Maternal and pre-school child nutrition guidelines

October 2012
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References

October 2012
Acknowledgement

The members of the Nutritional Guidelines Sub group who developed and edited this work are gratefully acknowledged for their contribution to the development of this document. Special thanks to Dr Trevor Brown and community paediatric dietitians for their invaluable contributions.

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1 Introduction

Nutrition in the early years of life is a major determinant of growth and development in childhood and it also influences adult health. The development of Regional Maternal and Pre School Child Nutrition Guidelines should be seen as a positive step towards maximising the nutritional health of children. In Northern Ireland children tend to have poorer nutritional and dental health than their counterparts in other areas of the U.K. The core purpose of these guidelines is to promote sound infant feeding practice and enable health professionals to give clear, consistent evidence based advice to parents and carers. These guidelines have been updated from those produced in legacy Trusts and Boards and incorporate guidance from the Department of Health (DoH), Department of Health, Social Services and Public Safety NI (DHSSPSNI), the Food Standards Agency(FSA) and the World Health Organisation (WHO). For the purpose of this document an infant is a child who has not attained the age of one year.

It is very important to encourage and support mothers to breastfeed for immunological and nutritional reasons as well as convenience, attachment and pleasure. If parents do decide to bottle feed their child, it is imperative that they are supported in their decision and are given accurate and consistent information on the preparation and use of modified infant formulae.

The Public Health Agency (PHA) produced a Health intelligence briefing on Breastfeeding in Northern Ireland (January 2012), see Appendix 1. In 2010, Northern Ireland was included in the UK Infant Feeding Survey, NHS Information Centre\(^1\). This showed that although Northern Ireland (NI) has seen significant increases in breastfeeding rates in the last twenty years, since 2005, there has not been a statistically significant increase. NI still has the lowest rates of breastfeeding in the United Kingdom (UK) and one of the lowest in Europe. Comparative data for breastfeeding rates in England, Wales, Scotland and Northern Ireland are presented in Appendix 1.
A Healthier Future: A Twenty Year Vision for Health and Wellbeing for Northern Ireland 2005-2025 targets include:\(^2\)

- by 2025, 70% of all infants will be breastfed at one week after birth (50% by 2010);
- by 2025, 40% of all infants will be breastfed at 6 months (20% by 2010);
- 70% at one week by 2025
- 40% at 6 months by 2025.

A DHSSPS Strategy ‘A Fitter Future for All – a 10 year cross-sectoral integrated life course framework to prevent and address obesity in Northern Ireland for 2011-2021’.\(^3\) This consultation document was issued at the end of 2010 and the final document is awaiting Ministerial approval.

In addition a Performance for Action Target has been set by the DHSSPS to reduce to 9% the proportion of children who are obese by 2012 and the PHA have developed a draft action plan to reduce obesity.\(^4\)
2 Aim and Objectives

2.1 Aim
To improve the nutritional health of mothers, fathers, carers and children under five years of age by providing clear and consistent information.

2.2 Objectives
1. To provide clear and consistent guidelines on maternal and child nutrition, which are evidence based.
2. To promote an increase in the prevalence and duration of breastfeeding.
3. Provide information on good oral health.
SECTION 1

Pre Conception and Ante Natal Nutrition
3 Nutrition Prior to and during Pregnancy and Lactation

3.1 Preconceptual nutrition

Diet is an important consideration for preconceptual care. Lower socio-economic groups are particularly at risk at this time and should be targeted for preconceptual information. Efforts should be concentrated on achieving acceptable body weight for height, eating a varied diet with a good intake of all essential nutrients and restricting or preferably excluding alcohol whilst trying to conceive. Health professionals can provide brief intervention and information about those foods that are not advised during pregnancy and should also be avoided pre-conceptually and ideally changes should be made three to four months prior to conception. Further advice is available to download on the PHA website in the leaflet ‘Preparing for Pregnancy’ and from local Trust Health Promotion Resources Centres.

It is particularly beneficial to stop smoking before becoming pregnant. Although it can be very difficult to give up smoking, many women find pregnancy a strong motivation. Strategies are available to help people who want to stop, including medication and psychological support.

In 1992, the Department of Health published recommendations for the prevention of neural tube defects. They recommended that to prevent first occurrence of neural tube defects all women should take an extra 400 micrograms of folic acid as a daily medicinal or food supplement prior to conception and until the twelfth week of pregnancy. They should also be encouraged to eat foods rich in folate such as green leafy vegetables, pulse vegetables (peas, beans, and lentils) and folic acid fortified breakfast cereals.

Women who have not been supplementing their folate/folic acid intakes and suspect they may be pregnant should start supplementation at once and continue until the twelfth week of pregnancy.
A higher dose of Folic acid should be taken:

- by women with a history of a previous child with neural tube defect;
- where there is a family history of neural tube defects;
- by women taking antiepileptic medication who wishes to become or who are at risk of becoming pregnant;
- by women with diabetes mellitus;
- by women with coeliac disease or other gastro intestinal malabsorption conditions;
- by women with sickle cell anaemia;
- by women with a BMI over 30. These women should be encouraged to lose weight prior to becoming pregnant to reduce the risks to themselves and their babies. Women with a high BMI have an increased risk of gestational diabetes, pre-eclampsia, higher birth weight babies and still births.

3.2 Antenatal milk collection

From as early as twenty eight weeks some mothers may find that they leak small amounts of colostrum. Mothers with diabetes may wish to hand express some colostrum from thirty six weeks which can be frozen for use after the baby is born as these babies are at high risk of hypoglycaemia. If possible formula should be avoided for these babies. Guidance can be obtained from The Human Milk Bank in Irvinestown (see useful Contacts and Resources).

3.3 Nutrition in pregnancy

Pregnant women should be given information on the principles of healthy eating, encouraged to eat to satisfy their appetite and to avoid eating to excess. Eating a healthy varied diet will help to meet the vitamin and mineral requirements during pregnancy. Vitamin and mineral supplements are generally not advised during pregnancy, however there are some vitamins and minerals that are especially important and will require supplementation, eg folic acid (see page 11); women following a vegan diet should continue to take vitamin B12 supplements daily.
A daily supplement of 10µg Vitamin D should also be taken during pregnancy and lactation and information and advice on this should be offered to all women. The National Institute for Clinical Excellence (NICE), recommend that during the booking appointment at the beginning of pregnancy, midwives should offer every woman information and advice on the benefits of taking a vitamin D supplement during pregnancy and while breastfeeding. NICE also recommend health professionals take particular care to check that women at greatest risk of deficiency are following the advice during pregnancy and while breastfeeding including women from ethnic minority groups Women at greatest risk are those:

- of South East Asian, African, Caribbean or Middle Eastern origin with limited exposure to sunlight, who are housebound or covered when outdoors;
- who have a diet low in Vitamin D. Sources of Vitamin D include oily fish, eggs, meat, Vitamin D fortified breakfast cereals and margarines. Women following strict vegetarian or vegan diets are particularly at risk of a low intake of Vitamin D;
- women with a pre pregnancy BMI above 30;

Some groups may require further supplementation and should seek advice from their GP, eg adolescents, immigrants, those who are underweight, living on a low income, or who have had a recent pregnancy.

It should be noted that supplements containing Vitamin A should be avoided throughout pregnancy.
Free vitamin supplements are available for those on Income Support and Job Seekers Allowance. For more information on Healthy Start vitamins visit the Healthy Start website at www.healthystart.nhs.uk/for-health-professionals/vitamins/.

The Business Services Organisation (BSO) purchases the Healthy Start vitamins on a regional basis on behalf of DHSSPS and the Health and Social Care Board (HSCB) from the NHS Supply Chain, for onward postal distribution directly to beneficiaries. Health professionals should advise beneficiaries to send their full Healthy Start letter (with the vitamin coupon still attached) to:

Business Services Organisation,
Healthy Start Vitamins Scheme,
Pinewood Villa,
73 Loughgall Road,
Armagh,
BT61 7PR

Healthy Start application leaflets are available to order from the orderline or online:

- 0300 123 1002;
- www.orderline.dh.gov.uk.

These supplements have been approved by the Vegetarian Society as suitable for vegetarians.

The Food Standards Agency publication ‘Eating While You are Pregnant’ " gives more detailed advice on important food safety and hygiene issues. In cases of severe nausea and vomiting in pregnancy useful information on management can be found at: www.cks.nhs.uk/nausea_vomiting_in_pregnancy/view_whole_topic
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Previously a woman with a personal or family history of allergy, eczema or hay fever was advised to avoid peanuts whilst pregnant or breastfeeding, however this advice has now changed. It is not clear whether eating or not eating peanuts in pregnancy affects the chances of a baby developing a peanut allergy. The advice is now that if a woman would like to eat peanuts or foods containing peanuts during pregnancy she can choose to do so, unless she is allergic to them herself. 10

Advice regarding avoiding unpasteurised raw egg mould ripened soft cheeses, blue cheeses, liver and products containing liver, such as pate, raw shellfish, undercooked or poorly reheated foods still stands.

Fish high in methyl mercury should be limited as high levels of mercury can harm the developing nervous system of the foetus. The advice is to avoid eating shark, swordfish and marlin and limit the amount of tuna eaten to two tuna steaks per week (140g cooked weight or 170g raw weight) or four medium cans of tuna per week (140g drained weight).

Excessive intakes of caffeine should also be avoided as this has been linked to low birth weight and miscarriage. The Food Standards Agency advice, 2008 is that caffeine intakes should not exceed 200mg per day

The amount of caffeine in food and drink will vary, but as a guide each of these contains approximately 200mg or less of caffeine:

- two mugs of instant coffee (100mg each);
• one mug of filter coffee (140mg each);
• two mugs of tea (75mg each);
• five cans of cola (up to 40mg each);
• two cans of ‘energy’ drink (up to 80mg each);
• four (50g) bars of plain chocolate (up to 50mg each), caffeine in milk chocolate is about half that of plain chocolate” FSA, 2008;
There is some concern about reduced intakes of Vitamin D and the re-emergence of rickets in the UK.

3.4 Antenatal education

All prospective parents should be offered an infant feeding class which covers both breastfeeding and formula feeding with the aim of supporting parents to make well informed choices about how they feed their baby.

Antenatal / Parentcraft classes should cover and discuss the following points:

• The perceived pros and cons of breastfeeding and bottle feeding, the reasons why breastfeeding is recommended including the health benefits of breastfeeding and the differences between breast milk and formula milk.
• Simple explanations of how breast feeding works, the anatomy and physiology of lactation as well as the hormones that control lactation.
• What both breastfeeding and formula parents need to know about feeding and caring for their baby including skin-to-skin contact, baby-led feeding, feeding cues, rooming in and bed sharing.
• How to maintain a good milk supply through frequent, effective feeding including reassurance that a normal healthy diet is all that is needed and the time to feed on demand.
• Recommendations about how long breastfeeding can continue as long as possible and ideally exclusive breastfeeding until six months with continued breastfeeding after solid foods have been introduced.
• The potential effect of using dummies and teats before breastfeeding is well established.
Factors which might affect deciding to breastfeed and being able to stay with the decision such as support from family and peers, role of the father, feeding in the presence of others when out and about, returning to work.

Clothing for breastfeeding eg bra type, pull up tops and other baby friendly fashion.

Breastfeeding challenges and how they can be prevented eg sore nipples, low milk supply, mastitis

Where to get help with breastfeeding, local voluntary breastfeeding support groups and peer support workers. See section 2 Ch. 6.13 for further information on the role and benefits of peer support.

Group demonstration of making up bottles at antenatal classes should not be undertaken however in order to ensure information to mothers is timely and effective, one to one or small group instruction on the safe preparation and storage of infant formula should be carried out in the early postnatal period before discharge from hospital. This may be repeated as necessary by community health staff.

At antenatal classes prospective parents should be given the opportunity to discuss both breastfeeding and formula feeding and reassured that if they are going home from hospital bottle feeding then they will be shown how to make up a bottle of formula before going home. Information about bottle feeding is available in the Pregnancy Book.\textsuperscript{11}

All pregnant women including those who do not attend classes need to be provided with the same information and given the opportunity to discuss infant feeding on a one to one basis.

3.5 Weight management in pregnancy

A weight reducing diet during pregnancy is not advised and there are no evidence based UK guidelines on recommended weight gain ranges during pregnancy. A healthy diet and moderate intensity physical activity is recommended. Myths around pregnancy such as eating for two should be dispelled. Postnatal women should be
encouraged to lose weight, however care should be taken when breast feeding as a healthy nutritious diet is necessary.\textsuperscript{12}

3.6 Alcohol in pregnancy

It is important to make pregnant women aware of the risks of drinking alcohol to the unborn baby. NICE recommends that women should avoid alcohol in the first three months of pregnancy if possible. If women choose to drink, they should have no more than one to two UK units once to twice a week. At this low level there is no evidence of harm. Women should be advised to avoid getting drunk and to avoid binge drinking.\textsuperscript{13} Binge drinking is defined as more than five standard drinks or 7.5 UK units on a single occasion. Drinking at this level may be harmful to the unborn baby.

3.7 Smoking in pregnancy

Women should be given information and support on how to stop smoking\textsuperscript{14} and if unable to stop they should be encouraged to reduce the number of cigarettes they smoke. Smoking during pregnancy is associated with significant risks:

- 25% higher risk of miscarriage;
- 33% higher risk of perinatal mortality;
- 30% higher risk of intra-uterine growth retardation;
- 40% higher risk of Sudden Unexpected Death In Infancy (SUDI);
- 2.5% increased risk of ectopic pregnancy;
- 3% increased risk of placental difficulty;
- 40% increased risk of stillbirth;

The infants of mothers who smoke in pregnancy are also at greater risk of breathing problems and wheezing in the first six months of life.

Women who smoke in pregnancy are less likely to breastfeed, produce less milk, poorer quality milk and feed for a shorter period of time. Children born to smokers are more likely to suffer from wheeze, asthma, severe ear, nose and throat problems including Otitis Media (glue ear). Psychological problems such as attention deficit hyperactivity and disruptive and negative behaviour are also more common.
Smoking during pregnancy has a strong social class gradient and contributes to health inequalities. It has been estimated that smoking in pregnancy costs the NHS between £8.1 - £64 million for maternal consequences and £12- £23.5 million for infant consequences, of which twenty two million pounds is spent on the care of low birth weight babies.\textsuperscript{15}

Giving up smoking is the most effective action a pregnant mother can take to protect her own health and that of her baby.

3.8 Medicines in pregnancy and lactation

Medicines may pass across the placenta and also into breast milk. The ingestion of medicines should be avoided when possible during pregnancy although very few medicines are completely contra-indicated during lactation. Appendix 4 of the British National Formulary (BNF) states:

“Drugs should be prescribed in pregnancy only if the expected benefit to the mother is thought to be greater than the risk to the foetus, and all drugs should be avoided if possible during the first trimester of pregnancy. Drugs which have been extensively used in pregnancy and appear to be usually safe should be prescribed in preference to new or untried drugs; the smallest effective dose should be used. If medicines are necessary, advice should be sought from a doctor or pharmacist on those suitable for mothers who are breastfeeding before any are taken.” Useful sources of information include “Medications and Mothers Milk” (Hales 2008) and the Breastfeeding Network (www.breastfeedingnetwork.org.uk) (see Useful Resources and Other Useful Websites).
SECTION 2

Post Delivery Nutrition and Infant Feeding
4 Post Delivery Nutrition and Infant Feeding

4.1 Breastfeeding

Mother’s milk is the ideal food for the young infant as it has many nutritional and anti infectious qualities, which cannot be reproduced in an infant formula. Breast milk is easily digested and absorbed and provides complete nutrition for the first six months of life. Regarding the optimal duration of breastfeeding the World Health Organisation (WHO) recommends that breastfeeding, with suitable complementary foods, can be continued until two years of age or beyond. 16

Vitamin supplements (Vitamins A, C, and D) should be offered to all children aged six months to five years (all breastfed babies and infants from six months drinking less than 500 mls of infant formula). The recommended dose of 5 drops (0.14 mls) provides: Vitamin A 233mg, Vitamin C 20mg and Vitamin D 3 7.5mg.

All mothers should be given accurate and timely information to enable them to make an informed choice about how they will feed their babies and healthcare staff should support all women in their chosen method of infant feeding.

The National Institute for Health and Clinical Excellence (NICE) Maternal and Child Nutrition guidance PH11 in 200817 recommended that all maternity care providers implement an externally evaluated structured programme that encourages breastfeeding, using UNICEF’s Baby Friendly Initiative as a minimum standard. This programme helps ensure that recognised best practice standards are in place for the provision of infant feeding information and the training of health professionals. In Northern Ireland all maternity units are working towards achieving or maintaining Baby Friendly Accreditation along with a significant number of Health and Social Care Trust community health care facilities and Sure Starts. Information about the UNICEF UK Baby Friendly Initiative and how it can improve support for both breastfeeding and bottle-feeding parents can be found at www.babyfriendly.org.uk
Appendix 2, details the UNICEF UK Baby Friendly Initiative Ten Steps to Successful Breastfeeding for care in the hospital and the seven point plan for care in the community.

4.1 Health Benefits of Breastfeeding

The health benefits of breastfeeding are now well recognised to extend beyond benefits to the infant. Benefits to both mother and child are maximised the longer breastfeeding continues and particularly if the infant is exclusively breastfed for several months.

4.1.1 Benefits to the infant:

- reduces the risk of gastroenteritis, middle ear, respiratory and urinary tract infections;
- optimum neurological development;
- reduces the risk of necrotising enterocolitis;
- reduced risk of Sudden Unexpected Death in Infancy (SUDI);
- Exclusive breastfeeding offers some protection against the development of atopic disorders and other allergies. Where there is a strong family history of eczema, asthma or cow's milk protein intolerance, breastfeeding should be encouraged;

4.1.2 Health benefits lasting into childhood:

Reduced risk of:

- diseases of the respiratory system;
- allergic disorders;
- Type 1 and Type 2 Diabetes;
- raised systolic blood pressure;
- childhood obesity;
- childhood leukaemia;
- dental malocclusion;
- delayed speech;
There is also increasing evidence of long-term protection against cardio-vascular disease.

