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# Infant and young child feeding: standard recommendations for the European Union

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## Foreword

EUNUTNET (European Network for Public Health Nutrition: Networking, Monitoring, Intervention and Training) is a European Commission funded project (SPC 2003320) co-ordinated by Agneta Yngve, Unit for Preventive Nutrition, Department of Biosciences, Karolinska Institute. The project brought together European scientists and public health experts in order to, inter alia, ensure the development and implementation of sustainable evidence-based coherent training and promotion strategies on nutrition and physical activity. Within EUNUTNET, a task force coordinated by Adriano Cattaneo, Unit for Health Services Research and International Health, Institute for Child Health IRCCS Burlo Garofolo, has drawn up, after extensive review of the research evidence and much consultation, these standard recommendations on infant and young child feeding to complement the Blueprint for Action for the Protection, Promotion and Support of Breastfeeding in Europe (European Commission funded project SPC 2002359). These recommendations, once published and launched, will be offered to relevant national associations, organizations and government bodies as a guide to professional practice in Europe.

The recommendations were formulated between March 2005 and June 2006 by:

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in consultation with the scientists and public health experts involved in EUNUTNET.

They have been reviewed by:

- Genevieve Becker, International Lactation Consultant Association (ILCA);
- Lida Lhotska, International Baby Food Action Network (IBFAN);
- Elizabeth Hormann, European Lactation Consultant Association (VELB);
- Amal Omer-Salim, Elisabeth Kylberg, Clara Aarts, Kerstin Hedberg-Nykvist, World Alliance for Breastfeeding Action (WABA);
- Mary J Renfrew, Professor of Mother and Infant Health, Director, Mother and Infant Research Unit, University of York, UK;
- Anthony F Williams, Senior Lecturer and Consultant Paediatrician, St George's, University of London, UK;

who provided many useful suggestions for the improvement of the manuscript.

They have been endorsed so far by:

- European Association of Perinatal Medicine;
- European Breast Cancer Coalition;
- European Federation of Nurses Associations;
- European Lactation Consultant Association;

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<sup>a</sup> Use this address for correspondence. The document can be downloaded at [http://www.burlo.trieste.it/old\\_site/Burlo%20English%20version/Activities/research\\_develop.htm](http://www.burlo.trieste.it/old_site/Burlo%20English%20version/Activities/research_develop.htm)

- European Midwives Association;
- Federation of European Nutrition Societies;
- International Baby Food Action Network, Europe;
- International Confederation of Midwives;
- International Council of Nurses;
- International Pediatric Association;
- Union of National European Paediatric Societies and Associations;
- World Alliance for Breastfeeding Action;
- World Health Organization Regional Office for Europe.

## **Abstract**

These standard best practice recommendations on infant and young child feeding have been developed within the European Commission funded project EUNUTNET (European Network for Public Health Nutrition: Networking, Monitoring, Intervention and Training) to complement the Blueprint for Action for the Protection, Promotion and Support of Breastfeeding in Europe, the result of a previous European Commission funded project. A common set of European best practice recommendations has many advantages: health professionals moving from one country to another will not need to change their practices; it will be possible to share resources, especially for planning, teaching and research; there will be a common basis for data collection and programme evaluation; harmonization and enforcement of marketing regulations will be facilitated. The recommendations are based on a large body of evidence published by United Nations agencies, governments, researchers, professional associations and non-governmental organizations. They also take into account the Convention on the Rights of the Child when it recognizes, in Article 24, the important role breastfeeding plays in the achievement of the child's right to the highest attainable standard of health. The recommendations consist of standard practice guidelines organised in a life cycle pattern: before pregnancy, in pregnancy, at childbirth, in the first few days of life, in the first month, between one and six months, and after six months. They also include guidelines for pre-term and low birth weight infants and on breastfeeding and young child feeding friendly environments. The recommendations end with four annexes. These present a supportive standard policy and give details on situations where breastfeeding may be contraindicated, on the risks of a decision not to breastfeed, and on safe alternative feeding. These recommendations, once published and launched, will be offered to relevant national associations, organizations and government bodies as a guide to professional practice in Europe. The recommendations have already been endorsed by many European and international professional associations, by relevant non-governmental organizations, and by the World Health Organization Regional Office for Europe.

## Background

The European Union (EU), through its institutions: “emphasizes ... the importance of nutrition as one of the key determinants of human health”; “is concerned by the consequences of the increase in obesity and overweight ... particularly among children and adolescents”; “considers that action on nutritional health must be given an adequate place in the future Community action programme on public health”; and “invites Member States, within the context of their national nutritional health policies, to ... continue to develop the production, dissemination and implementation of nutritional health guidelines on the basis of sound scientific evidence”.<sup>1</sup>

In this context, the development of standard recommendations on optimal infant and young child feeding is appropriate and timely.<sup>b</sup> Using a common set of best practice recommendations has many advantages. For example, health professionals moving from one country to another will not need to change their practices; it will be possible to share resources, especially for planning, teaching and research; there will be a common basis for data collection and programme evaluation; harmonization and enforcement of marketing regulations will be facilitated.

The recommendations encompass the contents of the Global Strategy for Infant and Young Child Feeding,<sup>2</sup> unanimously adopted by all World Health Organization (WHO) member states at the 55<sup>th</sup> World Health Assembly (WHA) in May 2002, as well as the large body of evidence published by United Nations agencies, governments, researchers, professional associations and non-governmental organizations. The recommendations also take into account the Convention on the Rights of the Child, signed and ratified by all EU Member States, when it recognizes, in Article 24, the important role breastfeeding plays in the achievement of the child’s right to the highest attainable standard of health.<sup>3</sup>

## Introduction

Breastfeeding is the natural way to feed infants and young children. Exclusive breastfeeding for the first six months of life ensures optimal growth, development and health. After that, breastfeeding, with appropriate complementary foods, continues to contribute to the infant’s and young child’s growth, development and health.<sup>4</sup> Low rates and early cessation of breastfeeding have important adverse health, social and economic implications for women, children, the community and the environment, result in greater expenditure on national health care provision, and may increase inequalities in health.<sup>5-8</sup> Despite difficulties in interpreting available data, it is clear that current initiation, exclusivity and duration rates of breastfeeding in virtually every country worldwide, including EU countries, fall short of recommended levels.<sup>9,10</sup> In some EU countries, initiation rates are very low, but even in countries where they are high, there is a marked fall-off in the first six months and throughout most of Europe the exclusive breastfeeding rate at six months is low. The most common identified barriers to the initiation and continuation of breastfeeding include:<sup>11,12</sup>

- insufficient coverage and quality of prenatal education on infant and young child feeding;
- suboptimal maternity hospital policies and practices;
- lack of timely follow-up and competent support;
- misinformation and lack of guidance and encouragement from health workers;
- lack of or poor implementation of the International Code of Marketing of Breast milk Substitutes;<sup>c13</sup>
- early return to work in the absence of workplace facilities and support for breastfeeding;

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<sup>b</sup> In this document, infants are aged less than 12 months, young children are aged 12 months up to three years (36 months). Older infants (more than six months) and young children are expected, according to these recommendations, to continue breastfeeding while at the same time eating a well balanced diet of nourishing family foods.

<sup>c</sup> The International Code of Marketing of Breast milk Substitutes and the subsequent relevant WHA Resolutions are jointly referred to in this document as the International Code.

- lack of family and broad societal support; and, in some countries,
- media portrayal of formula feeding as the norm.

Appropriate complementary feeding and transition towards a well balanced diet of nourishing family foods are also important for the growth, development and health of young children. The Green Paper recently issued by the European Commission recognises that “important lifestyle choices pre-determining health risks at adult age are made during childhood and adolescence; it is therefore vital that children be guided towards healthy behaviours”.<sup>14</sup> Promoting healthy eating behaviours in young children is acknowledged, with the promotion of physical activity, as one of the main interventions for the control of the current epidemic of obesity.<sup>15,16</sup>

The aim of this document is to provide recommendations that will inform all health workers - whether in primary health care, in hospitals or other community health care settings - caring for parents and children during pregnancy, childbirth and in the first three years of life, of the best evidence-based practices to protect, promote and support optimal feeding of infants and young children in their different work settings. The document concentrates on what health workers should do rather than detailing how the recommendations should be implemented, as the latter will depend on local structures, capacities and circumstances. In addition to the standard practice guidelines, the document includes four annexes. These present a supportive standard policy and details on situations where breastfeeding may be contraindicated, on the risks of a decision not to breastfeed, and on safe alternative feeding.

The document does not include the research-based benefits of breastfeeding, for three reasons:

- Firstly, breastfeeding is the natural and species-specific way to feed human infants and young children, therefore it does not require evidence to endorse it.
- Secondly, because “exclusive breastfeeding is the reference or normative model against which all alternative feeding methods must be measured with regard to growth, health, development, and all other short- and long-term outcomes”.<sup>4</sup> Thus, the burden of proof for the superiority or the equivalence of alternative ways to feed infants and young children should fall to those who propose these alternatives.
- Thirdly, because the benefits of breastfeeding are already well-known and readily accessible in numerous professional peer reviewed journals and in many policy statements.

