Guidelines for Feeding Infants and Pre School Age Children

Approved by: CHS Clinical Policy Group and Clinical Quality and Governance Committee

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Directorate responsible for Review: Nutrition and Dietetics

Policy Number: NP089

Signature: .................................................................
Jenny Dowling
Head of Clinical and Professional Practice and Board Nurse
# Guidelines for Feeding Infants and Pre School Age Children

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### Equality Impact Assessment Tool

To be completed and attached to any procedural document when submitted to the appropriate committee for consideration and approval.

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| 2. Is there any evidence that some groups are affected differently? | No |  |

| 3. If you have identified potential discrimination, are any exceptions valid, legal and/or justifiable? | Yes | Title clearly states who guidelines are aimed at |

| 4. Is the impact of the policy/guidance likely to be negative? | No |  |

| 5. If so can the impact be avoided? | N/A |  |

| 6. What alternatives are there to achieving the policy/guidance without the impact? | N/A |  |

| 7. Can we reduce the impact by taking different action? | N/A |  |

If you have identified a potential discriminatory impact of this procedural document, please refer it to the Policy Administrator, together with any suggestions as to the action required to avoid/reduce this impact.

For advice in respect of answering the above questions, please contact the Policy Administrator.
GUIDELINES FOR FEEDING INFANTS AND PRE SCHOOL AGE CHILDREN

Developed by the Leicestershire Nutrition and Dietetic Service in consultation with staff across the Leicestershire Health Community

These guidelines have been approved for use within the University Hospitals of Leicester NHS Trust and consultation is underway for adoption by Leicestershire PCT’s.

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1 PRE-CONCEPTION & PREGNANCY

1.1 Pre-conception

All women planning a pregnancy should be encouraged to ensure that their diet follows healthy eating guidelines as outlined by the Eat Well Plate. (Appendix 8)\textsuperscript{A7}

The foetus is most susceptible to nutritional deficiencies during the first trimester. As many women will not suspect that they are pregnant at this time it becomes extremely important that good nutrition is attained when they first consider becoming pregnant.

Extremes of weight loss or obesity reduce female fertility\textsuperscript{B33}. For those considering pregnancy, achieving an ideal Body Mass Index (BMI) of 19-25kg/m\textsuperscript{2} is desirable. For some this may mean trying to gain weight, for others it may mean losing weight. Women with a BMI of over 26kg/m\textsuperscript{2} should be encouraged to lose excess body weight prior to conception. This weight loss programme should be stopped when conception is planned, so that by the time they conceive, their diets are nutritionally adequate to support mother and baby. An energy restricted diet should not be followed during pregnancy.\textsuperscript{A7}

Women with a low BMI e.g. <19kg/m\textsuperscript{2} may find it difficult to conceive and therefore weight gain is encouraged.\textsuperscript{B33}

Women should avoid alcohol if planning a pregnancy. If they choose to drink, they should drink no more than 1-2 units of alcohol once or twice a week.\textsuperscript{A7}

All women planning a pregnancy should not only be eating a well balanced diet, but should also take 400mcg of Folic Acid daily, from the time they stop using contraception up until the end of the first trimester.\textsuperscript{A7}

Women with pre-gestational diabetes are in a higher risk category for foetal neural tube defects. Current National guidelines recommend a higher daily dose of folic acid, (usually 5mg/day)\textsuperscript{B46} This should be commenced prior to conception, and continued up to 12 weeks of gestation. It is also recommended that women achieve optimal glycaemic control prior to conception and throughout pregnancy, aiming for a HbA1C $\leq$ 6.5%.

1.2 During Pregnancy

A weight gain of 10-12kg during pregnancy is expected if pre-pregnancy Body Mass Index is within normal range.\textsuperscript{A7} If women gain too much weight this can affect their health but equally it is important that they do not try to restrict their diet.

An increase in energy intake is not usually needed until the third trimester when an additional 200kcal a day is required.\textsuperscript{A2}

For adolescents who themselves are still growing, an earlier increase in intake may be needed.

Pregnant Women should avoid alcohol. If they choose to drink, they should drink no more than 1-2 units of alcohol once or twice a week.\textsuperscript{A7}

6g extra protein daily is required throughout pregnancy from base level, but as most women will be consuming more than the recommended nutrient intake, a further increase is not usually needed.\textsuperscript{A2}
There is no need to increase iron or calcium intake as requirements for these do not increase in pregnancy.\textsuperscript{A2} Although some at risk groups of patients may need to increase their intake such as vegetarians with a diet poor in iron rich foods.

High intakes of Vitamin A can be teratogenic. It is therefore recommended that Vitamin A intake should not be excessive. Foods high in Vitamin A should be avoided – such as liver and liver-based products e.g. paté etc. Women should avoid taking Vitamin A supplements or cod liver oil supplements unless advised by a GP or other health care professional.\textsuperscript{A7}

During pregnancy, lack of vitamin D may adversely affect foetal bone mineralisation and accumulation if infant vitamin D stores for the early months of life. Research has shown that the bone mineral mass of children aged 9 correlates significantly with their mother’s vitamin D status during pregnancy.\textsuperscript{B49} As dietary sources of Vitamin D are limited and at UK latitudes, there is limited sunlight of the appropriate wavelength for vitamin D synthesis, daily vitamin D supplementation of 10mcg is recommended for all pregnant women.\textsuperscript{B47,B48}

### 1.3 Food Safety

All milk consumed should be pasteurised.

Listeria and Salmonella can be harmful to mother and baby. The following foods are high risk for listeria and salmonella and so should be avoided during pregnancy:\textsuperscript{A7}:

- Soft, ripened, un-pasteurised cheese like Brie, Camembert and blue vein cheeses. It is safe to eat hard cheeses, Cheddar, Red Leicester, etc. and cottage cheese, cheese spreads and yogurt.
- Paté – all types.
- Raw or soft-boiled eggs – eggs should be cooked until the yolk is hard e.g. boiling for 7 minutes or poaching for 5 minutes. Mayonnaise should be pasteurized.
- All fruit, salads (including pre-washed salads) and vegetables should be washed thoroughly.

Food preparation and handling

- Ensure that chilled or frozen ready meals are stored appropriately and reheated thoroughly in accordance with the manufacturers instructions to ensure that they are piping hot all the way through to the centre.
- Pregnant women should always wear gloves when gardening or changing cat litter and wash hands afterwards. This is to avoid toxoplasmosis, an infection caused by a parasite found in meat, cat faeces and soil. This infection may be harmful to unborn babies.
- Pregnant women should always wash their hands after handling raw meat.
- Pregnant women should ensure that raw meats are thoroughly cooked, taking particular care with minced meat and products like sausages and beefburgers.
- Pregnant women should choose cooked shellfish rather than raw. This is because raw shellfish may contain harmful bacteria or viruses e.g. salmonella or campylobacter.
More advice on food safety in pregnancy can be found on the Foods Standards Agency website www.foodstandards.gov.uk.

Avoid shark, swordfish and marlin, and limit the amount of tuna to four cans (140g drained weight) or two steaks per week (weighing approximately 140g cooked or 170g raw weight). This is due to the levels of mercury that have been found in these fish. Mercury can adversely affect the development of the nervous system of the foetus/baby.

Caffeine intake should be limited to 200mg a day – 2 mugs of instant coffee, 2 cups of brewed coffee e.g. filtered, percolated, 2 cups of tea, 6 cans of cola. Excessive caffeine intake is harmful to the developing foetus. Caffeine intakes above 200mg per day may be associated with low birthweight and in some cases, miscarriage.

There is no evidence to suggest that maternal avoidance of known food allergens during pregnancy or lactation reduces the risk of offspring developing allergic disease.

At this moment it is not proven that avoidance of peanuts has any influence on the development of peanut allergies. However, until further research is completed, mothers who have one first degree relative with an allergic disease (e.g. asthma, eczema, hay fever, food allergy) and/or have such a condition themselves, may wish to avoid peanuts during pregnancy and breast feeding.
2 BREASTFEEDING

“Breast feeding gives babies the best start in life” (National Breast Feeding Working Group 1996). This statement is widely accepted by health professionals and many parents, and is supported by the World Health Organisation and UNICEF who together launched the “The Ten Steps to Successful Breast Feeding” in 1994.

The Leicester, Leicestershire and Rutland Trusts have agreed to work towards implementing these ten steps part of which is the adoption of a common breast feeding policy which incorporates these steps. Exclusive breast feeding should be encouraged to six months of age and the advantages of this conveyed to all mothers.

Breast milk provides a complete food, which is all that a baby under six months of age requires nutritionally. Breast milk is nutritionally superior for all infants and pre-term infants are less likely to suffer from necrotising enterocolitis if given breast milk.

Breast milk is free and hygienic. It is correct in consistency and temperature. It is easily digested and increases in volume to meet the infant’s needs.

Breast milk provides antibodies to many infections. It protects the infant against gastro-enteritis and reduces the risk of ear infections and urinary infections. Breast milk reduces the risk of the infant developing diabetes.

Exclusively breast fed infants are less likely to develop food allergies and eczema. (See section 8.6).

Breast milk optimises neurological development and contributes to better mouth formation and straighter teeth.

Breast feeding offers the mother health benefits too e.g. lower risk of ovarian cancer, pre-menopausal breast cancer and osteoporosis in later life. Breast feeding women experience a delay in a return to menstruation, which has health benefits of its own.

Babies born to women with diabetes should be fed as soon as possible after birth and all should receive their first feed within 4 hours of birth, unless contraindicated for medical reasons. Interventions for management of feeding should be guided by blood glucose level and clinical assessment. Babies of mothers with diabetes should have a test of blood glucose concentration by 4-6 hours of age, before a feed. The diagnosis of hypoglycaemia should be made using a ward-based glucose electrode or laboratory method and not be reagent strip testing.

2.1 General important factors to consider for the mothers starting to breastfeed

Mothers should wash hands prior to handling baby and commencement of feeding.

All parents should have access to adequate information in the antenatal period to enable them to make an informed choice. This information should be offered by qualified experts and supported by written material.

Unless medically contraindicated babies should experience skin-to-skin contact with their mother following delivery and have access to the breast within the first hour of life. The importance of a good latch on the breast should be explained to the mother and if necessary instruction given. Support should be offered to the mother until good quality feeding is established.
**Babies should be fed on demand regardless of the interval of time of last feed.**  
Reluctant feeders need to be observed and extra support given to these mothers. See ‘Guidelines for the management of healthy term babies who are reluctant to feed’ (UHL Guidance) for more guidance about the care of these babies-B44

Healthy breast fed babies should not be ‘topped up’ or given complementary feeds unless medically indicated. Breast milk is produced on a supply and demand system and giving non-breast milk substitutes interferes with this process. Attachment to the breast differs to sucking on a teat and use of bottles may interfere with the establishment of good feeding technique.

Babies should be allowed to feed on the first breast until they come off spontaneously and if they are not content the second breast can be offered. The second breast will be offered first at the next feed time. The composition of milk changes throughout the feed.

To ascertain whether a baby is receiving adequate milk intake observation of the urine output and its colour as well as the consistency and colour of the stool is important. Weight monitoring may provide a useful measurement after the initial post birth weight loss but should not be done too frequently as this can cause anxiety in the mother and affect her let-down reflex. It is more important to observe the feeding technique and confirm that the baby is feeding efficiently.

### 2.2 Diet and Breast Feeding

Breast feeding mothers require a well balanced diet and there is some evidence that lactation increases nutritional requirements. No specific foods should be avoided apart from possibly peanuts, and foods containing peanut products, in families who suffer from diagnosed allergic conditions e.g. eczema, hayfever, food allergy, asthma, rhinitis. It is also advised that breast feeding women should limit their consumption of oily fish to 2 portions a week. This is because it contains pollutants such as dioxins and polychlorinated biphenyls. Oily fish includes fresh tuna (not canned tuna), mackerel, sardines. Women should avoid eating more than one portion of shark, swordfish or marlin a week because of the levels of mercury in these fishes. If for any reason a mother’s diet is nutritionally inadequate, the priority should be to improve her diet and offer her vitamin supplements. She should be discouraged from decreasing her intake in order to lose weight whilst breast feeding (see Appendix 2a and Appendix 2c for requirements).

Mothers should be encouraged to drink fluids whenever they are thirsty but should be advised that alcohol and caffeine pass into the breast milk. An occasional alcoholic drink or regular light drinking (one or fewer drinks per day) has not been found to be harmful to the nursing baby. If a breast feeding mother consumes more caffeine in a day than is found in 5 cups of coffee, caffeine could be accumulating in the baby’s system causing symptoms of caffeine stimulation. Remember caffeine is not only found in tea and coffee, but also in some soft drinks e.g. Lucozade, Cola/Coke/Pepsi, chocolate and chocolate drinks and over-the-counter medicines e.g. Anadin Extra, Beechams Powders Capsules.

### 2.3 Drugs And Breast Feeding

In many situations, especially if medication has been withheld during pregnancy, drug therapy in postpartum mothers is both necessary and important. However, a significant number of mothers choose, or are advised, to discontinue breast feeding in order to take a medication. It has been estimated that at least 90% of women who breastfeed will receive at least some medication during their first week postpartum. Maternal drug therapy is one of the most common reasons for premature discontinuation of breastfeeding, often unnecessarily.
Very few prescribed medicines taken by the mother would contraindicate breastfeeding or would require discontinuation of maternal drug therapy. Often the mother’s need for drug therapy is seen as a reason to stop breastfeeding, but this is based on lack of knowledge rather than on known hazards. In the vast majority of cases it can continue.

The quality and quantity of evidence on drug excretion into breast milk, and the real or potential risks to breast-fed infants, now allows, in the majority of clinical situations, the formulation of treatment strategies that permit the continuation of breastfeeding whilst minimising the risk to the infant for mothers requiring medication. Such strategies should be based on an understanding of the basic principles governing drug excretion into breast milk, maternal needs, infant factors, and data on specific drugs. Any doubts regarding medicines should be discussed with the Medicines Information Service, or a clinical pharmacist.

In terms of safety, drugs may be classified into 3 groups:

1. Drugs which are **unsuitable** for use in breast-feeding mothers include:
   - Those with high intrinsic toxicity in normal use,
   - Those for which adverse effects may be anticipated on theoretical grounds, such as antineoplastic agents
   - Those with serious adverse effects reported in breast-fed infants, such as indometacin (convulsions).

2. Drugs which can be **used with caution**, and only when mother and infant can be monitored. Such drugs include:
   - Those with minor adverse effects reported in breast-fed infants e.g. drowsiness with antihistamines
   - Those with which minor adverse effects can be anticipated on theoretical grounds
   - Those for which insufficient data are available to permit classification as safe, e.g. metronidazole given intravenously.