Data also suggests that breastfeeding for more than one month may have a beneficial effect on cognitive development (Ip Sloan et al, 2010).\textsuperscript{18}

4.1.3 **Benefits to the mother:**

- encourages emotional bonding between the mother and the infant;
- convenient and cheap;
- may enhance post partum weight loss;
- delayed return of fertility (see section 2 Ch. 6. 24);
- reduced risk of ovarian and breast cancers;
- reduced risk of developing Type 2 Diabetes;
- reduced risk of postmenopausal osteoporotic hip fracture; \textsuperscript{19}

4.2 **Anti-infective properties of breast milk**

- Colostrum is the concentrated milk produced in the first few days after birth. Apart from providing nutrients and fluid required by the infant, like mature breast milk, colostrum supplies immunoglobulin. It also has a laxative effect which reduces the severity of physiological jaundice.
- The transfer of lymphocytes and macrophage cells from breast milk enhances the infant’s gut defences.
- Other anti-infective agents in breast milk are the iron binding protein lactoferrin and the enzyme lysozyme.
- Breast milk also contains viral fragments, which help enhance the effectiveness of vaccines.
- Anti-inflammatory molecules in human milk help to prevent conditions such as necrotising enterocolitis.
- Breastfeeding provides unique ongoing passive immunity through maternal production of antibodies by the bronchi and gut associated lymphoid tissue pathways.\textsuperscript{20}

4.3 **Composition of breast milk**
Protein in breast milk is rich in lactalbumin (whey) and low in casein (curd) compared with cow’s milk. The amino acid content is more suited to the needs of the infant.

The fat content is rich in essential fatty acids particularly the long chain polyunsaturated fatty acids. Breast milk contains lipase, which aids fat absorption.

The principal carbohydrate in breast milk is the disaccharide lactose, which is also present in cow’s milk.

Breast milk provides the infant with his/her vitamin, mineral and trace element requirements.

Breast milk also contains hormones and growth factors such as epidermal growth factors to assist maturation of the infant gut.
5 Promotion of Breastfeeding

Parents should be enabled to make an informed choice about infant feeding and all pregnant women should be provided with a one to one discussion on the benefits of breastfeeding.

It is however now recognised as best practice not to ask women their feeding intention antenatally as this has the potential to discriminate between breast and formulae feeding mothers and to categorise a mother who may later choose to breastfeed as a formulae milk feeder. If a woman decides after delivery not to breastfeed she should be fully supported to bottle feed safely and successfully.

All mothers should be given their babies to hold for an unlimited period with skin-to-skin contact immediately following delivery or as soon as the mother is able to respond in the case of Caesarean section. All women should be offered help to initiate the first breastfeed as soon as the baby is receptive.21

5.1 Contra-indications to breastfeeding

Rare conditions in the infant which contra-indicate breastfeeding include hereditary galactosaemia and lactase deficiency. HIV positive status in the mother also contraindicates breastfeeding (see section 2 Ch. 6.17).

5.2 Vitamin K

Vitamin K is of importance in the prevention of haemorrhagic disease of the newborn. Regional guidance on the use of vitamin K in new born babies was issued by the Chief Medical Officer and Chief Nursing Officer in 1998 as follows:

- “We recommend that all new born babies should receive an appropriate vitamin K regime to prevent the rare but serious and sometimes fatal disorder of VKDB (Vitamin K Deficiency Bleeding)”.
• All should be offered one of the available regimes after an informed discussion with parents in the antenatal period.

NICE Guideline 37\textsuperscript{22}: Routine Postnatal Care of Women and their Babies states:

“All parents should be offered Vitamin K prophylaxis for their babies to prevent the rare but serious and sometimes fatal disorder of Vitamin K deficiency bleeding. Vitamin K should be administered as a single dose of 1mg intramuscularly, as this is the most clinically and cost effective method of administration. If parents decline intramuscular Vitamin K for their baby, oral Vitamin K should be offered as a second line option. Parents should be advised that oral Vitamin K must be given according to the manufacturer's instructions for clinical efficiency and will require multiple doses.”

5.2.1 Could vitamin K be harmful?

A joint Medicines Control Agency, Committee of Safety of Medicines and Department of Health expert group has concluded that overall, the available data does not support an increased risk of cancer caused by vitamin K but due to limitations of the data it is not possible to exclude a small increase in leukaemia.

In addition NICE guideline 37\textsuperscript{23} considered additional studies and concluded that there is no evidence for an association between Vitamin K intramuscular administration and leukaemia.

5.3 Postnatal period

Mother and infant should remain together and only be separated where the health of either the mother or the baby prevents them being cared for together.

• All mothers of ill or pre-term babies should be provided with information about the health benefits of breast milk. Mothers should be encouraged to express Colostrum as soon as possible or within six hours of delivery. Early suckling or expressing is important for stimulating lactation and aiding successful breastfeeding. To initiate lactation mothers should be encouraged to express
milk eight to ten times a day and to include at least once at night. If unable to provide all of the milk required, partial breastfeeding is better than none at all. The aim should be to stimulate lactation frequently in the early days with a target of 750mls of breast milk in total in twenty four hours. The frequency of expression can be reduced after a few weeks when the target amount is produced as the baby moves over to full breastfeeding. For practical details see booklet ‘Breastfeeding your ill or premature baby” Public Health Agency (PHA).

• Correct positioning and attachment of the baby on the breast is essential for effective feeding and to prevent nipple damage. Any experience of pain or other discomfort is abnormal and professional advice should be given.

5.3.1 Correct positioning of the baby:
• baby head and body in line (with freedom to tilt baby’s head back);
• baby’s body held close to mother;
• baby held nose to nipple;
• position should be sustainable for mother and baby;

5.3.2 Signs of good attachment and milk transfer:
• baby's chin touching breast and the nose is free;
• if visible, more areola seen at baby's nose and top lip;
• mouth wide open, bottom lip curved outwards;
• cheeks round, not dimpled or sucked in;
• Sustained rhythmic suck / swallow pattern with occasional pauses. Rapid sucks initially slowing down to deep slow sucks with swallow.
• feeding is comfortable;
• breasts softer after feed than before;
• baby satisfied after feeding;
• regular soaked nappies that is, six to eight wet nappies a day (by day six) and at least two yellow stools;
• mother not having problems with cracked nipples or engorgement;
All breastfeeding mothers should be told why hand expression is useful and shown how to express by hand and be given written instructions. Feeding on demand should be encouraged to establish a good milk supply and it is vital that mothers should learn to recognise their baby’s feeding cues and respond to these. Signals that the baby needs feeding include increased alertness, activity, mouthing or rooting.

Supplementary feeds should not be given unless clinically indicated or with fully informed maternal consent. Giving formula to a breastfed baby will interfere with demand feeding reducing the milk supply and consequently the health benefits to mother and baby. Even small amounts of formula milk can have adverse effects to the breastfed baby by increasing risk of infection, atopic dermatitis and diabetes. If a breastfed baby requires supplementation, expressed breast milk should be given in preference via a cup or syringe (for amounts less than 5mls) and not a bottle to avoid confusion between the nipple and teat.

The healthy, term baby is not at risk of developing hypoglycaemia as a result of simple underfeeding. If signs of hypoglycaemia are detected, an underlying condition should be suspected. At risk infants include premature and / or small for gestational age infants, those who suffered intrapartum asphyxia or who are sick or born to mothers with diabetes. “For newborns at risk, breast milk is the safest and nutritionally most appropriate food”. Appendix 3, provides guidance on managing infants at risk of hypoglycaemia (BFI sample)

All new mothers should eat a well balanced diet, which should be provided without restrictions. Maintaining a milk supply does not depend on a good diet however the need for a sufficient energy intake should be recognised and catered for to enable mothers to meet the demands of caring for a new baby; fluids should be increased according to thirst (see section 2 Ch. 5.4 on nutrition in pregnancy and lactation.

Breasts and nipples should be checked routinely and if a problem is detected then a feed should be observed and the mother supported to achieve effective positioning and attachment. A suitable safe emollient cream can be used to aid moist wound healing and soothe cracked nipples.
The GAIN mastitis guidelines should be referred to if breast problems are found:

www.gain- ni.org/Publications/Guidelines/GAIN%20Mastitis%20Guidelines

Test weighing should be discouraged as it is an ineffective method of assessing the adequacy of lactation. A feeding assessment should be undertaken by the community midwife on day five and repeated by the health visitor at the initial health review at 10-14 days. See Appendix 4.

The use of dummies should be discouraged at least until breastfeeding is established as this may make it more difficult for the baby to attach successfully to the breast, interfere with demand feeding and subsequently reduce the milk supply.

Mothers who wish to feed their baby expressed breastmilk or formulae by bottle should be encouraged to wait until feeding is well established before introducing a bottle. For most women this will be at least a few weeks and for some mothers who have experienced difficulty such as cracked nipples or poor infant weight gain this could be significantly longer.

Women who have decided to introduce formulae feed while breastfeeding should be made aware of the potential effect on their baby and on their milk supply. It is important to encourage these mothers to continue breastfeeding and to make them aware of the need to avoid breast engorgement and feed often in order to maintain a good milk supply. Details of local and national breastfeeding support contacts should be given before discharge from hospital.

5.4 Nutrition in lactation

For most women, increased quantities of a varied diet should provide their nutritional requirements. Calcium requirements are increased during lactation to the equivalent of 750ml/1.5 pints milk (200mls/1/3 pt milk = 30g/1oz cheese or 150ml yoghurt). This increased requirement should be met via increased appetite and an increased absorption of calcium. A supplement of 10 \( \mu \)g Vitamin D daily is recommended during lactation.
Strict weight reduction diets\textsuperscript{25} should be discouraged and fluid intake should be increased according to thirst. (It is not necessary to encourage breastfeeding women to drink large quantities of liquid). Excessive intake of alcohol\textsuperscript{26} should be avoided however; an occasional social drink is not believed to be harmful (see section 2 Ch. 6.25).

There is no evidence to suggest maternal avoidance of allergenic foods just because a woman is breastfeeding. It is perfectly normal for breastfed infants to have loose stools particularly from the third to the fifth day of life as this is related to the mother’s influx of milk and not any dietary factor. Some foods however may ‘upset’ individual infants. True food intolerance is rare; however, if dairy foods are suspected then they should only be eliminated from the diet for a two week trial. If a food is excluded for a long period of time, specialist dietary advice may be required to ensure that the mother has a nutritionally adequate intake. Referral to a registered dietitian may be made via the General Practitioner.

\section*{5.5 Breastfeeding and maternal use of street drugs}

Illegal drugs ('street drugs') such as opioids readily cross the placenta and also reach breast milk in significant quantities. Infants who have been exposed to street drugs in utero become dependent and show withdrawal symptoms following delivery. Inhaled drugs such as cannabis reach breast milk and are also passively absorbed through inhalation by the infant.

Mothers should be advised to avoid street drugs during pregnancy and lactation. Breastfeeding can however be encouraged for mothers who have been stabilised on a methadone maintenance programme, unless there are specific concerns about transmission of maternal HIV or hepatitis C.

While the amount of methadone found in breast milk appears to be relatively small, the effect of this exposure on the developing brain is unknown.\textsuperscript{27} Women who are being maintained on a methadone programme will require specialist breastfeeding support as infants born to this group of women may still show signs of withdrawal.
and usually have significant challenges to establishing breastfeeding. Health professionals need to ensure an individualised plan of care is in place for these women and to be aware that poly drug use is a possibility.

5.6 Smoking during breastfeeding

Smoking is not advised during breastfeeding and if a mother wishes to stop smoking during lactation, nicotine replacement patches can be used. If mothers do smoke they should have a cigarette after feeding and not before. Care must be taken with bed sharing due to the increased risk of unexpected death in infancy. Mothers should be advised to put their baby to sleep in a cot. Women, who smoke are less likely to breastfeed, produce less milk and usually feed for a shorter period of time.28

5.7 Neonatal jaundice

Jaundice in newborn babies is very common, is usually harmless and clears up on its own after 10-14 days. Breastfeeding should be continued and supported and a mother enabled to feed her baby effectively. It is rare that the level of bilirubin is so high that breastfeeding has to be interrupted. 29

“A breastfed baby who has signs of jaundice should be actively encouraged to breastfeed frequently and woken to feed if necessary”. Frequent breastfeeds lead to an increased excretion of bilirubin in the first three days of life. Correct positioning and attachment should be checked by observing a breastfeed. Mothers of sleepy babies should be encouraged to feed their babies frequently (8 - 12 times in 24 hours).

“Breastfed babies should not be routinely supplemented with formula, water or dextrose water for the treatment of jaundice” (Breastfeeding Answer Book, N. Mohrbacher, J. Stock).

If there is prolonged jaundice local standards/guidance should be followed.
5.8 Diabetes mellitus

Mothers with diabetes mellitus should be advised to eat extra carbohydrate when breastfeeding. In general, approximately 50g extra carbohydrate should be taken over the course of the day. Careful monitoring of blood sugars will help determine individual requirements for extra carbohydrate. Mothers should be advised to eat before feeding the baby to prevent hypoglycaemia and this includes night time feeds. Mothers on insulin may find that their insulin requirements are reduced due to the increased energy requirements of breastfeeding. Babies born to mothers with diabetes are at an increased risk of neonatal hypoglycaemia and should be cared for using guidelines based on WHO Guidance, *Prevention, Management and Treatment of Neonatal Hypoglycaemia*. The Human Milk Bank in Irvinestown has produced a leaflet for mothers with diabetes highlighting the benefits of breast milk to babies of mother’s with diabetes.
6 Maintenance of Breastfeeding

6.1 Duration of feed

There are no set rules as to how long a feed should take. Some babies will feed at a higher rate for a short time and others at a slow rate for a longer time. If feeds are routinely taking a long time, mothers may need further help with positioning and attachment. A mother should be encouraged to allow her baby to finish the first breast before offering the second. Equally the mother should be re-assured that it does not matter if her baby only wants to feed from one breast at an individual feed. If she starts with the second breast at the next feed there should be no long-term imbalance in milk production. She should be similarly reassured that if the baby requires both breasts at a feed, this is equally acceptable, and that the baby may shift from one pattern of feeding to another.

If a mother has a tendency to oversupply breast milk this can lead to loose, green stools. In this instance it is important that the baby finishes the first breast before offering the second.

The most common causes of insufficient milk supply are poor attachment and infrequent feeding.

6.2 Baby led feeding or demand feeding

Baby led (demand feeding) should be encouraged for all breastfed babies unless clinically contra-indicated. The expected pattern of feeding at different stages and variation between babies should be explained to mothers. Mother should be told about baby feeding cues and encouraged to respond to feeding cues rather than wait until their baby is crying before offering a feed. They should be encouraged to waken their baby for feeding if their breasts are overfull and to recognise signs of waking and willingness to feed in their baby. Unrestricted breastfeeding helps
prevent engorgement, increases milk supply, stabilises neonatal serum glucose levels and increases initial weight gain.

6.3 Exclusive breastfeeding

The Department of Health (DoH) and World Health Organisation (WHO) both recommend exclusively breastfeeding for the first six months of life with no other food or fluids being given. Expressed breast milk should be the supplement of choice. It can be given from a cup, spoon or syringe.

NOTE: Syringe feeding is only suitable for small amounts of colostrum (5ml only at each feed).

Any other food or drink should only be given for clear clinical indications and with fully informed maternal consent. The use of formulae milk, even when breastfeeding is well established, should not be encouraged. Formulae milk can sensitise a vulnerable baby to allergy.

6.4 Breastfeeding and infant weight gain

Normal weight gain for a breastfed infant is 125 - 200g / week in the first four months, 50 – 150g per week between 4-6 months and 25 – 75g per week between 6 and 12 months. Birth weight should be regained by 10 - 14 days old.

Weight should be plotted on the UK-WHO Growth Charts which are based on data from breastfed infants and therefore describe optimal growth of breastfed infants. These can be downloaded free of charge from www.growthcharts.rcpch.ac.uk

All babies should be weighed naked at birth, five and ten days. Thereafter healthy babes should be weighed (naked) no more than fortnightly and then at two and four months using well maintained, digital scales that are calibrated annually. (See Regional Growth monitoring guidelines, 2012)
Frequent weighing and suggestion that the infant is not gaining weight can be alarming to parents and can lead to introducing formula or pressuring feeding styles and so feedback to parents on child weight should be handled carefully.

If an infant is displaying faltering growth (see *Regional Growth Monitoring Guidelines 2012*) a history of breastfeeding should be taken. A breastfeed should be observed and position and attachment assessed. In addition, the number of feeds and frequency of wet/soiled nappies per day should also be assessed. The UNICEF Breastfeeding Assessment tool (Appendix 4) should be used and this can be downloaded from the Baby Friendly website (see Useful Websites). If the problem persists referral should be made to a lactation consultant or breastfeeding counsellor as well as a medical practitioner. There are five major causes of faltering growth, these are:

- inadequate intake;
- increased losses;
- failure to absorb;
- failure to utilise;
- increased requirements;

### 6.5 Increasing milk production

Early positive intervention makes this problem easier to solve without affecting the mother’s confidence in her ability to breastfeed and without resorting to formulae feeding. Firstly check technique and give support. Expressing breast milk will also stimulate supply and support weight gain. The use of a supplementary nutrition system of feeding bottle and tube attached to the nipple can be used to keep a baby at the breast and stimulate milk supply. There are very few women who do not produce sufficient milk. A common cause of insufficient milk supply is poor attachment and infrequent feeding. In these instances it is important that the baby finishes the first breast and is offered the second. It may be necessary for the mother to switch feed to stimulate lactation and encourage a sleepy baby to feed. This involves asking the mother to watch for the baby falling asleep on the breast or sucking infrequently rather than rhythmically. In this instance the mother should be
encouraged to offer the baby the other breast and to repeat this process until the baby will not keep feeding. Switch feeding over a 24 to 48 hour period can result in a significant improvement to the mother’s milk supply.

6.6 Supplementary feeds

Giving supplementary feeds of formula milk leads to less suckling, compromises the milk supply further and can cause nipple versus teat confusion. If supplementary feeds are required where possible expressed breast milk should be used. Women need ongoing support and information to treat poor lactation. If formula supplements are clinically indicated it is suggested that rather than topping up after every breastfeed a larger amount of formula is given a few times daily while the mother seeks to optimise her milk supply. The use of a supplementary nutrition system of feeding bottle and tube attached to the nipple can also be used to keep a baby at the breast and stimulate milk supply.