## Standard practice guidelines

These guidelines are organised in a life cycle pattern, except for the section on pre-term and low birth weight infants which is conveniently located after the section on the first few days of life. The guidelines are aimed at meeting the information needs of a generic health worker thereby ensuring that all health worker groups, regardless of their sphere of responsibility and expertise, operate from the same set of evidence-based recommendations. The guidelines are consistent with the Global Strategy on Infant and Young Child Feeding,<sup>2</sup> the Baby Friendly Hospital Initiative,<sup>17,18</sup> and the EU Blueprint for Action for the Protection, Promotion and Support of Breastfeeding.<sup>19</sup> They are also consistent with the recommendations and policy statements issued by relevant professional associations and health service bodies.<sup>4,20-27</sup>

### 1. Before pregnancy

Parents usually make decisions on infant and young child feeding shortly before or early in pregnancy.<sup>28-30</sup> The choice of infant feeding method can, however, be influenced by attitudes established long before a pregnancy is even contemplated.<sup>31</sup> It is therefore important to represent breastfeeding to the general public as the natural way to feed infants and young children and create an environment where breastfeeding becomes the normal, easy and preferred choice for the vast majority of parents. It is important that boys and men should also receive infant and young child feeding information because, as potential future fathers, they will have an important supportive role to play in the decision to breastfeed and in the success of breastfeeding.<sup>32-34</sup> This can be done:

- 1.1. Through the education system by integrating information about breastfeeding and infant and young child feeding in curricula and textbooks from pre-school education onwards.
- 1.2. During individual or group contacts between prospective parents and health, social and allied workers appropriately trained in infant and young child feeding by:
  - 1.2.1. Informing prospective parents and the general public that there are very few situations where breastfeeding is not recommended or achievable (Annex 1), while acknowledging there may be some barriers to breastfeeding, especially where formula feeding is common and where practices in health and social systems might not be conducive to the success of breastfeeding. These obstacles, however, can be overcome with appropriate support to mothers and families.
  - 1.2.2. Informing prospective parents that most women can breastfeed and that because breastfeeding is how nature intended human babies to be fed no special preparation is needed. This does not mean that individual support is unnecessary to initiate, establish and continue breastfeeding.
  - 1.2.3. Informing prospective parents that the use of certain substances (tobacco, alcohol, heroin, cocaine, amphetamines) pose risks to the foetus and the newborn infant, because they pass through the placenta and are present in breast milk. The use of these substances should be discontinued during pregnancy and lactation, or at least reduced to a minimum.<sup>35</sup> Individual counselling should be available to assist parents to make appropriate decisions in these situations.
- 1.3. In the media, switching from the current representation of bottle feeding as the norm,<sup>36</sup> to the representation of breastfeeding as the normal, natural and optimal way of feeding infants and young children.
- 1.4. With full implementation of the International Code, i.e. protecting consumers from the marketing of breast milk substitutes and from misinformation on infant and young child feeding.

## 2. Pregnancy<sup>d</sup>

Health education classes specifically dedicated to breastfeeding and multiple individual contacts with competent health workers, lactation consultants and/or peer counsellors, as part of a multifaceted programme with consistent messages that continue after childbirth, are an effective way to promote the initiation and extend the duration of breastfeeding.<sup>37-39</sup> The use of printed material alone, such as information booklets given to mothers, has not been found to be effective.<sup>38,40</sup> For women who may not use antenatal care services (clinics and classes) even when access is freely available (e.g. women from ethnic minority groups, adolescent mothers, women from lower socio-economic groups, women who left school early), the health care system should not only ensure easier access to services but also identify and remove any barriers (e.g. geographical, economic, linguistic, cultural) that may make these women less likely to use existing antenatal care services. This may require alternative service provision specifically adapted to meet the identified needs of these vulnerable expectant parents.<sup>e</sup> During antenatal care:

- 2.1. Health workers should assume that most expectant mothers intend to breastfeed. All expectant parents should be given information about the benefits of breastfeeding, as well as about the normal process of establishing breastfeeding following the birth and how this can be facilitated (i.e. the 10 Steps to Successful Breastfeeding).<sup>17</sup>
  - 2.1.1. Expectant parents who indicate that they intend to breastfeed should receive positive reinforcement and approval for their choice. Health workers should help parents develop their own realistic breastfeeding plan.<sup>20,21</sup> Opportunities should be provided to discuss real or perceived barriers to breastfeeding and how these can be overcome.
  - 2.1.2. Expectant parents who indicate that they intend to formula feed their infants should be given information on the risks and inconveniences of a decision not to breastfeed (Annex 2), to ensure that this is an informed decision.
  - 2.1.3. If expectant parents do not indicate their infant feeding choice during pregnancy, health workers should ask the mother how she intends to feed her baby only after she has given birth, when the baby is placed skin-to-skin on her chest. The first skin-to-skin contact between mother and newborn infant offers a golden opportunity to actively encourage breastfeeding.
- 2.2. Ultimately it is the responsibility of health workers to provide best evidence-based information that is independent of commercial interests, and thus to assist parents to make an informed infant feeding decision. Once the decision is made, health workers should document and respect it, and give the mother all the expert help she requires to fulfil it.
- 2.3. In conjunction with group antenatal education classes, all expectant parents should receive individual education on the following aspects of infant and young child feeding:
  - 2.3.1. The optimal duration of breastfeeding, the importance of exclusive and continued breastfeeding, and appropriate complementary feeding.
  - 2.3.2. The physiology of lactation, including information on the signs of correct positioning and attachment, signs of early feeding readiness, signs of effective breastfeeding, the variable frequency and duration of breastfeeding episodes they should expect with breastfeeding on demand.
  - 2.3.3. The routine practices that are known to favour the initiation and establishment of breastfeeding from the moment of birth onwards (i.e. the 10 Steps to Successful Breastfeeding).

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<sup>d</sup> A small number of women may have medical conditions that require different recommendations. This small number of women will require individually adapted education and counselling relevant to their particular needs.

<sup>e</sup> The need to pay particular attention to the most vulnerable groups and to remove barriers for them in accessing health and social services is placed in this paragraph because of the life cycle approach taken in this document, however, this point applies to all health care services.

- 2.3.4. The prevention of and solution to breastfeeding problems.
- 2.3.5. How to express, collect and store breast milk.
- 2.3.6. The risks of a decision not to breastfeed.
- 2.4. Fathers, grandparents and/or significant others identified by the new mother should be involved in infant and young child feeding education programmes to create a social environment that will support optimal infant and young child feeding.
- 2.5. Pregnant women should receive consistent information, as set down in best evidence-based policies, in all antenatal consultations and in all infant and young child feeding information materials (written or audio-visual) provided during antenatal care and lactation. It is important that such material be independent of and free from commercial interests and advertising.
- 2.6. Women with special needs (e.g. primiparae, immigrant women, adolescent mothers, mothers who will be parenting alone, mothers who have had previous difficult and/or unsuccessful breastfeeding experiences, women with multiple pregnancies) should receive care and support tailored to their specific needs.
- 2.7. Tobacco use (e.g., cigarettes, waterpipe, chews) should be discouraged and women should be advised to seek help to stop or reduce its use to a minimum. However, they can be reassured that tobacco use is not a contraindication to breastfeeding. Parents should be advised of the dangers of passive smoking, particularly for infants and young children.<sup>35,41</sup>
- 2.8. Pregnant women and those intending to breastfeed should be advised to avoid alcohol and given information on the risks involved for the developing foetus during pregnancy and its adverse effects on breastfeeding and the baby. Health workers should inform pregnant women and breastfeeding mothers of these dangers and counsel them to avoid alcohol or reduce its use to a minimum. If an occasional alcoholic drink is consumed, breastfeeding should be avoided for two hours afterwards.<sup>35,42-45</sup>
- 2.9. There are no special dietary requirements during pregnancy and lactation. Women should be advised to eat a nutritious well balanced diet. Economic support should be provided if needed to ensure adequate nutrition. Access to appropriately trained health workers (dietitians/nutritionists) should be available as needed. Iron and folic acid supplements may be prescribed based on individual need or local recommendations. The nutritional status of mothers does not adversely affect their ability to breastfeed, except in cases of extreme malnutrition.<sup>46-48</sup>
  - 2.9.1. In some regions, where the local diet may not provide an adequate amount of iodine, women should be advised to eat extra portions of fish, to use iodised salt (taking a maximum recommended intake of 5 grams per day),<sup>49</sup> or to take iodine supplements (200-300 µg/day) if the prevalence of iodine deficiency is high.<sup>50,51</sup>
  - 2.9.2. In some regions the local diet, the latitude, and some environmental and cultural determinants of exposure to sunlight may lead to insufficient intake and levels of vitamin D in some pregnant women;<sup>52</sup> these women should receive supplements, either 400 IU per day during the whole pregnancy or 1000 IU per day during the third trimester.<sup>53,54</sup>
- 2.10. Evidence suggests that overweight and obese women may be less likely to breastfeed or breastfeed for shorter periods.<sup>55-59</sup> They may need extra support to establish lactation following delivery.
- 2.11. Regular physical activity is beneficial and recommended during pregnancy and lactation for all women.<sup>60</sup>
- 2.12. The routine examination of breast and nipples during antenatal care to assess suitability to breastfeed is unnecessary. Pregnant women should be reassured that almost all breast and nipple shapes and sizes are compatible with effective breastfeeding, once positioning and attachment are correct. Women with previous breast surgery or breast diseases, or who have previously experienced difficulties with breastfeeding should get

individual specialised care from a competent professional to achieve correct attachment. Nipple preparation of any kind does not improve the practice of breastfeeding, may undermine women's self-confidence and damage delicate breast tissue.<sup>61,62</sup>

- 2.13. In rare situations and diseases occurring in pregnancy or during lactation, breastfeeding may be temporarily or permanently contraindicated or rendered difficult. Women in these situations should receive appropriate care, support and information from health professionals competent in both breastfeeding and lactation management and the specific disease or condition.
- 2.14. Group education classes on preparation of formula feeds should be avoided during the antenatal period (and after childbirth), regardless of the infant feeding decision of the expectant parents attending. There may, however, be group education on the risks of formula feeding.

### 3. Childbirth

Optimal care for the effective initiation and establishment of exclusive breastfeeding is the same whether the birth takes place in the home, at a birth centre, or in a maternity hospital setting.

Contact between the mother and her baby, as described below, is important for all regardless of method of infant feeding because it promotes bonding and facilitates the colonisation of the baby with maternal germs.