3. Drugs which appear to be **safe** in breast-feeding include those which:
   - Are not excreted into milk
   - Are not absorbed by the infant (e.g. insulin, heparin)
   - Give very low doses in the infant with no apparent ill effects (e.g. penicillins).

### 2.3.1 General principles of prescribing and breastfeeding

The following principles should be followed when prescribing for breastfeeding mothers:

- Avoid unnecessary drug use and limit use of over-the-counter (OTC) products
- Breastfeeding mothers should seek advice on the suitability of OTC products
- Avoid herbal and other complimentary medicines due to lack of safety evidence and often uncertain ingredients. However homeopathic preparations are considered safe with breastfeeding.
- Assess the benefit/risk ratio for both mother and infant
- Avoid use of drugs known to cause serious toxicity in adults or children
- Drugs licensed for use in infants do not generally pose a hazard
• Neonates (and particularly premature infants) are at greater risk from exposure to drugs via breast milk, because of immature excretory and metabolic functions (and the consequent risk of drug accumulation) and greater sensitivity to the effects of drugs, especially on the Central Nervous System (CNS). Older infants present a much lower risk.
• Choose a regimen and route of administration which presents the minimum amount of drug to the infant. If appropriate time breastfeeding to avoid peak maternal plasma and milk levels, although this is often difficult and dependant on many factors.
• Choose a drug with optimum pharmacokinetic and physical properties, although this information may not be readily available in clinical situations. Such properties include short half life, high maternal plasma protein binding, large molecular weight and poor oral absorption
• Avoid long-acting preparations, especially those of drugs likely to cause serious side effects (e.g. antipsychotic agents), as it is difficult to time feeds to avoid significant amounts of drug in breast milk
• Multiple drug regimens may pose an increased risk especially when adverse effects such as drowsiness are additive
• Infants exposed to drugs via breast milk should be monitored for unusual signs or symptoms
• Avoid new drugs if a therapeutically equivalent alternative that has been more widely used is available. A robust assessment of the balance of benefit to risk requires data both on the drug's passage into breast milk and its effects in infants: there is rarely enough information available for new drugs to allow such an assessment to be made. If a drug with limited data is deemed to be clinically necessary or for any further information, contact the UK Drugs in Lactation Advisory Service (see below).

Additional risk factors
A number of independent factors influence the assessment of risk in individual situations. Factors which potentially increase risk, and which therefore need to be taken into account, include:
• Prematurity or low birth-weight
• Hepatic impairment/jaundice
• Renal impairment
• Family/personal history of allergy
• Galactose 6 phosphatase deficiency
• Multiple drug regimens
• Dehydration
• Other infant morbidity, respiratory depression, cardiovascular disease

Further information
Further and more specific advice and information can be obtained from UKDILIAS (UK Drugs In Lactation Information & Advisory Service) provided by the Trent Medicines Information Service based at Leicester Royal Infirmary.

Contact the Medicines Information Service on (0116) 258 5779 or 258 6491.
e-mail medicines.info@uhl-tr.nhs.uk
Further information on http://www.ukmicentral.nhs.uk/drugpreg/qrg.htm
2.4 Maintenance Of Breast Feeding

Exclusive breast feeding to six months of age should be encouraged but signs of readiness to try solid food should not be overlooked e.g. reaching out for food and the disappearance of the tongue thrust. (See Section 6 on weaning).

As long as the baby is correctly attached to the breast and the mother’s let down reflex is operational, the supply of milk should be adequate. Feeding times should be baby led unless there are signs that the baby is not receiving enough milk, then the mother should be encouraged to offer feeds more frequently. It must be remembered that night feeds are important, as this is when prolactin is increased. Tiredness and tension can affect the milk supply, so mothers need to be encouraged to rest and practical support offered if possible.

Growth spurts do occur and the baby can become more demanding. It is important that mothers understand this and allow the baby to feed more frequently so as to allow the natural increase in supply of breast milk. Use of pacifiers should be avoided.

Breast feeding mothers need support and should be offered information about voluntary breast feeding support groups. (See Appendix 1 for contact details).

It is beneficial to all breast feeding mothers to be able to express their milk and this skill is best taught in the early post-natal period. Expressing milk can alleviate over full breasts, relieve a blocked milk duct, increase the milk supply or simply allow the mother to store some milk for a later date. Milk can be stored in a sterilized container (see Appendix 6).

All health care settings should encourage breast feeding by providing areas for mothers to breastfeed and making a public statement that breast feeding mothers are welcome. Positive images of breast feeding should be displayed and promotion of breast feeding supplements avoided. Formula milk company sales representatives should be regulated and not allowed free access to health care premises/health care users. Advertising material should not be displayed.

2.5 Breast Feeding – Special Considerations

Some mothers may experience problems when breast feeding, despite professional support. Understanding, encouragement and consistent advice is essential in these situations.

A small proportion of babies remain jaundiced beyond 7-10 days. Persistent jaundice should always be brought to the attention of a Paediatrician, even if the baby has no other symptoms. Breast milk jaundice is not a reason to stop breast feeding, as it is not detrimental to the baby.

Mothers should be aware that nicotine passes into the breast milk and should be advised to stop smoking. La Leche League International’s The Breast Feeding Answer Book, states heavy smoking can reduce a mother’s milk supply and on rare occasions has caused symptoms in the breast feeding baby such as nausea, vomiting, abdominal cramps and diarrhoea.

Sore or cracked nipples can affect the mother’s enjoyment of breast feeding but are invariably due to poor positioning and fixing onto the breast. Professional help should be available to these mothers.

Breast engorgement should not occur if the baby is allowed unlimited access to the breast, but if it does, the mother needs to gently massage her breasts and express some milk before putting the baby to the breast. Encourage the mother to offer the breast to the baby more frequently even if the baby is not demanding to be fed.
The mother can be advised to take Paracetamol and Ibuprofen, where appropriate. She may just have a blocked duct and a gentle massage of that area and repositioning the baby may aid the flow of milk.

Mastitis may occur and if the mother has generalised fever symptoms, it is likely that infection is present. Although it will be painful, she should be encouraged to continue to breastfeed the baby from both breasts. She will need to see a doctor and obtain antibiotics.

Breast abscesses may develop but is less likely if the breast is being emptied efficiently. Breastfeeding from both breasts can continue unless the treatment is contraindicated in breastfeeding.

Babies, who for some reason fail to thrive, require careful assessment before resorting to formula milk. Solutions may be as simple as increasing the rest the mother gets. It is important to define the cause of weight faltering and if the only cause is an inadequate milk supply, every effort must be made to improve the feeding technique. Occasionally the introduction of some formula may improve the situation, but should be preceded by a discussion with the mother.

Mothers who are known to be HIV antibody positive or at high risk of being so, should be discouraged from breastfeeding. Research continues into this topic and in time the current advice may change. The Hepatitis B positive mother should be advised similarly, unless she is E antibody positive and therefore not infectious, she can breastfeed safely. Less is known about Hepatitis C and its transmission to breast milk, so it is advisable not to breastfeed.

Diabetes Mellitus in the mother is not a contraindication to breastfeeding. These mothers will need advice regarding their diet and medication e.g. the need to increase the carbohydrate intake and to eat before feeding and medication, as there is an increased risk of hypoglycaemia while breastfeeding. It may be helpful if the diabetic mother can express colostrum prior to the birth of her baby so it can be stored for use in the early postnatal period to alleviate the baby’s falling glucose levels.

Any doubts regarding the safety of breast feeding in particular cases should be thoroughly investigated and advice should be sought from either the Obstetrician or Midwife or Paediatrician.
3 INFANT FORMULA MILKS

Breast feeding should be promoted as the normal method of feeding an infant. Infant formula milks are the only recommended alternatives to breast milk but are in no way superior.

Cow’s milk for infant formula is modified to resemble breast milk as closely as possible. However, formula milk can not substitute for the unique, irreplaceable qualities of breast milk.

The main difference between different infant formulas is the proportion of whey to casein contained in the protein component of the milk.

3.1 Whey and Casein Based Milks

Whey based milks more closely mimic breast milk and should be the first type of milk offered to the baby. They are based on demineralised whey protein, a small amount of skimmed milk, and a mixture of animal fats and vegetable oils. Casein based formula are based on a mixture of skimmed milk, added carbohydrate and a mixture of animal fats and vegetable oils. It is common practice to change from a whey based to a casein based formula to satisfy hungry babies, but there is no specific evidence to support this practice, which should therefore be discouraged. Most commercially available infant milks now have Prebiotics, Beta-carotene and Long Chain Polyunsaturates added to make them mimic breast milk more closely. However research is still ongoing into the benefits of these additions.

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<tr>
<th>WHEY DOMINANT</th>
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<tr>
<td>Casein whey ratio 40 : 60</td>
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</tr>
<tr>
<td>Hipp Organic Infant Milk*,** (Hipp Organic)</td>
<td>Not available</td>
</tr>
<tr>
<td>First Infant Milk (Cow &amp; Gate)</td>
<td>Infant Milk for Hungrier Babies** (Cow &amp; Gate)</td>
</tr>
<tr>
<td>SMA Gold* (SMA Nutrition)</td>
<td>SMA White* (SMA Nutrition)</td>
</tr>
</tbody>
</table>

* Does not contain Prebiotics
** Does not contain Long Chain Polyunsaturates (LCPs)

Mothers should be encouraged not to change brands or types of infant formula. There are no significant nutritional differences between brands. (The benefits of the addition of beta-carotene or long chain polyunsaturates (LCPs) to term formula is a matter of present research). The frequency and volume of feeds should be altered first. However, changing from a whey to a casein based formula is preferable to the early introduction of solids.

Like breast feeding, babies on infant formula should be offered feeds on demand. As a guide, 150-200ml of feed per kilogram bodyweight per day is used, from 0-3 months. This can be divided between 4 and 8 feeds per day. See Appendix 3 for fluid requirements of older infants and children.

If parents choose to bottle feed they should be shown how to make up infant formula following the manufacturer’s instructions and should be made aware of good hygiene and
safe storage requirements. See Appendix 7 for current guidance on preparing a feed using powdered infant formula.

It is vital that parents follow manufacturers’ instructions. A professional, caring for the mother, needs to check this and go through this with the mother in the early postnatal period. Over-concentration of feeds can lead to electrolyte overload, constipation and obesity, whereas under-concentration can lead to failure to thrive.

Some manufacturers produce their formula milk as Ready To Feed milk available to purchase in cartons and sachets. This should be stored according to the manufacturers’ instructions.

All water used for making feeds should be boiled and cooled for no longer than 30 minutes before use. It is important to advise parents that some mineral waters have mineral contents unsuitable for babies, often labelled ‘natural mineral water’. However, there are bottled waters that may have the statement ‘suitable for infant feeding’ on their label. This water is not sterile, so like tap water, must be boiled and cooled before using to make up a feed. Suitable bottled waters include Evian, Vittel.

Mineral concentrations greater than those in the box below should be avoided for infant feeding.

<table>
<thead>
<tr>
<th>Mineral</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium</td>
<td>200mg/l</td>
</tr>
<tr>
<td>Nitrate</td>
<td>100mg/l (best below 50mg/l)</td>
</tr>
<tr>
<td>Nitrite</td>
<td>3 mg/l</td>
</tr>
<tr>
<td>Sulphate</td>
<td>500mg/l</td>
</tr>
</tbody>
</table>

All other water, including bottled and sparkling mineral which has been artificially chemically softened and water from jug filters should not be used to make up infant formula feeds, because of high electrolyte load.

The practice of warming feeds in a microwave should not be recommended but it is recognised that many parents will use this method. Therefore great care should be taken if infant formula is warmed in a microwave. Variation in temperature within the bottle may result in very hot liquid at the centre scalding the baby. Ensure the container/bottle is shaken and temperature tested before giving to baby.

No sugar or solids (e.g. rusks) should be added to bottle feeds. Thickening of feeds should only be for medical reasons and under strict supervision. By adding solids, the consistency, energy density and electrolyte load of the feed alters. It concentrates the feed and can cause acute thirst in the baby, leading to dehydration. It may also increase the possibility of infection or sensitisation of the gut.

Breast milk and/or infant formula should be continued up to the age of 1 year. If the weaning diet is adequate and growth is normal, then whichever milk the baby has been on should be continued beyond 6 months.

Feeding from a cup should begin as sipping and swallowing replace sucking. Introduction to a cup is therefore recommended from the age of 6 months. Dentists recommend the introduction of an open cup from 6 months of age, reserving lidded cups for convenience e.g. when travelling. The use of a nursing bottle should be actively discouraged after the age of 12 months.
3.2 Follow on Formulae

Follow on formulae are less modified than normal whey or casein based formula. They have a higher iron and protein content and are not recommended before the age of 6 months. There is no nutritional advantage in changing to follow on milks from 6 months except where there are concerns about poor weaning diet and possible iron deficiency anaemia, or where siblings have been iron deficient. In this situation, it may be appropriate to continue follow on formula beyond 1 year of age.

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Milk</th>
<th>Iron Content mg/100ml</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cow &amp; Gate</td>
<td>Follow On Milk</td>
<td>1.3</td>
</tr>
<tr>
<td></td>
<td>*Growing Up Milk</td>
<td>1.2</td>
</tr>
<tr>
<td>Heinz</td>
<td>Growing Baby Follow On Milk</td>
<td>1.2</td>
</tr>
<tr>
<td>Hipp Organic</td>
<td>Follow On Milk</td>
<td>0.7</td>
</tr>
<tr>
<td></td>
<td>**Growing Up Milk</td>
<td>0.7</td>
</tr>
<tr>
<td>Milupa</td>
<td>Aptamil Follow On Milk</td>
<td>1.3</td>
</tr>
<tr>
<td></td>
<td>*Aptamil Growing Up Milk</td>
<td>1.2</td>
</tr>
<tr>
<td>SMA Nutrition</td>
<td>Progress</td>
<td>1.3</td>
</tr>
<tr>
<td>Average of all manufacturers</td>
<td>Whey Dominant Milk</td>
<td>0.66</td>
</tr>
<tr>
<td></td>
<td>Casein Dominant Milk</td>
<td>0.67</td>
</tr>
<tr>
<td></td>
<td>Full cream cow's milk</td>
<td>0.05</td>
</tr>
</tbody>
</table>

* For infants from 1 year onwards
** For infants from 10 months onwards

Vouchers can be exchanged for infant formulae, fresh fruit and vegetables or cow’s milk and are available for beneficiaries of the Healthy Start scheme. Families receiving Income Support, Income-based Job Seekers Allowance or receiving Child Tax Credit but not Working Tax Credit and have a family income below a certain limit are eligible to apply for Healthy Start vouchers (see section 10 for more details). This does not apply to follow on milks, soya formulae or low birthweight formulae.
4 OTHER MILKS

Please consider referring patients on other milks to a Paediatrician and/or a Registered Dietitian as necessary.