6.7 Breastfeeding and colic

Occasionally a breastfed baby may show signs of infantile colic, which can be caused by the oversupply of milk. These infants are usually thriving well but they seem very uncomfortable and have long bouts of crying usually in the late afternoon and evening. The mother may report that her baby is having frequent loose green stools and appears to have difficulty passing wind. The mother may also report that she appears to have too much milk and that she leaks milk all the time and suffers frequent breast engorgement. In these cases the cause of the infant's behaviour may be transient lactose intolerance due to the baby taking large volumes of high lactose foremilk. This can be minimised by encouraging the mother to ensure the baby is allowed to finish one breast at each feed before offering a second side. It may be appropriate to encourage the mother to try soothing the baby by rocking and carrying in a sling to avoid overfeeding in an attempt to settle the baby.
6.8 Night feeding

Babies should be breastfed on demand throughout 24 hours. Prolactin levels (which stimulate milk supply and depress fertility) are high at night and infant formula should not be given instead of a breastfeed. Mothers should be supported to manage night feeds by rooming in.

Information on bed sharing and the risks and contraindications should be highlighted to the mother.

6.9 Special circumstances

Where the infant’s medical condition prevents breastfeeding, the mother should be encouraged and supported to express and store breast milk until the infant recovers. The PHA leaflets ‘Breastfeeding your ill or premature baby’ and ‘Off to a Good Start’ provide information on initiating and maintaining lactation while separated from your baby. The NICE recommendations on the storage of breast milk are as follows:

- up to five days in the main part of a fridge at 4C or lower;
- up to two weeks in the freezer compartment of a fridge;
- up to six months in a domestic freezer at -18C or lower;
- Guidance for storing and freezing breastmilk for a premature baby is usually different and may be to use milk within 24-48 hours this is because these babies are more vulnerable and extra caution is needed.

DO NOT thaw or warm breastmilk in a microwave as frozen breastmilk should be defrosted in a refrigerator and used within twenty four hours of removal from the freezer.

6.10 Mastitis

Mastitis is an inflammatory condition of the breast that may or may not be accompanied by infection and lactational mastitis occurs when pressure builds within the milk cells (alveoli) from stagnant or excess milk leading to cellulitis of the...
interlobular connective tissue within the mammary gland. Mastitis is a common complication of breastfeeding and can lead to mother’s stopping feeding. The GAIN guidelines on the treatment, management and prevention of mastitis provide a structure for health professionals dealing with women with this condition. The supporting leaflet ‘Mother's Guide to Mastitis and Breastfeeding’ provides mothers with practical advice on the prevention of mastitis, self help measures to clear blocked ducts and relieve engorgement as well as advice on treatment. See the GAIN website to download a copy or for details of how to obtain copies go to: www.gain-ni.org and see Appendix 5 for the Flow chart on Mastitis Care Management.

6.11 Breastfeeding and returning to work

A mother who is planning to return to work should be encouraged to develop a plan for how she is going to manage feeding her baby. ‘Breastfeeding and returning to work’ (PHA, 2011) provides useful information. All mothers who are planning to return to work should be supported to develop and an individualised plan depending on the mother’s working hours and the age of her baby.

She may want to introduce bottle feeding to her infant. This should be initiated only when breastfeeding is well established and the infant is then given a small volume of expressed breast milk. The mother may wish to continue providing breast milk for her baby whilst at work and cup feeding, as an alternative to bottle feeding should be encouraged. Prior to returning to work mothers should be advised how to express, store and use breast milk or how to gradually introduce infant formula feeds if that is the mother's wish.

6.12 Discontinuing breastfeeding

Many mothers and children enjoy the unique contact provided by prolonged breastfeeding, and support should be given to those who wish to continue breastfeeding.
Breast milk continues to be rich in specific immunological properties after other foods have been introduced and throughout lactation. Health benefits to both mother and child are related to the duration of lactation and WHO recommend exclusive breastfeeding for at least six months with the benefits continuing beyond one year. If a mother wishes to discontinue breastfeeding, it is important to do so gradually e.g. by dropping one feed per day. Abrupt reduction or cessation may precipitate mastitis or even breast abscess. Pharmacological suppression is rarely necessary; if it should be required, for example in the event of the death of an infant, Cabergoline is the drug of choice (Medication and Mother’s Milk, Hales, T. 2004)\textsuperscript{35}.

6.13 Peer Support

The NICE guidance ‘PH11 Maternal and child nutrition’\textsuperscript{36} supports peer education as an approach. NICE detail the potential benefits of robust commissioning of a peer support programme for women who breastfeed, within a breastfeeding strategy, these include:

- An increase in the number of women who initiate breastfeeding, continue to six to eight weeks and those who breastfeed exclusively for the first six months.
- A reduction in the number of hospital admissions for diarrhoea and respiratory infections in infants.
- Reducing the risk of obesity in children, thereby lowering their risks of developing coronary heart disease and diabetes in later life.
- A reduction in the risk of ovarian and breast cancer in women who breastfeed.
- Raising public awareness of the benefits of breastfeeding.
- Reducing inequalities and improving access to breastfeeding support for women in low income groups.
- Increasing choice and improving performance and family centred care.

In 2000 Fairbank, et al \textsuperscript{37} deemed that peer support programmes were useful in the promotion of breastfeeding. Peer support programmes delivered in ante and postnatal periods, have also been shown to be effective at increasing both initiation
and duration rates of breastfeeding among women on low incomes, and particularly among women who have expressed a wish to breastfeed.

A list of breastfeeding support groups and further information can be found on the Public Health Agency breastfeeding support website www.breastfedbabies.org

6.14 Pre-term babies

Ideally all preterm babies should be fed breast milk. The anti-infective properties of breast milk (section 2 Ch. 4.2) are particularly beneficial to this group and breast milk exerts a favourable effect on the neuro-development and gut integrity of preterm babies.

When encouraging mothers of preterm infants to express breast milk, it should be highlighted to them that their breasts will not have matured to the same degree as a mother who has had a term baby. They should therefore be encouraged to start expressing early and frequently (eight to ten times in twenty four hours including at least once at night). Hand expression is recommended in the first few days and then when the amount being expressed increases an electric breast pump using a double pumping kit is recommended to maintain the milk supply.

Those infants born weighting less than 1500g may require a breast milk fortifier added to breast milk feeds under the direction of the neonatologist. Iron should also be started by the neonatologist between weeks six and eight of life for preterm babies until six months corrected age. Abidec 0.3 mls may be prescribed for preterm babies.

Low birth weight infants (less than 2500g) on nutritional assessment benefit from a breast milk fortifier added to feeds as breast milk is not sufficient alone to meet the energy, protein and some mineral requirements. Nutritional stores are low compared to the heavier preterm or term infant. Breast milk fortifier is not available in the community. Abidec 0.3 mls can be used if additional vitamin supplementation is
required. Iron should also be started by the neonatologist between six and eight weeks of life for preterm babies until six months of corrected age.

Where appropriate, the use of donor expressed breast milk should be considered. (Appendix 6, Sources of Useful Information).

6.15 Breastfeeding Multiples

Mothers of multiples can produce enough milk to breastfeed their babies. Good antenatal preparation is essential. Advice on feeding multiples can be found in the document ‘Guidance for Health Professionals on feeding Twins, Triples and Higher Order Multiples’ produced by the Multiple Birth Foundation endorsed by the Royal College of Paediatrics and Child Health and supported by the Royal College of Midwives. 38

6.16 Allergies

The Department of Health (DoH) recommends that weaning for all infants be delayed until six months (26 weeks). This advice is particularly relevant for infants at high risk of allergic disease owing to them having at least one first degree relative (parent or sibling) with allergic disease. Delaying the introduction of solid food beyond six months is not advised as there is no evidence to support restrictive weaning in allergy prevention. For more information on the treatment of cow’s milk allergy see section 4 Ch. 23. If the exclusion of common allergens is considered necessary the general practitioner should refer the mother to a registered dietitian for specific dietary advice.

6.17 Breastfeeding and HIV

In the UK and other developed countries, feeding infant formula milk poses less risk overall to the health of the baby of an HIV-infected mother than exposure to infected breast milk. This is because the risks associated with infant formula milk feeding can
usually be minimised. Avoidance of all breastfeeding by HIV-infected women is therefore recommended. 39

New guidance would suggest that although formula feeding is still the best and safest option in the UK to prevent mother to child transmission of HIV, if a woman is on effective Highly Active Antiretroviral Therapy (HAART) and chooses to exclusively breastfeed having carefully considered the available alternatives she should be supported to do so as safely, and for as short as period, as possible. Emphasis should be placed on exclusive breastfeeding only for these mothers. 40

6.18 Mothers with disabilities

Mothers with disabilities may find breastfeeding particularly convenient compared to preparing formulae. They should be offered appropriate information and given particular support with the initiation and maintenance of breastfeeding.

6.19 Medical problems in the infant

To support breast milk feeding in the infant with medical problems:

- minimise separation from the mother as far as possible;
- ensure early and frequent milk expression to stimulate and support lactation;
- encourage periods of skin-to-skin contact with opportunities for direct breastfeeding if appropriate;

Breast milk is of special importance to all vulnerable infants especially:

- Preterm infants and those born small for gestational age particularly benefit by protection from serious infection.
- Necrotising enterocolitis, which is often fatal, is almost entirely preventable by feeding breast milk, at least partially.
- Infants with cleft palate are protected from otitis media if they are fed breast milk.
While respecting sensitivities, parents should be provided with this information so that they can make an informed decision about feeding their infant.

Mothers of infants with congenital problems should be encouraged to breastfeed and offered support with establishing breastfeeding where possible.

The use of banked donor breast milk, if available, should be discussed. It may be offered if the mother is unable to provide an adequate supply.

6.20 Relactation

If a mother has stopped breastfeeding and wishes to start again, it is possible to do so. The earlier the baby can be reintroduced to the breast, the more likely relactation is to succeed. The milk supply is increased by skin-to-skin contact and frequent feeding. Complementary feeds of infant formula will also be necessary initially and are reduced as the mother's milk supply is increased.

The involvement of a health professional with special expertise in breastfeeding management is essential.

6.21 Breastfeeding an adopted baby

It is possible to stimulate lactation even when the adoptive mother has not recently or ever been pregnant. The involvement of a health professional with special expertise in breastfeeding management is recommended. In the first instance women who may want to breastfeed their adopted baby can contact their nearest hospital breastfeeding coordinator who will be able to provide support or suggest the services of lactation consultant.

6.22 Donating breast milk to the Milk Bank

The Human Milk Bank at Irvinestown collects, processes and stores human milk which is made available to sick infants in hospitals and specialist baby units
throughout Ireland. The donors of the breast milk are mothers who are breastfeeding their own babies and have excess milk which can be used to help tiny, premature, sick babies survive and leave hospital in a shorter period of time. If mothers request further information on becoming milk donor they should be advised to contact the Human Milk Bank on 028 68628333.

6.23 Toxins

Polychlorinated biphenyls (PCBs) and dioxins are widely present in small amounts in the environment and in foods including infant formula. Dietary intakes for adults are currently well below the tolerable amounts (based on known safe levels for animals). Dioxin concentrations in human milk are known to have fallen in recent years; comparable measurements of PCB concentrations are not yet available.

The possible risks of residual toxins in breast milk are greatly outweighed by the very significant advantages of breastfeeding.

6.24 Contraception

Breastfeeding can be a useful contraceptive method. It may be up to 95% effective only if ALL of the following conditions apply:

- the baby is less than six months old;
- the baby is exclusively breastfed, ie. no other solids or liquids;
- there should be a minimum of six long breastfeeds every twenty four hours and there should not be a gap of more than four hours during the day and six hours at night;
- mother has not resumed menstruation;

Oral contraceptives may be prescribed by a physician. The combined pill is not suitable for use when breastfeeding because it can reduce the milk supply and the progesterone only pill is suitable at this time. Other barrier forms of contraception do not interfere with breast milk supply. The effectiveness of this method may be compromised if mother is taking antibiotics or is unwell.
6.25 Alcohol

Although alcohol does transfer across into breast milk, occasional or light drinking (defined as one or two units per day) has not been found to be harmful to breastfed babies. Mothers who drink more than this may find that the letdown reflex is affected and milk intake by the baby is reduced. Other problems that may occur with moderate to heavy alcohol consumption include the infant’s motor development being affected and weight gain may be reduced.

Parents who have been drinking alcohol, who smoke, or have taken drugs or medication should avoid co-sleeping with their baby.

Further information about alcohol and breastfeeding can be found on the La Leche League website, www.lalecheleague.org
Use of “Dummies”

The use of a ‘dummy’ should be discouraged until breastfeeding is established as it may interfere with demand feeding, thus reducing milk supply. The sucking pattern with a dummy is different from breast feeding and it can be unhelpful to attachment. In 2009 the DHSSPSNI issued a leaflet ‘Reduce the risk of Cot Death’ which states:

“It is possible that using a dummy at the start of any sleep period reduces the risk of cot death” and also “Breastfeeding your baby reduces the risk of cot death”.

The advice to parents is “Do not begin to give a dummy until breastfeeding is well established, usually when the baby is around one month old. Stop giving the dummy when the baby is 6-12 months old”.

Mothers who have made a decision to use a dummy only use it when settling the baby to sleep. If a dummy is used the following guidelines should be followed:

• Strict standards of hygiene should be maintained. When not in use the dummy should be kept in a steriliser.
• Never dip the dummy in honey, syrup or sugar.
• The dummy should be removed from the child as soon as he/she has settled as the prolonged use of a dummy can prevent the teeth and gums from developing properly and also impair speech development.
• A baby should not be allowed to sleep with a dummy in his/her mouth. However if a baby has become accustomed to using a pacifier while sleeping, it should not be stopped suddenly during the first 26 weeks.41

7.1 Nipple shields

The use of nipple shields while breastfeeding is not usually recommended as this can affect milk transfer to baby and milk production. Nipple shield use should therefore be restricted to situations where all other alternatives have been explored.
If a shield is being used the mother should be supported to develop a plan to be able to feed without the shield and in the meantime staff should ensure that breastfeeding is effective and that the baby is getting enough milk.
8

Formula Feeding

"Appropriate feeding practices are of fundamental importance for the survival, growth, development and nutrition of infants and children everywhere." \(^{12}\)
(Infant Feeding Recommendations D.H, 2003)

To ensure that mothers are aware of how to make up formula feeds safely all mothers should be given the PHA leaflet ‘Bottle feeding’.

8.1 Frequency of feeds

As for breastfed infants, infants fed on manufactured formula milks should be fed ON DEMAND. Parents should be advised that infants will require frequent feeds, usually every three to four hours over a twenty four hour period (averaging six to eight feeds daily), to ensure adequate volumes and nutritional intake are achieved. As the infant gets older they may feed less frequently if tolerating larger feed volumes. A useful guide to the frequency of feeds is to avoid any gap of more than five hours between daytime feeds and more than eight hours at night. If an infant demands to be fed more than every two to three hours he/she may require extra fluids. Freshly boiled cooled water without added sugar may be offered in this situation.

8.2 Volume of feeds

In general, an infant’s fluid, energy and protein requirements will be satisfied by an intake of 150ml/kg body weight per twenty four hours, (2.5fl.oz/ lb) of infant formula from birth until six months of age. Infants achieving these volumes of infant formula will ensure adequate nutritional intake for age. From seven to twelve months fluid intake usually reduces to 120ml per kg body weight as solids are increased. Infant formula volumes will gradually decrease in view of increased weaning foods. A minimum of 500ml formula should be encouraged daily (per twenty four hours) to
ensure appropriate vitamins and minerals are provided. Infants who are fed dilute feeds are at a greater risk of being undernourished.

8.3 Overfeeding

Infants who receive correctly prepared infant formula are unlikely to be overfed. Formula must be prepared according to manufacturer’s instructions and the measuring scoop provided should be used. Feeds should be made up by first measuring out the cooled boiled water and then adding the correct number of level scoops to the fluid. Extra formula powder should not be added as this will result in an over concentrated feed. Instruction in proper measurement technique should be given on a one to one basis post natally. It is of paramount importance that solids are never added to bottle feeds.

It has also been noted that some parents and carers encourage the infant to finish the bottle without focusing on signals of satiety by the infant such as turning away, dribbling milk, biting the teat, spitting up thus encouraging overfeeding.

* Measuring scoops differ between brands and even between products within the same brand: the specific measuring scoop provided should be used.

8.4 Underfeeding

Infants who have faltering growth must be identified; their feeding pattern and the volume of formula taken should be assessed. If necessary the baby should be referred for medical investigation promptly. Weight gain should be plotted on the UK-WHO Growth Charts.

8.5 Monitoring

Infant's growth will be reviewed at universal contacts (Healthy Child Healthy Future (DHSSPSNI 2010)) during the first year of life and recorded on percentile charts used by Health Visitors to record weight gain/loss in the Personal Child Health
Record (‘red book’). When pre-term babies are monitored on percentile charts an allowance should be made for their prematurity (see Growth Monitoring Guidelines for Health Professionals, 2012). Concerns about growth should be discussed with the GP or Paediatrician.

8.6 Hazards of bottle feeding

8.6.1 Contamination

Bottle fed infants may develop gastroenteritis from contaminated formula feeds. Feeds may be contaminated by a variety of methods, including using bottles and utensils that are either not properly washed or sterilised or not making feeds up correctly. The European Food Safety Authority (EFSA) issued advice which has been adopted by the Dept of Health on the safety of making up bottle feeds Appendix 7. This is due to the risk of contamination of infant formulae with Salmonella and Enterobacter Sakazakii. Contamination of formulae with these bacteria can occur during the production of powdered infant formulae. These bacteria can grow in the reconstituted product if it is stored above 5ºC for a sufficient time and multiply very rapidly at room temperatures.

The most recent advice is:

- good hygienic measures are essential to avoid contamination (eg wash hands, ensure cleanliness of kitchen and equipment);
- prepare powdered infant formula for each feed;
- use sterilised containers to reconstitute the formula (use clean bottles, ideally sterilised in boiling water);
- reconstitute feeds with fresh tap water that has been boiled and left to cool for no more than 30 minutes (temperature >70C);
- the feed should then be made up as per the manufacturer’s instructions and if necessary cool to the correct temperature and use immediately;
- after feeding discard any remaining formula;
- If away from home the advice is to bring a sterilised container of measured powdered formula and a clean flask of hot water that has been boiled and
allowed to cool slightly and an empty sterilised feeding bottle. Alternatively, sterile ready to feed cartons of formula may be used.

For older babies in day care if this is not possible, agreed good practice is to make up bottles in the morning and refrigerate as soon as possible (Dept of Health booklet ‘Bottle feeding’)\(^45\).

Health professionals involved in teaching parents to prepare bottle feeds should emphasise the importance of using proper techniques when sterilising utensils and equipment required in the preparation of feeds.