- 3.1. To facilitate the initiation of breastfeeding, the newborn should be dried and placed skin-to-skin on the mother's chest and abdomen immediately after birth, or as soon as possible thereafter and covered with a dry warm blanket or towel. This initial skin-to-skin contact should last for as long as possible, ideally for at least two hours after birth or until after the first breastfeed. All the routine neonatal procedures that are not life saving (e.g. washing, weighing and non-urgent medical procedures) should be postponed until after the first breastfeed.<sup>63-65</sup> If the baby or the mother need urgent medical care, skin-to-skin contact should be offered as soon as they are stable.
- 3.2. During the initial skin-to-skin contact, the baby will find and explore (i.e. nuzzle and lick) the breast, and will eventually find the nipple and latch on for the first breastfeed. Health workers should not force or accelerate this occurrence, but rather help the mother to choose a comfortable position. Good positioning and attachment will often occur spontaneously. If this does not happen, health workers should help the mother and the newborn achieve correct positioning, if possible using a hands-off<sup>f</sup> technique.<sup>38,66</sup> The first breastfeed should last until the baby stops sucking and releases the nipple.
- 3.3. During the first and subsequent early breastfeeds, health workers should observe the mother and the baby for signs of good positioning and attachment and of effective or ineffective breastfeeding (Table 3.3). There is no need to intervene when breastfeeding is going well. When signs of possible difficulty are detected, competent health workers should gently encourage mothers to improve their and/or their babies' position and attachment and show how to check when this is done correctly. A hands-off technique is always recommended in these situations.

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<sup>f</sup> A hands-off technique means that health workers use only verbal advice to enable mothers to position and attach their babies for themselves, without actually doing it for them.

Table 3.3. Signs of good positioning and attachment and of effective/ineffective breastfeeding.

Signs that breastfeeding is going well	Signs of possible difficulty
Position of the mother and the baby	
<input type="checkbox"/> Mother relaxed and comfortable <input type="checkbox"/> Baby held close to mother's body <input type="checkbox"/> Baby's head and body in line, facing breast <input type="checkbox"/> Baby's chin touching breast <input type="checkbox"/> Baby's whole body supported <input type="checkbox"/> Baby approaches breast nose to nipple <input type="checkbox"/> Eye contact between mother and baby	<input type="checkbox"/> Shoulders tense, leans over baby <input type="checkbox"/> Baby held away from mother's body <input type="checkbox"/> Baby's head and neck twisted to feed <input type="checkbox"/> Baby's chin not touching breast <input type="checkbox"/> Only head and neck supported <input type="checkbox"/> Baby approaches lower lip/chin to nipple <input type="checkbox"/> No mother/baby eye contact
Suckling	
<input type="checkbox"/> Baby's mouth open wide <input type="checkbox"/> Lower and upper lips turned outwards <input type="checkbox"/> Tongue cupped around nipple and areola* <input type="checkbox"/> Cheeks full and rounded when suckling <input type="checkbox"/> More areola seen above baby's upper lip <input type="checkbox"/> Slow deep sucks, with pauses <input type="checkbox"/> Can see or hear swallowing	<input type="checkbox"/> Mouth not wide open <input type="checkbox"/> Lips pursed or turned in <input type="checkbox"/> Baby's tongue not observed* <input type="checkbox"/> Cheeks pulled in when suckling <input type="checkbox"/> More areola seen below lower lip <input type="checkbox"/> Rapid shallows sucks <input type="checkbox"/> Smacking or clicking sounds
Signs of effective transfer of milk	
<input type="checkbox"/> Moisture around the baby's mouth <input type="checkbox"/> Baby gradually relaxing hands and arms <input type="checkbox"/> Breast gradually softening while feeding <input type="checkbox"/> Milk leaking from the opposite breast <input type="checkbox"/> Signs of oxytocin reflex noticed** <input type="checkbox"/> Baby releasing the breast by him/herself when the feed is finished	<input type="checkbox"/> Baby fussy or unsettled, coming on and off the breast <input type="checkbox"/> Mother feeling pain or discomfort in the breast or nipple <input type="checkbox"/> Breasts looking red, swollen or sore <input type="checkbox"/> No signs of oxytocin reflex noticed** <input type="checkbox"/> Mother taking the baby off the breast

\* This sign cannot be observed during suckling, only during rooting and latching on.

\*\* Mother feeling thirsty, getting relaxed or drowsy, increased uterine contractions and increased lochia flow during feeding.

3.4. There is growing evidence that pharmacological analgesia during labour may interfere with the spontaneous breast seeking and breastfeeding behaviour of the newborn infant.<sup>67-69</sup> However, epidural analgesia does not seem to affect breastfeeding rates at discharge and at 6-8 weeks postpartum.<sup>69,70</sup> When these interventions are used, mothers and babies may need additional support and time to initiate breastfeeding. Prior to pharmacological analgesia being offered to mothers, they should be fully informed of the possible effects on breastfeeding initiation. Alternative non-pharmacological labour pain relief methods should also be available.

#### 4. The first few days of life

4.1. Within 24 hours of birth, mothers should be shown how to recognise and respond to their own baby's early feeding cues (e.g. increased alertness or activity, rapid eye movements, mouthing or rooting, hand-to-mouth and sucking movements, soft cooing or sighing, sucking sounds and fussiness - crying is a late indicator of hunger) that demonstrate his/her readiness to feed and informed of the importance of baby-led or demand feeding. During this time mothers should also be shown how to correctly position and attach their baby at the breast and what signs to look for when this is done effectively. The normal pattern of expected initial weight loss and subsequent gain, and the number of wet nappies (6 or more in 24 hours) to expect as an indication of sufficient milk intake when breastfeeding is exclusive, should also be explained.<sup>38</sup>

- 4.2. As the separation of the newborn infant from his/her mother may have a negative impact on breastfeeding, it should only be done for valid medical reasons and with informed consent. Without a valid medical reason mothers should be advised of the crucial importance of staying in the same room with their baby 24 hours a day (rooming-in).<sup>38</sup> While in hospital babies should be placed in a separate cot in the same room as the mother or in a special clip-on cradle attached to the mother's bed.
- 4.3. Those mothers (and fathers) who decide to share a bed with their baby (bedding-in or co-sleeping) while in hospital and after discharge should be advised to use a wide bed with a firm mattress and place the baby on his/her back below or away from pillows. Bed sharing parents should also be advised not to use soft pillows, quilts or mattresses; not to have an unprotected gap between the side of the bed and surrounding structures; not to use heavy duvets or other sources of excessive heat; not to sleep on sofas; not to smoke or use alcohol or narcotic drugs or prescription drugs that affect alertness.<sup>71-73</sup>
- 4.4. Newborn infants should have access to unrestricted breastfeeding.<sup>38</sup> Mothers should be informed that it is perfectly normal for newborn infants to want to breastfeed up to 12 times or more in 24 hours; frequent feeding is normal and helps to establish and maintain a good milk supply. Some infants may want to suckle continuously for long periods of time and their sleep cycles may vary.<sup>74</sup> But mothers should also be informed that in the early days newborn infants need at least eight effective breastfeeds in 24 hours. Finally, mothers should be informed that some infants are satisfied with one breast, while others will breastfeed on both breasts at every feeding. Babies should be breastfed on the first breast until they spontaneously release the nipple before they are offered the second breast.
- 4.5. All new mothers should understand the basics of breastfeeding. This should include the following information in both verbal and written formats:
  - 4.5.1. The process of milk production and how it is regulated by the baby, i.e. the more milk the baby removes from the breast, the more milk is produced.
  - 4.5.2. The baby shows his/her readiness to feed by a series of early feeding cues that mothers should be able to recognise and respond to, because crying is a late sign of hunger.
  - 4.5.3. The duration of each feed, as well as the number of feeds, is regulated by the baby, and is dependent on the effectiveness of suckling, the baby's fluid and energy needs, and the time lag between feeds. The healthy baby will self-regulate his/her own breast milk intake if allowed to suckle freely.
  - 4.5.4. The signs that breastfeeding is going well and the signs of possible difficulty.
  - 4.5.5. The prevention of engorgement by early, frequent and effective breastfeeding, and the prevention of sore nipples by correct positioning and attachment.
- 4.6. If effective feeding is not initiated within 12 hours after birth, the mother should be shown how to express her breast milk by hand and how to feed this to her baby (e.g. with a cup or a spoon); at the same time she should continue to receive help with positioning and attachment.
- 4.7. If an effective breastfeed has not taken place within the first 24 hours, the feeding technique should be re-evaluated and support provided at each feed until the problem has been solved. If breastfeeding difficulties persist, the baby should be seen by a paediatrician to exclude medical reasons.
- 4.8. Some neonatal weight loss is usual, due to loss of excess fluids. With correct support for exclusive breastfeeding as described above, weight loss is minimised and weight recovery starts on average on day four. About 3% of term newborn infants lose more than 10% of birth weight and these need careful observation and support to improve the frequency and effectiveness of breastfeeding.<sup>75</sup> They may also need to be seen by a paediatrician to exclude medical reasons for the weight loss. Only a small minority of these infants will require supplementation with donor breast milk or infant formula to

avoid excessive weight loss and/or hypernatraemic dehydration.<sup>76,77</sup> If the hospital staff observe more than 5% of newborn term infants losing more than 10% of birth weight, a reassessment of hospital breastfeeding and birthing policies, practices and guidelines should be undertaken.