If cow’s milk protein or lactose intolerance is suspected and it seems likely that it will continue beyond starting solids, then the weaning diet will need to be cow’s milk protein and lactose free also. This can only be done with the advice of a Registered Dietitian. If the child has milk intolerance, there is no advantage in recommending soya milk or other formula and allowing a normal diet (see section 8.6).

4.1 Soya Formula

Only the following prescribable milks should be used where use of such a formula is medically indicated e.g. lactose intolerance (they are not indicated for minor problems such as colic). They should not be recommended as first line treatment of cow’s milk allergy in infants under 6 months due to concerns regarding phytoestrogen content and their potential in triggering allergy in atopic infants.

<table>
<thead>
<tr>
<th>MANUFACTURER</th>
<th>MILK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cow &amp; Gate</td>
<td>Infasoy</td>
</tr>
<tr>
<td>Abbott</td>
<td>Isomil</td>
</tr>
<tr>
<td>Heinz</td>
<td>Nurture Soya Infant Formula*</td>
</tr>
<tr>
<td>Mead Johnson</td>
<td>Prosobee</td>
</tr>
<tr>
<td>SMA Nutrition</td>
<td>Wysoy</td>
</tr>
</tbody>
</table>

*Heinz Soya Formula is the only formula suitable for vegan diets, because the source of vitamin D used does not come from animals.

Cartons of soya milk bought in the supermarkets or health food shops are not suitable as a milk substitute for babies or small children under 2 years of age due to their low calcium, energy and vitamin content.

4.1.1 Soya Formula and Dental Health

Soya formula contains glucose syrup instead of the lactose present in normal infant formula. Due to the greater potential of glucose to cause tooth decay, care needs to be taken when using soya formula. We do not recommend the use of bottles and feeding cups as comforters as this can result in a very destructive form of tooth decay known as “nursing bottle caries”. Parents should remove the bottle or cup as soon as feeding is finished.

4.1.2 Soya Formula and Aluminium

The aluminium content of soya formula is marginally higher than that of cow’s milk formula, though well within currently accepted safety levels. Whilst there is no evidence that the intake of aluminium from soya formula is harmful, it is recommended that they are only used on the advice of a Doctor or Registered Dietitian. Soya formula should not be used in premature babies or those with renal impairment.
4.1.3 Soya Formula and Phytoestrogens

The Committee on Toxicity of Chemicals in Food (COT) Report of 2003 highlights two studies which raise concerns over the possible long term effects of giving high amounts of naturally occurring plant oestrogens in infancy (as found in infant soya formula). As a precautionary measure, it is therefore recommended that soya formula only be used in infants less than 6 months where there is medical need. Otherwise a hydrolysate formula (Section 4.2) should be used at all times if the infant is less than 6 months old. In cases of Galactosaemia or Galactokinase Deficiency, a soya formula should be used as soya formulae are the most suitable for these medical conditions, under the care of a specialist Registered Dietitian.

4.2 Hydrolysates

For infants less than six months of age, fully hydrolysed formula should be prescribed instead of soya formula for lactose intolerance or cow’s milk protein intolerance. If the infant is over 6 months use of a hydrolysate formula should also be considered as 30% of infants with cow’s milk protein intolerance also have a soya protein intolerance. If the infant is on a weaning diet, then this should also be cow’s milk and soya free when using a hydrolysate formula milk. Soya formula may be used in infants over 6 months for lactose intolerance or cow’s milk protein intolerance if soya protein intolerance is not suspected. Suitable fully hydrolysed formula include:-

<table>
<thead>
<tr>
<th>Milk</th>
<th>Manufacturer</th>
<th>Other information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nutramigen (1 &amp; 2)</td>
<td>Mead Johnson</td>
<td>Extensively hydrolysed casein</td>
</tr>
<tr>
<td>Pregestamil</td>
<td>Mead Johnson</td>
<td>Extensively hydrolysed casein with MCT</td>
</tr>
<tr>
<td>Pepti</td>
<td>Cow and Gate</td>
<td>Extensively hydrolysed whey NB contains lactose</td>
</tr>
<tr>
<td>Pepti Junior</td>
<td>Cow and Gate</td>
<td>Hydrolysed whey with MCT</td>
</tr>
<tr>
<td>Pepdite</td>
<td>SHS</td>
<td>Hydrolysed pork and soya proteins</td>
</tr>
<tr>
<td>Prejomin</td>
<td>Milupa</td>
<td>Hydrolysed pork collagen and soya protein</td>
</tr>
</tbody>
</table>

The above hydrolysates differ in their protein source and therefore tolerance may also vary.

Allergy prevention

Formulae for use in allergy prevention (partially/extensively hydrolysed formula) should be used for the first 6 months in infants with a family history of atopy, e.g. hayfever, asthma, eczema, food allergy, if an alternative to breast milk is required. Nan HA 1 and 2 (Nestlé Infant Nutrition) is a partially hydrolysed formula that can be bought over the counter and used to help prevent protein sensitisation. It is not to be used to treat cow’s milk protein allergy. In cases of maternal eczema the infant should be placed on to an extensively hydrolysed casein formula alone if no breast milk is available.
4.3 Elemental milks

For those children who do not respond to an extensively hydrolysed formula, an elemental amino acid based formula can be used. Milks are Neocate LCP (formula for infants), Neocate Active (supplement for children over 1 year) and Neocate Advance (formula for children over 1 year of age). Children should be under the supervision of a Registered Dietitian if these milks are used.

Soya formula, hydrolysates and elemental milks are all prescribable until age 5 for proven cow’s milk intolerance.

4.4 Lactose free milk

Lactose free formula are available for the treatment of suspected or proven lactose intolerance. These include:

- SMA LF – SMA Nutrition
- Enfamil lactofree – Mead Johnson

These formula are NOT suitable for the treatment of suspected/proven cow’s milk allergy as they contain cow’s milk protein.

4.5 Goat’s and Sheep’s Milk

Goat’s and sheep’s milk should not be given to infants under the age of 12 months and if given to older babies must be pasteurised. There is no evidence to suggest that goat’s/sheep’s milk is nutritionally superior to breast/modified cow’s milk and as 90% of the proteins are identical to cow’s milk, it is not suitable for the treatment of proven cow’s milk allergy. Both goat’s and sheep’s milk contain lactose and therefore should not be used for the management of lactose intolerance. Both milks are also deficient in vitamin D, iron and folic acid (goat’s milk is also low in vitamin A), and are therefore nutritionally inadequate for children as a milk source. Both milks may be used after 1 year of age, but must be pasteurised or boiled for 3 minutes before use and the diet will require supplementation, on the advice of a Registered Dietitian.

Infant formulas based on goat’s milk protein have not been approved for use in Europe.

4.6 Rice and Oat Milk

Rice and oat milks are not suitable as a milk substitute for infants under 2 years and should only be used with caution over 2 years. This is because they are lacking in nutrients necessary for growth and development. They should only be used in young children under dietetic supervision and are usually only used as a drink when a suitable complete formula is refused. The child may require vitamin, mineral, energy and protein supplementation under dietetic supervision.

4.7 Cow’s Milk

Up to the age of 2 years, breast milk is the milk of choice. If not breast fed, formula milk should be used up to one year. Full cream pasteurised cow’s milk is the healthy choice for young growing children from the age of 1 year if they are not breastfed. Unpasteurised milk should not be given to infants or young children. Where the family use it, it must be boiled for 3 minutes to ensure any harmful bacteria are destroyed. As with ordinary pasteurised milk, it should not be used as a main drink below the age of 1 year.
Skimmed milk is not suitable for children under the age of 5. It is lacking in energy and vitamin A. Semi-skimmed milk may be given to children from age 2, providing their overall diet contains sufficient energy and vitamins to enable them to grow and develop satisfactorily.
5 OTHER DRINKS

For a guide to fluid requirements for babies and young children, please see Appendix 3.

Babies fed solely on breast milk do not normally require additional water. The breast
produces watery milk when the baby requires extra fluid e.g. when babies are unwell or it is
extremely hot. Mothers should be encouraged to drink extra fluids during hot weather.
The baby may want more frequent feeds during this time.

5.1 Waters

Mineral waters, and water which has been repeatedly boiled should also be discouraged in
infants under 6 months of age because of potentially high sodium content. Kettles with built
in water filters should not be used.

Filtered water and bottled water whose label includes the words “natural mineral water” may
have a high sodium content and would therefore have an adverse effect on the kidneys of a
young baby, and also may have a high fluoride content. Effervescent or sparkling water is
not suitable to be given to infants.

In temporary situations (i.e. overseas holidays in countries where the tap water is unsafe)
there is an advantage in using bottled water in preference to boiled tap water. Mothers
should be reminded that only still bottled water should be used and boiled before preparing
infant formula feeds. See section 3.1 for suitable brands and more information on water.

5.2 Other Drinks

Baby and herbal drinks are not recommended for infants. They may be high in sugar. The
use of fizzy drinks, fruit squashes and baby drinks should be discouraged as many have a
high sugar content (sucrose/glucose/fructose/maltodextrin/other sugars). They are not
suitable for young babies.

Avoiding or restricting the use of these drinks to mealtimes only will help prevent the
development of a “sweet tooth” which is advantageous in helping to avoid both dental caries
and obesity in early childhood.

Many of these carbonated and fruit drinks are also very acidic and can result in erosion of
the tooth enamel especially if used regularly and for prolonged periods of time in a bottle or
feeder-beaker given as a comforter or at night.

From weaning, older babies can be offered very dilute unsweetened fruit juice (1 part juice in
10 parts water), preferably at mealtimes only. Many feeder beakers have a 10% marker to
aid with this dilution. Between meals it is better to give water or milk to drink.

Tea is not advisable as a main drink for infants and young children. Tannin in tea binds iron
and other minerals and reduces their bioavailability. If sugar or honey is added to tea, it will
contribute to the formation of dental caries. Honey should not be given to babies until they
are one year old. Diet drinks and “no added sugar” drinks are not intended for babies or toddlers. The Food
Standards Agency is advising parents to give young children no more than three beakers
(about 180ml each) a day of diluted soft drinks or squashes containing the sweetener
cyclamate (also known as E952 or cyclamic acid). They also recommend that parents should
dilute these drinks more than they would for an adult. This is a precautionary measure
because drinking more than this amount could lead to children aged one to four and a half consuming more than the acceptable daily intake of cyclamate. Young children drinking large amounts of dilutable soft drinks containing aspartame, acesulfame K or saccharin would not be above the acceptable daily intake for these sweeteners.
6 WEANING

Weaning is the process of expanding the diet to include foods and drinks other than breast milk or infant formula. Weaning allows the infant to meet changing nutritional needs and to become less nutritionally dependent on milk. This normally takes about a year, so that by the time the baby is 18-24 months old he/she should be able to eat family meals and join in meal times to encourage good social training. See Appendix 5 “A Guide to Foods during Weaning”.

Advice on the timing of weaning should be given at an early stage.

Breast feeding is the best form of nutrition for healthy infants and can provide complete nutrition for the first six months (26 weeks) of life for most infants.

The Scientific Advisory Committee on Nutrition (SACN) sub group on Maternal and Infant Nutrition concluded in the publication Information for Health Professionals on Infant Feeding:- ‘6 months is the recommended age to introduce solid foods for all normal healthy infants, whether breast fed or given infant formula. Health professionals should consider infants’ individual developmental and nutritional needs, whether breast fed, mixed fed or given solely infant formula before giving advice to introduce solid foods. Where mothers choose to introduce solid food before 6 months they should follow existing guidance on appropriate types and amounts of first foods (COMA 1994).’

If parents decide to start solids earlier than 6 months (26 weeks) they should be advised not to start them before 4 months or 17 weeks of age. If weaning does commence before 6 months some foods should be avoided:

- Foods containing gluten – wheat based foods like bread, rusks and some breakfast cereals
- Eggs
- Fish and shellfish
- Nuts and seeds
- Liquid cow’s milk and dairy products such as yoghurts and cheese especially soft and unpasteurised cheeses.

If parents decide to start solids earlier than 26 weeks suitable first foods would be:

- Pureed fruit or vegetables
- Baby Rice

Premature introduction of solids before 6 months is undesirable because:

- it may potentiate the early onset of food allergy or intolerance in some infants.
- milk contains all the nutrients a baby needs. If replaced too early babies lose out on some important nutrients.
- infants do not develop the ability to deal with food in the mouth before the age of 6 months (i.e. form a bolus, move the food from the front to the back of the mouth, chew and bite more solid foods).
- it might precipitate hypernatraemia

Advantages of waiting to around 26 weeks or 6 months:

- the infant’s mouth is more able to cope with the transition from drinking to eating.
- Giving only breast milk means less exposure to harmful bacteria and the baby will receive more antibodies and other protective factors, protecting against atopy.

There are nutritional and developmental reasons why infants need solid foods from six months. Infants who are weaned at six months, after a shortened period on smooth pureed...
foods will need to be moved onto the second stage of weaning more quickly than those weaned earlier to ensure continued development of normal feeding behaviour and continued nutritional adequacy. (Second stage of weaning: beginning mashed food with soft lumps and soft finger foods between the ages of six and nine months). Foods high in iron including meat, oily fish and pulses should be introduced at or around six months.

Delayed weaning after 6 months may lead to iron deficiency anaemia as the infant’s iron stores are depleted around 6 months of age after which dietary sources must be relied upon. Energy, protein, zinc and vitamins A and D may also be inadequate if milk is the only source of nutrition after this age. Delayed weaning may also result in delayed ability to chew and lack of progress on to more solid textures and new tastes.

It is important to assess each child’s signs of readiness to wean. One or more of the following indicates readiness to wean:

- starts to show an interest in food and may be keen to try what a parent or sibling is eating
- is able to sit up with support
- is able to pick up food and put it in his/her mouth
- no longer automatically pushes solids out of his/her mouth (young babies have a tongue-thrusting reflex).

An infant may seem hungrier, but this is not necessarily a helpful signal on its own as infants often have appetite spurts. Before six months extra breast or formula milk can be given more frequently for a few days to respond to this need.

6.1 Stage 1

Ideal first foods have a smooth consistency and bland taste. These can be mixed with cooled boiled water, expressed breast milk or infant formula. The texture of home cooked foods may be more acceptable to babies if they are mixed with baby (See Section 8.6 re. Atopy).

Commercial baby foods are a useful alternative to home cooked foods but should not be totally relied upon. Care should be taken to choose no added salt and sugar varieties.