For babies over the age of six months feeding bottles do not need to be sterilised.

8.6.2 Safety of Feeding Bottles

There has been some discussion around the safety of polycarbonate bottles which contain Bisphenol A (BPA). It has been suggested that this chemical, commonly found in many household items, is linked to heart disease. Despite there being a growing body of evidence into the safety of BPA, none of the research to date appears to have found conclusive evidence that it is harmful to humans. The European Food Safety Authority continues to monitor the situation.

8.6.3 Heating bottles in a microwave

An infant’s feed should not be warmed in a microwave oven. Very hot fluid at the centre of the bottle may be missed and may scald the baby.

8.6.4 Bottled water

All water used to make up infant formula feeds or for giving as a drink of water to infants less than six months of age should be boiled and cooled. There is no advantage under normal circumstances to using bottled water. In the situation of a power failure where water cannot be boiled and no ready to feed formula is available, bottled water can be used to prepare a feed without boiling it. It must be
used immediately. In the UK there is no legal definition for what is meant by ‘spring’ or ‘natural’ water. Some bottled water labelled as ‘natural mineral water’ may have high levels of sodium that are not suitable for infants. Any bottled water should have a sodium (Na) content of no more than 200mg/l and no more than 250mg/l of sulphate (SO).

The Dept of Health recommends that while travelling abroad you should use ‘readymade’ formula milk (available in cartons). If this is not possible then boiled and cooled bottled water with a sodium and sulphate content detailed above is recommended. Avoid using water labelled ‘natural mineral water’ and ensure the tamper proof seal is intact. Ideally water from an internationally recognised manufacturer should be used; most of these will include an EU safety mark on their label or a mark to confirm they belong to the International Bottled Water Association. If suitable bottled water is not available use boiled and cooled tap water.

8.6.5 Filtered Water

Any filtered water used in the preparation of infant formula for infants up to twelve months should be boiled before use because of the risk of bacterial contamination.

8.6.6 Softened Water

Water softeners use an ion exchange system, which exchanges calcium in water for sodium. Softened water can therefore contain an unacceptably high level of sodium and such water should not be used for the reconstitution of infant formula.

8.7 Gastroenteritis/dehydration

Gastroenteritis causes diarrhoea (a change in bowel habit to looser, more frequent stools) and/or vomiting. Mild to moderate cases may be treated at home. Nice CG84 Diarrhoea and vomiting in children under 5: NICE quick reference guide CG84, 2009 recommends the following actions:46
In children with gastroenteritis but without clinical dehydration:

- continue breastfeeding and other milk feeds;
- encourage fluid intake;
- discourage the drinking of fruit juices and carbonated drinks, especially in those at increased risk of dehydration (see below);
- offer oral rehydration salt (ORS) solution as supplemental fluid to those at increased risk of dehydration (see below);

In children with clinical dehydration, including hypernatraemic dehydration:

- use low-osmolarity ORS solution (240–250mOsm/l)1 for oral rehydration therapy give 50ml/kg for fluid deficit replacement over four hours as well as maintenance fluid;
- give the ORS solution frequently and in small amounts;
- consider supplementation with their usual fluids (including milk feeds or water, but not fruit juices or carbonated drinks) if they refuse to take sufficient quantities of ORS solution and do not have symptoms or signs likely to progress to shock (red flag symptoms or signs) consider giving the ORS solution via a nasogastric tube if they are unable to drink it or if they vomit persistently;
- for children with symptoms or signs likely to progress to shock red flag symptoms or signs, do not give oral fluids other than ORS solution;
- monitor the response to oral rehydration therapy by regular clinical assessment;

Use intravenous fluid therapy for clinical dehydration if:

- shock is suspected or confirmed;
- a child with symptoms or signs likely to progress to shock (red flag symptoms or signs) shows clinical evidence of deterioration despite oral rehydration therapy;
- a child persistently vomits the ORS solution, given orally or via a nasogastric tube;

Details of IV fluid therapy are available in the NICE guidance
These children are at increased risk of dehydration:

- children younger than one year, especially those younger than six months;
- infants who were of low birth weight;
- children who have passed six or more diarrhoeal stools in the past twenty four hours;
- children who have vomited three times or more in the past twenty four hours;
- children who have not been offered or have not been able to tolerate supplementary fluids;
- before presentation infants who have stopped breastfeeding during the illness;
- children with signs of malnutrition;

After rehydration:

- give full-strength milk straight away;
- reintroduce the child’s usual solid food;
- avoid giving fruit juices and carbonated drinks until the diarrhoea has stopped;

Fluid management after rehydration

- encourage breastfeeding, other milk feeds and fluid intake;
- consider giving 5ml/kg ORS solution after each large watery stool to children younger than one year (especially those younger than six months) and infants who were of low birth weight;
- children who have passed six or more diarrhoeal stools in the past twenty four hours;
- children who have vomited three times or more in the past twenty four hours;
- if dehydration recurs start ORT again;

ESPGHAN recommends four to six hours of rehydration at 100mls/kg low osmolar rehydration solution and then resume normal feeding. Replacing with water alone in inappropriate as it may cause hyponatraemia.

If symptoms do not respond to treatment (particularly if both vomiting and diarrhoea are occurring), medical advice should be sought.
Diarrhoea which fails to settle within seven to ten days suggests that temporary lactose intolerance has occurred. If the infant is artificially fed, the feed should be changed to a lactose-free preparation (such as SMA LF or Enfamil O- Lac) for a period of about six weeks, and then feeding should revert to a standard formula if tolerated. It should be noted that soya-based formulas are no longer recommended for the treatment of lactose intolerance, because of their allergenicity and oestrogenic effects, in particular for those under six months of age.

8.8 Ready to feed preparations

Hygienic procedures must be followed when opening and transferring from the carton to the bottle. Opened cartons stored in the fridge should be discarded after twenty four hours.

8.9 Bottle caries

This occurs in infants or toddlers who are given a feeding bottle for extended periods of time during the day or at night. Although lactose is relatively noncariogenic, it will cause tooth decay if it is left in contact with the teeth for long periods of time. Infants should not be put to bed with feeding bottles. If this is not possible, then a bottle containing water should be used. Advice to use a cup from six months of age should be reinforced.
9 Infant Formulae

A wide range of infant formulae are available from those for healthy term babies to specialised formulae for medical conditions, the main types of formulae available are listed below.

9.1 First baby formulae

There are two main types of infant formula, whey based and casein based. Whey based formulae are more similar to breast milk than casein based formulae. Whey based formulae are recommended for healthy term babies as they are easier to digest than casein based formulae and have a lower renal solute load.

NOTE: Some formula milk companies have recently changed the way they describe their products. Casein based milks that have often been described as being for ‘hungrier’ babies and been branded as Second or Stage 2 milks are now branded as specialist formula. Follow-on milks, only suitable for babies over six months are now being described as Second or Stage 2 milks. There is no consistency between the formula milk companies as to how they are branding their milks so it is extremely important that parents read labels carefully.
Examples of current infant formulae available

<table>
<thead>
<tr>
<th>Whey based</th>
<th>Casein based</th>
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</thead>
<tbody>
<tr>
<td>Aptamil First Milk (Milupa)</td>
<td>Aptamil Hungry Milk (Milupa)</td>
</tr>
<tr>
<td>Cow and Gate First Infant Milk from Newborn(Cow and Gate)</td>
<td>Cow and Gate Infant Milk for Hungrier Babies (Cow and Gate)</td>
</tr>
<tr>
<td>HiPP Organic First Infant Milk (HIPP)</td>
<td>HiPP Organic Hungry Infant Milk (Hipp)</td>
</tr>
<tr>
<td>SMA First Infant Milk (SMA Nutrition)</td>
<td>SMA Extra Hungry Infant Milk (SMA Nutrition)</td>
</tr>
</tbody>
</table>

Changing to a casein-based formula is common practice in order to ‘satisfy’ a hungry baby. There is no scientific evidence to support this practice and it should be discouraged. The frequency and volume of feeds should be considered in addressing this. However, changing from whey to casein milk is preferable to the early introduction of solids.

9.2 Follow-on milks

Follow-on milks are not recommended for use as a replacement for breastmilk or infant formula before six months of age. They are aimed at infants and children where there are concerns over the dietary intake of iron, but for the majority of infants and children they are not necessary as the increased requirements of iron and calcium are met by a varied diet. Breastfeeding should not be stopped in favour of using follow on milk.

“Continued use of iron enriched infant formula or follow on milk as a main drink after the first year should be considered if there are concerns about the adequacy of iron in the diet.”

Coma Report Weaning and the Weaning diet, 1994
9.2.1 Examples of Follow-on Milks are:

- Aptamil Follow on (Milupa);
- Cow and Gate Complete Care Follow-on Milk (Cow and Gate);
- HiPP Organic Follow-on Milk (HiPP);
- Good Night Milk* (HiPP);

*NOTE: Good Night Milk is not a follow on formula. It contains corn starch, rice flour and oatmeal and has 76Kcals/100mls which is higher than other follow-on milks.

A new group of formulae have emerged more recently, termed ‘Toddler Milks’. As with follow-on formulae these are not necessary in infants with a varied diet where the additional nutritional requirements are met by food and the need for formula is reduced. These formulae are marketed for children from one year of age.

9.2.2 Examples of Toddler Milks are:

- Aptamil Growing Up Milk (Milupa);
- Cow and Gate Growing Up Milk (Cow and Gate);
- HiPP Organic Growing Up Milk (HiPP);
- SMA Toddler Milk (SMA Nutrition);

9.3 Soya formulae

Soya formulae are no longer recognised as an appropriate first line treatment for lactose intolerance (section 4 Ch. 23.4) or cow’s milk protein allergy (see section 4 Ch 23). Infants at risk of cow’s milk protein allergy may also be sensitive to soya protein, particularly if the cow’s milk protein allergy has been manifested in gastrointestinal symptoms. The Chief Medical Officer stated in 2004 that soya–based formulae:

"should only be used in exceptional circumstances to ensure adequate nutrition. For example they may be given to infants of vegan parents who are not breastfeeding or infants who find alternatives unacceptable." 48
There are also concerns in relation to the long term effects of using soya based formulae in infancy. These relate to a significant increase in prolonged and painful menstruation in adult women fed soya formulae, changes in the number of Leydig cells in the testes and suppression of testosterone rise in neonatal marmosets partially fed soya formula.49

The National Toxicity Programme for the Evaluation of Risks to Human Reproduction (NTP-CERHR) also suggests that isoflavins are present at similar blood concentrations in infants fed soya formula as in rats exhibiting adverse developmental effects. Together with continued concern around the relevance of the Sharpe Study, the possibility of adverse effects of soya based formula cannot be dismissed.

The Paediatric Group of the British Dietetic Association have issued a Position Statement 50 on the use of Soya Protein for Infants. It recommends:

“that the use of soya protein as first line treatment should be discouraged during the first six months of life.”

This is to avoid sensitisation to soya protein and exposure to phytoestrogens while organ systems remain at their most vulnerable. This includes soya infant formula and soya products such as desserts, etc. Also there have been concerns of an increased risk of peanut allergy in infants fed soya based infant formula.

The Dept of Health does not advise the use of soya formulae for infants less than six months because of the possible oestrogenic effect. Soya formula is not recommended for premature infants.

When a soya-based infant formula is used, should be informed of current findings relating to phytoestrogens and health and on the clinical need for soya. Any parent choosing to use soya for their infant should be supported in their decision. More research is needed into whether any adverse effects are dosing related 37.
If a soya formula is to be used, infants should be fed on demand and it should be remembered that the lactose has been substituted with glucose or sucrose. It therefore carries a risk to dental health and parents should be advised to safeguard dental health. A cup should be introduced at six months and by one year bottle feeding should be discontinued. Soya formula between meals or at bedtime is not recommended.

Soya formula is clinically indicated for the following situations:

- infants with Cow’s Milk Allergy who refuse extensively hydrolysed / elemental formulae;
- vegan mothers who choose not to breastfeed;
- Galactosaemia.

9.3.1 Nutritionally complete soya formulae include:

- Infasoy (Cow & Gate);
- SMA Wysoy (SMA Nutrition);

9.4 Lactose-free formula

There are infant formulae which have been developed specifically for lactose intolerance. They are cow’s milk based, but the lactose has been replaced with glucose and they are more useful for infants with temporary lactose intolerance following a gastro-intestinal infection. Parents occasionally try these formulae for babies with colic and the formulae available are:

- Enfamil O-Lac (Mead Johnson);
- SMA LF (SMA Nutrition);

There is no clear evidence to support this practice.
9.5 Modified formulae for Minor Digestive Problems/ Transient lactase deficiency

These are infant formulae, which are partially hydrolysed and have a reduced lactose content.
There is no good evidence that transient lactase deficiency occurs or if it does, that it could cause infantile colic, therefore there is no support for prescribing formulae, such as Comfort (Aptamil or Cow and Gate).

9.6 High Energy Formulae

These formulae are designed for use in faltering growth, disease related malnutrition or malabsorption where a modified formula is not required. Formulae available are:
- Infatrini (Nutricia);
- Similac High Energy (Abbott);
- SMA High Energy (SMA Nutrition);

9.7 Extensively hydrolysed formula (EHF)

These are the usually recommended formulae for the treatment of cow’s milk protein allergy (CMPA). Formulae include:
- Nutramigen LIPIL 1 (Mead Johnson);
- Nutramigen LIPIL 2 (from 6 months of age) (Mead Johnson);
- Aptamil Pepti (Milupa);
- Pepti-Junior(Cow & Gate);

Less commonly used:
- Peptide (SHS);
- MCT Peptide (SHS);
- Pregestimil LIPIL (Mead Johnson);

These formulae are proven to be effective in treating 90% of infants with Cow’s Milk allergy with 95% confidence. Extensively hydrolysed formulae may be whey based
such as Aptamil Pepti and Cow and Gate Pepti-Junior or casein based such as Nutramigen 1 and 2 (Mead Johnson).

9.8 Amino-Acid formula (AAF)

AAF formulae are indicated for CMPA infants presenting with:

- more severe allergic symptoms;
- failure to improve on extensively hydrolysed formulae;
- multiple food protein allergies;
- faltering growth;
- a reaction to cow’s milk protein in breast milk and require complementary feeds;

Currently Neocate LCP (SHS Nutricia) or Nutramigen AA (Mead Johnson) are available.

Ideally all pre-term infants should be fed breast milk; however this will need supplementation to improve the iron and fat soluble vitamin content. Abidec 0.3mls and Sytron 1mg daily should be prescribed by the neonatologist upon discharge from the neonatal unit and continued until six months corrected age. If pre-term formulae replaces greater than 50% of breast feeds supplementation may be stopped. Pre term formulae are intended only for pre term or low birth weight infants and should only be used on medical recommendation. They provide more energy, protein and minerals per unit volume than whey based formulae. They are not suitable for infants with faltering growth or low birth weight term infants. In these two cases a high calorie formula such as SMA High Energy or Infantinini could be used and referral to a registered dietitian for assessment made. A preterm baby on preterm formula should continue until six months corrected age and be under the care of a registered paediatric dietitian and consultant.

Hospital Use Formulae:

- Aptamil Preterm (Milupa);
- Nutriprem 1(Cow and Gate);
- SMA Gold Prem 1(SMA Nutrition);
Formulae for Community use Post Discharge:

- Nutriprem 2 (Cow and Gate);
- SMA Gold Prem 2 (SMA Nutrition);

These formulae are higher in iron and vitamin D than standard formulae.

This formula should be started if breastfeeding stops and the infant is less than six months corrected age. Vulnerable premature babies benefit from the use of ready to feed formulae rather than powdered formula to reduce the risk of contamination and infection in hospital however on discharge home, a powdered formulation can be used. In some cases, babies, may refuse the powdered formulation at discharge, as it tastes different to the readymade formulation or may become constipated. If parents report either of these as an issue they can be encouraged to change over to the powdered formulation by gradually adding increasing proportions of the “made up” powdered formula to the readymade formula until it is accepted/tolerated by the baby.

9.9 Breast milk fortifiers (Neonatal units only)

Breast milk fortifiers are available to increase the nutritional content of expressed breast milk, however it should be remembered that these products contain cow’s milk protein.

9.10 Anti-reflux formulae

Enfamil AR (Mead Johnson) and SMA Staydown Infant Milk (SMA Nutrition) may be an appropriate choice for reflux management when addition of a thickener is not appropriate or where non compliance is likely.

9.11 Organic formulae

These are available from birth to twelve months and are nutritionally complete. Usual weaning practice should be adopted.
9.12 Goats milk infant formulae

These are not recommended. Infant formula and follow on milks made from goat’s milk are not approved for use within Europe.

9.13 Prebiotics

These are non-digestible carbohydrate components that occur naturally in breast milk and provide a substrate for the beneficial bacteria naturally resident in the gut. Some manufactures have added Prebiotics derived from cow’s milk and chicory to their formula to increase the amount of bifidobacteria in the gut. This results in a softer stool and creates a more acidic environment, said to inhibit the growth of harmful bacteria.
10 Labelling and Advertising Regulations on Infant Formulae

In 1981 the International Code on the Marketing of Breast Milk Substitutes (WHO) laid out guidance on the proper use of breast milk substitutes. This guidance still stands and is outlined below. The European Union followed by the Dept of Health and Food Standards Agency in 2007, set out stricter controls on the promotion, labelling and composition of infant and follow-on milk. Directive 2006/141/EC and the regulations seek, in summary, to ensure that:

- The essential composition of infant formulae and follow-on formulae satisfy the nutritional requirements of infants in good health as established by generally accepted scientific data.
- The labelling of infant formulae and follow-on milk allow the proper use of such products and promotes and protects breastfeeding.
- The rules on composition, labelling and advertising are in line with principles and aims of the International Code on the Marketing of Breast Milk Substitutes.
- Any information provided to carers about infant feeding does not counter the promotion of breastfeeding.


The aim of this code is to:

"contribute to the provision of safe and adequate nutrition for infants, by the protection and promotion of breastfeeding, and by ensuring the proper use of breast milk substitutes, when these are necessary, on the basis of adequate information and through appropriate marketing and distribution" 

Those concerned with maternal and infant nutrition should make themselves familiar with their responsibilities under this code, particularly the information specified in Article 4.2 which states:

“Informational and educational materials, whether written, audio or visual, dealing with the feeding of infants and intended to reach pregnant women and mothers of infants and young children, should include clear information on all the following points:

- The benefits and superiority of breastfeeding;
- Maternal nutrition, and the preparation for and maintenance of breastfeeding;
- The negative effect on breastfeeding of introducing partial bottle-feeding;
- The difficulty of reversing the decision not to breastfeed;
- Where needed, the proper use of infant formula, whether manufactured industrially or home prepared.