- 4.9. Unless medically indicated, the healthy term newborn infant should not be given supplements of infant formula, glucose solution, water, tea or camomile tea. The mother's own expressed breast milk or donor human milk should be the supplement of choice, if a supplement is medically indicated. Acceptable medical reasons for supplementation are: very low birth weight (less than 1500 g) or gestational age (less than 32 weeks), infant small for gestational age with potentially severe hypoglycaemia, serious infant or maternal illness, weight loss of 8-10% accompanied by delayed lactogenesis (more than 5 days).
- 4.10. Non-haemolytic jaundice may occur in exclusively breastfed newborn infants. However, the level and duration of the jaundice is lessened by giving the first breast feed as soon as possible after birth, with frequent breastfeeds thereafter. The number of infants requiring phototherapy decreases when the practice of early and frequent breastfeeding increases.<sup>78,79</sup>
- 4.11. Neonatal hypoglycaemia is a rare occurrence if exclusive breastfeeding is supported as described above.<sup>80,81</sup> Routine blood glucose monitoring in appropriate weight for gestation healthy term infants is not justified.
- 4.12. Because breast milk may not ensure the amount of vitamin K required to prevent deficiency bleeding, 1 mg of parenteral vitamin K should be administered to all newborn infants.<sup>82,83</sup>
- 4.13. Discharge from hospital should be delayed until effective breastfeeding has been observed or the continuity of support after discharge is guaranteed either by the staff of the maternity hospital or by suitably qualified primary care providers and/or lactation consultants, peer counsellors and mother-to-mother support groups, where available.<sup>38,84-87</sup>
- 4.14. The healthy term newborn does not need to use pacifiers (soothers); there is no evidence that the use of these in the first month of life provide any benefit.<sup>88,89g</sup> It is normal for an infant to engage in comfort or non-nutritive suckling at the breast from time to time.
- 4.15. The mother should not receive commercial discharge packs, especially if these contain information or marketing materials or samples of products related to formula feeding.<sup>38,91</sup>

## 5. Pre-term and low birth weight infants

Some infants born at or near term who are small for gestational age may not require additional support to effectively breastfeed, but will require extra monitoring. However, additional support, as described below, will be needed for most pre-term and low birth weight infants. These recommendations can also be adapted for ill newborns.

- 5.1. If a pre-term or high risk baby is anticipated, the parents should receive prenatal information about optimum feeding and nutrition and the importance of own mothers milk and breastfeeding. Testing the mother for cytomegalovirus antibodies may be considered to decide whether pasteurisation or other methods of treating expressed breast milk is needed before giving it to pre-term infants less than 32 weeks of gestational age.<sup>92-94</sup>
- 5.2. As soon as possible after the birth parents should be facilitated and encouraged to visit their baby in the intensive care unit and allowed to hold, or at least touch, and photograph their baby. At the same time, but within the first six hours after birth, the

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<sup>g</sup> There is some evidence that using a pacifier at nap and bed time after the first month, i.e. after breastfeeding is firmly established, may reduce the risk of Sudden Infant Death.<sup>72,90</sup>

mother should be encouraged to start breastfeeding or to express colostrum. Expressed colostrum should be fed to the infant by the mother herself or in her presence if possible, unless there is a contraindication for enteral feeding. This process will support long-term milk production.<sup>95</sup>

- 5.3. If the baby is initially too immature to breastfeed or to ill to tolerate enteral feeds, the mother should get help to initiate and establish a pattern of frequent and regular effective milk expression or pumping and advised on the safe handling and storage of breast milk for later use by her baby. No colostrum or breast milk should be wasted.
- 5.4. Health workers should try to lessen the factors that might cause extra stress to the mother. Stress may hinder the flow of milk but not its production, and might therefore lead to milk stasis. The mother should be informed of the physiology of milk production and shown how to massage the breast to facilitate let-down and milk flow. This information should also be given in written format with ample use of diagrams/pictures.
- 5.5. As soon as possible and no later than day 3, a regular pattern of expressing/pumping breast milk every three hours and at least eight times per 24 hours, with at least one expression/pumping during the night, should be established. If possible, expressing or pumping should be done next to the infant's cot/incubator; otherwise, a room with a comfortable chair and a quiet peaceful atmosphere should be made available for this purpose. A double pumping set can minimise the pumping time and at the same time increase the milk yield.<sup>95-97</sup> The advantages and disadvantages of all methods of expressing and pumping should be discussed with the mother and she should be provided with the opportunity to try different pumping options before she decides which method is most efficient and suitable in her situation.
- 5.6. Kangaroo mother care (KMC) or skin-to-skin-contact should be started immediately or as soon as possible after birth, depending on the infant's medical condition and on the mother's willingness and ability to be present in hospital, and continued for prolonged periods of time, at least one hour at a time or as often as possible. Extended KMC, up to full-time, is of benefit.<sup>64,98,99</sup>
- 5.7. If milk production is low, the cause should be explored (e.g., check the pumping technique, does it cause discomfort or is pumping too infrequent, is there retention of placental tissue, is the mother using medication that can reduce milk production). Milk production of 600 ml per day at the end of the 2<sup>nd</sup> week is a positive predictor of sufficient milk supply during subsequent weeks.<sup>100</sup>
- 5.8. At 27-29 weeks gestational age, as soon as the infant does not need a ventilator, Continuous Positive Airway Pressure or other assisted ventilation treatments, and does not respond adversely to handling, his/her nose and lips can be brought in close contact to the mother's nipples. The baby is developmentally able to lick/drink small amounts of milk from the breast.<sup>101,102</sup> Full breastfeeding is possible from a gestational age of 33-34 weeks.
- 5.9. Breastfeeding is less exhausting and no more dangerous than bottle feeding at any gestational age. Evidence suggests that there is less oxygen de-saturation associated with breastfeeding than with bottle feeding.<sup>103,104</sup>
- 5.10. The pre-term infant should be given the opportunity to breastfeed when he/she is awake and stable, irrespective of current maturational level or age, and especially when the infant demonstrates feeding readiness cues. The guiding principle should be that breastfeeding should occur as frequently as possible, or as often as the infant needs/wants feeding, depending on his/her medical condition. Regular checking of positioning and attachment should continue to ensure effective and comfortable breastfeeding. Tube or cup feeding and/or intravenous nutrition can continue, while the mother pumps/expresses with the same frequency.
- 5.11. After about 35 weeks gestational age, breastfeeding on demand can be started while continuing and facilitating rooming-in and skin-to-skin contact or KMC. Supplementary

feeding (if possible with own mother expressed breast milk) should be used if weight gain is insufficient (monitoring of body weight once a day may be necessary, not more frequently). Pre-term infants generally do not have the neurological maturation needed for true demand feeding. The mother should therefore be well versed in recognising feeding readiness cues, when and how to stimulate a sleepy infant to breastfeed, and signs of correct latch-on in order to achieve a sufficient number of feeds per 24 hours (semi-demand feeding), and to identify signs of correct latch-on. If the mother cannot be present for all feeds, her milk, or donor human milk, can be given by cup or tube.

5.12. At the mother's discharge, she should be able to effectively hand express her milk or have available to her a modern, well functioning and comfortable pump that she is familiar with, and she should be well informed on the correct expressing/pumping technique and on how to safely handle, store, freeze and transport her expressed breast milk. Health workers should confirm that the mother knows all sources of breastfeeding support available to her, including mother-to-mother groups, lactation consultants and special support groups or organisations for mothers/parents of pre-term infants or newborns with health problems.

## 6. First month of life

- 6.1. All mothers and newborn infants should be visited, seen or otherwise communicated with within 48 hours after discharge, by a competent health professional and/or a trained peer counsellor to check that exclusive breastfeeding is progressing satisfactorily. Most problems identified at this stage can be easily solved. Difficult problems should be referred to a lactation consultant or a trained health professional with a recognised competence in breastfeeding support. The longer the first visit is delayed the more difficult it is to solve any problems that might have arisen.<sup>105</sup>
- 6.2. During this visit, and subsequent visits as necessary, the health worker or peer counsellor should observe a breastfeed to ensure correct position and attachment, confirm good milk transfer, and reassure the mother that she is doing a good job in order to maximise her self confidence. The mother's knowledge and practice of breastfeeding should be reinforced.
- 6.3. Breastfeeding problems such as sore nipple and breast engorgement, i.e. the potential precursors of mastitis, can be prevented by ensuring correct positioning and attachment and with baby-led breastfeeding (i.e. feeding on demand).<sup>106</sup> If these conditions have already occurred, treatment will depend on individual presentations. None of these problems require the discontinuation of breastfeeding and short-term interruption is rarely needed.
- 6.4. Mothers perceiving infant crying and frequent feeding as breast milk insufficiency need explanation, reassurance and support. Episodes of increased feeding frequency are normal, they are a regulating mechanism of milk removal and milk synthesis to meet the evolving needs of the baby.<sup>107-109</sup> These episodes often coincide with a normal growth spurt and reassurance and extra support is generally all that is needed in these situations.
- 6.5. Data regarding weight gain for exclusively breastfed infants in the first weeks of life are now available.<sup>110,111</sup> Table 6.5 shows the 3<sup>rd</sup> and 97<sup>th</sup> percentile of weight-for-age until the completion of the first four weeks of age, for boys and girls, based on the new WHO child growth standards. If an infant of this age fails to gain 200 g/week on average,<sup>h</sup> girls slightly less than boys, health workers should check the effectiveness of breastfeeding and correct feeding technique if necessary. Should growth faltering persist, health workers should check for medical problems and act accordingly.

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<sup>h</sup> Weight gain should always be calculated from the lowest post-partum weight, not from birth weight.