Sugar, honey, salt and spices should not be added to any baby foods at this stage. Salt may lead to risk of hypernatraemia and sugar may cause dental caries. However a small amount of sugar may be added to very sour fruit e.g. cooking apples, rhubarb and gooseberries, to improve palatability.

Suitable foods include:

- baby rice/pureed home-cooked white rice
- mashed potato
- pureed, non-fibrous vegetables (carrots, swede, parsnip)
- unsweetened plain yogurt/baby fromage frais or yogurts
- pureed soft fruit, e.g. apple, banana, pear
- custard made using pasteurised whole cow’s milk

If an infant has a family history of atopy, e.g. food allergy, asthma, eczema hay fever, see section 8.6 for advice regarding suitable weaning foods.
When the infant has accepted eating from a spoon, different tastes and textures can be introduced. Quantity can also be increased gradually, replacing milk feeds. Foods which can now be introduced include:

Meat and fish can be mixed with vegetables and pureed – remember do not add salt.

Beans, peas and lentils can be introduced and must be cooked correctly before pureeing.

6.2 Stage 2

At this stage the amount and variety of foods should continue to be increased and milk feeds reduced. Some infants will move very quickly to this stage once weaning commences and texture should progress from pureed to minced/mashed and then to finely chopped. Specific foods to consider are:

Cheese can be introduced from 6 months of age, but it is recommended that cottage cheese is used to begin with as it contains less salt than hard cheese.

Eggs can be introduced from 6 months, but must be well cooked until the yolk is hard. Dishes containing homemade mayonnaise should not be introduced before 12 months. Pasteurised mayonnaise can be used before 1 year of age.

Pasteurised full cream cow's milk can be used on cereals from 6 months but not as a drink.

Nut butters, smooth in consistency can be introduced from 6 months if there is no family history of atopy but whole nuts should be avoided until 5 years of age because of the risk of asphyxiation. Nuts need not be introduced if parents are worried. See 6.1 and 9.6 for more information on weaning a child with a family history of atopy.

See Section 8.6 for advice on nut allergy and atopic families.

Finger foods are usually given around 7-8 months if solids are introduced at 6 months but some babies prefer food they can hold to mashed foods so finger foods can be offered from when you start weaning at 6 months. They are important to aid development of oral muscles used in speech. Suitable foods are:

- bread
- breadsticks
- toast
- rice cakes
- savoury biscuits
- soft peeled fruits
- sticks of cooked vegetables
- cubes of cheese

It is not recommended that rusks are used as they contain sugar. However, they do have no added sugar varieties available and they do have the advantage of dissolving quickly, which may aid the initial introduction of finger foods. Babies should never be left alone when finger foods are offered, due to the risk of choking.

Honey should be avoided due to the presence of clostridial spores which can lead to infant botulism. (see section 6.4)

6.3 Stage 3
By the end of 1 year, the infant’s diet should be mixed and varied and integrated into family meals. Weaning should have progressed so that lumpy or chopped foods of different textures are accepted. By this stage, three meals a day with two or three healthy snacks in-between are recommended.

By the time a child is taking a mixture of foods, cups should be used for drinks. **Bottle feeding should be discouraged after the age of 12 months.** It should be noted that keeping a child on a bottle for an extended period can lead to dental caries and delays in learning the food handling skills needed to diversify the diet.

Salty foods, e.g. stock cubes, yeast extract and salt itself should only be used in very dilute/small quantities, as hypernatraemia can result from excessive salt use.

The advice on adding sugar to foods still applies at this age i.e. only add to sour fruit to improve palatability. This will minimize the risk of obesity developing and will also help to maintain oral health.

Meat will need to be minced or finely chopped. Chopped cooked vegetables and some salad vegetables can be included. Finger foods should continue to be encouraged, as this promotes the transition to full self-feeding and a selection from small cubes of cheese, cooked potato, toast, fruit and vegetables should be offered at each meal.

Life long eating habits will be based on this initial weaning period. It is therefore recommended that a healthy diet is introduced in order to promote optimum growth and development. An adequate energy intake is essential and this can normally be obtained from a varied diet without the need for processed foods and snack items which generally contain artificial additives, sugar and are high in fat.

**However, if a child has poor weight gain, or is a faddy/fussy eater, advice needs to be more flexible.**

It often helps infants to establish good eating habits if they learn to eat with other people. Families should be encouraged to allow the infant to be included in meal times with parents, siblings or other children whenever possible.

The above information is presented as a chart in Appendix 5 for ease of reference.

### 6.4 Baby-led Weaning

Baby-led weaning encourages the infant to feed him/herself with a mixture of hand held solid foods rather than initially feeding the infant just pureed foods. To date there has been very limited research to support baby-led weaning and until there is more evidence it is difficult to state any potential benefits or problems it may offer. However, studies have shown that children who, from 6 months onwards, have opportunities to eat a mixture of foods, both pureed and solid, have the greatest nutrient intakes and the healthiest diets throughout childhood and into adulthood. It, therefore, seems likely that the presentation of a variety of foods with differing flavours and textures that the child can explore is important, rather than a focus on puree food versus solid food per se.

### 6.5 Food Handling and Hygiene

All equipment used to feed babies under six months of age should be sterilised e.g. bottles, teats, spoons, bowls, breast pumps etc. Utensils should be thoroughly cleaned and sterilised, either in a chemical solution or by steaming or boiling for ten minutes. After six
months bottles and teats should continue to be cleaned and sterilised if they are still being used. Microwaves are not sterile and are therefore not suitable for sterilising bottle feed equipment. Microwave steam sterilisation units may be used provided manufacturers’ instructions are followed carefully. There is concern about the use of sterilisation with chlorine based products such as Milton and asthma. Research is on-going. Please note that chemical solutions/steam/boiling achieve disinfection rather than sterility. However it has become accepted terminology to use the word ‘sterile’ when referring to baby feeding.

Babies and young children are more at risk of severe illness from food borne infection than older children or adults. Any food being bought and used in the kitchen may be contaminated and it is therefore important to handle it correctly and hygienically, particularly for infants.

Hands should be washed thoroughly before starting to handle or serve any foods, particularly in between handling raw and cooked foods and after changing a baby’s nappy or going to the toilet.

It is essential that foods are stored correctly prior to use. Perishable and ready to eat chilled foods must be stored under refrigeration up to the point of use. All raw and cooked food should be separated when being handled or stored. Raw foods should be stored below and apart from cooked foods in the refrigerator. Use different chopping boards/work surfaces for raw food and ready to eat food. Clean knives and utensils thoroughly after use with raw food.

Food used at home, whether it is fresh, canned, chilled or frozen should be within the manufacturer’s recommended “use-by date”. Food should be cooked thoroughly and served and consumed as soon as possible after cooking. However, care must be taken to ensure no scalding occurs from food which is too hot.

Food should not be left to stand at room temperature. Partly eaten food should be thrown away. Prepared food which is to be re-used should be wrapped or covered and stored above and apart from raw food in the refrigerator. Any food not used after 24 hours should be discarded.

Small portions of homemade prepared foods may be frozen. This should be done as soon as the food has cooled after cooking. Care in the handling of home prepared foods to be retained for freezing is very important. All utensils including storage containers should be thoroughly cleaned before use. Food should be handled with clean utensils. The time period from cooking to being placed in the freezer should be no more than 90 minutes. Food must be placed in covered containers. If clingfilm is used it should not come into direct contact with high fat foods such as cheese and meat, due to migration of chemical plasticisers into the food. If used it should not touch the food just cover it.

Commercial foods are required by law to be safe up to the point of sale. However, failure to store and handle these foods correctly at home can create risks. Manufacturers’ instructions for the storage and handling of foods once opened should be followed; this includes cooking times and oven temperatures. As with home prepared food, partly eaten food and part used jars/tins of commercial food should be discarded. Do not overheat or reheat baby meals more than once. Always check the safety button on the cap before opening a jar.

Microwaves are not recommended for heating a baby’s food, but if used extreme caution needs to be exercised. To ensure even heat distribution, cooked/heated food should be left to stand for 1-2 minutes. Microwaved food should be checked before serving to ensure it is not too hot for consumption. Commercial baby foods may have reheating instructions on them. Where they do, this advice should be followed.
It is recommended that honey is not given to infants (i.e. below the age of 12 months). Honey occasionally contains Clostridial spores which are not removed during normal processing and which may lead to infant botulism. As the intestine matures, the spores can no longer germinate and there appears to be no risk over the age of 12 months. This advice only applies to spoonable liquid and set honey and not to honey in commercial weaning foods. Infant botulism is very rare in the U.K.

Domestic pets such as cats and dogs may carry bacteria. It is important to ensure that potential contamination from this source is avoided. Separate utensils and feeding bowls should be used for pet foods. Pet foods should be stored away from other foods. Pets should not come into contact with baby foods.
7 VITAMIN AND MINERAL SUPPLEMENTATION

7.1 Pregnancy and Lactation

All women who are pregnant or breast-feeding are encouraged to eat a balanced diet containing a variety of foods, and to drink plenty of fluids. All women should be encouraged to ensure that their diet follows healthy eating guidelines – The Eat Well Plate (Appendix 8)\textsuperscript{A7}. A varied healthy intake reduces the need for supplementation and would include plenty of fruit, vegetables and starchy foods and moderate amounts of protein sources such as dairy, meat and fish. The table below details the advice regarding specific vitamins and minerals. Should a woman choose to take vitamin and mineral supplements, it is not advisable to take more than one multivitamin daily, as some vitamins and minerals can be dangerous at high doses.

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Relevance</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vitamin A</td>
<td>Pregnancy</td>
<td>Vitamin A is important but could be harmful to a baby in high doses. Avoid liver and liver products (e.g. paté). Avoid high dose vitamin supplements and avoid cod liver oil supplements and omega 3 and 6 supplements. Vitamin A supplements should only be taken under the supervision of a Doctor.</td>
</tr>
<tr>
<td>Vitamin D</td>
<td>Pregnancy and Breast feeding</td>
<td>All pregnant and breastfeeding women should take a 10µg (0.01mg) supplement daily. The Reference Nutrient Intake for Vitamin D in pregnancy and breastfeeding cannot be met from diet alone \textsuperscript{A7}. Those entitled to the Healthy Start Scheme (see section 10) can obtain the supplements free of charge.</td>
</tr>
<tr>
<td>Folate</td>
<td>Pregnancy</td>
<td>Take 400µg (micrograms) (0.4mg) daily from when trying to conceive until 12 weeks of pregnancy. Also include folate rich foods, such as green vegetables, brown rice and fortified products in diet. Some foods rich in folate display a special symbol.</td>
</tr>
<tr>
<td>Iron</td>
<td>Pregnancy</td>
<td>Both deficiencies and high intake of iron can be harmful in a baby. Iron supplementation is not recommended for pregnant or breastfeeding women, unless recommended by a Doctor or midwife. It is, however, a good idea to include good sources of iron and Vitamin C (improves iron absorption) in the diet.</td>
</tr>
<tr>
<td>Mercury</td>
<td>Pregnancy and Breast feeding</td>
<td>Do not eat more than two tuna steaks (140g cooked/170g raw) or 4 medium cans of tuna a week (140g drained weight). Do not eat shark, swordfish or marlin.\textsuperscript{A7}</td>
</tr>
</tbody>
</table>

All pregnant women under 18 years of age and women whose families receive Income Support, Income Based Jobseeker’s Allowance or receive Child Tax Credit but not Working Tax Credit and have a family income below a certain limit are entitled to supplements containing Vitamins C and D, and folate through the Healthy Start scheme\textsuperscript{B34}. (See Section 10) More dietary information regarding pregnancy and breastfeeding can be found in other sections.

7.2 Infancy

Newborn infants who may be at risk of vitamin deficiency include those born prematurely, those who have had major resections of the bowel and those with certain metabolic disorders that affect their absorption and metabolism of nutrients. A Registered Dietitian or Doctor’s advice should be sought in these cases to provide appropriate diet plans.
Supplementation of Vitamin A, C and D in the form of Healthy Start vitamin drops available from Child Health Clinics or Abidec, available from local supermarkets/pharmacies, is necessary in infancy in the following circumstances:

(i) Breast fed infants at risk of vitamin deficiency because of concerns about the adequacy of the mother’s diet during pregnancy. Supplementation should start at age 1 month.

(ii) Breast fed infants aged 6 to 12 months, where breast milk is their main drink because their vitamin stores may be depleted.

(iii) Formula fed infants consuming less than 500ml of infant formula per day.

(iv) Vitamin D deficiency has been found to be very common during and after pregnancy in mothers of South Asian and Black African origin, particularly those who are inadequately exposed to sunlight on their skin. Infants who are born to these mothers, especially those who are breast fed, are at high risk of Vitamin D deficiency. They should receive 10mcg of Vitamin D in the form of infant A, C, D drops until adequate weaning is completed.

(v) Infants using unsupplemented soya/rice milks under the guidance of a Registered Dietitian/ Paediatrician.

7.3 Childhood

All children aged between one and four years should receive Vitamin D supplements. NICE guidance states that there has been “widespread confusion among health professionals about this policy and are concerned that the advice is not been followed. There is no evidence that Vitamin D supplements at the doses recommended, in addition to what is normally consumed in the diet, are harmful.” Some children consuming little or no meat may be at risk for iron-deficiency anaemia and require supplementation.

In general a healthy, balanced diet will contain:

- Plenty of fruit and vegetables (5 portions daily: fresh, frozen, tinned, dried, juice)
- Good portions of starchy foods (especially high fibre forms of rice, cereals, bread, potatoes).
- A serving of protein-rich foods with meals (meat, chicken, eggs, pulses and fish – aim for 2 servings per week, encourage oily fish).
- Dairy foods (milk, cheese and yogurt).

If a healthy, balanced diet is not guaranteed, families receiving Income Support, or Income Based Job Seekers Allowance or Child Tax Credit but not Working Tax Credit and have a family income below a certain level can obtain supplements through the Healthy Start scheme. Information regarding commercially available preparations can be sought from a Pharmacist, GP or Registered Dietitian.

7.4 Vitamin K

In Leicestershire, it is advised that Vitamin K prophylaxis be given at birth to all infants to avoid haemorrhagic disease of the newborn. Parents can discuss this with a Consultant Paediatrician or Midwife for further information.

7.5 Fluoride and Dental Health

The water in Leicestershire at present has insufficient natural fluoride to benefit teeth.
In order to protect teeth against decay, it is recommended the twice-daily use of fluoride toothpaste for everyone but recognise that there are some children who would benefit from the use of fluoride supplements on a daily basis.

The need for fluoride supplementation is best determined by the family dentist and should be reviewed on a regular basis. Fluoride supplements might be recommended for children who have learning difficulties, cardiac problems or other compromising medical histories.

