



Infant Feeding

From Birth to 12 Months

Section 3

Infant Feeding

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Breastfeeding is recognised internationally as the optimal way to feed infants from birth and exclusive breastfeeding is recommended until 6 months of age. It has been estimated that if all UK infants were exclusively breast fed, the number hospitalised each month with diarrhoea would be halved, and the number hospitalised with a respiratory infection would be cut by a quarter (Quigley et al. 2007). Infant formula is the only alternative to breast milk during the first 6 months of life for term infants.

The Department of Health (2007a) recommends that babies should be introduced to solid foods when they are developmentally ready, and this is usually around 6 months. Breastfeeding mothers should be supported to continue to breastfeed through the weaning period; formula milk is the only alternative until 12 months.

Healthcare professionals and childcare staff should ensure that parents and carers have access to reliable advice and information to be able to make an informed choice about how to feed their infants. When a mother has decided how to feed her infant, she should be supported in that choice and given advice on safe feeding.

This section covers:

- **Breastfeeding**
- **Formula feeding**
- **Weaning onto solid foods**
- **Common feeding challenges**

Benefits of breast milk for the infants and their mothers

Breast milk is a unique fluid which has a complex biology and contains more than 200 known constituents. There are extensive health benefits for mothers and babies in the short and the long term (see table below). Maximum health benefits are afforded by exclusive breastfeeding to 6 months, then continuing breastfeeding alongside solid foods to one year and beyond.

'Exclusive breastfeeding from birth is possible except for a few medical conditions, and unrestricted exclusive breastfeeding results in ample milk production' (WHO 2003).

Advantages of breastfeeding to the infant	Reference
Optimal nutrition, growth and development reduced incidence of gastrointestinal, urinary tract and respiratory infections	Ip et al. 2007 Horta et al. 2007 Howie et al 1990 Marild et al 2004
Helps to prevent and reduce the severity of allergic conditions e.g. asthma and eczema	Kull et al 2002, Sears et al 2002
Reduced risk of otitis media (ear infections) until the age of 5 to 7 years	Duncan et al 1993, Aniansson et al 1994
Reduced incidence of both insulin and non-insulin dependent diabetes	Aberblom et al 1999 Saduskaite-Kuehne et al 2004
Prevents necrotising enterocolitis (NEC) in pre-term infants	Lucas and Cole 1990
Contains growth factors, which enhance the infant's gut development and maturation	Sheard and Walker 1988
Reduced risk of constipation	Lawrence 1994
Reduced incidence of some childhood cancers (e.g. leukaemia and lymphomas)	Davis 1998 Shu et al 1999
Reduced risk of Sudden Infant Death Syndrome	Ford 1993 Horne et al. 2004
Some evidence that babies who are not breastfed are more likely to become obese in later childhood	Li et al. 2003 Michels et al. 2007
Less likely to visit the doctor in the first two years of life	Ball and Wright 1999

Benefits for the mother

Encourages emotional bonding between the mother and the infant due to the release of endorphins which give a feeling of well being	Lawrence 1994
Delay in return to menstruation which allows maternal iron stores to be replenished following pregnancy and childbirth	Unicef 1998
Reduces risk of breast and ovarian cancer	World Cancer Research Fund 2007
Lower incidence of osteoporosis and hip fractures over the age of 65 for women who have breast fed	Cummings a Klineberg 1993
Helps mothers return to their pre-pregnant weight	Dewey et al. 1993

Supporting mothers to breastfeed

Bath & North East Somerset is committed to achieving UNICEF UK Baby Friendly Initiative accreditation across both maternity and health visiting services. These standards will ensure that mothers have care and support based on best practice standards. Staff in all NHS establishments and childcare settings in Bath & North East Somerset should promote breastfeeding as the normal way to feed a baby. Information about the Baby Friendly Initiative can be accessed on:

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www.unicef.org.uk
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For more information on local breastfeeding initiatives, training opportunities and support in Bath & North East Somerset go to:

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www.sirona-cic.org.uk
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Antenatal discussion

All pregnant women in Bath & North East Somerset have the opportunity to discuss the benefits and management of breastfeeding with their midwifery and/or health visiting team. This discussion ensures that pregnant women are aware of the many health benefits of breastfeeding for both mothers and babies, and that information is provided about the factors that help breastfeeding to be successful. Alongside this discussion, pregnant women are given a leaflet 'Off to the Best Start'.