When such materials contain information about the use of infant formula, they should include the social and financial implications of its use; the health hazards of unnecessary or improper use of infant formula and other breast milk substitutes. Such materials should not use any pictures or text which may idealise the use of breast milk substitutes.”

It is important that health professionals do not inadvertently promote and endorse formulae to mothers by carrying/using sponsored diaries, stationery, calendars and pens.
SECTION 3

The Infant 0-1 Year
11  Milks

If an infant or child is on a cow’s milk free diet then dietary assessment is required.

11.1 Cow’s Milk

Breast milk or infant formulae should be continued until one year of age. (Section 2 Breastfeeding re optimal duration of breastfeeding)

- Small quantities of whole cow’s milk may be used to mix solid foods from six months of age; however whole cow’s milk should not be used as a main drink until after one year of age.
- The use of a minimum of 350mls of whole cow’s milk or breast milk daily is recommended from one year of age, however the intake of large volumes ie more than 600mls (one pint) should be discouraged as this will decrease the appetite for other foods.
- Semi-skimmed milk may be given to healthy children over two years who are eating a good variety of foods and when it is already in general use within the home.
- Skimmed milk should not be given to children under five years because of its low energy and reduced vitamin A and D content.
- Pasteurised cow’s milk does not need to be boiled provided it is kept covered and refrigerated and does not require dilution before use.

11.2 Soya drinks

Soya drinks (previously known as ‘soya milk’), which are not infant formulae, should not be used during weaning. If used after one year of age particular attention should be given to ensure adequate vitamin and mineral intake, especially calcium intake. Particular care should be taken to safeguard dental health owing to the high sugar content of some soya drinks. Unsweetened varieties are available.
11.3 Goat and sheep's milk

These milks are totally unsuitable for infants under one year of age because they have a very high protein and salt content. They are also deficient in vitamins A, D, C, B12, folate and iron and are not always pasteurised. Although these milks may be perceived as less allergenic or as providing special nourishment, none of these claims have been substantiated. Goat and sheep's milk should not be given to infants but may be given from the age of one year so long as precautions against mineral and vitamin deficiencies are taken. The milk must be pasteurised or boiled. Infant formulae and follow on milks made from goat’s milk are not approved for use within Europe.

11.4 Rice Milk

The Food Standards Agency (FSA) in May 2009 advised that Rice Milks should not be given to children under four years and six months of age. Children who require a cow’s milk protein exclusion diet should be kept on appropriate hypoallergenic formulae for at least eighteen months of age. Beyond this age a calcium enriched milk for example, oats-based milk can be considered. A registered dietitian may well need to help with this decision and also to assess whether additional supplements such as Vitamin D may be required.
### 11.5 Summary of use of different milks / formulae

<table>
<thead>
<tr>
<th>Milk types</th>
<th>Age when used</th>
<th>Special points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breast</td>
<td>0 - 2 years, sole form of nutrition for first 6 months</td>
<td>May be continued for longer if wished</td>
</tr>
<tr>
<td>Formula milk</td>
<td>0 - 1 year, sole form of nutrition for first 6 months</td>
<td>May be continued for longer if considered necessary.</td>
</tr>
<tr>
<td>Follow – on milk</td>
<td>From 6 months – 1 year</td>
<td>Not necessary as increased requirements for iron and calcium are met by a varied diet</td>
</tr>
<tr>
<td>Whole cow’s milk</td>
<td>From 6 months, From 1 year</td>
<td>May be used to make up solid food but not as a main drink. As a main drink.</td>
</tr>
<tr>
<td>Semi -skimmed milk</td>
<td>2 years +</td>
<td>Provided dietary intake is otherwise adequate.</td>
</tr>
<tr>
<td>Skimmed milk</td>
<td>5 years +</td>
<td>Provided dietary intake is otherwise adequate.</td>
</tr>
<tr>
<td>Low lactose formulae</td>
<td>0 – 1 year</td>
<td>May be continued for longer if considered necessary. Not suitable for cow’s milk protein allergy.</td>
</tr>
<tr>
<td>Modified formulae for Minor Digestive Problems/Transient lactase deficiency</td>
<td>From birth</td>
<td>There is no good evidence to support their use.</td>
</tr>
<tr>
<td>Extensively hydrolysed formulae</td>
<td>From birth</td>
<td>Preferred formulae for most children with cow’s milk protein allergy.</td>
</tr>
<tr>
<td>Soya formulae</td>
<td>Not recommended.</td>
<td>It contains sugar and presents a risk to dental health. Indicated for galactosaemia and vegan diets.</td>
</tr>
<tr>
<td>Soya drink</td>
<td>1 year +</td>
<td>Particular attention needs to be given to ensure an adequate vitamin and mineral intake. These may contain sugar and present a risk to dental health. Low sugar varieties are available.</td>
</tr>
<tr>
<td>Goat / Sheep milk</td>
<td>1 year +</td>
<td><strong>Not</strong> recommended, but if used after 1 year must be pasteurised or boiled. Attention to ensure adequate vitamin and mineral intake is required</td>
</tr>
<tr>
<td>Rice milk</td>
<td></td>
<td><strong>Not</strong> recommended for children under 4.5 years (arsenic content)</td>
</tr>
</tbody>
</table>
12 Fluids

Breast milk, formula, follow-on milk or water constitutes the majority of the total drinks given to the infant until one year of age. Breastfed babies do not require additional fluids. If formula fed infants are given extra fluids water should be boiled and cooled for those less than six months of age. For further information on other drinks including tea, soft drinks and fruit juices see Chapter 26.

Re follow on milk: even if not a requirement or recommended, parents use it so it has to be referenced
‘Colic’ is a common but often distressing condition and occurs particularly in the first three months of life, particularly in the evenings, and can be very distressing for families. It has been defined as ‘crying for more than three hours a day, three or more days a week and for more than three weeks’\(^{53}\). Sympathetic treatment is required initially and milk type should not be changed routinely. Anticipating the baby’s needs, reducing stress and creating a calm environment may be helpful. Occasionally, an alteration in the maternal diet, if the mother is breastfeeding, may be worth a trial. See nutrition and lactation section 2 Ch.5.4. Gripe Water, herbal drinks containing sugar, local ‘remedies’ or medicines are not recommended. There is no evidence to support the use of formulae modified for minor digestive problems in formula fed babies.

A trial of an extensively hydrolysed formula with medical follow up may be considered for treating colic as it is estimated that 10% of infants with colic may have related cow’s milk protein allergy. If it is decided that the formulae is to be continued after the trial period, a referral to a registered dietitian should be considered. La Leche League has a leaflet entitled ‘The Unhappy Breastfed Baby’ which may be helpful.
Reflux in infants due to immaturity of the lower oesophageal sphincter function is common. Breastfeeding may be beneficial due to the less irritant nature of breast milk and the more rapid emptying of the stomach.

Possetting can be distressing to parents and they may seek treatment for it. However in an infant who is gaining weight satisfactorily, possetting is normal and harmless and is usually transient. The mother may find it helpful to hold her baby upright for feeding and to prop him/her up afterwards. Smaller, more frequent feeds may be helpful. Feed thickeners have not been shown to be effective in prevention.

Gastro Oesophageal Reflux Disease (GORD) may be alleviated by the addition of a thickener to formula or expressed breast milk eg Carobel. A gastric thickening feed which thickens on contact with stomach acid after feeding may also be used eg SMA Staydown (SMA Nutrition) or Enfamil AR (Mead Johnson). These formulae should not be used in conjunction with anti reflux medication eg omeprazole or lansoprazole as they will not thicken when stomach acids have been neutralised. They are indicated where the use of a thickener is not appropriate or where non compliance is likely. Infant Gaviscon is often used for a trial period. There is no clear evidence to support this at present.

Specialised advice should be sought in dealing with reflux if it is persistent or problematic.
15  Constipation

(See Bristol Stool Chart Appendix 8)

- Constipation may be defined as difficulty in passing hard stools and not the passing of stools less frequently than ‘normal’ for that individual. Bottle fed infants are much more likely to suffer from constipation than those who are breastfed, however constipation is a rare event in all newborns and infants.

- The stools of breastfed babies may vary considerably in texture, colour and frequency. In the child who is thriving, this variation should cause no alarm. Sometimes a breastfed baby will not pass any stools for several days; this should not cause any concern in babies over six weeks. In younger babies this may indicate a low milk intake. For babies less than four weeks old refer to the Breastfeeding Assessment form. http://www.babyfriendly.org.uk/pdfs/bf_assessment_tool.pdf

- Constipation may occasionally occur during the early stages of weaning in breastfed babies and care should be taken to prevent this by maintaining regular breastfeeding.

- Any cause of dehydration may produce constipation in babies eg over concentrated bottle feeds, excess sweating caused by fever, excessive clothing or exposure to high temperatures.

- The older child who is eating a low fibre diet may also suffer constipation.

15.1 Treatment of constipation

- enquire about normal bowel habit to help quantify the problem;
- check that bottle feeds are made up correctly according to the manufacturer’s instructions;
• Give cooled boiled water up to six months of age. After six months well diluted unsweetened pure fruit juice (diluted to one part fruit juice to ten parts water) between feeds. The addition of sugar, glucose or honey to water/feed is not recommended.

• Give the following high fibre foods to infants over 6 months: cereals such as Weetabix, porridge or Ready Brek, wholemeal/wheaten bread, fresh/dried fruit, pulses (peas, beans, lentils) and fresh and frozen vegetables. A child’s portion of fruit and vegetables is equivalent to the size of child’s palm. Any increase in fibre intake must be accompanied by an increase in fluid intake.

Note: Pure bran must not be given to children under 5 years.

If a child does not respond to this treatment medical advice should be sought.
Diarrhoea may be defined as a change in bowel habit for the individual child resulting in substantially more frequent and/or looser stools. Medical advice should be sought for an infant with these symptoms.

In bottle fed infants, mild to moderate cases may be treated at home by stopping formula and giving appropriate prescribable oral rehydration solutions (ORS) eg Dioralyte, Dextrolyte or Rehydrate. Infants who are not weaned should recommence on full strength lactose containing formula as soon as possible following rehydration with ORS (which is normally given over four hours).

Breastfed infants should continue to breastfeed through the rehydration and maintenance phases of their acute gastroenteritis illness. Sugary drinks eg cola drinks and ‘home made’ salt/sugar solutions should not be used, as they are unsuitable for rehydration therapy. If the diarrhoea does not respond to treatment, further medical advice should be sought and if an infant is vomiting as well as having diarrhoea, the danger of dehydration is greatly increased and urgent medical attention should be sought.
Acquired Lactase Deficiency

True primary lactose intolerance due to enzyme deficiency is extremely rare and does not usually present until two to five years of age. However, in bottle fed infants, inappropriate use of lactose free formula delays the diagnosis of cow’s milk protein allergy (CMPA) as symptoms are commonly misinterpreted as lactose intolerance. See section 4 Ch.23 on Cow’s Milk Protein Allergy.

Primary lactose intolerance due to enzyme deficiency rarely causes symptoms in the preschool years. From the age of four or five years, it is an occasional cause of gastrointestinal symptoms, especially in children from a non-Caucasian, ethnic background.

The continuing common practice to prescribe a lactose free milk formulae for infants with continuing unexplained diarrhoea has led to both a missed and delayed diagnosis of cow’s milk protein allergy in a significant number of infants.

Transient secondary lactose intolerance can follow an episode of infective gastroenteritis, and this can present at any age. Most of the children will only need lactose removed from their diet for an initial six week period.
Weaning

The Department of Health and WHO recommends that weaning begins from the age of six months (twenty six weeks). From this age infants need more iron and other nutrients than breast milk or infant formulae alone can supply. From six months, babies:

- are able to actively move the upper lip down to clean the spoon;
- chew;
- use the tongue to move food from the front to the back of the mouth;
- are curious about other tastes and textures;
- develop eye-hand co-ordination;

Older babies more readily accept a diet with varied textures, tastes and amounts. Vitamin supplements, such as Healthy Start vitamins, may be introduced at this stage.

Early introduction of solids may predispose the infant to age-related gastrointestinal disease during the first six months of life as the human gut is functionally immature at birth.

If parents choose to introduce solids earlier than this they should be advised not to do so before seventeen weeks. Early weaning requires additional advice (see section 3 Ch. 18.4).

NOTE: Food should always be offered from a shallow spoon and never added to bottles. This produces an over concentrated feed, which may lead to hyperosmolar states. The thickened feed may also block the teat of the bottle. Thickened feeds can also increase the risk of choking and can cause acute thirst. In addition, the infant needs to learn how to take food from a spoon.
Infants should never be left alone when eating, as they may choke or inhale small hard pieces of food.

For further advice on weaning refer to the leaflet ‘Weaning Made Easy’, PHA.

### 18.1 Preparation of weaning foods

Family foods may be cooked in bulk, without added salt or sugar, and frozen in individual portions. These should be allowed to defrost thoroughly, then be reheated to boiling and allowed to cool before feeding.

Commercial baby foods should be transferred into a bowl before feeding. Only the quantity of food required should be heated and the remainder should be stored according to the manufacturer's instructions.

### 18.2 How to wean

Weaning should be an enjoyable, relaxed and often messy experience. Food should never be forced and if a baby refuses food then it should be removed and that food offered again on another day.

Start with baby rice, smooth or well mashed cooked vegetable such as carrot, parsnip, potato, turnip, etc., smooth or well mashed banana, stewed apple, tinned fruit (in fruit juice), natural/plain yoghurt (whole milk varieties, if possible) and unsweetened custard.

One or two teaspoons of semi-solid food should be offered at first. The use of small shallow plastic spoons and special feeding bowls is recommended. After six months of age equipment does not need to be sterilized. As the baby learns to take food from a spoon the amount and number of spoon feeds will need to be increased. This should be guided by the baby’s appetite and interest in eating.

New foods do not have to be introduced one at a time, at three or four day intervals, unless there is a history of atopy in the family.
At this stage breastfeeding on demand or at least 500 to 600mls infant formula should continue to be used until at least one year of age. Cow’s milk may be used to mix foods but should not be used as a main drink until after one year of age.

A cup can also be introduced at this stage for both breastfed and bottle fed infants

**18.3 Foods to avoid:**

- **Salt:** including stock cubes as babies’ kidneys are not fully developed at six months of age and high amounts of salt / salty foods can be harmful.
- **Sugar:** encourages a sweet tooth and can lead to dental decay.
- **Honey:** avoid in the first year of life as honey can contain the botulinum bacteria. After the age of one year the infant gut matures and the bacteria is no longer able to grow. It is important to remember that honey is a sugar and can lead to dental decay.
- **Nuts:** children under five should avoid whole nuts. Products containing peanuts are safe for most children however if there is a history of conditions such as asthma, eczema or hay fever in the family (ie parents, brothers or sisters), parents should speak to their GP, health visitor or medical allergy specialist before giving peanuts to the child for the first time. (PHA, DHSSPSNI Weaning made easy)

After a couple of weeks the texture can be increased to include a few soft lumps and the variety of foods increased. In particular foods containing iron eg beef, lamb, pork, and egg yolk. Green vegetables, beans, lentils and fortified breakfast cereals should be included regularly.

By seven months food can be mashed with a fork and babies should be having three spoon feeds a day.

By nine months the infant can progress to chopped foods and by one year should be eating family meals.

**18.4 Weaning before six months**

If parents decide that they wish to wean their baby earlier, they should be advised not to wean before seventeen weeks. Babies should still continue to receive breast
milk on demand or at least 600mls infant formula. At this stage a number of foods need to be avoided due to the risk of developing allergies.

18.4.1 Foods to be avoided before six months:

- gluten containing foods eg. wheat flour, bread, wheat containing breakfast cereals, rusks, pasta;
- nuts and seeds including peanut butter and other nut spreads;
- eggs;
- cow’s milk and this also includes using milk to mix into foods;
- fish and shellfish;
- citrus fruits including fruit juices;
- soft and unpasteurised cheeses;
- salt (including stock cubes);
- sugar;
- honey;

All feeding equipment needs to be sterilised for babies less than six months old. Suitable first foods at this stage include baby rice, pureed potato, carrot, parsnip, turnip, pureed banana, and unsweetened stewed fruit.

Start with a teaspoon of a suitable food mixed with breast milk or infant formula to a thin consistency. As the baby gets used to taking food from a spoon the variety of food can be increased, (taking into account the list above). Again, foods should be of a pureed consistency. Food should be thoroughly cooked.

Gradually increase the amount of food offered and the number of spoon feeds. The texture and variety of food should also be increased. It is important to always ensure suitable iron rich foods are included as this happens. The variety available to be offered is dependent on the baby’s age.
18.5 Pre-term Infants

Advising parents when to wean an infant born prematurely can present difficulties. Very occasionally a premature baby may benefit from weaning before five months; however this must be discussed with the healthcare team. Current advice is to begin weaning between five and eight months, the age from their birth date and not the corrected age date. The decision as to when to start weaning should include signs that the baby is ready to begin weaning and these include:

- the baby showing interest in other people eating;
- the baby putting things into his or her mouth and drooling;
- the baby seems ready for something new;
- the baby seems less satisfied with milk alone;
- the baby may begin waking in the night, where before they slept longer;

Breast milk or infant formula should be the only nourishment prior to this and expert advice can be sought from the paediatrician who can make a referral to a registered paediatric dietitian.

18.6 Summary of suitable foods and drinks

18.6.1 Milk

Breast, formula or follow-on milk should be continued until 1 year of age and longer if considered necessary. Cow’s milk products, such as custard and plain unsweetened yoghurt (whole milk varieties, if possible), or whole cow’s milk for mixing food may be introduced after six months.

18.6.2 Eggs

Well-cooked eggs may be introduced from six months.
18.6.3 Fluids
Water should be boiled and cooled until the baby is six months old. Baby juices and herbal drinks are not needed, but if given they should be used sparingly, and only at meal times from a feeding cup to protect dental health.

- Colas, squashes, fizzy drinks and 'diet' drinks are unsuitable for infants.
- Tea (with or without sugar) should not be given to infants as a main drink. The tannin in tea binds with iron and other minerals and if sugar is added, it is a risk to dental health.
- Unsweetened orange or other fruit juice may sometimes be given to infants as a source of vitamin C to assist iron absorption, particularly in the case of vegetarians. This juice should be diluted to a level of 1:10, given from a cup at meal times and never in a bottle at bedtime.