Fluoride supplements can be taken as drops or in tablet form in the following typical regimens:

- 6 months to 3 years – 0.25mg daily
- 3 years to 6 years – 0.5mg daily
- 6 years to 11 or 12 years – 1.0mg daily

Care should be taken to avoid fluorosis of the teeth resulting from excessive ingestion of fluoride. This is usually a consequence of the misuse of fluoride toothpaste. To reduce this risk, parents should:

- Supervise and assist with toothbrushing for all children under 8 years of age.
- Brush their child’s teeth just twice a day – morning and night.
- Not allow children to eat toothpaste. Tap the paste into the brush head so that they cannot suck it off.
- Ask their dentist about the appropriate level of fluoride toothpaste to use for their child.
- Use a smear of fluoride toothpaste for infants and gradually increase up to a small pea-sized amount by 2½-3 years of age when all the baby teeth have erupted.

To gain the most benefit from the fluoride in toothpaste, parents should encourage their children to just spit out after brushing. If desirable, the child can wet the toothbrush head with water and transfer this to their mouth to “rinse” but rinsing with a large volume of water is not recommended.
8 SPECIAL DIETARY CONSIDERATIONS

8.1 Vegetarian Diets

Lacto-ovo vegetarian diets exclude meat, poultry and fish, but include milk, milk products and eggs. Providing a wide variety of food is eaten, it should be nutritionally adequate. The most likely nutritional problem is iron deficiency and this can be prevented by consuming wholegrain cereals, hard cooked eggs, green vegetables, dried fruit and pulses. Absorption of iron will be increased if a vitamin C source, e.g. diluted pure fruit juice or fresh fruit, is taken at the same time as an iron-containing meal. If there is any concern about dietary adequacy, refer to a Registered Dietitian.

Vegan diets exclude all animal products and may not provide sufficient energy, protein, iron and B vitamins for the growing infant or young child. Referral to a Registered Dietitian should be made if there is concern about the adequacy of the diet. The only infant formula suitable for vegan diets is Heinz Nurture Soya Infant Formula. Additional supplements of vitamin B2 (Riboflavin) and vitamin B12 may be required at weaning, if the child is taking insufficient soya infant formula.

8.2 Macrobiotic, Rastafarian And Other Restricted Diets

These diets should not be recommended at any time for infants and young children. They are severely deficient in most nutrients and are not compatible with normal growth and development.

8.3 Asian Infant Feeding

A large proportion of Leicestershire’s population is made up of Asian ethnic minorities; 29.1%, 3.1% black and 3.1% other ethnic minority groups in Leicester City, 3.7% in the county and a further 1.5% from other ethnic minority groups in the county (information from local authorities in 2003). Dietary advice needs to be adapted for the specific needs of each community taking into account their traditional eating habits.

The majority of Asian mothers choose to breast feed in hospital, but many discontinue this practice on their return home. Some Asian mothers do not breast feed until the third day and do not give colostrum, as they believe that it is unsuitable for the baby. Many mothers have adopted ‘western’ bottle feeding practices because of cultural barriers to breast feeding. The advantages of breast feeding should be promoted where possible.

The introduction of solids to Asian infants is often delayed (in some cases up to 2 years of age) and this can cause anaemia, failure to thrive and rickets. Routine supplementation of vitamins A and D is particularly important in these infants. Vitamin D is provided using Healthy Start Vitamin Drops to take 5 or preferably 7 drops daily (1 drop = 40 units = 1 mcg daily Vitamin D) or Abidec from 1 month in high risk groups. Careful exposure to sunlight should also be encouraged. Mothers should be encouraged to wean within the recommended age range (refer to Section 6).

Prolonged bottle feeding and the addition of sugar, gur, jaggery or honey to drinks are common practices in the Asian community. For nutritional, developmental and dental health reasons, these practices should be discouraged and good weaning practices promoted. (Refer to Section 6).
Weaning on to appropriate solids can sometimes be a problem. Some Asian mothers are reluctant to use home cooked foods and are unaware of which manufactured baby foods are suitable for their infants. As a result, weaning diets are sometimes limited to puddings and desserts as mothers are sure of the content of these. These are high in sugar and are poor sources of other nutrients.

8.4 Afro Caribbean Diets

Cereals and tubers such as rice, green banana, yam and sweet potato form the main part of the diet. These are served with small helpings of preserved meat and fish, alongside well-seasoned peas, beans, nuts and leafy green vegetables. Delayed introduction of solids and excessive use of cow’s milk has led to a higher incidence of iron deficiency in this population group. Rickets has been seen in Afro Caribbean and North African children, hence the appropriate use of vitamin D supplement is an important factor in this at risk group. (See section 9.16 for more information).

8.5 The Pre-Term Infant

Infants born pre-term (<37 weeks gestation) are nutritionally vulnerable with reduced fat, glycogen and mineral stores. Premature infants are born during a period of very rapid intrauterine growth and consequently have increased energy, protein and mineral requirements compared with a fully grown term infant.

The diet provided at birth and during weaning should ensure adequate sources of energy and nutrients in forms which can readily be absorbed by the infant.

Breast milk is encouraged for feeding pre-term infants where possible. Breast milk contains several non-nutritive factors which are not present in commercial formula and recent studies have shown that low birth weight infants who received breast milk during the neonatal period have lower rates of infection and necrotising enterocolitis as well as better neurodevelopmental scores. If the sucking reflex is present, mothers may be able to directly breast feed their infants, but where this is not possible, expressed breast milk can be fed via a nasogastric/nasojejunal tube.

Low birthweight formula milks are used if birth weight is less than 2kg and are indicated when the mother is unable to breast feed or does not wish to. The initial feeding route is via a nasogastric/nasojejunal tube but as the sucking reflex develops, a bottle will be used. Such formula include:-

<table>
<thead>
<tr>
<th>NAME</th>
<th>MANUFACTURER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aptamil Pre Term</td>
<td>Milupa</td>
</tr>
<tr>
<td>Nutriprem 1</td>
<td>Cow &amp; Gate</td>
</tr>
<tr>
<td>Osterprem</td>
<td>Heinz</td>
</tr>
<tr>
<td>SMA Gold Prem</td>
<td>SMA Nutrition</td>
</tr>
</tbody>
</table>

Infants will normally transfer to a term formula at 2kg in weight. Low birthweight formula milks are not used after discharge from hospital unless there are exceptional circumstances.

Normal infant formula (see Section 3) are recommended after the infant has reached 2kg in weight for mothers who are not breast feeding or who do not wish to continue. At discharge from hospital, most preterm babies should be receiving either breast milk or a normal term formula.
In special circumstances, an interim formula may be recommended by the Paediatrician and Registered Dietitian. They are called follow on premature formula. These formula provide more energy, protein, minerals and vitamins than normal infant formula. They are available in the community and are prescribable but are not available through the Healthy Start Scheme.

These are:

<table>
<thead>
<tr>
<th>NAME</th>
<th>MANUFACTURER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Premcare</td>
<td>Heinz</td>
</tr>
<tr>
<td>Nutriprem 2</td>
<td>Cow &amp; Gate</td>
</tr>
</tbody>
</table>

Breast milk fortifiers may be clinically indicated for some pre-term infants. They contain energy, protein, minerals and vitamins. As the composition of pre-term milk approaches that of term milk, some infants may fail to thrive and the Paediatrician and Registered Dietitian may advise fortification. Fortifiers are not available in the community and are for hospital use only.

These are:

<table>
<thead>
<tr>
<th>NAME</th>
<th>MANUFACTURER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eoprotin</td>
<td>Milupa</td>
</tr>
<tr>
<td>Nutriprem Breast Milk Fortifier</td>
<td>Cow &amp; Gate</td>
</tr>
<tr>
<td>SMA Breast Milk Fortifier</td>
<td>SMA Nutrition</td>
</tr>
<tr>
<td>Enfamil Breast Milk Fortifier</td>
<td>Mead Johnson</td>
</tr>
</tbody>
</table>

8.5.1 Long Chain Polyunsaturates (LCPs) And Neurodevelopmental Outcome And Retinal Development

LCPs are important structural components of the brain and retina. The two major brain LCPs are decosahexaenoic acid and arachidonic acid. These fatty acids are present in breast milk as well as their precursors, linoleic and linolenic acids. When born at term, the infant is well provided with LCPs in the liver and brain. However, the tissues of infants born early in the third trimester of pregnancy contain much lower concentrations of LCPs. Studies have suggested that desaturation enzymes may not be fully mature, therefore pre-term infants may be particularly vulnerable to fatty acid deficiency/nutritional inbalance. The use of breast milk is therefore likely to be advantageous in these preterm infants.

All low birthweight formula have LCPs added.

8.5.2 Weaning Pre-Term Infants

Weaning these infants can present difficulties. Once discharged from hospital, very low birthweight infants will be seen regularly as outpatients to monitor progress and weight gain. Preterm infants are a special case and advice should be sought from the Registered Dietitian and medical team caring for them.

8.6 Food Allergies and Intolerances
Serious allergies to various types of food are not very common in infancy. However, if an infant is thought to be food allergic or food hypersensitive to a particular food, it is important that the condition is properly diagnosed by a Doctor. Symptoms can include diarrhoea, vomiting, angioedema, urticaria, eczema, severe and persisting colic.

A Registered Dietitian should be consulted so that the child’s diet can be properly assessed for its nutritional adequacy, and adapted as necessary and confirmation of diagnosis made.

Sensitisation to food allergens (and subsequent presentation of food allergy) is most prominent in the first 6 months of life as this is when the infant’s immune system is least mature. There is also evidence suggesting altered gut mucosa in atopic infants at this time.

Infants who have a family history of atopic disease should be encouraged to exclusively breast feed for 6 months and formula top ups (particularly in the first few days) should be avoided wherever possible. Where there is a family history of atopy, then a fully or partially hydrolysed formula should be used for infants who are not able to be fully breast fed for the first 6 months.

Formulae for use for allergy prevention (partially/extensively hydrolysed formula) should be used for the first 6 months of life only. In infants with a family history of atopy, e.g. food allergy, asthma, eczema, hay fever, rhinitis, where an alternative to breast milk is required either to supplement breast feeds or replace breast milk as the sole source of nutrition, then either partially or extensively hydrolysed formula milk with a proven or confirmed reduced allergenicity is recommended. However where there is maternal eczema the infant should be placed straight on to an extensively hydrolysed casein formula if no breast milk is available. All other milks must not be given (see Appendix 9 for flowchart).

There are no proven benefits in preventing allergy by maternal avoidance of certain foods during lactation. However, breast fed infants who are displaying symptoms of food allergy or who have a sibling with proven food allergy may benefit from maternal food exclusion e.g. cow’s milk, egg. This should only be carried out under the supervision of a Registered Dietitian. At this point in time it is not proven that avoidance of peanuts in pregnancy or whilst breastfeeding has any influence on the development of peanut allergies. However until further research is completed, mothers who have a first degree relative with an allergic disease, e.g. asthma, eczema, hay fever, food allergy, and/or have such a condition themselves, may wish to avoid peanuts during pregnancy and breast feeding.

Solids should be introduced at the age of 6 months. If weaning takes place early it should not occur before 17 weeks. Parents of infants where there is a family history of allergy should be strongly discouraged from weaning early as this can cause early sensitisation.

If an infant has a family history of atopy, weaning should commence with the traditional low allergenic weaning foods such as rice, potatoes, root and green vegetables, apple, pear, banana and stone fruits i.e. a diet which is gluten free, milk free, egg free, soya free, fish free, meat free. If using commercial weaning foods care must be taken to stay within these guidelines. High allergenic foods must never be introduced before 6 months, but once the child is 6 months old they should be introduced as soon as weaning has become well established. These guidelines are not applicable to infants who already have a suspected or proven food allergy or any other allergic disorder. They require individual assessment and advice.

The list below states the foods or food additives which are the source of the majority of adverse food reactions:

- peanuts
- tree nuts
• sesame seed
• mustard seed
• cow’s milk
• eggs
• fish
• shellfish
• soy
• wheat
• celery
• sulphites

From the age of 6 months, once weaning is well established, the majority of these foods (except for peanuts) may be introduced one at a time starting with a small amount and introducing no more than one new allergenic food at a time. By the age of 12 months (apart from peanut products which should not be introduced until 3 years, whole nuts at 5 years of age) all the major high risk foods should be introduced. (See Appendix 9 for flowchart). This is based on current best practice but may change at a later date. See Section 4 for advice on which formula to use if an alternative to breast milk is required.

It may be beneficial for home cooked rather than commercial weaning foods to be used during the first few months of weaning as it is easier to introduce one high allergenic food at a time. We recommend that they are introduced singly starting with a small amount and introducing no more than one new allergenic food at a time and allowing at least a week between each new food in order to enable easy identification of any causing reactions.

There is no research evidence to support delayed weaning beyond 6 months and it is possible that it could adversely affect the development of food allergies.

8.7 Coeliac Disease/Gluten Intolerance

The development of an intolerance to gluten may be delayed (although not prevented) by not introducing gluten containing foods (wheat, rye, barley and oats) until age 6 months.

Mothers should be encouraged to choose rice, fruit and vegetables as first foods.

If coeliac disease is suspected in a child, it is important that the diagnosis be confirmed or refuted by a Paediatrician. An empirical trial of gluten exclusion will only cause confusion and should never be attempted.

8.8 Cow’s Milk Protein Allergy

Cow’s milk protein allergy has an estimated prevalence of 2% among children under one year old and due to over-reporting should be diagnosed medically before excluding cow’s milk. About half outgrow their allergy by 1 year and many children have outgrown it by 3 years of age. However, cow’s milk allergy may be lifelong. If diagnosed in an infant, mothers should be encouraged to continue breast feeding and occasionally may also need to avoid cow’s milk and dairy products themselves due to transmission of cow’s milk antigens via breast milk. (Breast feeding mothers who avoid cow’s milk will require calcium supplements).

Alternatively, the infant can be fed using a hydrolysate infant formula (see Section 4.2) if less than 6 months or a soya formula if over 6 months due as long as there is no suspected soya intolerance.
Cow’s milk intolerance is more common than cow’s milk allergy and is usually transient, requiring short lived dietary exclusions.

8.9 Lactose Intolerance

Trauma to the gut such as severe infection, gastroenteritis, resection etc. can lead to the temporary loss of the enzyme lactase, which is required to break down lactose (the sugar found in milk). As a result the infant may experience severe diarrhoea, dehydration and possibly failure to thrive. It is important to confirm the diagnosis by identifying reducing sugars in the stools (Clinitest showing > 1% or stool chromatography) or with positive hydrogen lactose breath test if an older child.