Table 6.5. 3<sup>rd</sup> and 97<sup>th</sup> percentiles of weight (in kg) for age (in weeks) for boys and girls.<sup>110</sup>

Age in weeks	Boys		Girls	
	3 <sup>rd</sup>	97 <sup>th</sup>	3 <sup>rd</sup>	97 <sup>th</sup>
0	2.5	4.3	2.4	4.2
1	2.6	4.5	2.5	4.4
2	2.8	4.9	2.7	4.6
3	3.1	5.2	2.9	5.0
4	3.4	5.6	3.1	5.3

- 6.6. Mothers should be advised to eat a balanced nutritious diet, with no need to avoid specific foods. Breastfeeding mothers who avoid meat, fish, poultry, eggs and dairy products are at significant risk of calcium, iron and vitamin B<sub>12</sub> deficiency that may cause health problems in their babies. These babies should be monitored regularly by a paediatrician and given vitamin B<sub>12</sub>, iron and calcium supplements as needed.<sup>112</sup>
- 6.7. Lactation is not affected by the amount of ingested fluids and mothers should be advised to drink sufficiently to satisfy their thirst. Water and pure unsweetened fruit juices are the best sources of fluid.
7. From one to six months<sup>i</sup>
- 7.1. If exclusive breastfeeding is well established, there is no need to supplement breast milk with other foods or fluids.<sup>j</sup> Mothers should be advised to check growth, e.g. by arranging for infant weight checks monthly, and to continue breastfeeding on demand.
- 7.2. At around six months, most infants will show an interest in complementary foods (i.e. solids) as well as breastfeeds.<sup>k</sup> Provided infants are in good health parents should be advised to observe their infants' feeding behaviour and respond appropriately to it (i.e. never force infants to eat).
- 7.3. In settings where micronutrient deficiency in infants under six months of age is a concern, improved maternal intake during pregnancy and lactation, instead of premature introduction of complementary foods, is the most effective, and less risky, way of preventing deficiencies.
- 7.4. Vitamin D deficiency may occur in exclusively breastfed infants who are not sufficiently exposed to sunlight, i.e. confined indoors during daylight hours, covered with clothing while outdoors, living at high latitudes with seasonal variation of ultraviolet radiation, living in urban centres where high rise buildings and pollution can block sunlight, darker skin pigmentation, use of sun screens. Short 15-minute exposures to sunlight several times a week is a sufficient and safe way to ensure adequate vitamin D synthesis and avoid burns. Giving vitamin D supplements to at risk infants will prevent this deficiency.<sup>113</sup> Formula-fed infants do not need these supplements if they use vitamin D enriched formula.
- 7.5. Growth charts are useful to monitor infant growth, but should not be the sole determinant of the need for the introduction of complementary feeding. This applies not

<sup>i</sup> To clarify, "six months" is defined as the end of the first six months of life (180 days), when the infant is 26 weeks old, as opposed to the start of the sixth month of life, that is at 21-22 weeks of age. For pre-term infants this means six months corrected age.

<sup>j</sup> Tea is given to infants in some societies; this is not recommended and can be harmful (especially if sugar is added), because it undermines breastfeeding.

<sup>k</sup> This document uses the terms "complementary feeding" and "complementary foods" rather than the more commonly used terms "weaning" and "weaning foods". Weaning and weaning foods are misleading because they imply that complementary foods substitute for rather than complement breast milk and are intended to lead to the cessation of breastfeeding. Instead, breastfeeding should continue after the introduction of complementary foods and the infant and young child should not be weaned off breast milk.

only to the growth charts in predominant use for the past 40 years, which are based mainly on cohorts of formula-fed infants, but also to the newly recommended WHO growth charts based on infants exclusively or predominantly breastfed for at least four months, who continued breastfeeding for at least 12 months and who received complementary foods from the age of four/six months.<sup>110,111</sup> The WHO growth charts indicate in which percentile or z-score the growth of a given baby falls when compared with the average growth of infants optimally fed in the same age group; they are not an indication of readiness for complementary foods.

- 7.6. To facilitate mothers in the paid workforce to breastfeed exclusively up to six months and to continue breastfeeding after that in combination with appropriate complementary foods for as long as they wish, a breastfeeding supportive workplace as well as family and social support is needed. Access to ongoing expert support and help from health workers and/or peer counsellors and/or mother-to-mother support groups, and information on expression, safe handling and storage of breast milk, is also required.<sup>114</sup> Employers, trade unions, politicians and society as a whole are responsible for putting in place legal protections for the breastfeeding mother in the paid workforce.
- 7.7. Exclusively breastfeeding mothers who use the Lactation Amenorrhoea Method (LAM) of birth control have a high rate of protection from unwanted pregnancy until their infants are six months old.<sup>115</sup> After this, or if LAM is not used, mothers who wish to avoid a pregnancy should use other contraceptive methods. Among hormonal methods of birth control, progestin-only contraceptives are highly effective and have no inhibitory effect on lactation, however, combination contraceptives appear to be associated with a decline in milk production.<sup>116</sup>

## 8. After six months<sup>117-122</sup>

While allowing for some individual need variation, breast milk alone is no longer sufficient to meet all the nutritional requirements of infants and young children after six months of age.

Complementary foods are generally needed after this age along with breast milk. Complementary foods can be subdivided into:

- Transitional (puréed, mashed, semi-solid) foods, which are foods specifically selected from the main food groups and adapted to meet the particular nutritional and physiological needs of the infant.
  - Family foods, largely based on a normal well-balanced varied family diet, with some minor adaptations.
- 8.1. Both transitional and family foods, should be based on the family diet if this is varied and well balanced, sufficiently high in energy, protein and micronutrients, and adapted to the eating capabilities of a growing and developing infant. The change from breastfeeding alone to transitional foods and then to a normal family diet with the eventual cessation of breastfeeding, should be gradual.
- 8.2. Starting complementary feeding too soon is not advisable because:
- 8.2.1. Breast milk can be displaced by other fluids or foods of poorer quality that may not be sufficiently nutrient and energy dense to meet the infant's requirements, and giving these foods or fluids can lead to a reduction in the mother's breast milk supply.
- 8.2.2. Infants are not yet able to digest certain foods.
- 8.2.3. The early exposure of infants to microbial pathogens potentially contaminating complementary foods and fluids puts them at increased risk of diarrhoeal disease and consequently malnutrition.
- 8.2.4. The early exposure of infants to certain foods may trigger allergies.
- 8.2.5. There is an earlier return to fertility for mothers, because decreased suckling reduces the period during which ovulation is suppressed.

- 8.3. Delaying the introduction of complementary foods for too long is also not advisable because:
- 8.3.1. Breast milk alone may not provide enough energy and nutrients and may lead to growth faltering and malnutrition.
  - 8.3.2. Breast milk alone may not meet the infant's growing requirements of some micronutrients, especially iron and zinc.
  - 8.3.3. The optimal development of oral motor skills, such as the ability to chew, and the infant's ready acceptance of new tastes and textures may be adversely affected.
- 8.4. Infants should, therefore, be started on complementary foods at or shortly after six months of age. Between 6-8 months these foods should be given 2-3 times a day, increasing to 3-4 times daily after nine months of age, with additional nutritious snacks offered 1-2 times per day, as desired, after 12 months. Breast milk, however, should remain the primary source of nutrition for the whole of the first year of life. During the second year of life, family foods should gradually become the primary source of nutrition. While fully accepting that mothers make the decision about how long they and their babies wish to breastfeed, they should receive all the support necessary to help them continue breastfeeding to two years of age and beyond, as recommended by WHO and most national and professional policies and practice recommendations.<sup>2,4,20-26</sup>
- 8.5. By around six months most infants can sit with support and can "sweep a spoon" with their upper lip, rather than merely sucking semi-solid food off the spoon. By around eight months they have developed sufficient tongue flexibility to enable them to chew and swallow more solid lumpier foods in larger portions. From 9-12 months most infants have the manual skills to feed themselves, drink from a standard cup using two hands and eat food prepared for the rest of the family, with only minor adaptations, e.g. cut into bite-sized portions and eaten from a spoon, or as "finger" foods. It is important, for nutritional and developmental reasons, to give age-appropriate foods at the correct consistency and by the correct method.<sup>123</sup> Table 8.5 shows examples of the types of food that can be consumed and swallowed successfully at given ages and stages of development; it does not necessarily indicate that these foods should be offered at these ages.<sup>124,125</sup>
- 8.6. The main factors influencing whether an infant's energy and nutrient requirements are met are the consistency (thickness) and energy density (energy per unit volume) of the semi-solid food plus the quantity and frequency of feeds. To ensure that the energy and nutrient needs of growing children are met, they should be offered a wide variety of foods of high nutritional value. Moreover, offering children a more varied diet improves their appetite. Although patterns of food consumption vary from meal to meal, children's overall daily energy intake is normally relatively constant. When offered a range of nourishing foods most children tend to select a variety and so instinctively choose a nutritionally complete diet.
- 8.7. A number of features, such as flavour, aroma, appearance and texture, affect the infant's intake of semi-solid foods. Taste buds detect four primary taste qualities: sweet, bitter, salt and sour. Sensitivity to taste helps protect against the ingestion of harmful substances and, in addition, can help regulate a child's intake. Children's preferences for the majority of foods are strongly influenced by learning and experience; they develop a preference in relation to the frequency of exposure to particular tastes. The only innate preference is for the sweet taste, and even newborn infants will avidly consume sweet substances, if given them. Increasing the variety of foods will enhance a child's acceptance of different tastes.<sup>126</sup> It is therefore important not to introduce sugar in any concentrated form (e.g. desserts, ice creams) until the infant has a chance to experience and develop a taste for other flavours, especially vegetables and fruits.

Table 8.5. Examples of age-appropriate foods for different ages and stages of development (these foods are merely examples and are not the only ones that can be introduced).