18.7 Comparison of home prepared with commercial baby foods

The majority of the infant's food should come from family meals. In general, home prepared weaning foods have many advantages over commercial baby foods (see table below). Health professionals should take the opportunity at antenatal and baby clinics to advise on the adaptation of family food for weaning. Advice on the use of appropriate commercial foods should also be given, e.g. more use of savoury meals and fruit purees rather than puddings.

"If parents are giving predominantly manufactured foods, it is important that the home prepared foods should also be given to accustom the infant to the greater ranges of flavour and texture that they provide." 56

(Weaning and the Weaning Diet, Committee of Medical Aspects of Food Policy, 1994)
Comparison of home prepared and commercial baby foods

<table>
<thead>
<tr>
<th>Home prepared foods</th>
<th>Commercial baby foods</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Cheap.</td>
<td>• Expensive.</td>
</tr>
<tr>
<td>• More control over ingredients.</td>
<td>• Fixed ingredients - may not be desirable eg. sugar, gluten.</td>
</tr>
<tr>
<td>• Infant becomes accustomed to family foods.</td>
<td>• Infants may reject family foods.</td>
</tr>
<tr>
<td>• May be produced in bulk and frozen in small amounts.</td>
<td>• Large contents of tin / jar may be wasted in early stages of weaning.</td>
</tr>
<tr>
<td>• Texture of food may be varied to suit various stages of weaning.</td>
<td>• Hard lumps of &quot;junior&quot; or &quot;stage 2&quot; foods may be rejected by infants.</td>
</tr>
<tr>
<td>• Unknown nutritional content eg food may be overcooked.</td>
<td>• Known nutritional content. However parent has no quality control over the process.</td>
</tr>
<tr>
<td>• Not always convenient eg. inadequate home cooking facilities, poor family diet, etc.</td>
<td>• Convenient. Useful when away from home, travelling, etc.</td>
</tr>
</tbody>
</table>

18.8 Infant led weaning

A recent study by researchers at the University of Nottingham\(^{57}\) have suggested that when weaning, children who are offered a variety of finger foods and allowed to feed themselves are less likely to become overweight than those fed pureed food.

Caution is recommended as this study was based on a small sample (155 parents, 92 baby led and 63 spoon fed) and relied on self report. Further research will be required. There may be a potential for a nutritionally deficient diet if the choice is left with the child and the best approach is for the parent/carer to offer finger food alongside traditional weaning advice.
Nuts / Hard particles

The consumption of nuts, crisps or other hard particles should be discouraged in infants and young children. These may be inhaled rather than swallowed and cause choking and suffocation. Children under the age of five years should not be given whole nuts to eat. If there is no family history of allergy, peanut butter and ground nuts may be included in the diet from six months.

19.1 Feeding and swallowing difficulties

If a child shows distress and / or difficulty swallowing it is important to be clear that this is not due to a physiological problem. Medical referral along with a referral to a speech and language therapist should be recommended. If the swallowing system is healthy and there are no identifiable problems with strictures or function it is likely that the difficulties have a psychological basis.

Pseudodysphagia (an irrational fear of choking and / or swallowing) usually develops after a traumatic experience of vomiting or reflux which leaves the child in an anxious state because of a psychological connection made between food going into the mouth and its regurgitation. Children can also be resistant to new or certain foods and may need a slow programme of systematic desensitisation. Referral to clinical psychology may be appropriate.
These are substances added to foods to improve their appearance, texture or keeping qualities. Total removal of food additives is neither practicable nor achievable and indeed some food additives improve the nutritional value of a food item. The consumption of excess additives is not recommended and this can be achieved by using family foods and unprocessed foods as often as possible and limiting confectionery, sweets and soft drinks which contain a lot of additives.

Some food additives are natural substances and some are synthetic. Any additives put into foods must, by law, be shown on the label. Additives with E numbers have been tested and passed as safe for use in EU Countries.

Intolerance to food additives is very uncommon however a small number of children have been found to be intolerant to certain food additives. If food additive intolerance is suspected it is essential that the diet of the child does not become nutritionally inadequate due to overzealous and often unnecessary dietary restriction imposed by parents or advisers. Such children should receive dietary advice from a registered dietitian. The association of food additives with hyperactivity and related problems remains unproven.
Inborn Errors of Metabolism

Children with inborn errors of metabolism such as Phenylketonuria and Galactosaemia will require lifelong adherence to special diets. These children require specialised medical and dietary advice and monitoring.
22 Vitamins and Minerals

22.1 Vitamins A, D, and C

“Breastfed infants under six months of age do not need vitamin supplementation provided the mother had an adequate vitamin status during pregnancy.”\(^{58}\)
(Weaning and the Weaning Diet, Committee of Medical Aspects of Food Policy, 1994)

If there are doubts about the nutritional (see page 12 Ch 3.3) status of the mother during pregnancy, vitamin supplements may be given to the baby from one month of age. The vitamin supplements used should be sugar free.

“Bottle fed infants who are consuming 500ml infant formula or follow-on milk a day do not need vitamin supplementation because these manufactured products are fortified with vitamins”\(^{59}\)
(Weaning and the Weaning Diet, Committee of Medical Aspects of Food Policy, 1994)

Vitamin A, C and D supplements should be given to a child from six months of age (breastfed babies and infants drinking less than 500mls of infant formula). These supplements should be continued until five years of age unless the child's diet contains plenty of vitamin A, C and D rich foods and the child has moderate exposure to sunlight. Infants and children should not be placed in direct sunlight, where they would be at risk of sunburn. Vitamin C is included in the supplement due to families on lower incomes tending to have less Vitamin C in their diet.

Vitamin A, C and D supplements should be particularly encouraged until five years of age in children from traditional Asian or Islamic communities, children born with poor stores of vitamin D including pre-term babies and children who are poor eaters.
Healthy Start vitamins are available for those on Income Support and Job Seekers Allowance and the recommended dose of 5 drops (0.14 mls) provides: Vitamin A 233mg. Vitamin C 20mg and Vitamin D 3 7.5mg.

22.2  Iron

Babies born at term have accumulated an iron store which can meet the infant’s iron requirements for the first four to six months of life. Pre term babies do not have these iron stores and are particularly vulnerable to deficiency during the first year. Breast or formula milk supplies all a healthy term infant’s nutritional needs for the first six months of life. Thereafter iron intakes need to be increased to meet the increasing demands of the growing infant. Iron deficiency is the most common nutritional disorder during early childhood in the UK. Iron deficiency can cause apathy, reduced exercise capacity and poor appetite. Iron deficiency anaemia in toddlers is also associated with psychomotor delay.

22.2.1 Prevention of iron deficiency

After six months, the amount of iron from breast milk or formulae cannot meet increasing needs and therefore adequate intakes of iron as well as other minerals must be provided from other dietary sources.

- Dietary advice around the time of weaning is particularly important. Good sources of iron include red meat, liver, cooked lentils and beans (pulses), green vegetables, iron fortified cereals and egg.
- Foods containing haem iron such as red meat, liver, fish, poultry and meat products should be introduced by six to eight months unless the infant is being weaned on a meat free diet.
- Adequate Vitamin C should be ensured with meals to assist iron absorption from foods containing non haem iron eg cereals, pulses and green vegetables. This is particularly important if the diet is meat free.
- Foods which are poor sources of iron, such as cow’s milk, should not be consumed as main foods until a mixed diet is well established and likely to
provide adequate bio available iron from other sources. Breast milk, infant formula or follow on milk are therefore recommended in preference to cow’s milk as the main drink before twelve months of age.

- The absorption of iron from breast milk is greater if breastfeeds are given separately from solid foods.
- If there are concerns about the adequacy of iron in the child’s diet after twelve months, continued use of iron enriched infant formula or follow on milk as a main drink should be considered.
- Drinks, which are known to inhibit iron absorption such as tea and coffee, should be avoided.
SECTION 4

Allergies
23 Allergies

Food allergy is an adverse immune response to food and although it is one of the most common allergic disorders a true allergy to food is uncommon (see NICE guidance: Food Allergy in Children and Young People, Feb. ‘11^60). Dietary restriction should not be undertaken without a clear diagnosis.

23.1 Cow’s Milk Protein Allergy (CMPA)

Cow’s milk protein allergy is the most common infant food allergy. UK prevalence of cow’s milk allergy in early childhood has been recorded at 2 to 3 %. However many infants show suspected symptoms of CMPA.

Diagnosis is difficult because CMPA symptoms are complex, generally involving one or more organ systems such as the skin, gastrointestinal and respiratory tract. Symptoms may present as acute IgE mediated antibody reactions within two hours or more delayed reactions. An initial detailed family history focusing on any of clinical atrophy followed by a detailed personal history is key to diagnosis.

There are mild, moderate and severe spectrums of both IgE and Non-IgE CMPA. However, severe, acute IgE reactions have immediate life threatening potential in the form of anaphylaxis and require emergency medical treatment with onward urgent referral to a local Paediatric Allergy Service.

23.2 Management of CMPA in a formulae fed infant

For infants with strongly suspected CMPA, it is appropriate to perform a trial exclusion of cow’s milk protein, as a diagnostic tool. Choose a milk free formula from section 4 Ch. 23.5. Infants who respond and who require continued milk exclusion will benefit from referral to a paediatric dietitian for nutritional assessment and
weaning advice. It is essential to continue to maintain the infant on a strict milk free diet.

Usually extensively hydrolysed formula is adequate unless symptoms are moderate to severe. The challenging taste of the new formula must be overcome. If parents are experiencing problems establishing their child on the new formulae, then consider referral to a paediatric dietitian for further advice. Again diagnosis often requires temporary exclusion of cow’s milk protein in formula and weaning foods.

23.3 CMPA in breastfed infants

Occasionally, a breast fed infant may present with food allergy. In such cases the allergy is usually manifests with the first introduction of cow’s milk in formulae or weaning foods. Infants with severe symptom reactions need referred for urgent medical assessment. Many infants with CMPA tolerate the low levels of cow’s milk protein in breast milk. However where CMPA is suspected in an exclusively breast fed infant; it may be appropriate to temporarily remove dairy from the maternal diet, and in addition if the infant is over six months of age the weaning diet, for example for a two to four week trial. If there is no benefit, resume normal maternal (and weaning) diet. If the infant responds well and continued CMPA exclusion is necessary refer for dietetic and medical advice.

The parents of breast fed infants with diagnosed CMPA may need advice on complementary formulae feeds. If complementary feeds become necessary or are needed to make up weaning foods choose suitable formulae from section 4 Ch. 23.5 However the taste must be introduced very gradually.

23.4 Acquired lactase deficiency

This is a condition, which occurs quite commonly in Asians and some Africans. After infancy the level of lactase decreases and thus the ability to digest cow's milk or cow's milk products lessens. The child may be able to tolerate up to 250mls of milk but quantities greater than this will promote diarrhoea. In cases such as these symptoms will most commonly appear in the one to five year group, a lactose
tolerance test should be carried out and, if positive, low lactose formula should be given instead of cow’s milk.

23.5 Summary of suitable and unsuitable products for cow’s milk protein allergy

23.5.1 Suitable Hypoallergenic Formulae under one year

Extensively Hydrolysed Formulae (EHF)
- Nutramigen LIPIL 1 (under 6 months);
- Nutramigen LIPIL 2 (6 months +);
- Pepti-Junior;
- Pepti;

Amino Acids Formulae (AAF)
- Neocate (0-12 months);
- Nutramigen AA;

23.5.2 Suitable Formulae Over one year
- Neocate Advance;
- Neocate Active;

23.5.3 Unsuitable Formulae
- modified Formulae for minor digestive problems (eg. Easy Digest, Comfort);
- goats milk or formula;
- soya formula (See exceptions section 9.3);
- any non formula milk eg. UHT soya drink, rice milk;
- cow’s milk formulae;
- lactose free formulae;
- anti-reflux formulae;
23.6 Peanut allergy

The prevalence of peanut allergy appears to be increasing and it is thought to be lifelong. Reactions can be severe to fatal and appropriate medical advice must be given to those who have a suspected allergy to peanuts. Treatment involves avoiding all contact with peanuts. It is advisable to avoid all other nuts including eating, touching and inhaling. Referral should be made to a state registered dietitian.

Peanuts and peanut products should not be given to children with an atopic family history until at least three years of age however products containing peanuts are safe for most children. If there is a history of conditions such as asthma, eczema or hay fever in the family (ie parents, brothers or sisters), parents should speak to their GP, health visitor or medical allergy specialist before giving peanuts to the child for the first time. (PHA, DHSSPSNI, Weaning made easy) For children from non-atopic families there is no need to delay the introduction of peanuts. Peanuts of a suitable texture (eg peanut butter) can be introduced from six months of age. Whole nuts should be avoided until five years of age to reduce risk of choking and inhalation.

23.7 Primary Prevention of Allergy and Food Intolerance

23.7.1 Weaning and a family history of atopy disease

Where there is a family history of atopy disease mothers should be advised to breastfeed for at least six months and weaning before six months should particularly be discouraged. If the infant is formula fed hypoallergenic milk is required, an amino acid or extensively hydrolysed formula may be prescribed following medical advice. The British Dietetic Association’s Food Allergy and Intolerance Group have produced a statement on managing infants at risk of developing food allergies. This recommends not weaning before seventeen weeks and not later than six months and offering least allergenic foods first such as rice, root vegetables, pear, stone fruits, then white meats and cereals. Higher, potentially, allergic foods may be introduced carefully, one at a time, in small amounts at three to four day intervals. If reactions do occur, seek specialist medical advice.
23.7.2 Weaning and a family history of coeliac disease (Gluten Enteropathy)

If parents choose to wean early avoid traditionally allergenic foods. Infants with a family history of coeliac disease (gluten enteropathy) should be given gluten containing foods from six months of age. If concerns arise regarding gluten intolerance, seek medical advice.61

23.7.3 Weaning infants with CMPA

Infants with diagnosed CMPA allergy need referral to a paediatric dietitian for individual weaning advice. Up to 50% of infants with cow’s milk protein allergy will react to at least one other food of which the most common is egg. Weaning should commence at six months of age, with the potentially least allergenic foods first eg rice, root vegetables, pear, stone fruits, then white meats and cereals.

<table>
<thead>
<tr>
<th>Type of Formula</th>
<th>Product and Manufacturer</th>
<th>Age Range</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extensively Hydrolysed (EHF)</td>
<td>Nutramigen 1 (Mead Johnston)</td>
<td>From birth – 6 months</td>
<td>Lactose free</td>
</tr>
<tr>
<td>Caesin Based EHF</td>
<td>Nutramigen 2 (Mead Johnston)</td>
<td>0 - 6 months</td>
<td>54% MCT</td>
</tr>
<tr>
<td></td>
<td>Pregestimil (Mead Johnston)</td>
<td>6 months +</td>
<td>Lactose free</td>
</tr>
<tr>
<td>Whey based EHF</td>
<td>Aptamil Pepti (Cow and Gate)</td>
<td>From Birth</td>
<td>Reduced Lactose contains MCT fat, aids malabsorption.</td>
</tr>
<tr>
<td></td>
<td>Pepti- Junior (Cow and Gate)</td>
<td>From Birth</td>
<td>Contains lactose, Prebiotics</td>
</tr>
<tr>
<td>Non-dairy based EHF</td>
<td>Pepdite</td>
<td>0 – 1 year</td>
<td>All contain meat derivatives, generally poor taste. Suitable for</td>
</tr>
<tr>
<td></td>
<td>Pepdite MCT (SHS Nutricia)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
As weaning progresses, one new food should be introduced at three to four day intervals, and this food should be given daily for that time period to assess whether it has caused any side effects.

The most common allergens are: fresh cow’s milk; egg; wheat; nuts; citrus fruits. These should not be introduced into the diet until after six months of age. Vitamin supplements should be given from the age of one to five years (from six months for breastfed infants), particularly in those at risk of nutritional deficiency. The range of foods given should be gradually increased until the child is having a full and varied diet by the age of approximately one year.

In the case of an infant with suspected food allergy/intolerance, it is important that the diagnosis is confirmed. The public often attempt self-diagnosis and treatment of food allergic disease when medical and dietetic advice is not available or forthcoming. The dietary treatments undertaken may often be unnecessary and indeed potentially harmful. The use of soya formula should not be recommended.

<table>
<thead>
<tr>
<th>Elemental Amino Acid Formula</th>
<th>Over 1 year</th>
<th>malabsorption. Pepdite MCT (75% MCT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elemental for Over 1 year old</td>
<td>Neocate Advance (SHS Nutricia)</td>
<td>1 – 10 years</td>
</tr>
<tr>
<td></td>
<td>Neocate Active (SHS Nutricia)</td>
<td>1 – 10 years</td>
</tr>
<tr>
<td></td>
<td>Neocate LCP (SHS Nutricia)</td>
<td>From birth</td>
</tr>
<tr>
<td></td>
<td>Nutramigen AA (Mead Johnston)</td>
<td>From birth</td>
</tr>
<tr>
<td></td>
<td>Pepdite 1+ (SHS Nutricia)</td>
<td>Over 1 year</td>
</tr>
</tbody>
</table>
To better confirm the diagnosis, withdrawal and reintroduction of the suspected food or foods should be shown to respectively promote the disappearance and reappearance of symptoms. If an allergic reaction has been severe or an acute onset, reintroduction of the foods, often called ‘challenge’, should be carried out under medical supervision. Withdrawal of the food causing the problems may increase the sensitivity of the individual to that food; therefore in the case of a child with acute onset IgE mediated antibody type reactions, challenge may be deferred for several years or indeed may not be carried out at all.

If a child requires an exclusion diet it is vital that a registered dietitian gives the parents specific advice in order to ensure adequate nutrition.
SECTION 5

The Child 1-5 Years
24 Healthy Eating for the One to Five’s

Like the rest of the family, the child aged from one to five years needs to eat a variety of foods from the following five food groups:

- milk and dairy foods;
- bread, rice, potatoes, pasta (and other starchy foods);
- fruit and vegetables;
- meat, fish, eggs, beans and other non-dairy sources of protein;
- foods and drinks high in fat and/or sugar;

They need small amounts of food regularly throughout the day ideally as three small meals and two to three nutritious snacks. This is due to these children having small appetites and high requirements for energy and other nutrients. Diet, low calorie and low fat foods should be avoided. This information differs from the eatwell plate which relates to adults and children over the age of five years (www.eatwell.gov.uk) Appendix 10. The eatwell plate does not apply to the under two's, or those who are ill or on special diets. Between the ages of two and five years children’s eating habits should gradually move towards the eatwell plate.