During the period of intolerance, it is important that the infant is taken off all foods containing the lactose to which it is intolerant and switched to a lactose free formula such as SMA LF, Enfamil LF or Lactofree, Lactolite milks if the child is over 1 year of age. Soya formula should not be used if the is infant less than 6 months. A lactose free diet should be prescribed and the advice of a Registered Dietitian sought. This is usually a short term condition lasting 6 to 8 weeks. Persistent lactose intolerance is more common in African Caribbean children. If symptoms persist, referral for specialist assessment is indicated.

8.10 Hypersensitivity

Synthetic colours, preservatives, some other food additives, as well as salicylates present naturally in food, may be linked to some food hypersensitivity conditions such as urticaria. The role of such substances in behaviour disorders has not been confirmed in double blind studies and is controversial. A Registered Dietitian should advise parents if exclusion of these substances is attempted. Deliberate breaks in the diet are often appropriate to check the diagnosis. The need to continue a diet must be reviewed rationally as must the need to institute it.

8.11 Acute Diarrhoea

When acute diarrhoea occurs in the breast fed infant, breast feeding should be continued and Dioralyte given. When it occurs in a bottle fed infant, milk and solids should be stopped for 4 hours if the infant is dehydrated and the infant rehydrated over 4 hours with Dioralyte. After 4 hours the hydration state should be reassessed and further Dioralyte only given over 4 hours if the infant is still dehydrated. Once the infant is rehydrated, milk and bland solids (if the child is on solids) should be restarted and Dioralyte given as well to replace ongoing losses. It is preferable to use a commercially prepared glucose electrolyte solution such as “Dioralyte”. Seek medical advice if concerned about the child e.g. very young.

Anti-diarrhoeals and anti-emetics should never be used for children.

When the patient has recovered give extra food for 2 weeks to make up for weight loss in the period of illness. 

There is no need to regrade formula milks in children with acute diarrhoea. If cow’s milk allergy is thought to be the cause of diarrhoea, an alternative substitute should be used. See Section 8.8
8.12 Post Gastro-Enteritis Diarrhoea

If diarrhoea persists for more than 2 weeks in a baby receiving cow’s milk, consider lactose or cow’s milk protein intolerance. Test the stool for lactose (see section 8.9) and if positive place on appropriate diet. This may require exclusion of dairy products and/or lactose containing solids but it is usually short lived (6-8 weeks). Medical advice should be sought. Then the advice of a Registered Dietitian to give special dietary advice if necessary.

8.13 Toddler Diarrhoea

In so-called “toddler diarrhoea” (the “peas and carrots syndrome”), recognisable vegetable matter is seen in the stool. Growth is usually normal and the child is normally well and thriving.

If the diarrhoea is unresolved by the age of three years or the child is unwell, other more serious causes of chronic diarrhoea must be excluded. A referral to a Consultant Paediatrician for confirmation of the diagnosis should be made. A Registered Dietitian may be able to give advice on dietary modification, e.g. increasing fat intake if necessary, if symptoms are troublesome or offensive.

8.14 Constipation

If wholegrain foods, fruit, vegetables and fluids are taken regularly, constipation should not be a problem. Normal bowel frequency may vary from several stools per day to 2-3 days between stools. A history should be taken from parents before advising on treatment – reassurance may be all that is needed.

Breast fed infants are rarely constipated but formula fed infants may become constipated:

(i) if the feed is over concentrated
or
(ii) there is inadequate fluid intake

Occasionally constipation can be a symptom of food intolerance. If constipation is a problem in young infants, firstly ensure that adequate fluid is being taken. Extra drinks of cooled boiled water or fresh fruit juice diluted 1 part juice in 10 parts water can be offered.

In older infants, a diet higher in fibre should be encouraged, including fruits, vegetables, pulses and cereals. An adequate fluid intake should also be encouraged.

Unprocessed bran is not recommended for young children as it may compromise nutrient absorption.

More severe constipation may lead to an anal fissure which is painful and which may cause faecal retention and commence the vicious cycle of withholding faeces and chronic constipation. If constipation does not respond to simple dietary measures, medical help should be sought.

The practice of adding sugar/honey to bottles to cure constipation is not endorsed.

8.15 Mild Gastro-Oesophageal Reflux
Mild gastro-oesophageal reflux can present with excessive possetting/vomiting, irritability, screaming, reluctance to feed and failure to thrive. Pre-thickened infant formula (listed above) are now available over the counter or on prescription to help manage this. If this is suspected in an infant, change of formula should be under medical supervision. If failure to thrive persists, referral to a Paediatrician is essential.

It is worth considering cow’s milk protein intolerance in reflux, particularly if there is a family history of atopy. Again a change of formula should be under medical supervision.

### 8.16 Vitamin D Deficiency

Vitamin D deficiency has been found to be very common during and after pregnancy in mothers of South Asian and Black African origin, particularly those who are inadequately exposed to sunlight on their skin.

Vitamin D supplementation (10mcg) is strongly recommended in this high risk group. Infants born to these mothers, especially those who are breastfed are at high risk of vitamin D deficiency. This may manifest as neonatal hypocalcaemic fits and later rickets. These at risk babies should receive additional prophylactic Vitamin D (10mcg) in the form of infant A, C, D drops until adequate weaning has been completed.

### 8.17 Iron Deficiency Anaemia

An entire section is devoted to iron deficiency anaemia, as it is the most commonly reported nutritional deficiency during early childhood. The National Diet and Nutrition Survey showed 12% of 1½ – 2½ year olds and 6% of 2½ – 4½ year olds were anaemic.

The following table shows the reference range for haemoglobin in infants and young children:

<table>
<thead>
<tr>
<th>Age</th>
<th>Haemoglobin levels</th>
</tr>
</thead>
<tbody>
<tr>
<td>Newborn – 3 months</td>
<td>13.5 – 19.5g/dl</td>
</tr>
<tr>
<td>3 months – 1 years</td>
<td>9.5 – 12.5g/dl</td>
</tr>
<tr>
<td>1 year – 2 years</td>
<td>11.0 – 13.0g/dl</td>
</tr>
<tr>
<td>3 years – 6 years</td>
<td>12.0 – 14.0g/dl</td>
</tr>
</tbody>
</table>

Serum ferritin levels in this age group are the same as for adults, i.e:-

- Males: 23 - 54 µg/L
- Females: 10 - 420 µg/L
Before the age of 6 months, iron is provided by the baby's iron stores and by either fortified infant formula or breast milk. Although the iron content of breast milk is low, the absorption is very much more efficient than that from infant formula.

Iron rich foods need to be included in the weaning diet as baby’s iron stores begin to be depleted after 6 months of age. Foods which are good sources of readily absorbable iron are liver, kidney, meat (especially red meat) and eggs (hard cooked for this age group). Other good sources but less well absorbed include wholegrain and fortified cereals, bread, pulses, green leafy vegetables, dried fruit and cocoa. See LNDS weaning leaflet Stage 2 for more information or section 6.2.

Excessive quantities of bran enriched and high fibre cereals may contain phytates which bind with the iron and reduce absorption further. High intakes of these foods should be discouraged for this reason and also because the large bulk of these foods may lead to there being insufficient energy intake.

It is important to ensure that Vitamin C rich foods are eaten alongside foods rich in iron to enhance absorption of dietary iron. Good sources of vitamin C include fruit, vegetables and diluted fruit juice.

Drinks of tea and coffee should be discouraged in babies and young children as tannin in these drinks decreases the absorption of iron. Decaffeinated and tannin-free tea is available in supermarkets.

The introduction of sweets, chocolate, crisps etc. should be discouraged because they are of poor nutritional value and may lead to reduced appetite for foods which provide better nutritional quality.

Preterm infants will receive an iron supplement from about 4 weeks of age as their stores are depleted from that time. They are usually continued until on a varied diet or 1 year of age.

8.18 Food Refusal/Faddy Eaters

Most parents experience food refusal in their children at some stage. ‘Toddler strikes’ are a good way of gaining attention, therefore the best advice to give is to ignore this behaviour. Arguments over meals will make the situation worse.

Parents need reassurance that the well child will not come to harm, even if the diet is temporarily inadequate. Parents should be encouraged that eating habits will improve and they should keep offering different foods.

It is recommended that parents do not force children to eat.

Referral to a Registered Dietitian for dietary analysis may help to alleviate parents’ concerns and provide reassurance along with proof of adequate intake.

If the situation persists, referral to a Consultant Paediatrician may be necessary.

Toddlers should be discouraged from taking high intakes of fluid (so called ‘Squash Drinking Syndrome’), i.e. squash, juice, milk, where this blunts the appetite at mealtimes.
Negative strategies, e.g. bribing, withholding desirable foods, leaving long gaps between meals, should be discouraged by professionals working with parents of children who are refusing food. Positive reinforcement is the most useful strategy.

Professionals should appreciate that parents may have different approaches to encouraging their children to accept new foods.

Some parents prefer to encourage good eating habits by integrating the child into family meals; others prefer to feed their child separately when time and undivided attention can be given. Both approaches are satisfactory.
9 HEALTHY EATING FOR THE UNDER FIVES

Recommendations for healthy eating in this age group are taken from the Committee on Medical Aspects of Food Policy (COMA) 1994 reports “Nutritional Aspects of Cardiovascular Disease”\textsuperscript{A3} and “Weaning and the Weaning Diet”\textsuperscript{A1}. Recommendations also come from the Food Standards Agency website\textsuperscript{A7} and the Scientific Advisory Committee on Nutrition report on Salt and Health (2003)\textsuperscript{B19}.

9.1 Fat

Fat is an important source of energy and fat soluble vitamins for infants and young children. Therefore a low fat diet should not be recommended for children under 2 years of age. By the age of 5, COMA recommendations for lowering fat intake can apply in full, providing children are eating a varied, balanced diet and are growing and developing normally. A flexible approach is needed to the extent and timing of dietary change between the ages of 2 and 5 years.

9.2 Sugar

Sugar provides energy but no other nutrients. It may contribute to the development of dental caries and obesity and therefore consumption should be limited. Other names by which sugars may be listed on manufactured products include sucrose, honey, glucose, maltose, dextrose, fructose, brown sugar, raw cane sugar, invert sugar, corn syrup, molasses and concentrated fruit juice. In order to prevent tooth decay, foods and drinks that contain sugar should be restricted to mealtimes only and never given at bedtime or over night. The twice-daily use of fluoride toothpaste should also be encouraged.

9.3 Fibre

Dietary fibre should be introduced gradually into the diets of infants and young children; any increase in fibre must always be accompanied by an increased fluid intake. Foods which provide fibre naturally in the diet can be introduced e.g. fruit, vegetables, wholegrain cereals and bread, beans and pulses. However, unprocessed bran is not recommended because it may compromise the absorption of calcium, iron and zinc. Excessive amounts of fibre may lead to diarrhoea or constipation. It could also result in a low energy intake leading to failure to thrive.

9.4 Salt

Children require a low amount of salt in their diets and therefore salt should be restricted by reducing intake of high-salt foods, such as crisps, other savoury snacks, stock cubes, gravies and soups.

Parents should also avoid adding extra salt to food at the table or whilst cooking. They should also avoid the use of salt substitutes e.g. Lo Salt, Natrex, because of the high potassium content and they still contain approximately 30% salt.

The Scientific Advisory Committee on Nutrition report on Salt and Health (2003) provide target salt intakes for infants and children (shown below). This target does not represent an optimal or ideal consumption level for infants and children but an achievable population goal.
<table>
<thead>
<tr>
<th>AGE</th>
<th>RNI Sodium mmol/d (mg/d)</th>
<th>Salt (g/d)</th>
<th>Target average salt intake (g/d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-6 months*</td>
<td>10.5 (242)</td>
<td>0.6</td>
<td>&lt;1</td>
</tr>
<tr>
<td>7-12 months*</td>
<td>14.5 (334)</td>
<td>0.84</td>
<td>1</td>
</tr>
<tr>
<td>1-3 years</td>
<td>22 (500)</td>
<td>1.28</td>
<td>2</td>
</tr>
<tr>
<td>4-6 years</td>
<td>30 (700)</td>
<td>1.8</td>
<td>3</td>
</tr>
</tbody>
</table>

*The RNI for infants aged 0-6 months represents the average RNI of the 0-3 months and 3-6 months age groups; the RNI for infants aged 7-12 months represents the average RNI of the 7-9 months and 10-12 months age groups.

9.5 Obesity

Obesity in children is on the increase. Being overweight can be linked to conditions such as diabetes and heart disease. There is a mixture of causes which contribute to obesity.

- Lack of exercise
- Inappropriate (energy dense) diet

It is important to avoid dieting in overweight children as they still need enough nutrition to grow. Instead of dieting aim for healthy eating and encourage appropriate physical activity. Refer child on to a Paediatrician and/or a Registered Dietitian as appropriate.

9.6 Type 1 Diabetes

The prevalence of type 1 diabetes in the under 5’s is 1:10,000. Any child diagnosed with diabetes must be referred to the specialist children’s diabetes team at Leicester Royal Infirmary UHL NHS Trust for advice and support.

9.7 Summary

Children’s nutritional needs vary according to age, sex and physical activity. (See Appendix 3). It is important that a variety of foods are included to meet those needs and food should be chosen from each of the following food groups daily:

- Bread, cereals, potatoes, pasta and rice and flour products e.g. chapattis
- Fruit and vegetables
- Meat, fish, beans and eggs
- Milk and dairy produce

Young children often need snacks between meals if they are to meet energy requirements. Suitable snacks include fresh fruit, plain yogurt, wholemeal sandwiches, cheese, muffins, teacakes, crackers, breadsticks, toast.

In order to avoid problems of tooth decay, it is best to restrict all sugar-containing foods and drinks e.g. sweets, chocolates, biscuits and fruit drinks to mealtimes only. Fatty foods such as crisps should be kept to a minimum, preferably as treats rather than as regular dietary items.

Children aged between 1 and 5 years should be taking 1 pint of full cream milk per day, in cooking and food and drink. The equivalent of half pint milk = 1oz cheese or 1 pot of yogurt.
Semi-skimmed milk can be introduced from the age of 2 years, providing the child is eating a good mixed diet and is growing and developing adequately.

See Section 7 on Vitamins and Minerals for advice on vitamin supplements.

Fully skimmed milk should not be offered to children below the age of 5.

Low/reduced fat foods e.g. low fat spread, low fat yogurt, reduced fat hard cheeses, should not be offered to children under 2 years of age, but may be introduced later, providing the child is thriving.
10 HEALTHY START

Healthy Start replaced the Welfare Food Scheme. It is now live throughout Great Britain and Northern Ireland.

