 ml/kg
3.6 - 6.0 kg	170 ml/kg

\*average rounded to nearest 5ml

# Annex 18

## Therapeutic milk feeds in the catch-up phase for infants who are not being breastfed

Weight of infant	Total feed volume in 24 hours	Volume of feed according to feed frequency (per 24 hours)					
		12 feeds	10 feeds	8 feeds	7 feeds	6 feeds	5 feeds
mls	<i>mls</i>	mls	mls	mls	mls	mls	mls
1.2	360	30	30	40	50	55	70
1.3	360	30	40	50	50	55	70
1.4	360	30	40	50	55	65	70
1.6	420	35	40	50	60	70	80
1.6	480	40	50	55	65	70	90
1.7	480	40	50	55	65	70	90
1.8	480	40	50	65	65	70	95
1.9	480	40	50	65	70	80	95
2.0	480	40	55	65	70	80	105
2.1	480	40	55	65	70	80	105
2.2	600	50	55	70	80	95	110
2.3	600	50	55	70	80	95	110
2.4	600	50	55	70	80	95	110
2.5	660	55	65	80	90	105	120
2.6	660	55	65	80	90	105	120
2.7	660	55	65	80	90	105	120
2.8	660	55	65	90	95	110	130
2.9	660	55	65	90	95	110	130
3.0	780	65	70	95	105	120	135
3.1	780	65	70	95	105	120	135
3.2	780	65	70	95	105	120	135
3.4	780	65	70	95	105	120	135
3.5	780	65	80	105	110	130	150
3.6	780	65	80	105	110	130	150
3.7	780	65	80	105	110	130	150
3.8	780	65	80	105	110	130	150
3.9	780	65	80	105	110	130	150
4.0	840	70	90	110	120	135	175
4.4	840	70	90	110	120	135	175
4.5	960	80	95	130	145	150	190
4.9	960	80	95	130	145	150	190
5.0	1140	95	110	145	160	175	210
5.4	1140	95	110	145	160	175	210
5.5	1140	95	130	160	175	190	240
5.9	1140	95	130	160	175	190	240
6.0	1320	110	135	175	190	225	280

**How total feed volumes are calculated for catch-up/rehabilitation (non-breastfed infants)**

The lower the weight of the infant, the higher the volume of feed per kg required.  
As a guide, the average volume of feed /kg, according to weight in the catch-up phase is:

Weight	Feed ml/kg/24 hours*
1.2 - 1.9 kg	270 ml/kg
2.0 - 3.0 kg	ml/kg
3.1 - 3.5 kg	ml/kg
3.6 - 6.0 kg	ml/kg

\*average rounded to nearest 5ml