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Initiating breastfeeding

Skin contact

All mothers are encouraged to have unhurried skin contact with their babies as soon as possible after birth. In preparation for this, all pregnant women will be informed of the physiological and emotional benefits of skin to skin contact:

- Calms mother and baby
- Keeps the baby warm
- Stabilises the baby's breathing and heart rate
- Facilitates the rapid release of hormones that help the new mother to bond with her baby
- Helps towards breastfeeding being more successful

The first breastfeed

The first breastfeed often occurs during the first period of skin to skin contact after delivery. Mother and baby are alert to each other and sometimes babies are able to self attach to the breast. Midwives support mothers with positioning and attachment at this first breastfeed.



How breastfeeding works?

Successful attachment, the process by which the baby scoops up enough breast tissue into its mouth, is the key to successful breastfeeding.

- Mothers and babies need to learn effective attachment at the breast as it ensures a good milk supply and a comfortable feed
- At the end of a feed mothers can check that their nipple is round (rather than pinched or creased), as this is a sign of good attachment
- Pregnant women and new mothers receive help and support. This is taught using visual aids such as a doll and/or a knitted breast, leaflets and verbal description rather than by the health care professional putting the baby to the breast for the mother



Baby-led feeding

- All mothers are encouraged to follow baby led feeding, which means allowing the baby to feed when s/he wishes, rather than feeding to a schedule
- Baby-led feeding ensures that the breasts receive lots of messages to make milk, as the frequent removal of milk encourages further milk production. Baby-led feeding also helps mothers and babies to learn the skills of breastfeeding together
- A baby that is fed as frequently as he/she desires is calm and relaxed whilst feeding
- Frequent feeding means that there is more opportunity for both mother and baby to develop the skills of positioning and attachment

Feeding cues

Health professionals support mothers with baby-led feeding by helping them to recognise early feeding cues. These can sometimes be subtle and occur before crying. Early feeding cues include:

- Rooting
- Hand-to-mouth movements
- Sucking on fingers or fist
- Wriggling
- Restlessness

If these are ignored or misinterpreted, the baby may go back to sleep or become very distressed. In this way the baby misses the opportunity to stimulate the breast to make lots of milk.

Sometimes mothers may wish to feed the baby before s/he is giving feeding cues. This may be because of over-full breasts or because of time management issues, such as needing to attend to other children. Feeding the baby sooner than the baby is asking for a feed is never a problem, as long as the mother **usually** follows baby-led feeding.

Frequency of feeds

- In the first 2 weeks of life, all breastfeeding mothers are encouraged to feed their babies a minimum of 8 times in 24 hours, including at night
 - This ensures that effective feeding and a good milk supply is established
 - Many new mothers are surprised at how often a new baby wants to feed. A young baby naturally feeds around 8-12 times, or even more, in 24 hours
 - Health professionals need to reassure parents that frequent feeds are normal and help in developing a good milk supply
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Ending the feed

An important aspect of baby-led feeding is to ensure that the baby is allowed to feed for as long as s/he wants to. It is important that the baby is allowed to make the small fluttery sucks at the end of the feed, as at this point the baby is receiving the higher fat part of the feed which sustains the baby until the next feed and helps with good weight gain. If feeds are halted by the mother too early, babies can miss out on the higher fat content at the end of the feed. At all feeds, the mother is encouraged to allow the baby to feed at the first breast until s/he spontaneously detaches; the mother then offers her second breast if the baby is awake and hungry.



Breastfeeding patterns as the baby grows

Cluster feeds

Cluster feeding occurs when babies wish to feed frequently, and it can be difficult for the mother to tell when one feed ends and another begins. Cluster feeding is very common during the evening in the first few weeks of life. Health professionals should reassure parents that this is normal neonatal behaviour and not indicative of insufficient milk supply. Extra family support can be invaluable in helping the mother cope during this time.