The new scheme:

- includes fresh fruit and vegetables as well as milk and infant formula milk
- supports breastfeeding
- encourages earlier and closer contact between health professionals and families from disadvantaged groups
- includes free vitamin supplements for children from 6 months until their 4th birthday, and free vitamin supplements for pregnant women and women with babies up to one year old.

Health Professionals working with people who qualify for Healthy Start, will need to encourage them to apply for the scheme and offer them appropriate health advice.

Healthy Start is open to pregnant women and families with children under the age of four who are on:

- Income Support
- income-based Jobseeker’s Allowance or
- Child Tax Credit (but not Working Tax Credit unless their family is receiving Working Tax Credit run-on only*) with an income of £15,575 a year or less (2008/9)

*Working Tax Credit run-on is the Working Tax Credit received in the 4 weeks immediately after stopping working for 16 hours or more per week

All pregnant women under the age of 18 also qualify, whether or not they are on benefits.

Once accepted on the scheme, pregnant women and families will receive a set of vouchers through the post every four weeks. Each voucher can be exchanged for any combination of milk, fresh fruit, fresh vegetables and infant formula milk in registered shops.

Entitlement to vitamin supplements will be printed on the letter attached to the vouchers. Beneficiaries can take this letter with them to claim their vitamins from the distribution points within their Primary Care Trust.

- Pregnant women and children aged between one and four will receive one voucher per week, for each child/pregnancy.
- Babies under one year old will receive two vouchers per week.
- Babies who are born before the estimated date of delivery (EDD) will receive two vouchers until one year after their EDD. Babies who are born after the EDD will receive vouchers for one year from the date of delivery.

More information, including a dedicated section for Health Professionals is available at www.healthystart.nhs.uk
11 REFERENCES

A. Major References

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2. “Dietary Reference Values for Food Energy and Nutrients for the UK”.

3. “Nutritional Aspects of Cardiovascular Disease”
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5. “Successful Breastfeeding : A Practical Guide for Midwives and others supporting Breastfeeding Mothers”
   1988. Royal College of Midwives.

6. Taitz, L.S., Wardley, B.L.


B Specific References used in Text

1. “Leicestershire Breastfeeding Initiative” and “Breastfeeding Charter for Mothers”, Leicester Royal Infirmary Maternity Hospital, and Leicester General Hospital Maternity Unit. 1996.

2. The Department of Health
“HIV Infection, Breastfeeding and Human Milk Banking in the UK” PL/CMO 89-4; PL/CNO 89-3.

3. Balmer, S.E., Scott, P.K., Wharton, B.A.

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6. Taitz, L.S., Scholey, E.
“ Are babies more satisfied by casein-based formula?”

7. ESPGAN Committee of Nutrition of the Preterm Infant.


9. Cooke, R.J., Zee P., Yeh, Y.Y.
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12. Carlson, S.E.1
“Long chain fatty acids and early visual and cognitive development of preterm infants”

13. Lucas, A.
“Breast milk and subsequent intelligence quotient in children born preterm”


30. “Information for health professionals on infant feeding” www.sacn.gov.uk

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44. Guidelines for the management of healthy term babies who are reluctant to feed (UHL Guidance). January 2000.


47. Scientific Advisory Committee on Nutrition (2007) Update on Vitamin D. Position
Statement by the Scientific Advisory Committee on Nutrition. London: The
Stationery Office

48. Department of Health (2005) CMO Update Issue 42. London: The Department of
Health

Journal of Human Nutrition and Dietetics 20: 294-301.

12 APPENDICES

APPENDIX 1
Helpful Contacts

The following lists people/agencies that may be useful for specific information.

1. **LEICESTERSHIRE NUTRITION AND DIETETIC SERVICE**
   *(hosted by LEICESTERSHIRE COUNTY & RUTLAND PRIMARY CARE TRUST)*
   Leicestershire Nutrition & Dietetic Service
   Units 11 and 12
   Warren Park Way
   Enderby, Leics LE19 4SA
   Tel: 0116 272 7200
   Fax: 0116 272 7228
   Website: [www.lnds.nhs.uk](http://www.lnds.nhs.uk)

   Please contact the above address and you will be put in contact with the Registered Dietitian who covers your area or consult [www.lnds.nhs.uk](http://www.lnds.nhs.uk)

2. **BREAST FEEDING SUPPORT**

   **Leicester Breast Feeding Helpline**
   Manned by volunteers between 6.00 p.m. – 11.00 p.m. daily
   Tel: 0116 2551935

   **Association of Breast Feeding Mothers**
   Tel: 020 7823 1481

   **La Leche League (Great Britain)**
   Telephone Helpline: 0845 120 2918

   There are local support groups in Leicester/Leicestershire for the above organisations. Midwives, Health Visitors and other health professionals in contact with parents post-natally should make themselves aware of local contact numbers and have these available to give to parents.

3. **COMMUNITY DENTAL SERVICE**

   **Prince Philip House**
   St Matthew’s Health and Community Centre
   Malabar Road
   Leicester LE1 2NZ
   Tel: 0116 2954632

4. **SPEECH AND LANGUAGE THERAPY SERVICE**

   **Prince Philip House**
   St Matthew’s Health and Community Centre
   Malabar Road
   Leicester LE1 2NZ
   Tel: 0116 2954670

5. **TRENT MEDICINES INFORMATION SERVICE**

   **Leicester Royal Infirmary**
   Leicester LE1 5WW
### UK DIETARY REFERENCE VALUES FOR PREGNANCY AND LACTATION (A2)

#### Estimated Average Requirements (EARs) for Energy

<table>
<thead>
<tr>
<th>Females</th>
<th>EARs</th>
<th>kcal/day</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-18 years</td>
<td>8.83</td>
<td>2,110</td>
</tr>
<tr>
<td>19-50 years</td>
<td>8.10</td>
<td>1,940</td>
</tr>
<tr>
<td>Pregnancy</td>
<td>+0.80*</td>
<td>+200</td>
</tr>
<tr>
<td>Lactation:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 month</td>
<td>+ 1.90</td>
<td>+450</td>
</tr>
<tr>
<td>2 months</td>
<td>+ 2.20</td>
<td>+530</td>
</tr>
<tr>
<td>3 months</td>
<td>+ 2.40</td>
<td>+570</td>
</tr>
<tr>
<td>4-6 months (Group 1)</td>
<td>+ 2.00</td>
<td>+480</td>
</tr>
<tr>
<td>4-6 months (Group 2)</td>
<td>+ 2.40</td>
<td>+570</td>
</tr>
<tr>
<td>&gt; 6 months (Group 1)</td>
<td>+ 1.00</td>
<td>+240</td>
</tr>
<tr>
<td>&gt; 6 months (Group 2)</td>
<td>+ 2.30</td>
<td>+550</td>
</tr>
</tbody>
</table>

**Group 1**  
Women who practice exclusive or almost exclusive breast feeding until the baby is 3-4 months old, then progressively introduce weaning foods as part of an active process which often lasts only a few months.

**Group 2**  
Women who introduce only limited complementary feeds after 3-4 months and whose intention is that breast milk should provide the primary source of nourishment for 6 months or more.

*Last trimester only*
## APPENDIX 2B

### UK DIETARY REFERENCE VALUES (A2)

**Reference Nutrient Intake for Protein and Minerals**

<table>
<thead>
<tr>
<th>Females</th>
<th>Protein g/day</th>
<th>Calcium mg/day</th>
<th>Iron mg/day</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-18 years</td>
<td>45</td>
<td>800</td>
<td>14.8⁵</td>
</tr>
<tr>
<td>19-50 years</td>
<td>45</td>
<td>700</td>
<td>14.8⁵</td>
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<tr>
<td>Pregnancy⁰</td>
<td>+6</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Lactation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-4 months *</td>
<td>+11</td>
<td>+550</td>
<td>*</td>
</tr>
<tr>
<td>4+ months *</td>
<td>+8</td>
<td>+550</td>
<td>*</td>
</tr>
</tbody>
</table>

⁰ To be added to baseline requirement through all stages of pregnancy and lactation.

* No increment.

⁵ Insufficient for women with high menstrual losses where the most practical way of meeting iron requirements is to take iron supplements.
APPENDIX 2C

UK DIETARY REFERENCE VALUES FOR PREGNANCY AND LACTATION

Reference Nutrient Intake for Vitamins

<table>
<thead>
<tr>
<th>Females</th>
<th>Thiamin mg/day</th>
<th>Riboflavin mg/day</th>
<th>Niacin mg/day</th>
<th>Vit B6 mg/day</th>
<th>Vit B12 mcg/day</th>
<th>Folate mcg/day</th>
<th>Vit C mg/day</th>
<th>Vit A mcg/day</th>
<th>Vit D mcg/day</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-18 years</td>
<td>0.8</td>
<td>1.1</td>
<td>14</td>
<td>1.2</td>
<td>1.5</td>
<td>200</td>
<td>40</td>
<td>600</td>
<td>-</td>
</tr>
<tr>
<td>19-50 years</td>
<td>0.8</td>
<td>1.1</td>
<td>13</td>
<td>1.2</td>
<td>1.5</td>
<td>200</td>
<td>40</td>
<td>600</td>
<td>-</td>
</tr>
<tr>
<td>Pregnancy</td>
<td>+0.1xxx</td>
<td>+0.3</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>+100</td>
<td>+10</td>
<td>+100</td>
<td>10</td>
</tr>
<tr>
<td>Lactation 0-4</td>
<td>+0.2</td>
<td>+0.5</td>
<td>+2</td>
<td>*</td>
<td>+0.5</td>
<td>+60</td>
<td>+30</td>
<td>+350</td>
<td>10</td>
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<tr>
<td>months</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lactation 4+</td>
<td>+0.2</td>
<td>+0.5</td>
<td>+2</td>
<td>*</td>
<td>+0.5</td>
<td>+60</td>
<td>+30</td>
<td>+350</td>
<td>10</td>
</tr>
<tr>
<td>months</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* No increment

**xxx** For last trimester only

1 Based on protein providing 14.7 per cent of energy
### APPENDIX 3

#### DIETARY REFERENCE VALUES<sub>A2</sub>

#### 0-5 YEARS

**FEMALES**

<table>
<thead>
<tr>
<th>Age</th>
<th>Fluid ml/kg</th>
<th>Estimated Average Requirements (EAR)</th>
<th>Protein g</th>
<th>Calcium mg</th>
<th>Iron mg</th>
<th>Vitamin C mg</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-3 months</td>
<td>150</td>
<td>515</td>
<td>12.5</td>
<td>525</td>
<td>1.7</td>
<td>25</td>
</tr>
<tr>
<td>4-6 months</td>
<td>130</td>
<td>645</td>
<td>12.7</td>
<td>525</td>
<td>4.3</td>
<td>25</td>
</tr>
<tr>
<td>7-9 months</td>
<td>120</td>
<td>765</td>
<td>13.7</td>
<td>525</td>
<td>7.8</td>
<td>25</td>
</tr>
<tr>
<td>10-12 months</td>
<td>110</td>
<td>865</td>
<td>14.9</td>
<td>525</td>
<td>7.8</td>
<td>25</td>
</tr>
<tr>
<td>1-3 years</td>
<td>95</td>
<td>1165</td>
<td>14.5</td>
<td>350</td>
<td>6.9</td>
<td>30</td>
</tr>
<tr>
<td>4-6 years</td>
<td>85</td>
<td>1545</td>
<td>19.7</td>
<td>450</td>
<td>6.1</td>
<td>30</td>
</tr>
</tbody>
</table>

**MALES**

<table>
<thead>
<tr>
<th>Age</th>
<th>Fluid ml/kg</th>
<th>Estimated Average Requirements (EAR)</th>
<th>Protein g</th>
<th>Calcium mg</th>
<th>Iron mg</th>
<th>Vitamin C mg</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-3 months</td>
<td>150</td>
<td>545</td>
<td>12.5</td>
<td>525</td>
<td>1.7</td>
<td>25</td>
</tr>
<tr>
<td>4-6 months</td>
<td>130</td>
<td>690</td>
<td>12.7</td>
<td>525</td>
<td>4.3</td>
<td>25</td>
</tr>
<tr>
<td>7-9 months</td>
<td>120</td>
<td>825</td>
<td>13.7</td>
<td>525</td>
<td>7.8</td>
<td>25</td>
</tr>
<tr>
<td>10-12 months</td>
<td>110</td>
<td>920</td>
<td>14.9</td>
<td>525</td>
<td>7.8</td>
<td>25</td>
</tr>
<tr>
<td>1-3 years</td>
<td>95</td>
<td>1230</td>
<td>14.5</td>
<td>350</td>
<td>6.9</td>
<td>30</td>
</tr>
<tr>
<td>4-6 years</td>
<td>85</td>
<td>1715</td>
<td>19.7</td>
<td>450</td>
<td>6.1</td>
<td>30</td>
</tr>
</tbody>
</table>
**APPENDIX 4**  
*Drugs and Breastfeeding*  
**Table 1. Drugs contra-indicated in breast feeding**

<table>
<thead>
<tr>
<th>Drug</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amiodarone</td>
<td>Theoretical risk of thyroid disturbance because of high iodine content</td>
</tr>
<tr>
<td>Antineoplastic agents</td>
<td>Reports of blood dyscrasias with cyclophosphamide. Theoretically possible with all antineoplastics</td>
</tr>
<tr>
<td>Chloramphenicol</td>
<td>Theoretical risk of blood dyscrasias</td>
</tr>
<tr>
<td>Clindamycin</td>
<td>Report of enterocolitis</td>
</tr>
<tr>
<td>Codeine/dihydrocodeine (long-term and/or high dose)</td>
<td>Report of death of one infant whose mother was rapid metaboliser of codeine leading to high plasma morphine levels.</td>
</tr>
<tr>
<td>Dapsone</td>
<td>Haemolytic anaemia reported</td>
</tr>
<tr>
<td>Doxepin</td>
<td>Case-report of profound respiratory depression on 75mg daily</td>
</tr>
<tr>
<td>Ergotamine</td>
<td>Risk of ergotism in infants</td>
</tr>
<tr>
<td>Gold salts</td>
<td>Risk of hypersensitivity reactions and of haematological and renal toxicity</td>
</tr>
<tr>
<td>Indometacin</td>
<td>Case of infant convulsions reported</td>
</tr>
<tr>
<td>Iodides (including some cough preparations)</td>
<td>Theoretical risk of thyroid disturbance</td>
</tr>
<tr>
<td>Lithium</td>
<td>Tremor and involuntary movements reported</td>
</tr>
<tr>
<td>Oestrogens (high dose)</td>
<td>May cause feminisation of male infants</td>
</tr>
<tr>
<td>Phenindione</td>
<td>Case of haematoma and abnormal blood coagulation reported</td>
</tr>
<tr>
<td>Radio-isotopes</td>
<td>Radiation exposure</td>
</tr>
<tr>
<td>Vitamin D (high dose)</td>
<td>Case report of hypercalcaemia in infant</td>
</tr>
</tbody>
</table>