24.1 Milk and dairy foods

Give about three servings from this group daily:

Includes: Milk, cheese, yoghurt, fromage frais and milk based dishes such as custard

Main nutrients: Calcium
- Protein
- Vitamin B12
- Vitamin A and D

What types of milk? Breast milk or whole cow’s milk from one year
Semi-skimmed milk - from two years providing the child is consuming a balanced and varied diet and growing
Skimmed milk not before five years

Ideas:
Macaroni cheese, cheese on toast, cauliflower cheese, potatoes and cheese sauce, milky puddings, yoghurt, fromage frais (not diet types)

One serving = 200mls (1/3 pt) milk or 30g (1oz) cheese or 125g pot of yoghurt or bowl of milk pudding

Children should have at least 350mls milk per day but no more than 600mls. From the age of one year children should be drinking from a cup and a feeding bottle should no longer be used. Children under the age of two need the extra fat and vitamins in full-fat dairy products.

24.2 Bread, rice, potatoes, pasta (and other starchy foods)

A variety of these foods should be served at all meal times and as snacks.
Includes: Breads, breakfast cereals, pasta, rice, oats, noodles, potatoes
Main nutrients: Energy Carbohydrates Fibre Calcium Some contain Iron B Vitamins

What types? Once a child is two years of age, more wholegrain and high fibre can gradually be added to the diet so that by five years of age they are used to a healthy adult diet. Too much fibre can interfere with absorption of iron and other minerals and can fill the child up too quickly to get all the calories they need. Unprocessed bran is particularly unsuitable for these reasons.
Ideas: Wholemeal/white/granary bread, toast, breadsticks, pitta bread, crumpets, breakfast cereal, pasta, rice, potato.

The amount of these foods eaten will vary from child to child and depend on the child’s appetite. These foods also make good between meal snacks.

### 24.3 Fruit and vegetables

Try to introduce at least five servings from this food group daily.

**Includes:** Fresh, frozen and tinned fruit and vegetables, dried fruit, fruit juice

**Main nutrients:** Vitamin C, Carotenes, Folate, Fibre and some carbohydrate

**Servings:** Aim for five child sized servings. Child sized servings are half of an adult serving eg. one and a half tablespoonfuls of vegetables, half a medium sized fruit (apple, banana, pear), one mandarin orange, one kiwi. Another estimation of fruit and vegetable portion size is to use what the child can hold in their hand as a guide.

**Ideas:** Vegetables served as soups, snacks or part of main meals; fruits served as desserts fresh, stewed or mixed with yoghurt. Finger snacks eg. apple, banana, cucumber, carrot and tinned fruit in juice or unsweetened diluted fruit juice. Dried fruits should only be given at meal times due to the concentration of sugars and they can get stuck in children’s teeth.
24.4 Meat, fish, eggs, beans and other non-dairy sources of protein

Encourage child to eat one to two servings from this food group daily.

Includes: Meat, poultry, fish, eggs, nuts, pulses (including beans, lentils and peas) and foods made from pulses (tofu, hummus, soya mince, and oily fish) Vegetarians and vegan diets please see page Ch. 30 p115

Main nutrients: Protein
Iron, B vitamins (especially B12), zinc, magnesium

Ideas: Beef, pork, lamb, mince, burgers, bacon, ham, chicken, turkey, liver pate, fish fingers, fish cakes, canned tuna, pilchards, sardines, salmon, baked beans, smooth nut and seed spreads (smooth peanut butter and tahini), textured vegetable protein, quorn, eggs.

Liver pâté should not be offered more than once a week, to avoid excessive vitamin A intake.
Whole nuts and seeds should not be given to children under the age of five as these may cause choking. It is important to grind nuts finely (see Section 4 Ch. 23.6 for information on peanut allergy).

24.5 Foods and drinks high in fat and/or sugar

Foods and drinks high in fat and/or sugar are the fifth main food group.

Includes: Butter, margarine, cooking oils, lard, mayonnaise, cream, chocolate, chips, crisps, biscuits, cake, pastries, rich sauces, sweets, sugar, sugary and fizzy drinks

Main nutrients: Some vitamins and essential fatty acids but also excessive amounts of fat, sugar and salt

Fat Some vitamins are only found in fats; it is important to give such foods as whole milk, yoghurt, cheese and oily fish. Young children, especially the under twos, need the concentrated energy provided by fat in their diet.
Between two and five gradually introduce lower fat dairy products and cut down fat in other foods so that by five the child is eating a healthy low fat family diet.

Sugar

Small amounts of sugary foods and drinks at mealtimes are acceptable. Regular contact with sugary foods and drinks will cause tooth decay. It is therefore important to reduce the amount of sugary foods given to the child between meals and at bedtime.

A guide appropriate portion sizes for children can be found in Appendix 9.
All infants and young children aged six months to five years should take a daily supplement containing vitamin A, C and D in the form of vitamin drops, to help them meet the requirement set for this age group. Healthy Start vitamins are available for those on Income Support and Job Seekers Allowance (see page 14) and the recommended dose of 5 drops (0.14 mls) provides: Vitamin A 233mg, Vitamin C 20mg and Vitamin D 3.75mg. Vitamin C is included in the supplement due to families on lower incomes tending to have less Vitamin C in their diet.

However, those infants who are fed infant formula will not need vitamin drops until they are receiving less than 500ml of infant formula a day, as these products are fortified with vitamin D. Breastfed infants may need to receive drops containing vitamin D from one month of age if their mother has not taken vitamin D supplements throughout pregnancy.

Vitamin A, C and D supplements should be particularly encouraged until five years of age in children from traditional Asian or Islamic communities, children born with poor stores of vitamin D including pre-term babies and children who are poor eaters.

<table>
<thead>
<tr>
<th>Age</th>
<th>Vit. Supplement</th>
<th>Special points</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-6 Mths</td>
<td>Breast fed</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>Mother requires Vit D supplement</td>
</tr>
<tr>
<td>0-6 Mths</td>
<td>Formula</td>
<td>No</td>
</tr>
<tr>
<td>6-12 Mths</td>
<td>Breast fed</td>
<td>Vit A&amp;D</td>
</tr>
<tr>
<td>6-12 Mths</td>
<td>Formula</td>
<td>No</td>
</tr>
<tr>
<td>1-5 years</td>
<td>Mixed diet</td>
<td>Vit A&amp;D</td>
</tr>
</tbody>
</table>
Milk and water are the preferred drinks. From twelve months children can take whole cow’s milk to drink instead of infant formula or follow on formula milk. Those breastfed may continue to breastfeed or switch to whole cow’s milk. Children over two years may be given semi-skimmed milk, provided they are eating a wide variety of foods and are growing well. At least 350ml of milk should be offered each day (but not more than 600ml).

Baby juices and herbal drinks have little nutritional value. Some contain high concentrations of sugar. In addition, acidity can cause dental decay and erosion of teeth. ‘Baby’ drinks are not needed, but if given they should be used sparingly, well diluted and given in a feeding cup at meal times only.

If fruit juices other than “baby” fruit juices are given they should be diluted to ten parts water and one part juice and offered in a cup with meals. Colas, squashes, fizzy drinks, diet drinks should not be given to children due to their sugar, acid or artificial sweetener content. Tea, coffee and cola drinks are not suitable for infants and young children. They contain the stimulant caffeine. If sugar is added there is risk to dental health. Tannins in tea bind with iron and other minerals and reduce absorption.

From six months onwards, infants should be encouraged to drink from a trainer cup (with a lid) rather than a bottle, to help reduce the risk of dental caries. Infants should not be put to bed with a bottle.

Soya drinks should be used with caution. They contain high levels of sugar and can cause dental caries. However unsweetened varieties are available. Attention should be given to ensuring adequate vitamin and mineral intake, especially calcium, if these drinks are given frequently. Soya drinks tend to be low in fat and not suitable as a main milk drink until two years.
Lidded free flow cups should be used rather than non-spill valved ones, which can extend drinking times and allow teeth to be bathed in the drink for longer.
27 Snacks

Young children need nutritious snacks in addition to regular meals to ensure that they meet their energy requirements. Snacks should be sugar free, low in fat, high in fibre and low in salt. Healthy snacks included toast, bread and butter, and sandwiches with savoury fillings, pieces of fruit and vegetables, natural yoghurt, milk.

27.1 Whole nuts and crisps

Whole nuts, crisps and other hard particles should not be given to children under the age of five as they may cause choking. It is important to grind nuts finely (see section 4 Ch. 23.6 for information on peanut allergy).
SECTION 6

Obesity
28 Overweight and Obesity

Overweight and Obesity

Obesity is a significant health concern in Northern Ireland and the regional strategy for health and well-being, ‘A Healthier Future’, builds on the PFA target ‘to halt the rise in obesity in children and young people by 2010’ and aims to see a 50% reduction in levels of obesity in children by 2025.

Children have high-energy requirements because they are growing. A varied and nutritious diet is essential for their development. However, like adults, if they take in more energy in the form of food and drink than they use up through natural bodily processes and physical activity, the extra energy is stored in their bodies as fat. Children who are overweight tend to grow up into adults who are overweight. They therefore have a higher risk of developing serious health problems in later life, including heart attack and stroke, type 2 diabetes, bowel cancer, and high blood pressure. The risk of health problems increases the more overweight a person becomes.

Information taken from the Child Health System indicates that in 2008/09, 22.5% of children entering P1 are already overweight (17%) or obese (5%). Prevalence of overweight and obesity are higher among girls (19.5% and 6% respectively) at this age than among boys (15% and 4.5% respectively).

A child can be defined as obese if their weight is more than two centiles greater than height. Body mass Index (BMI) and waist circumference may also be plotted on the appropriate centile charts in the assessment of overweight and obesity. The aim of treatment is to hold the child’s weight steady while height increases in proportion to weight.
28.1 Prevention of overweight in infants

Exclusive breastfeeding, sustained over several months, appears to reduce the risk of overweight and obesity in later childhood.

If the infant is bottle fed, the preparation of the feed should be checked to make sure it is not over-concentrated and that there are no additions to the bottle such as sugar, rusk, and cereal.

Overfeeding may occur if reasons other than hunger are not considered in a crying infant, e.g. boredom, tiredness or discomfort. Parents and carers should be discouraged from encouraging the infant to always finish the bottle and they should look for signs to satiety rather than the amount of feed left in the bottle. Solids should not be introduced before six months; as the quantity of solids increases, the volume of milk should be reduced.

28.2 Prevention of overweight in preschool children

The whole family should be encouraged to a healthy nutritious diet. Milk should be changed to semi-skimmed when the child is two years old and limited to one pint per day provided the child consumes a varied diet.

- fried food should be avoided;
- butter and margarine should be used sparingly;
- drinks other than water or milk should be limited and low sugar options chosen;
- fruit and vegetables should be given daily;
- portion sizes should be age-appropriate;
- treats should be of a non-food type e.g. an outing, comic or crayons;
- physical activity should be encouraged and the whole family involved;
Section 7

Feeding Challenges
Fussy eaters

It is quite normal for an infant or child to refuse food occasionally and become fussy about the food that they eat. In most cases the child is found to be adequately nourished and this can be checked by weighing, measuring and examining the child. Parents may be reassured by keeping a food diary. Star charts may work for the older child.

Parents should be reassured that the fussy picky eating behaviours that emerge around eighteen months to two years are a normal part of child development, as this can be stressful for parents and result in anxious mealtimes and forced feeding. Children will usually grow out of this. Parents are often anxious that their child is refusing the foods which they are supposed to eat more of such as fruit and vegetables. Health care professionals can talk to parents about the importance of exposure, and repeated exposure to foods (it may take up to twenty presentations of a food before a toddler learns to like it and most people give up well before then) and also the importance of parents showing that they too eat healthy foods. More than one pint of milk per day can severely impair a child’s appetite for other foods.

All children should be given a vitamin supplement of vitamins A and D as many children of this age do not get enough of these vitamins from their food. This is of particular importance to children who are fussy eaters. See Section headed Vitamin Supplements.

29.1 Making Mealtimes Easier

- Main meals should be regular so that the child knows when to expect food.
- The child should sit at a table with other members of the family.
- Helpings should be kept small. Second helpings may be offered if appropriate.
• New foods should initially be introduced in small qualities and may need to be offered on several occasions before they are accepted.
• It may be helpful to ask parents to share control about food intake with the child, ie parents decide which foods are served, child decides how much to eat as this may facilitate the child’s appetite regulation.
• Mealtimes should be limited to twenty to thirty minutes. If the meal is not eaten in this time it should be taken away without any comment and no alternatives given.
• Distraction such as television should be avoided at mealtimes.
• Offering sweets or puddings as a reward should be avoided as this can reinforce the idea that they are more desirable that savoury foods.
• The child should feed him or herself if possible.
• Controlling feeding and being over anxious about mess can lead to food refusal or behavioural problems.
• The child should not be chased around the room with food.
• The child should never be forced to eat.
Vegetarian and vegan diets

The Vegetarian Society’s definition of a vegetarian is:
“..........someone living on a diet of grains, pulses, nuts, seeds, vegetables and fruits with or without the use of dairy products and eggs.”

A vegetarian diet does not contain meat, poultry or fish. A vegan diet contains no animal products. Parents and carers should be asked about which foods they are giving their children. A well-planned vegetarian diet can be as nutritious and balanced as those containing meat and allow normal growth and development. The same guidelines for weaning and feeding the one to five years old apply to the vegetarian child. Children on a vegan diet require careful dietary planning and vitamin supplementation from a registered dietitian.

30.1 Vegetarian / Vegan diets

There are various categories of vegetarians, who exclude different foods. Lacto Ovo vegetarians do not eat meat but take milk and eggs. Ovo vegetarians will eat eggs but not milk or meat. Vegans exclude all meat and animal derived products eg milk, eggs, honey. Vegans require foods fortified with B12 (fortified cereals, Marmite, Vegemite) and a vitamin B212 supplement. Children on a vegan diet also require riboflavin supplementation. Food with moderate calcium content (tofu, chickpeas, soya mince, lentils) should be included in the diet. Calcium will also be provided by continued breastfeeding or by giving soya infant formula milk until two years of age. Calcium-enriched cartoned soya drinks are suitable from two years. A calcium supplement is needed when a child will not take a minimum of two thirds of a pint (400mls) of formula or calcium -enriched soya milk.

30.2 Infants

Breast milk or infant formula should be given throughout the first year. Vegan infants (ie those on a diet excluding all animal products) should have breast milk or soya
based infant formula until at least two years of age. To avoid vitamin B12 deficiency in breastfed vegan infants, the maternal diet should be checked for nutritional adequacy. To ensure an adequate intake of all the essential amino acids, vegetable sources of protein (pulses, nuts) should be eaten with a cereal food (bread, rice, pasta), eg beans on toast, lentil curry with rice. Nuts and seeds should be finely ground or made into a paste. Iron absorption from vegetables, pulses and cereals will be maximised by giving vitamin C rich foods (eg citrus fruits, tomatoes, broccoli, and peppers) and drinks with them. Infants on a vegan diet should receive vitamin supplementation, particularly vitamin B12 and riboflavin.

**Note:** The Department of Health does not advise the use of soya formulae for infants less than six months because of the possible oestrogenic effect. Soya formula is not recommended for premature infants.

### 30.3 Infant feeding for vegetarians

Breastfeeding should be recommended. If the parents choose not to breastfeed one of the following formulae should be chosen:

<table>
<thead>
<tr>
<th>Formulae Suitable for Vegetarians</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Milk based</strong></td>
</tr>
<tr>
<td>SMA Extra Hungry – <strong>powder only</strong> (SMA Nutrition)</td>
</tr>
<tr>
<td>SMA Follow on – <strong>powder only</strong> (SMA Nutrition)</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

### 30.4 Children

Energy-dense foods eg fats and oils should be included regularly in the diet. It may be necessary to choose some lower fibre cereal foods (white bread, pasta and rice) to prevent the diet becoming too bulky,
30.5 Weaning for vegetarians

Breast milk or a suitable infant formula is recommended to be used for two years and up to five years in vegan children. A cup should be introduced from six months. If a soya formula is being used it is important to safeguard dental health owing to the sugar content. Care should be taken to ensure that a nutritionally adequate diet is provided. Children being weaned onto a vegan diet will require supplements of vitamin B12 and riboflavin. Where there are doubts about the adequacy of intakes, the child should be referred to a registered dietitian for dietary assessment and advice. Examples of suitable weaning foods are given in the PHA leaflet ‘Weaning made Easy’.
31 At Risk Groups

31.1 Low income

The Low Income Nutrition and Diet Survey (2007) found that generally those on low income were less likely to eat wholemeal bread and vegetables. They tended to drink more soft drinks (not diet drinks) and eat more processed meats, whole milk and sugar. The average consumption of fruit and vegetables was one-half of the recommended five portions per day and there was evidence of inadequate nutritional status for iron, folate and vitamin D. As a result, the infants in these families may also have inadequate nutrient intakes. These families should be strongly encouraged to avail of free milk use vitamin supplements for infants and avail of the Healthy Start scheme.

31.2 Ethnic minority groups

Some religious or ethnic minority groups are at an increased risk of nutritional problems due to cultural or religious beliefs. Hindus and Sikhs generally exclude beef and all types of carnivorous animals. Jews eat meat that has been killed in a kosher method and avoid pork and only eat animals which have both a cloven hoof and chew the cud. Meat and dairy products are not consumed at the same meal and dairy foods cannot be eaten until three hours after eating meat. Eggs containing a blood speck cannot be eaten.

Muslims avoid pork and all fish must have fins and scales and meat must be slaughtered ritually (Halal). Alcohol is avoided.

Some groups tend to eat very hot or highly spiced foods, which are not easily digested by infants.

Chinese people tend to exclude dairy produce.

People from Eastern European countries, especially those from the former Soviet Union may delay initiating breastfeeding and follow a strict breastfeeding timetable including not feeding overnight. Early weaning, early introduction of cow’s milk and
the use of sugar to sweeten food and drinks including tea or herbal tea is traditional in a number of countries.

The Travelling Community culturally do not breastfeed. The lack of sanitation facilities or running water on Traveller’s sites may mean that it is very difficult to prepare feeds hygienically. It is important to raise awareness of these issues with this group.