Age (months)	Reflexes/skills	Types of food that can be consumed	Examples of foods
0–6	Suckling/sucking and swallowing	Liquids	Breast milk only
4–7	Appearance of early “munching”; increased strength of suck; movement of gag reflex from mid to posterior third of tongue	Puréed foods (only if the individual child’s nutritional requirements call for addition of complementary foods)	Breast milk plus cooked puréed meat; vegetable (e.g. carrot) or fruit (e.g. banana) purées; mashed potato; gluten-free cereals (e.g. rice)
7–12	Clearing spoon with lips; biting and chewing; lateral movements of tongue and movement of food to teeth. Fine motor skills developing to facilitate self-feeding.	Increasing variety of mashed or chopped foods and finger foods-combining new and familiar foods. Give three meals per day with two snacks in between.	Breast milk plus cooked minced meat; mashed cooked vegetables and fruit; chopped raw fruit and vegetable (e.g. banana, melon, tomato); cereal (e.g. wheat, oats) and bread <sup>1</sup>
12–24	Rotary chewing movements; jaw stability	Family foods	Breast milk plus whatever the family is eating, provided the family diet is healthy and well-balanced

- 8.8. Children appear to consume more when they receive a varied diet compared with a limited monotonous one.<sup>130</sup> It is important that children, for whom all complementary foods are initially unfamiliar, have repeated exposure to new foods during the early complementary feeding period in order to establish a healthy food acceptance pattern. It has been suggested that a minimum of 8–10 exposures are needed, with clear increases in food acceptance appearing after 12–15 exposures.<sup>131</sup> Parents should thus be reassured that the rejection of new foods is normal. Foods should be offered repeatedly, as those that are initially rejected are often accepted later. If the child’s initial rejection is interpreted as unchangeable, the food will probably not be offered to the child again and the opportunity for building up a broad range of exposure to and acceptance of new foods and tastes will be lost. Breastfed infants may accept solid foods more rapidly than those fed on infant formula, as they have become accustomed to a range of flavours and odours derived from their mothers’ diet and conveyed to them in breast milk.<sup>131-133</sup> The use of commercial complementary foods may delay the infant’s acceptance of the family’s normal diet and represents an unnecessary financial burden on family budgets.
- 8.9. Adding salt is not recommended when preparing complementary foods or family foods for infants and young children, or indeed for any family members. Therefore, not adding salt in any food preparation will benefit the whole family. Very salty foods such as pickled vegetables, salted meats, stock cubes and soup powders should be avoided. If using salt, salty foods or spices for the rest of the family, a portion of family food should be removed for the infant or young child, prior to adding these. Sugar should not be added to foods for infants and young children either.

<sup>1</sup> The age of introduction of cereals containing gluten is still the subject of research. It appears that breastfeeding is a protective factor for coeliac disease and that gluten should not be introduced early (at 4-6 months), particularly if breastfeeding has already stopped. If breastfeeding continues, the risk of coeliac disease associated with the introduction of gluten may be lower if this happens after 7-8 months. Other factors, including genetic and environmental factors, as well as the amount of gluten given to the infant, also seem to play a role.<sup>127-129</sup>

- 8.10. Vegetables and fruit provide vitamins, minerals, starch and fibre. They play a major protective role, helping to prevent micronutrient deficiency, and generally have a low fat content. Vegetables and fruit make the most significant contribution to vitamin C intake. Eating vegetables and fruit that contain vitamin C along with iron rich foods such as beans, lentils and whole-grain cereals, will improve the absorption of non-haem iron from plant foods. Other micronutrients present in vegetables and fruits are the B vitamins, including vitamin B<sub>6</sub>. Dark-green leaves and orange-coloured fruits and vegetables are rich in carotenoids, which are converted to vitamin A, and dark-green leaves are also rich in folate, with potassium and magnesium present in significant levels. It is therefore advisable to choose a variety of vegetable and fruit to meet daily nutrient recommendations. Some of the health benefits associated with vegetable and fruit consumption may come from non-nutrient components such as antioxidants and phytosterols. This is one reason why vitamins and minerals are best obtained from vegetables and fruit rather than from tablets or supplements.
- 8.10.1. The availability of fresh vegetables and fruit varies by season and region, although frozen and preserved vegetables and fruits can ensure a supply of these foods throughout the year. If processed or preserved fruit and vegetable products are used, they should contain the minimum possible amounts of added fats, oils, sugars and salt. Many green leafy vegetables are cooked before consumption. Cooking in water can lead to leaching and thermal losses of vitamin C, especially when the vegetables are left to stand before consumption. Steaming or boiling using a minimum amount of water, or boiling for a very short time, reduces vitamin loss.
- 8.10.2. Fruit juice refers to the juice produced by compressing fruits. Nutritionally, fruit juices produced from compressed fruit contain all the nutrients present in fruits, with the exception of the dietary fibre. Fruit juices are a good source of vitamin C, and if given as part of a meal will improve the bioavailability of non-haem iron present in plant foods. It is nevertheless important to limit the amount of fruit juice offered to avoid reducing the intake of breast milk and decreasing the acceptance for savoury foods in the diet. Furthermore, fruit juices contain natural glucose, fructose, sucrose or other sugars which, because of their acidity can cause dental caries and erosion of the teeth. The term “fruit drink” is sometimes used to describe a drink made from jam or fruit compote mixed with water and sugar. These drinks contain negligible vitamin C and therefore have none of the benefits of the fruits from which “real” fruit juice is made.
- 8.10.3. Concerns have also been raised about the over consumption of so-called fruit juices containing artificial sweeteners and simple carbohydrates other than glucose, sucrose or fructose. Those containing sugar alcohols, such as mannitol and sorbitol, have been linked with causing diarrhoea in some children.<sup>134-136</sup> Excessive consumption of fruit juices (whether “real” or “so-called”) also decrease the child’s appetite for other foods, and may cause loose stools. For this reason, no more than 120-180 ml of fruit juice per day is recommended. Excess fruit juice consumption has also been linked with failure to thrive and with short stature and obesity.<sup>137</sup>
- 8.10.4. Finally, the use of a bottle to give the infant fruit juices and other sweet drinks, especially if taken to bed, has been associated with an increased incidence of dental caries.<sup>138</sup> Parents should be warned that such practice entails a risk and should be advised to use a cup instead.
- 8.11. Nutrients are more concentrated in lean meat tissue than in fat meat. Liver is naturally low in fat and has the additional benefit of being easily cooked and puréed without becoming stringy, which makes it easier for infants and young children to eat. Lean meat contains substantial amounts of protein and is an important source of highly bio-

available minerals such as iron and zinc. Young children may have difficulty eating meat because of its stringy nature, lean meat should therefore be minced, finely chopped or puréed before giving to infants, at least in the early months of complementary feeding. Some meats are expensive but some, like liver, are not; small amounts, however, can provide much needed nutritional benefits for infants and young children.

- 8.12. Fish is also an important source of high quality protein and weight-for-weight has the same amount as lean meat. Moreover all fish (freshwater fish, saltwater fish and shellfish) are rich sources of essential amino acids. As well as being good sources of protein, white fish and shellfish are also very low in fat, and the fat in other fish (such as salmon, tuna, sardines, herring and mackerel) has a high proportion of n-3 long-chain polyunsaturated fatty acids, which are important for neurodevelopment. Fish also provides a good source of iron and zinc, which are found in slightly lower concentrations than in meat, with the exception of shellfish. Saltwater fish are the key source of iodine for infants, apart from breast milk. Iodine deficiency is still prevalent in Europe, especially where salt is not iodised, and iodine is essential for optimal child development and growth.
- 8.13. Eggs provide a versatile food source. Egg proteins contain amino acids essential to growth and development, and the lipids in eggs are rich in phospholipids with a high ratio of polyunsaturated to saturated fatty acids. Their iron content is relatively high, but it is bound to phosphoprotein and albumin and is therefore less bio-available. Eggs are relatively cheap and are a valuable means of improving the intake of animal protein. Uncooked or partially cooked eggs are a potential cause of salmonella poisoning, and therefore, require thorough cooking. Eggs are therefore recommended for infants after six months and young children. For infants with a family history of egg allergy, eggs should be avoided in the first 12 months of life, then egg yolk can be introduced, followed by egg white.
- 8.14. Milk should continue to be an integral part of a diet based on complementary foods. It is recommended that breastfeeding should continue throughout the first two years of life and beyond. If the volume of breast milk is still high, there is no reason to introduce other milks. In non-breastfeeding infants and young children an excessive intake of infant formula before one year of age or cow's milk thereafter can limit the intake and diversification of complementary foods in the diet, which is important in exposing the infant to new tastes and textures that promote the development of eating skills. A young child consuming either one litre of cow's milk or an equivalent formula milk product is meeting as much as two thirds of his or her energy requirement from this source, leaving very little appetite for other more varied healthy foods. For non-breastfed infants after six months of age it is therefore recommended to give 280-500 mL/d of iron-fortified infant formula, if other animal-source foods are included in the diet, 400-550 mL/d if they are not. For non-breastfed young children over one year, undiluted whole cow's milk can be used, 200-400 mL/d if other animal-source foods are included in the diet, 300-500 mL/d if they are not.
- 8.14.1. To ensure that animal milks are microbiologically safe, it is important that they be either pasteurized or boiled before consumption. Low fat, skimmed (usually <0.5% fat) or semi-skimmed (1.5- 2% fat) cow's milk has a significantly lower energy and fat-soluble vitamin content than whole cow's milk and is therefore not recommended for children under two years of age. Similarly, powdered milk made from dried, skimmed milk is also not recommended due to its low energy content. Furthermore, like commercial infant formula, powdered milk may be intrinsically contaminated during the manufacturing process or extrinsically contaminated in the process of handling and reconstitution. It is therefore essential to sterilise all equipment and prepare it under hygienic conditions, reconstituting only as required. Strictly following the manufacturers' instructions for

reconstitution also avoids over-concentration or over-dilution, both of which can also prove detrimental to health.