Growth spurts

Over the first few months many babies have periods of a day or two where they seem to want lots of feeds. This may be to increase milk supply and meet the baby's developmental needs. Mothers are encouraged to continue with baby-led feeding as this very frequent feeding usually settles within a short period.

Very frequent long feeds

If every feed lasts for an hour or more and/or the baby never spontaneously comes off the breast, then attachment is not effective. In this situation the mother needs skilled help from a health professional or qualified breastfeeding counsellor to improve attachment at the breast and boost milk supply.

Night feeds

Night feeds are important in establishing a good milk supply as prolactin levels are higher at night. Many mothers find night feeds tiring and need support to cope with this. Midwifery and health visiting staff discuss night feeds with the mother and suggest ways of minimising disruption, for instance by having the baby in the same room, feeding lying down and safe bed sharing.



Keeping mothers and babies close

In order to facilitate baby led feeding, all pregnant women and new mothers are encouraged to keep their babies close to them night and day. Keeping the baby close helps mothers:

- To recognise feeding cues
- Form a close relationship with their baby
- Reduces the risk of sudden infant death syndrome (SIDS)

All mothers are advised to share the same bedroom with their baby for the first 6 months of life.

Mothers will be given information by health professionals about the risks and benefits of bed-sharing.

Teats, dummies and nipple shields

Pregnant women and new mothers are informed that teats, dummies and nipple shields can interfere with the baby's ability to learn to breastfeed effectively so should be avoided during the establishment phase; ideally until the baby is breastfeeding well and thriving.

If the mother wishes to use a dummy, she should be advised that it should be used with caution as it may mask feeding cues and therefore reduce the frequency of feeds, leading to a reduction in milk supply. There is no evidence on which to either recommend or discourage dummies for use in the prevention of SIDS.

Nipple shields are associated with reduced milk transfer and hence reduced milk supply; therefore nipple shields should not be recommended.

Supplementary formula feeds

Pregnant women and new mothers are informed of the importance of exclusive breastfeeding as this ensures mothers and babies gain all the benefits of breastfeeding.

(See advantages of breastfeeding to the infant on page 22).

Pregnant women and new mothers are advised that giving supplementary formula feeds to a breast fed baby can interfere with the establishment and maintenance of a good milk supply.

Supplements of formula milk within the first six months increases the incidence of eczema, asthma and juvenile onset diabetes (Ip et al. 2007; Horta et al. 2007).

No food or drink other than breast milk should be given to a breast fed baby unless it is medically indicated or the mother requests this when fully informed.



Peer support for breastfeeding mothers

Breastfeeding counsellors

Breastfeeding counsellors are mothers who have themselves breast fed and have undergone training to enable them to support other mothers.

Organisations that train breastfeeding counsellors include The National Childbirth Trust and The Association of Breastfeeding Mothers

Both of these organisations have a network of local counsellors who offer mother-to-mother support. Contact numbers for counsellors and of national help lines can be found on each organisation's website.

National website addresses for breastfeeding counselling organisations are:

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www.laleche.org.uk
abm.me.uk
www.nct.org.uk
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National Helpline number:

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0844 209 09 20
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Breastfeeding support groups

Many mothers report that they stopped breastfeeding earlier than they intended (Bolling et al. 2007). Breastfeeding support groups are available across Bath & North East Somerset to help and encourage mothers to continue to breastfeed. Groups are run by either the health visiting team, Children's Centres, breastfeeding counsellors or peer supporters. A list of local groups can be found at:

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www.sirona-cic.org.uk
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Children's centres

All children's centres in Bath & North East Somerset are signed up to the Bath & North East Somerset Breastfeeding policy ensuring that breastfeeding is welcome, and that best practice is followed. Breastfeeding welcome signs are displayed and staff receive training on how to support mothers to breastfeed. Many of the children's centres host breastfeeding support groups and provide refreshments and play facilities for older children. Training is available for all children's centre staff. Information on local children's services available in B&NES, contact the Family Information Service, tel: 0800 073 1214.