**Notes:**

1. These drugs are unsuitable for administration to a breast-feeding mother, either because serious adverse effects have been described or because they may be predicted on theoretical grounds.
2. The list of drugs in this Table is not comprehensive.
Table 2: Examples of common drugs to be used with caution in breast feeding

<table>
<thead>
<tr>
<th>Drug</th>
<th>Comments</th>
</tr>
</thead>
</table>
| Salicylates (low dose or short-course use only) | Risk of Reye's Syndrome unknown  
Prefer alternative e.g. paracetamol                                                                                       |
| Piperazine                                | Report of lactation inhibition  
2-day course of piperazine + senna (Pripsen) preferred.  
*Delay breast feeding for 8 hours after each dose*                                                                 |
| Erythromycin                              | Avoid in neonatal period because of possible association with infantile pyloric stenosis                                                 |
| Quinolone antibiotics                     | Single report of severe pseudomembranous colitis with ciprofloxacin.  
Little evidence with other quinolones.                                                                                     |
| Anticonvulsants                           | Little or no evidence for safety of gabapentin, lamotrigine and vigabatrin.  
Minor side effects reported with phenobarbitone, phenytoin and valproate.  
Carbamazepine and ethosuximide appear to be safe.                                                                     |
| Antidepressants                           | SSRIs – report of adverse effects with fluoxetine.  
Sertraline or paroxetine preferred due to shorter half life.  
Little evidence for lofepramine                                                                                         |
| ACE inhibitors                            | Little direct evidence for newer agents, although levels of captopril and enalapril suggest acceptable.                                 |
| Beta blockers                             | Single report of bradycardia, cyanosis and hypotension with atenolol.  
High levels of sotalol in milk  
Propanolol, metoprolol or labetalol preferred.                                                                               |
| Anti-inflammatories                        | Single case of haemorrhage and anaemia in a neonate with naproxen.  
Prefer alternative NSAID in neonates.                                                                                  |
| Antimigraine drugs                         | Insufficient evidence of complete safety for sumatriptan, clonidine and pizotifen, although now considered low risk.                 |
| Antipsychotics                            | Insufficient evidence or minor side effects reported.  
Caution required.                                                                                                          |
| Antithyroid drugs                          | Theoretical risk with carbimazole and propylthiouracil, although latter preferred as fewer side effects in adults.                |

Note:  
The list of drugs in this Table is not comprehensive.
### Table 3: Some drugs considered to be safe in breast-feeding

<table>
<thead>
<tr>
<th>Drug Category</th>
<th>Drugs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antacids</td>
<td></td>
</tr>
<tr>
<td>Anti-emetics</td>
<td></td>
</tr>
<tr>
<td>Antihistamines</td>
<td><em>non-sedating only, e.g. cetirizine or loratadine</em></td>
</tr>
<tr>
<td>Antimalarials</td>
<td><em>prophylaxis with chloroquine or proguanil</em></td>
</tr>
<tr>
<td>Beta blockers</td>
<td><em>propranolol, metoprolol or labetalol preferred – avoid atenolol, nadolol, celiprolol and sotalol</em></td>
</tr>
<tr>
<td>Carbamazepine</td>
<td></td>
</tr>
<tr>
<td>Cephalosporins</td>
<td></td>
</tr>
<tr>
<td>Corticosteroids</td>
<td><em>inhaled and low dose oral</em></td>
</tr>
<tr>
<td>Cromoglycate</td>
<td></td>
</tr>
<tr>
<td>Digoxin</td>
<td></td>
</tr>
<tr>
<td>Ethosuximide</td>
<td></td>
</tr>
<tr>
<td>Fluconazole</td>
<td><em>oral and vaginal use</em></td>
</tr>
<tr>
<td>Folic acid</td>
<td></td>
</tr>
<tr>
<td>Heparin</td>
<td></td>
</tr>
<tr>
<td>Ibuprofen</td>
<td></td>
</tr>
<tr>
<td>Insulins</td>
<td></td>
</tr>
<tr>
<td>Laxatives</td>
<td><em>bulk laxatives, senna</em></td>
</tr>
<tr>
<td>Metronidazole</td>
<td><em>standard oral dose</em></td>
</tr>
<tr>
<td>Nifedipine</td>
<td></td>
</tr>
<tr>
<td>Opiate analgesics</td>
<td><em>short-term use including low-dose codeine/dihydrocodeine</em></td>
</tr>
<tr>
<td>Paracetamol</td>
<td></td>
</tr>
<tr>
<td>Penicillins</td>
<td></td>
</tr>
<tr>
<td>Progestogens</td>
<td></td>
</tr>
<tr>
<td>Salbutamol</td>
<td><em>by inhalation</em></td>
</tr>
<tr>
<td>Sucralfate</td>
<td></td>
</tr>
<tr>
<td>Terbutaline</td>
<td></td>
</tr>
<tr>
<td>Thyroxine</td>
<td></td>
</tr>
<tr>
<td>Trimethoprim</td>
<td></td>
</tr>
<tr>
<td>Vaccines</td>
<td></td>
</tr>
<tr>
<td>Vitamins B &amp; C</td>
<td></td>
</tr>
<tr>
<td>Vitamins A &amp; D</td>
<td><em>low replacement doses only</em></td>
</tr>
<tr>
<td>Warfarin</td>
<td></td>
</tr>
</tbody>
</table>

**Note:**

*The list of drugs in this Table is not comprehensive.*
## APPENDIX 5
### A GUIDE TO FOODS DURING WEANING

<table>
<thead>
<tr>
<th>STAGE 1</th>
<th>STAGE 2</th>
<th>STAGE 3</th>
<th>AFTER 1 YEAR</th>
<th>EXTRA INFORMATION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MILK</strong></td>
<td><strong>MILK</strong></td>
<td><strong>MILK</strong></td>
<td><strong>MILK</strong></td>
<td>If milk drinks are rejected; use alternatives (e.g. cheese) &amp; give water to drink.</td>
</tr>
<tr>
<td>MINIMUM 600ml BREAST MILK OR INFANT FORMULA</td>
<td>500-600 BREAST MILK, INFANT FORMULA OR FOLLOW-ON FORMULA DAILY</td>
<td>500-600ml BREAST MILK OR INFANT MILK DAILY</td>
<td>MINIMUM 560ml MILK DAILY OR 2 SERVINGS DAIRY PRODUCT (e.g. yogurt, cheese sauce)</td>
<td>Discourage large volumes of milk after 1 year (i.e. more then 600ml) as it will stop appetite for other foods.</td>
</tr>
<tr>
<td>Cow’s milk products can be used such as yogurt, custard, cheese sauce)</td>
<td>Also use any milk* to mix solids</td>
<td>Also to use any milk** to mix solids</td>
<td>Whole milk can be used as a drink &amp; soft cheeses included after 1 year. Lower fat milks can be used in cooking, but not as main drink.</td>
<td>Discourage drinking/feeding from a bottle after 1 year.</td>
</tr>
</tbody>
</table>

### DAIRY PRODUCTS AND SUBSTITUTES

<table>
<thead>
<tr>
<th><strong>DAIRY PRODUCTS AND SUBSTITUTES</strong></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Mix smooth cereal with milk; use low-fibre cereals (e.g. rice based). Mash or purée starchy vegetables</td>
<td>Hard cheese (e.g. Cheddar) can be cubed or grated and used as ‘finger food’.</td>
<td>3-4 SERVINGS DAILY</td>
<td>encouraged</td>
<td>Most baby &amp; breakfast cereals are fortified with iron &amp; the B vitamins.</td>
</tr>
<tr>
<td><strong>THE STARCHY FOODS</strong></td>
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<td>Cereals and bread derived from wholegrain are a richer source of nutrients and fibre than refined cereals.</td>
</tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Use soft-cooked vegetables &amp; fruit as a smooth purée.</td>
<td>2 SERVINGS DAILY</td>
<td>3-4 SERVINGS DAILY</td>
<td>encouraged</td>
<td>Vegetables may be preferred raw (e.g. grated carrot, chopped tomato) or may need to be disguised in soups, pies and stews.</td>
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</tr>
</thead>
<tbody>
<tr>
<td>Use soft cooked meat/pulses. Add no salt or sugar or minimum quantities to food during or after cooking.</td>
<td>1 SERVING DAILY</td>
<td>MINIMUM 1 SERVING DAILY FROM ANIMAL SOURCE OR 2 FROM VEGETABLE SOURCES</td>
<td>encouraged</td>
<td>To improve iron absorption, give vitamin C (fruits &amp; vegetables) with every meal.</td>
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<tbody>
<tr>
<td>Choose lower-sugar desserts; avoid high salt foods.</td>
<td>Encourage savoury foods rather than sweet ones.</td>
<td>May use moderate amounts of butter, margarine. Small amounts of jam (if necessary) on bread.</td>
<td>Limit crisps &amp; savoury snacks. Give bread, or fruit if hungry between meals. Do not add sugar to drinks. Try to limit soft drinks to</td>
<td>Encourage a pattern of three main meals each day.</td>
</tr>
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</tr>
<tr>
<td>Water/milk are the best drinks for infants.</td>
<td>Try to limit salty foods.</td>
<td>Honey may be used after 1 year of age.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>--------------------------</td>
<td>--------------------------------------</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Includes breast milk, infant formula, follow-on formula and whole cow’s milk.
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APPENDIX 6

Storage times for expressed breast milk for healthy babies:

- 24 hours in fridge from time of removal from freezer (defrosting time included in 24 hours)
- 48 hours in the fridge if not previously frozen
- 3 months in self-contained freezer unit.
- 6 months in separate deep freezer
APPENDIX 7

Guidance for Preparing Feeds in the Home

Preparing a feed using powdered infant formula

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

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

Alternatively, you may:

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

APPENDIX 8

The Eat Well Plate

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The eatwell plate shows how much of what you eat should come from each food group. This includes everything you eat during the day, including snacks.

So, try to eat:
– plenty of fruit and vegetables
– plenty of bread, rice, potatoes, pasta and other starchy foods – choose wholegrain varieties whenever you can
– some milk and dairy foods
– some meat, fish, eggs, beans and other non-dairy sources of protein
– just a small amount of foods and drinks high in fat and/or sugar
APPENDIX 9

DIETARY ADVICE FOR ALLERGY PREVENTION

These guidelines are not applicable to infants who already have a suspected or proven food allergy, or an allergic disorder (e.g. eczema) is already present. They require individual assessment and advice.

Family history of atopy, e.g. asthma, eczema, hay fever, rhinitis, food allergy.

Infant less than 6 months of age with a family history of atopy

breast milk available?

No

use extensively hydrolysed casein formula (see table in 3.6)

Yes

use breast milk solely if possible until 6 months age

There is no proven benefit in continuing partially/extensively hydrolysed formula after 6 months
Weaning an infant with a family history of allergy

Start with low allergenic foods e.g. rice, potatoes, root and green vegetables, apple, pear, banana and stone fruit (these should be the only weaning foods given if weaning started before 6 months)

Progress onto higher allergenic foods (after 6 months), one at a time, starting with a small amount.
These include:

- Meats
- Fish/shellfish
- Wheat
- Soy
- Cow’s milk
- Egg
- Pulse vegetables (peas/beans)
- Tree nuts and seeds

Do not introduce peanuts until 3 years (whole nuts at 5 years of age due to asphyxiation risk). By 12 months all major high risk foods should be introduced unless a reaction has occurred.

The above is based on current best practice but may change at a later date.
APPENDIX 10
RESOURCES AVAILABLE FOR THE UNDER FIVES

The following resources are available on the Leicestershire Nutrition and Dietetic Service website: www.lnds.nhs.uk

(a) First Foods to Give to Your Baby
Questions and answers about first foods to give to your baby
- a leaflet produced jointly with Surestart
www.lnds.nhs.uk

(b) Weaning for Babies and Infants – Stage 1 Smooth Textures and Tastes
An LNDS leaflet giving weaning advice on stage 1
www.lnds.nhs.uk

(c) Babies and Infants – Stage 2 Lumpier Textures and Starting Finger Foods
An LNDS leaflet giving weaning advice on lumpier textures and starting finger foods
www.lnds.nhs.uk

(d) Babies and Infants – Stage 3 Lumps, Chopped Foods and Finger Foods
An LNDS leaflet giving weaning advice on moving onto family meals
www.lnds.nhs.uk

(e) Babies and Infants – First Tastes for the First Year
An LNDS leaflet giving weaning advice for the first year of an infant’s life
www.lnds.nhs.uk

(f) Eating Well while Expressing Breast Milk
LNDS advice for anyone wishing to express breast milk for their baby
www.lnds.nhs.uk

(g) Weaning Your Premature Baby
Weaning advice specifically for premature babies
www.lnds.nhs.uk

(h) Help to pack a healthy packed lunchbox – Lunchbox Logic
An LNDS leaflet containing nutritious and balanced ideas for lunchboxes for children
www.lnds.nhs.uk

(i) Healthy Eating for Children - Pack a Healthy Lunch – Fact Sheet 1
British Dietetic Association Fact Sheet
www.lnds.nhs.uk

(j) Healthy Eating for Children - Snack Attack! – Fact Sheet 2
British Dietetic Association Fact Sheet
www.lnds.nhs.uk

(k) Healthy Eating for Children – Eat 2b Fit – Fact Sheet 3
British Dietetic Association Fact Sheet
www.lnds.nhs.uk

(l) Healthy Eating for Children – What Can A Label Tell You? – Fact Sheet 4
British Dietetic Association Fact Sheet
www.lnds.nhs.uk
The following resources are available to order from the Leicestershire Nutrition & Dietetic Service:

(a) Breakfast and Teatime Ideas for Babies and Toddlers
(b) Healthy Eating for Toddlers
(c) Healthy Eating for Toddlers Eating an Asian Diet
    This leaflet is also available translated into Bengali, Gujarati, Punjabi and Urdu
(d) Feeding the Vegetarian Baby
(e) Surestart – Questions & Answers About First Foods to Give To Your Baby (Asian version)
(f) Happier Mealtimes
    An LNDS leaflet giving advice for fussy eaters
(g) Make Eating Fun
    (A shortened version of the above)
(h) Iron – An Essential Mineral
    (For use with infants diagnosed as having iron deficiency only)

An order form may be downloaded and printed off by visiting the Leicestershire Nutrition & Dietetic Service (LNDS) website at www.lnds.nhs.uk