As with vegetarians / vegans, ethnic minority groups should be encouraged to breastfeed their babies or if this is not possible, to use an appropriate recommended formula. Some cultures traditionally add solids to bottle feeds and this practice should be strongly discouraged for the reasons outlined earlier as should the tendency to introduce cow’s milk early which tends to increase the prevalence of iron deficiency anaemia. The dilution of cow’s milk which can lead to faltering growth and also anaemia should also be discouraged.

It is important to note that early weaning is traditional to many cultures, however this should be discouraged and weaning started at six months. It is important to encourage families to incorporate appropriate foods in keeping with their culture. Many savoury baby products contain meat, which has not been killed by the Halal method and these products are unacceptable to Muslims. Rice with the addition of family food items should be encouraged rather than a dependence on manufactured puddings and desserts.

Vitamin supplements should be given until the age of five years. The ethnic minority groups whose dress code does not allow skin to be exposed to the sun tend to have a greater incidence of rickets and the need for an adequate intake of vitamin D and calcium is even greater. If not breastfeeding, infant formula rather than cow’s milk should be given until one year of age, since it is fortified with vitamins and minerals.

There have been recent increases in the population of Black, Minority and Ethnic groups, many of whom either do not speak English or it is not their first language. They may be on low incomes and face particular difficulties feeding their babies.
Special attention should be given to these families to ensure that information is provided in a suitable format to enable them to feed their babies safely.

The PHA leaflet ‘Weaning made easy’ is now available to download and is available in a number of languages: http://www.publichealth.hscni.net/publications/weaning-made-easy-moving-milk-family-meals

UK WHO Growth charts are suitable for all children including those from all black, minority and ethnic groups.
Many children continue to suffer from tooth decay which is largely preventable as the principle cause is the frequent consumption of sugars in confectionary, snack foods and drinks. Healthy teeth and gums are important for biting and chewing speaking and appearance. For good oral hygiene:

- Brushing should start as soon as the first deciduous tooth erupts.
- Brushing should occur twice daily by cleaning teeth last thing at night before bed and at least one other time each day.
- Children under three years should use no more than a smear of toothpaste and must not be permitted to eat or lick the toothpaste from the tube.
- Family fluoride toothpaste (1350 – 1500ppm fluoride) is indicated for maximum caries control for all children except those who cannot be prevented from eating toothpaste. Advice must be given about adult supervision and the small amount to be used.
- Children between three and six years should use no more than a pea sized amount of toothpaste.
- Children need to be helped or supervised by an adult when brushing until at least seven years of age and must not be permitted to eat or lick toothpaste from the tube.
- Rinsing with lots of water after brushing should be discouraged. Spitting out excess toothpaste is preferable!
- Brushing is more effective with a small headed toothbrush with soft round ended filaments.

"Fluoride dietary supplements may be considered for those for whom the consequences of decay pose a hazard to general health or for whom dental treatment would be difficult because of their medical or physical condition" \(^{64}\) (The Scientific Basis of Oral Health, R.S Levine and C.R. Stillman-Lowe, 2004).
At risk categories include children with heart disease, cardiac defects, systemic disorders and those with special needs. They also include evidence of past caries activity, history of high caries in siblings, social deprivation and dietary indicators such as the use of infant formula which contain high levels of carcinogenic sugars.

### 32.1 Fluoride

In the absence of fluoride at a concentration one part per million (ppm), which has been demonstrated to convey lifelong resistance to dental decay, a similar effect can be achieved by either:

- Twice daily brushing with fluoride toothpaste.
- Prescribing fluoride dietary supplements for individuals who are considered to be at high risk of tooth decay.

At present there is no water fluoridation in Northern Ireland and all water supplies contain fluoride below the level of 0.2ppm. Twice daily tooth brushing with fluoride toothpaste is currently considered to be the most effective alternative method of preventing tooth decay.

#### 32.1.1 Fluoride supplement guidelines

- Advice on fluoride supplements should be given by dentists based on individual need.
- Health visitors, pharmacists, doctors and other health professionals are encouraged to advise parents of at-risk children to contact a dentist for advice.
- If fluoride supplements are being used, tooth brushing should take place at a different time for maximum effectiveness and reduced risk of fluorosis.
- The British Society of Paediatric Dentistry (BSPD) guidelines on fluoride supplement dosage, where the water has less than 0.3ppm of fluoride are as follows:
Fluoride supplements – recommended dosage

<table>
<thead>
<tr>
<th>Age</th>
<th>mg Fluoride / day</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 months – 3rd birthday</td>
<td>0.25</td>
</tr>
<tr>
<td>3 years – 6th birthday</td>
<td>0.5</td>
</tr>
<tr>
<td>6 and over</td>
<td>1.00</td>
</tr>
</tbody>
</table>

BSPD 1996
Paediatric Medicines

In the past the majority of medicines were sweetened to make them more appealing to children. The sugar in medicines may promote tooth decay. Many drug companies have now replaced the sugar with non-cariogenic sweeteners.

Where available the use of sugar free medicine is desirable, therefore it is important to check if a medicine contains sugar before prescribing or recommending its use. Liquid formulations of medicine should be used whenever possible as many solid-dose forms are not intended to be crushed. It may be inappropriate to add medicines to food because of the effect of the food on the medicine. Cooled boiled water is a more suitable vehicle and allows the medicine to be given on an empty stomach, where this is a requirement.
Faltering growth may be defined as failure to grow at the expected rate. This should be based on serial measurements. It may present as:

- weight crossing centiles in a downward direction (refer to thrive lines if available);
- actual weight loss;
- static weight or height;
- weight two or more centile lines below height centile line;

Causes are often multifactorial and may include:

- inadequate intake (food refusal, inappropriate restriction, feeding difficulties);
- malabsorption;
- increased requirements;
- emotional deprivation;

Further medical investigation is required if:

- the child appears ill or lethargic;
- downward trend in weight centile position continues despite dietary advice;
- weight and height differ from each other by more than two centile lines;
Appendix 1: Health Briefing PHA

Incidence, prevalence and duration of breastfeeding in the United Kingdom
1995 and 2000

<table>
<thead>
<tr>
<th>Age of Baby</th>
<th>England/Wales (%)</th>
<th>Scotland (%)</th>
<th>N Ireland (%)</th>
<th>United Kingdom (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birth</td>
<td>1</td>
<td>77</td>
<td>63</td>
<td>70</td>
</tr>
<tr>
<td>1 week</td>
<td>57</td>
<td>65</td>
<td>50</td>
<td>57</td>
</tr>
<tr>
<td>(exclusively breastfed)</td>
<td>54</td>
<td>61</td>
<td>47</td>
<td>54</td>
</tr>
<tr>
<td>2 weeks</td>
<td>43</td>
<td>49</td>
<td>40</td>
<td>44</td>
</tr>
<tr>
<td>(exclusively breastfed)</td>
<td>43</td>
<td>49</td>
<td>40</td>
<td>44</td>
</tr>
<tr>
<td>6 weeks</td>
<td>30</td>
<td>31</td>
<td>14</td>
<td>20</td>
</tr>
<tr>
<td>(exclusively breastfed)</td>
<td>(17 weeks)</td>
<td>29</td>
<td>35</td>
<td>(8)</td>
</tr>
<tr>
<td>9 months</td>
<td>14</td>
<td>19</td>
<td>15</td>
<td>15</td>
</tr>
</tbody>
</table>

Source: O.N.S. Infant Feeding Survey 2000 and 2005

As outlined above, the incidence, prevalence and the duration of breastfeeding in Northern Ireland remain lower than in the other countries studied in the 2005 ONS survey. It is well worth noting that the increase in rates between 2000 and 2005 was greater in Northern Ireland than elsewhere in the UK.
Appendix 2: The UNICEF UK Baby Friendly Initiative

Care in the hospital

The Ten Steps to Successful Breastfeeding

Every facility providing maternity services and care for newborn infants should:

1. Have a written breastfeeding policy that is routinely communicated to all health care staff
2. Train all health care staff in skills necessary to implement this policy
3. Inform all pregnant women about the benefits and management of breastfeeding
4. Help mothers initiate breastfeeding within an hour of birth
5. Show mothers how to breastfeed and how to maintain lactation even if they should be separated from their infants
6. Give newborn infants no food or drink other than breast milk, unless medically indicated
7. Practise rooming in - allow mothers and infants to remain together - 24 hours a day
8. Encourage breastfeeding on demand
9. Give no artificial teats or dummies to breastfeeding infants
10. Foster the establishment of breastfeeding support groups and refer mother to them on discharge from the hospital or clinic.
The UNICEF UK Baby Friendly Initiative: care in the community

The Seven Point Plan

1. A health care facility caring for mothers and babies in the community should:

2. Have a written breastfeeding policy that is routinely communicated to all
   health care staff

3. Train all health care staff involved in the care of mothers and babies in the
   skills necessary to implement the policy

4. Inform all pregnant women about the benefits and management of
   breastfeeding

5. Encourage exclusive and continued breastfeeding, with appropriately timed
   introduction of complementary foods

6. Provide a welcoming atmosphere for breastfeeding families

7. Promote co-operation between health care staff, breastfeeding support
   groups and the local community.

Recommendations of the National Institute for Health and Clinical Excellence

The National Institute for Health and Clinical excellence (NIHCE) in 2006
recommended that all maternity care providers implement an externally evaluated
structured programme that encourages breastfeeding, using UNICEF’s Baby
Friendly Initiative as a minimum standard.
Appendix 3: Guidance on Managing Children at Risk of Hypoglycaemia

UNICEF UK Baby Friendly Initiative Hypoglycaemia Guidance document

Appendix 4: Breastfeeding Assessment

UNICEF UK Baby Friendly Initiative Day 5 breastfeeding assessment tool


UNICEF UK Baby Friendly Initiative Day 10 -14 breastfeeding assessment tool

Appendix 5: Flow Chart on Mastitis Care Management


GAIN guidelines on the prevention, management and treatment of mastitis (Flow chart on page 28)
Appendix 6: Sources of Useful Information

Breastfeeding coordinators

<table>
<thead>
<tr>
<th>Name</th>
<th>Hospital</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gillian Anderson</td>
<td>Antrim Area Hospital</td>
</tr>
<tr>
<td>Helen McIroy</td>
<td>Royal Jubilee Hospital</td>
</tr>
<tr>
<td>Barbara Spratt</td>
<td>Mater Hospital</td>
</tr>
<tr>
<td>Audrey Moore</td>
<td>Altnagelvin Hospital</td>
</tr>
<tr>
<td>Rosemary Kerr</td>
<td>Causeway Hospital</td>
</tr>
<tr>
<td>Anna Maria McDonnell</td>
<td>Erne Hospital</td>
</tr>
<tr>
<td>Sandra Hewitt</td>
<td>Craigavon Area Hospital</td>
</tr>
<tr>
<td>Lesley McKeown</td>
<td>SEHSCT Community</td>
</tr>
<tr>
<td>Ann McCrea</td>
<td>WHSCT Community</td>
</tr>
<tr>
<td>Brigeen Canavan</td>
<td>WHSCT Community</td>
</tr>
<tr>
<td>Catherine Irvine</td>
<td>Ulster Hospital</td>
</tr>
</tbody>
</table>

Breast feeding support lines:

La Leche League: Mrs Sarah McCann, Volunteer Breastfeeding Counsellor

La Leche League,
29 Downshire Gardens,
Carrickfergus,
Tel: 028 93362387  www.lalecheleague.org

LLL GB National Helpline: Tel: 0845 120 2918

National Childbirth Trust

www.nctms.co.uk/res

Breast pump Loan Service: 33 Ballynahinch Road,
Carryduff
BT8 8EH
Tel: 028 9081 5050

Tiny Life: www.tinylife.org.uk
Regional Breastfeeding Strategy Coordinator: Janet Calvert,
Public Health Agency,
18 Ormeau Avenue,
Belfast
BT2 8HS
Tel: 028 9031 1611 www.publichealth.hscni.net

Royal College of Midwives: NI Board,
58 Howard Street,
Belfast
BT1 6PH
Tel: 028 9024 1531 www.rcm.org.uk

TAMBA: Twins and Multiple Births Ass.
216 Belmont Road,
Belfast
Tel: 028 9023 9050 www.tamba.org.uk

Regional Milk Bank Coordinator: Ann McCrea,
The Human Milk Bank,
Unit 2 The Cornsheads
Mill Street,
Irvinestown
Co Fermanagh
Tel: 028 6862 8333 TMB.IRVINESTOWN@westerntrust.hscni.net
Useful Resources

- The Pregnancy Book – Dept of Health, product number 286153
- Collection and Storage of Breast milk in the Neonatal Unit – UK Association of Milk Banks.
- Eating While You Are Pregnant (leaflet) – Food Standards Agency.
- Feeding Your Baby (leaflet) – Health Promotion Agency.
- Bottle feeding - Public Health Agency
- Bottle feeding – Dept of Health
- Good Food for Mums to Be (leaflet) – Eastern Area CRIS.
- Nutrition and Dental Health Guidelines, EHSSB.
- Off to a Good Start (leaflet) – Public Health Agency.
- Preparing for Pregnancy – Healthy Living, Healthy Baby (leaflet) – Eastern Area CRIS.
- Breastfeeding Your Ill or premature baby – Public Health Agency
- Breastfeeding and Returning to Work - Public Health Agency
Other Useful Websites

Breastfed Babies.org                  www.breastfedbabies.org
The Breastfeeding Network          www.breastfeedingnetwork.org.uk
Department of Health                www.dh.gov.uk
Department of Health, Social Services and Public Safety for NI                          www.dhssspsni.gov.uk
Public Health Matters              www.publichealthmatters.com
GAIN (Guidelines and Audit Implementation Network)                          www.gain-ni.org
Scientific Advisory Committee on Nutrition                                 www.sacn.gov.uk
World Health Organisation         www.who.int/en
NICE                                 www.nice.org.uk
Food Standards Agency              www.food.gov.uk
UNICEF UK Baby Friendly Initiative www.babyfriendly.org.uk


La Leche League LLL International   www.llli.org
LLL of GB                           www.laleche.org.uk
LLL of Ireland                      www.lalecheleagueireland.com
National Childbirth Trust          www.nctpregnancyandbabycare.com
Bliss                                www.bliss.org.uk
Foods for religious faiths          www.deni.gov.uk/guidance
Appendix 7: Guidance for Preparing Formula Feeds in the Home

Preparing a feed using powdered infant formula

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

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

**DH Food Standards Agency**
Appendix 8: Bristol Stool Chart

What should my stools look like?

The type of stool or faeces depends on the time it spends in the colon. After you pass faeces, what you see in the toilet bowl is basically the result of your diet, fluids, medications and lifestyle. You can use the Bristol Stool Chart to check what your stools are telling you. The Bristol Stool Chart shows seven categories of stool. Every person will have different bowel habits, but the important thing is that your stools are soft and easy to pass – like types 3 and 4 below.

Type 1–2 indicate constipation. Type 3–4 are ideal stools as they are easier to pass, and Type 5–7 may indicate diarrhoea and urgency. The Bristol Stool Chart was developed by K. W. Heaton and S. J. Lewis at the University of Bristol and first published in the Scandinavian Journal of Gastroenterology in 1997.
## Appendix 9:

### Healthy Family Toolkit: Nutrition Resources (SHSCT Healthy Family Toolkit resources 2008)\(^6^5\)

### Portion Sizes for Children

<table>
<thead>
<tr>
<th>Age</th>
<th>Age 1</th>
<th>Age 2-3</th>
<th>Age 3-5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Meal pattern</strong></td>
<td>3 Small meals and 3 snacks plus milk</td>
<td>3 Small meals and 1-2 snacks plus milky drinks</td>
<td>3 Small meals and 1-2 snacks plus milky drinks</td>
</tr>
<tr>
<td><strong>Meat, fish etc</strong></td>
<td>½ of 1 tablespoon or 20-30 g of minced/finely chopped meat with gravy/sauce; ½ of 1 hard cooked egg</td>
<td>11/2 tbsp or 20-30g chopped meat; 1 fishfinger; 1 sausage; 1 egg</td>
<td>2-3 tbsp or 40-80g meat; 1-2 fishfingers; 1-2 sausages; 1 egg</td>
</tr>
<tr>
<td><strong>Potato</strong></td>
<td>1 tbsp or 30g mashed</td>
<td>1-2 tbsp or 30-60g; 5 small chips</td>
<td>2-3 tbsp or 60-80g; 8-10 small chips</td>
</tr>
<tr>
<td><strong>Cheese</strong></td>
<td>20g grated</td>
<td>25-30g cubed or grated</td>
<td>30-40g</td>
</tr>
<tr>
<td><strong>Vegetables</strong></td>
<td>1 tbsp or 30g soft or mashed</td>
<td>1-2 tbsp or 30-60g or small chopped salad</td>
<td>2-3 tbsp or 60-80g</td>
</tr>
<tr>
<td><strong>Fruit</strong></td>
<td>½ or 1 piece 20-30g</td>
<td>1 piece or 80-100g</td>
<td>1 piece or 100g</td>
</tr>
<tr>
<td><strong>Dessert eg. yogurt or custard</strong></td>
<td>2 tbsp or 60g</td>
<td>2-3 tbsp or 60-80g</td>
<td>4 tbsp or 120g; 1 carton yogurt 150g</td>
</tr>
<tr>
<td><strong>Bread</strong></td>
<td>½-1 slice or 20-30g</td>
<td>1 large slice or 40g</td>
<td>1 large slice or 40g</td>
</tr>
<tr>
<td><strong>Breakfast cereal</strong></td>
<td>1 tbsp or 15g or ½ wheatabix</td>
<td>1-2 tbsp or 15-20g or 1 wheatabix</td>
<td>1-2 tbsp or 15-20g or 1 wheatabix</td>
</tr>
<tr>
<td><strong>Drinks</strong></td>
<td>¾ cup or 100mls</td>
<td>1 teacup or 150mls</td>
<td>1 teacup or 150mls</td>
</tr>
<tr>
<td><strong>Milk</strong></td>
<td>500mls whole milk per day</td>
<td>350mls whole milk or semi skimmed per day</td>
<td>350mls whole milk or semi skimmed per day</td>
</tr>
</tbody>
</table>
Appendix 10: The eatwell Plate

Between the ages of 2 and 5 years, children should gradually move toward eating the same food as older children or adults as shown on the Eatwell Plate.

The eatwell plate shows the different types of food we need to eat and in what proportions to have a well balanced and healthy diet.
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