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fis@bathnes.gov.uk
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Breastfeeding out and about

Concerns about breastfeeding in front of other people can mean that some mothers do not breastfeed outside the home. This serves to reduce the number of breastfeeds and can lead to early cessation of breastfeeding. All new mothers need the opportunity to discuss feeding outside the home. Solutions that other mothers have found helpful in these situations are using a scarf or shawl to maintain privacy and visiting local places which are breastfeeding friendly.

B&NES health and wellbeing partnership are committed to the national Breastfeeding Welcome scheme which aims to ensure that mothers have places where they can breastfeed their babies when out and about. The scheme involves a commitment from local businesses taking part in the scheme to uphold a mother's right to breastfeed. Businesses are also required to clearly display a poster and/or sticker to welcome mothers that are breastfeeding.

To view a full list of venues signed up, see:

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www.breastfeedingwelcomescheme.org.uk
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Ongoing support for breastfeeding in the postnatal period

Throughout the early postnatal period health professionals continue to support a mother to develop the skills and confidence to manage her own breastfeeding. Mothers are given information on how to recognise that their baby is getting enough breast milk to help to build confidence in their ability to breastfeed their baby.

Signs that breastfeeding is going well

- The baby appears content and satisfied after most feeds
- The baby attaches to the breast without fuss at most feeds
- The baby is healthy
- The baby is gaining weight satisfactorily
- The mother feels confident and her nipples are not sore
- The baby has at least 6 wet nappies a day (after 6 days old)
- The baby is passing loose yellow stools at least twice a day

Normal stools for breastfeeding infants

Mothers are often concerned about their baby's pattern of passing stools and ask for reassurance from health professionals.

- From the first couple of days to a month, the baby should pass a soft yellow stool at least twice a day
- Later on it is normal for the bowel movement frequency to change and some babies may only have a dirty nappy once a week. If the baby is otherwise well, infrequent stools are not significant after one month
- Exclusively breast fed babies very rarely become constipated, however it is common in exclusively bottle fed babies and can occur when an otherwise breastfed baby is given a supplementary bottle

Expressing breast milk

All mothers are taught to express their breast milk by hand. This ensures that women are able to manage some common breastfeeding challenges, for example, a full breast or a blocked duct, for themselves. This will be taught in the early postnatal period and revisited by the health visiting team at the primary visit. The pictures and information in 'Off to the Best Start' can be used as a teaching aid to support effective delivery of this information.



Storing expressed breast milk

All mothers are given information about the storage of expressed breast milk, as in 'Off to the Best Start' (DH 2007b).

- Expressed breast milk should be collected and stored in sterilised equipment. When expressing breast milk by hand it may be easier to collect the breast milk in a large sterilised measuring jug or bowl. If using a pump then expressed breast milk can be stored in the sterilised collecting bottle or bags.
 - Expressed milk can be stored for up to 5 days in the main part of a fridge (i.e. not in the door), at 4°C or lower
 - Expressed milk can be stored for up to 2 weeks in the freezer compartment of a fridge, and up to 6 months in a domestic freezer, at minus 18°C or lower
 - If expressed breast milk is stored for less than 5 days, the fridge preserves its properties more effectively than freezing
 - Breast milk should be given as fresh as possible. After 5 days in a fridge, milk will have begun to change in flavour and composition
 - Frozen expressed breast milk should be defrosted in the fridge and should not be re-frozen once thawed
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Storage of breast milk in hospital

The very intensive use of fridges in a hospital setting means that the temperature of the fridges cannot be guaranteed to remain below 4 degrees. Therefore Bristol hospitals recommend that breast milk is stored for only 48 hours in a hospital fridge and at Weston hospital breastmilk is stored for up to only 24 hours.

Warming breast milk feeds

Breast milk should be warmed by standing the feed in a jug of hot water for a few minutes.

Microwaving feeds is NOT recommended practice and should be discouraged for the following reasons:

- Ongoing cooking – the milk will continue to heat after removal from the microwave
 - Hot Spots - the hot fluid in the centre of the bottle may be undetected and scald the infant (as in p45)
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Advice for overcoming breastfeeding challenges

If there are problems with breastfeeding, the mother and infant should be referred for breastfeeding help to a professional or breastfeeding supporter who has undertaken a specialist training in breastfeeding management. This could be a midwife, health visitor or breastfeeding counsellor.