- 8.14.2. Fresh liquid milk has a short shelf life. Fermentation extends its shelf life and thereby allows milk and its products to be stored and transported. Fermented milks are nutritionally similar to unfermented milk, except that some of the lactose is broken down to glucose and galactose. Fermented milks represent an excellent source of nutrients such as calcium, protein, phosphorus and riboflavin. The two most common fermented milk products available are yoghurt and cheese. They can be introduced in small amounts into the complementary feeding diet at around 6–9 months of age.
- 8.15. Because breast milk is around 87% water, healthy infants and young children who are breastfed on demand generally receive plenty of fluids. However, non-breastfed children need to obtain fluids from other sources when complementary foods are given as well as infant formula. Non-breastfed infants and young children 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. Clean tap water (boiled before use up to one year of age, or longer, depending on the quality of the water supply) should be offered several times per day for non-breastfed infants to ensure that their thirst is satisfied.
- 8.16. Tea is not recommended for infants and young children. Tea contains tannins and other compounds that bind iron and other minerals, thereby reducing their bioavailability. Furthermore, sugar is often added to tea, which increases the risk of dental caries. Also, sugar consumed in tea may blunt the appetite and inhibit the consumption of more nutrient-dense foods. Sweetened soft drinks should be avoided for the same reasons. In many countries there is a growing trend towards the use of “natural” substances and alternative medicines, and this has led to an increase in the use of herbal preparations for infants. Owing to their small size and rapid growth rate infants are potentially more vulnerable than adults to the pharmacological effects of some of the chemical substances present in herbal teas. Herbal teas such as camomile and green tea may also have the same adverse effects on non-haem iron absorption as other teas. There is moreover a lack of scientific data on the safety of various herbs and herbal teas for infants.
- 8.17. Honey may contain the spores of *Clostridium botulinum*, the causal agent of botulism. Since the gastrointestinal tract of infants contains insufficient acid to kill these spores, honey should not be given to infants under one year of age.
- 8.18. Vegetarian diets exclude, to varying degrees, animal products; vegan diets exclude all animal products. The main area of concern regarding vegetarian diets is the small but significant risk of nutritional deficiencies. These include deficiencies of iron, zinc, riboflavin, vitamin B<sub>12</sub>, vitamin D and calcium (especially in vegans), and inadequate energy intake. These deficiencies are highest in those with increased requirements, such as infants, children and pregnant and lactating women. Although the inclusion of animal products does not automatically ensure the adequacy of a diet, it is easier to select a balanced diet with animal products than without them. A vegetarian diet with egg, milk and milk products provides high-quality protein and is also a good source of the B group vitamins and calcium. Problems may occur as a result of vegan diets. Infants and young children aged 6–24 months fed on these diets must be given a good variety of plant proteins; each meal should contain two complementary sources of plant protein, such as legumes accompanied by wheat, or rice with lentils. A very restrictive vegan or macrobiotic (a restrictive vegetarian regimen coupled with adherence to natural and organic foods) diet may have serious adverse effects and should be discouraged during the complementary feeding period. These carry a high risk of nutrient deficiencies and have been associated with protein–energy malnutrition, rickets, growth retardation and

delayed psychomotor development in infants and children.<sup>139-141</sup>

- 8.19. Commercial baby foods are popular with parents because they are quick, easy and convenient to use. These advantages need to be balanced against the relative cost, which may be prohibitive for low-income families. Moreover, they offer no nutritional advantages over properly prepared family foods, except where there is a particular need for micronutrient fortification. Even if caregivers decide to feed commercially prepared infant foods, home-prepared foods should also be given to accustom the infant to a greater range of flavours and textures.
- 8.20. The way in which caregivers facilitate feeding and encourage eating plays a major role in the food intake of infants and young children. There are four dimensions of appropriate feeding:
  - 8.20.1. Adaptation of the feeding method to the psychomotor abilities of the child (ability to hold a spoon, ability to chew).
  - 8.20.2. Responsiveness of the caregiver, including encouragement to eat, by offering varied additional foods.
  - 8.20.3. Interaction with the caregiver, including the conveying of affection.
  - 8.20.4. The feeding situation, including the organization, frequency, duration and regularity of feeding, and whether the child is supervised and protected while eating and by whom.
- 8.21. Adapting to the child's changing motor skills requires close attention by the caregiver, since these skills change rapidly during the first two years of life. The time required for a child to eat a specific amount decreases with age for solid and viscous foods, but not for thinner purées. A child's ability to hold a spoon, handle a cup or grasp a piece of solid food also improves with age. Caregivers need to be sure that children are capable of the self-feeding expected of them, as well as giving children the opportunity to develop these motor skills. Children have a drive for independence, and may eat more if they are allowed to use newly learned finger skills to pick up food.
- 8.22. A relaxed and comfortable atmosphere during meals will facilitate good eating practices as well as providing an opportunity for social interaction and cognitive development. A responsive caregiver who can also adapt to a child's possible food refusals with gentle encouragement in a non-confrontational way, can ensure that these episodes are transient thus maintaining adequate food intakes. Consistency in meal times and place, with sufficient undisturbed time allotted for meals and food that is accessible to the young child, are also important to ensure that meals are enjoyable and intake is adequate.
- 8.23. For safety reasons infants and young children should always be supervised during meals. Foods that may cause choking, e.g. nuts, grapes, small pieces of raw carrots, should be avoided. Thorough washing of caregivers' and children's hands before food preparation and eating, safe food handling, preparation and storage, and the effective cleaning of utensils and surfaces used to prepare and serve foods are very important in avoiding contamination with potential pathogens.

## 9. Breastfeeding and young child feeding friendly environments

- 9.1. The way infant feeding is portrayed and represented in a culture (as reflected in textbooks, in the mass media and in signs, for example, indicating infant feeding/changing facilities in airports, shopping centres and railway stations) may influence the prevalence and duration of breastfeeding. Breastfeeding should be represented as the norm, with formula feeding portrayed as the exception.
- 9.2. Breastfeeding should be made as compatible as possible with the lives and commitments of women in modern society. This means that women should be supported and encouraged to breastfeed whenever and wherever it is necessary to do so

and this support should continue for as long as the mother and her baby want to continue breastfeeding. In cultures where breastfeeding may not be universally accepted in public areas there should be legislation in place to protect mothers from harassment and discrimination for breastfeeding in public service areas (e.g. cinemas, restaurants, theatres, parks, shopping centres etc.). Facilities should also be provided in these areas for women who request more privacy.

- 9.3. Making exclusive breastfeeding achievable for the first six months and making it easier for women to also extend breastfeeding for up to two years of age or beyond should involve reinforcement of existing or adoption of better legislation for adequate paid maternity leave for all women, whether employed in full, part-time, contract or casual work, as well as legislation giving entitlement to paid breastfeeding/lactation breaks following the mother's return to the workplace.<sup>142</sup>
- 9.4. The decision to breastfeed and breastfeeding itself, for as long as it continues, should not be undermined by the commercial promotion of breast milk substitutes and other products used to formula feed (bottles, teats). The International Code should be fully incorporated into the relevant EU directives and national legislations, and comprehensively implemented and enforced with regular independent monitoring and prosecution of violations.
- 9.5. Finally, as recommended by the Global Strategy for Infant and Young Child Feeding<sup>2</sup> and by the document on Protection, Promotion and Support of Breastfeeding in Europe: a Blueprint for Action,<sup>19</sup> health care systems should be Baby Friendly, i.e. should fully implement the Baby Friendly Hospital Initiative and other initiatives to make community health and social services Baby Friendly.

## **Annex 1. Standard policy.**

A policy is a series of statements that define the actions that a national or local public authority decides to put into practice to address a matter of public health concern, such as achieving optimal infant and young child feeding. The following policy statements are recommended:

- Breastfeeding is a right that everyone will respect, protect and help families accomplish, however, mothers will not be obliged to breastfeed, as putting undue pressure on them to do so is as unacceptable as putting undue pressure to opt for formula feeding.
- All expectant parents will be provided with evidence-based and objective (i.e. independent from commercial interests) infant feeding information in order to ensure they make an informed decision.
- All mothers who decide to breastfeed will be supported to initiate breastfeeding, to breastfeed exclusively for six months and to continue breastfeeding, with appropriate complementary foods, until two years and beyond, or as long as the mother and baby wish.
- Special support for optimal infant and young child feeding will be offered to disadvantaged individuals, groups and communities with low breastfeeding rates and with poor infant and young child feeding practices.
- Because there is no evidence for the superiority or equivalence of formula feeding when compared to breastfeeding, competent health workers will not recommend it as an alternative or a complement to breastfeeding, unless there are legitimate medical reasons for doing so.
- All pregnant women and mothers will be educated and get one-to-one counselling on optimal infant and young child feeding in antenatal classes/clinics and after the birth of their baby.
- Every effort will be made to facilitate mothers in the paid workforce to exclusively breastfeed up to six months and to continue breastfeeding after that for as long as the mother and baby wish, in combination with appropriate complementary foods.
- Before their infants reach six months, all parents will receive information and advice on appropriate complementary foods and when and how to introduce these to their infants' diet.
- After six months, all parents will be advised to introduce and gradually increase the frequency, consistency and variety of healthy family foods, adapting them to the infant's requirements and abilities, while avoiding sugary drinks and drinks with low nutrient value.
- All hospitals, maternity units and primary health care facilities will adopt and implement effective strategies for the protection, promotion and support of breastfeeding, such as those included in the Baby Friendly Initiative.
- All health, social and allied workers caring for mothers, infants and young children will get the education, training and skill development required to implement this policy.
- All health, social and allied workers and institutions caring for mothers, infants and young children will fully comply with all the provisions of the International Code.
- Collaboration between health workers, lactation consultants, other service providers and other support groups in the community will be encouraged.
- The media will be encouraged to represent breastfeeding and appropriate complementary feeding as the normal, natural and optimal way of feeding infants and young children.
- Comprehensive, timely and accurate data on breastfeeding rates and practices, using standard agreed definitions and methods, will be collected for planning, evaluation and operational research purposes.