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Avoiding mastitis

Mothers should be encouraged to be breast aware and to check their breasts regularly for lumps that may indicate a blocked duct. If the mother finds a blocked duct she should be encouraged to make sure the baby is feeding effectively on that side, making adjustments in positioning and attachment as necessary to achieve this, and use hand expression and gentle massage to unblock the duct.

A mother who complains of any of the following may be suffering from mastitis:

- A red area on part of the breast
- A lumpy breast which feels hot to touch
- The whole breast aching and becoming red
- Flu-like symptoms, such as aching, increased temperature, shivering, becoming tearful and tired
- Sudden onset of any of the above

If mastitis is suspected, the mother should contact her midwife or health visitor as soon as possible for information and support. If mastitis does not quickly resolve using self-help measures, or if symptoms worsen quickly, then the woman may need to be prescribed antibiotic therapy by her GP.

It is very important that the mother with mastitis continues breastfeeding, as sudden cessation of breastfeeding will lead to worsening mastitis and possibly breast abscess. Further guidance for treatment is available from the breastfeeding network:

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www.breastfeedingnetwork.org.uk

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Returning to work

Many mothers continue to breastfeed successfully on returning to work by:

- Continuing baby-led feeding before and after work
- Expressing milk so that her infant can be fed by cup or bottle while she is away
- Finding childcare close to her work and arranging to breastfeed during breaks in her work day
- Asking her employer for flexible hours around breastfeeding
- Requesting part-time work or job sharing

It is not essential that all babies learn to take milk from a bottle when their mother returns to work, as many babies move straight from breastfeeding to a cup or a beaker at around 5-6 months of age. Using an open cup, or a free flowing cup without a valve, helps the baby to learn to sip and is better for the baby's teeth.

If a mother is returning to work earlier than 5-6 months, or for any other reason wants to help her baby learn to accept a bottle, the following tips have been helpful to many mothers:

- The baby is more likely to take a bottle from someone else other than the mother
- It is best to try giving a bottle when the mother is not present
- Something that smells of the mother nearby may help

Planning for returning to work can be an emotional time for new mothers. It can be helpful to meet other mothers at breastfeeding support groups who have experience of returning to work and the emotional adjustment involved.

If a mother informs her employer in writing that she wishes to breastfeed, support can be put in place to allow her to express and store breast milk while at work. The Workplace Regulations and Approved Code of Practice require employers to provide suitable facilities for pregnant and breastfeeding mothers to rest.

Information on the rights of mothers returning to work is available in the Department of Health leaflet 'Breastfeeding and Work'.

Information for employees and employers is available to download from:

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www.gov.uk
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Breastfeeding in special circumstances

Premature babies

Mothers of infants born early need extra support to initiate and maintain lactation. The babies will then learn to feed from the breast when they are ready.

Mothers in this situation are encouraged to start expressing early (usually before they leave delivery suite) and frequently (at least 8 times in 24 hours, or 10-12 times in 24 hours if the baby has been born very prematurely). Mothers are given support to do this effectively to ensure that their milk supply is maximised. When the baby is ready to breast feed they will be given full support to learn this skill.

More information on breastfeeding premature infants is available from:

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www.bliss.org.uk
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Breastfeeding twins and multiples

In the same way that mothers make enough milk for one infant, they can make enough for two or more babies. All the principles that underpin successful breastfeeding with one baby also apply in this situation.

Individual circumstances will need to be taken into account, but most mothers will start by feeding each baby separately until they are confident with positioning and attachment. Once that has been achieved, feeding twins together will shorten overall feeding times and may be preferred by the mother for at least some of the feeds.

More information on breastfeeding twins & multiples is available from:

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www.tamba.org.uk
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Medication during lactation

Although there are few medicinal drugs that are unsafe to use during lactation, breastfeeding mothers should not take drugs unnecessarily and should take advice from their doctor or pharmacist.