Once adopted, the policy will be communicated to all health and relevant allied workers caring for mothers, infants and young children. The policy will be revised every 3-5 years, or earlier if new evidence warrants it. The policy will be followed by practice guidelines, such as those presented in this document, and a plan of action based, for example, on the EU Blueprint for Action for the Protection, Promotion and Support of Breastfeeding.<sup>19</sup>

## **Annex 2. Situations where breastfeeding is contraindicated.**

### **A. Situations where breastfeeding is contraindicated for medical reasons<sup>m</sup>**

There are very few situations in which breastfeeding is contraindicated.<sup>4</sup> These include:

- Infants with galactosaemia, a rare inborn error of metabolism. Infants with phenylketonuria can be partially breastfed.
- Infants born to mothers affected by HTLV I and II infections.
- Infants of mothers with HIV/AIDS where suitable replacement infant formula is acceptable, feasible, affordable, safe and sustainable should not be breastfed. However, if suitable replacement feeding is not acceptable, feasible, affordable, safe and sustainable, and if a safe source of donor breast milk is not available, the safest alternative is exclusive breastfeeding for the first months of life, until the infant is developmentally ready to obtain its full nutrient requirement with transitional and family foods.<sup>143,144</sup>

### **B. Situations where breastfeeding is temporarily contraindicated<sup>n</sup>**

- Some viral infections can be transmitted to the baby and can cause serious illness, especially if the baby is pre-term or otherwise immune-compromised.<sup>145,146</sup> Infants whose mothers have an active herpes simplex lesion on the nipple or areola should not be breastfed from the affected breast until the lesion has cleared. The infant may feed from the other breast if it is unaffected, provided contact between the baby and the active lesions is prevented (i.e. by keeping the affected breast covered during feeding from the unaffected breast) and given the expressed breast milk from the affected side via cup or spoon. The same recommendation applies to mothers with active herpes zoster lesions (shingles). Varicella (chickenpox) present up to five days before and two days after delivery can be transmitted to the infant in a severe form. The mother should therefore be isolated during the contagious phase until lesions crust. Varicella-zoster immunoglobulin or standard immunoglobulin should be given to the infant as soon as possible. The mother's breast milk should be expressed and given to the infant.
- Infants of mothers with active untreated tuberculosis should be separated from the mother until treatment is fully established and the mother is medically deemed to be no longer infectious. The mother's breast milk should be expressed and given to the infant. These infants should also receive appropriate immunization and chemoprophylaxis.<sup>145-147</sup>
- Where lactating mothers are receiving diagnostic or therapeutic radioactive isotopes, breastfeeding should be interrupted for a time equal to five half lives of the isotope used.<sup>148</sup>
- Nearly all common health problems can be treated pharmacologically by drugs which are compatible with breastfeeding. Lactating mothers receiving antimetabolites or chemotherapeutic drugs (cyclophosphamide, cyclosporine, doxorubicin, methotrexate) and a number of other drugs (e.g. amiodarone, bromocriptine, cabergoline, ciprofloxacin, ergotamine, indomethacine, lithium, sulphas, tetracyclines, cloramphenicol, first generation antidepressant such as monoaminooxidase inhibitors) should not breastfeed until these medications are discontinued and her breast milk is clear of these drugs.<sup>149,150</sup> The recommendations periodically published by WHO and UNICEF will be useful to update the list of drugs that render breastfeeding temporarily contraindicated.<sup>151</sup>

### **C. Situations where breastfeeding may be mistakenly thought to be contraindicated**

- Everybody is today exposed to some environmental chemical agents. However, the benefits of breastfeeding outweigh any potential risk associated with these environmental

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<sup>m</sup> This list is not exhaustive and may change over time. Health workers who are unsure if breastfeeding is permanently or temporarily contraindicated in a particular situation should seek expert clinical advice.

<sup>n</sup> In these situations maternal lactation should be maintained through regular daily expressing and discarding of breast milk until the prevailing medical condition or treatment has ceased to be a contraindication for breastfeeding.

contaminants.<sup>152-156</sup> Current levels of chemical residues in breast milk in Europe are within acceptable limits and do not justify recommending restrictions to breastfeeding or eliminating specific foods from maternal diets.<sup>157</sup>

- Breastfeeding is not contraindicated for infants born to mothers who are hepatitis B surface antigen–positive, mothers who are infected with hepatitis C virus (persons with hepatitis C virus antibody or hepatitis C virus-RNA–positive blood), mothers of healthy term newborns who are seropositive carriers of cytomegalovirus, and mothers who are febrile, unless fever is caused by a disease that contraindicates breastfeeding permanently or temporarily.
- The vast majority of infants and young children who suffer from allergies or gastro-oesophageal reflux should continue breastfeeding and do not require special formulae (e.g. Hypo Allergenic and Anti Reflux formulae).<sup>158,159</sup>
- Mastitis is not a contraindication to breastfeeding; on the contrary, effective milk removal from the breast is part of the recommended treatment. In addition, there is no evidence that babies who suck from an affected breast get infected.<sup>160</sup>

Mothers need ready access to trained and competent health workers or skilled lactation consultants to obtain expert information on the above and any other related issues and, even more importantly, to receive prompt and skilled support if they are experiencing breastfeeding difficulties.

### **Annex 3. The risks of a decision not to breastfeed and the disadvantages of formula feeding.**

#### **A. Risks for the child:**

- Increased risk of several infectious diseases, mainly infections of the gastrointestinal and respiratory tracts as well as ear, urinary tract infection<sup>161</sup> and other general infections.<sup>4</sup>
- Increased risk of several non infectious and chronic diseases mainly related to metabolic and immune disorders (e.g. type I and II diabetes mellitus, allergies), but also including sudden infant death syndrome, hypertension and some forms of cancer (e.g. lymphoma, leukaemia, Hodgkin disease).<sup>4</sup>
- Increased risk of malnutrition, including protein-energy malnutrition in low-income populations and overweight and obesity in both low- and high-income populations, with all their health, developmental, social and economic consequences.<sup>4</sup>
- Increased risk of dental malocclusion.<sup>162,163</sup>
- Increased risk of infant and young child mortality in low-income countries and of post-neonatal mortality in high income countries.<sup>164,165</sup>
- Increased risk of hospitalisation in both low- and high-income countries.<sup>166,167</sup>
- Poorer outcomes in brain development<sup>168,169</sup> and performance tests for cognitive development.<sup>170,171</sup>

#### **B. Risks for the mother:<sup>172</sup>**

- Increased risk of post-partum bleeding and slower uterine involution.
- Reduced birth intervals and increased menstrual blood loss.<sup>115</sup>
- Delayed return to pre-pregnancy weight.
- Increased risk of breast and ovarian cancer.<sup>173</sup>
- Increased risk of osteoporosis and hip fracture after menopause.

#### **C. Other disadvantages of formula feeding for women, families and communities:**

- Increased cost for the purchase of formula, with ready-to-feed products being more expensive than dried infant formulae.
- Cost for the purchase of bottles, teats, fuel, water, sterilising products and equipment.
- Time needed for preparation and feeding, less time for attention to siblings and other family matters.
- Increased health care cost for the family and for the health and social services.<sup>174-177</sup>
- Increased parental absenteeism from work.<sup>178</sup>
- Negative national food balance sheet and significant national economic loss.<sup>179,180</sup>
- Increased amount of waste and energy expenditure, with its resultant environmental consequences.<sup>181</sup>

Mothers who formula feed should be supported to maximise bonding opportunities (e.g. using feeding times for close skin-to-skin contact with the baby and not delegating feeding to anyone other than a parent, where possible).

#### Annex 4. Safe alternative feeding.

Pregnant women who, after receiving information on breastfeeding, decide to formula feed their infants should be provided with one-to-one support and information on how to do so correctly and safely. This applies also to the small number of women for whom breastfeeding is not possible or is contraindicated, and to those women who, having to work outside the home before their babies are six months old, may not be able to continue exclusively breastfeeding/breast milk feeding and may need infant formula to supplement breastfeeding when they are apart from their babies. All these mothers should be fully informed that:

- Dried infant formulae are not sterile products; there is evidence of intrinsic contamination with potentially harmful bacteria.<sup>182</sup> Extrinsic contamination is also possible in the handling, storage and preparation of these products. To minimise the risks involved, strict hygienic practices should be adhered to.<sup>183,184</sup>
- Commercial ready-to-feed liquid infant formulae, usually sold in single-use feeding bottles or in tetra-pack cartons, are sterile products. These, however, can be contaminated with potentially harmful environmental bacteria after opening or during the handling and administration of feeds. Strict hygienic procedures should therefore be followed also in using these products, to minimise the risks involved.
- For dried infant formulae, the instructions on the tin or carton for reconstituting and preparing feeds must be followed exactly to ensure that the preparation is not too concentrated or too dilute; over-concentration and over-dilution can both be dangerous to the infant.
- Undiluted cow's milk (or milk from other mammals), or condensed milk, or skimmed or semi-skimmed milks, or home adaptations of these should not be used for infants under one year of age. After one year of age, if using cow's milk, full fat milk should be used and not skimmed or semi-skimmed milks. These latter products should be avoided at least until the child is over two years of age.

The following practices are recommended for reconstituting, storing and feeding dried infant formula, and for the safe handling of ready-to-feed liquid infant formula at home:<sup>185</sup>

- Avoid contamination (e.g. wash hands, ensure cleanliness of kitchen and equipment).
- Prepare powdered infant formula fresh for each meal.
- Use germ-free containers (i.e. thoroughly washed and sterilized by boiling for 10 minutes, by immersion in chemical sterilising liquids, or by using microwave sterilisers).
- Reconstitute formula in hot water (>70°C) or water that has been boiled and cooled to 70°C, avoiding recontamination.
- Cool the reconstituted formula rapidly (no longer than 30 minutes) and use it immediately; be cautious about the temperature to avoid the risk of burning the infant's mouth.
- Discard any remaining formula after each feed.

Similar and even stricter measures are needed in hospitals where ready-to-feed formula is not used:

- Caregivers should be trained to safely reconstitute dried formula in centralized units and in neonatal health care units.
- Good hygienic measures are essential to avoid contamination (e.g. ensure cleanliness and sterility of equipment, wash hands).
- Sterile containers should be used to reconstitute the formula under an air sterile cabinet, avoiding recontamination.
- Formulae should always be reconstituted in hot water (>70°C), avoiding recontamination.
- The reconstituted formula should be cooled rapidly to temperatures below the growth range of *Enterobacter sakazakii* (below 4-5°C) and maintained at this temperature until used.
- If continual feeding is necessary, the maximum hang time should be no more than two hours.

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