The Breastfeeding Network has excellent evidence based information sheets on common drugs / medications and breastfeeding.

These can be accessed via:

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www.breastfeedingnetwork.org.uk
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Health care professionals can obtain information from:

- **South West Medicines and Information Training Level 4**
King Edward Building
Bristol Royal Infirmary
BS2 8HW

Phone: **0117 342 2867**
- Thomas Hale's book:
Medications and Mother's milk (39)

The 'Drugs in Breast Milk' national helpline can be accessed by both parents and health care professionals on:

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0844 412 46 65
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Breastfeeding and HIV

In the United Kingdom, it is currently recommended that women known to be HIV Antibody Positive (or those at high risk who have not been serologically tested), should be advised not to breastfeed but to use infant formula for feeding their baby as the HIV virus can be passed to the infant via breast milk (CMO Report 2004).

In developing countries where there are not the facilities to make up infant formula safely, HIV positive mothers are encouraged to breastfeed exclusively to reduce the risk of death through gastroenteritis due to bacterial contamination of infant formula.

Specific advice will be required in circumstances where a mother is likely to be travelling back to her country of origin. If this is a country in which formula feeding would not be safe or culturally acceptable, advice will be given by the specialist HIV teams providing the woman's medical and obstetric care.

Once an HIV positive mother has made a choice between breastfeeding and formula feeding her infant, she should be advised not to mix feed by offering both breast milk and infant formula. Mixed feeding carries the highest risk of HIV transmission to the infant.
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The eatwell plate



Use the eatwell plate to help you get the balance right. It shows how much of what you eat should come from each food group.



Mother's diet during lactation



Eating a healthy balanced diet based on the five food groups will usually ensure nutritional requirements are met except for vitamin D.

The nutritional quality of breast milk is not significantly affected by the mother's diet unless she is undernourished. However mothers on very restrictive diets may require some supplementation.

Pregnancy and breastfeeding are times when families are often well motivated to adapt their lifestyles, therefore providing an opportunity to give information on healthy eating to the whole family.

Vitamin D supplementation recommendations

Some pregnant women in Bath & North East Somerset are offered Healthy Start Vitamins during pregnancy as infants whose mothers are vitamin D deficient during pregnancy are at risk of tetanic fits or rickets.

The Department of Health recommends breastfeeding mothers should take a 10µg vitamin D per day (DH COMA Report 1991).

The Healthy Start vitamins for women should be recommended as they include 0.4mg folic acid which will help to build up the mother's stores of folic acid for any future pregnancies.

Breast fed infants should begin vitamin D supplements from 6 months. Health professionals may recommend starting the supplements at 1 month in babies who are nutritionally at risk.

Information on their availability should be given to families.

Foods to limit while breastfeeding

Oily fish should be eaten once or twice per week because they are a good source of omega 3 fats. However, breastfeeding women should not have more than two portions per week because some of these fish contain dioxins and PCBs (polychlorinated biphenyls) which can be toxic (FSA 2008).

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Oily fish includes salmon, trout, mackerel, sardines, pilchards, herring, kippers, eel, whitebait and tuna. These fish count as oily fish when they are canned, fresh or frozen with the exception of tuna, which loses its oil content as part of the canning process. Breastfeeding mothers and women planning a pregnancy should not eat more than 4 medium sized cans of tuna a week (with a drained weight of about 140g per can) or fresh tuna steaks (weighing about 140g when cooked or 170g raw) because of the risk from heavy metals.

Shark, marlin and swordfish should be limited to one serving per week due to their mercury content (DH 2002).

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Alcohol is absorbed directly into the blood stream and passes into breast milk. The highest level of alcohol in milk will occur between 30-90 minutes after ingesting alcohol. Breastfeeding mothers who choose to drink alcohol should not ingest alcohol for about 2 hours before breastfeeding and should keep alcohol intake to a minimum. Regular or binge drinking should be avoided. (FSA 2008)

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Caffeine in tea and coffee does not need to be avoided but some mothers find large amounts unsettle their baby.

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Food intolerance

It is very rare that a food that the mother eats can affect the baby causing an allergic response. Common triggers are dairy products, eggs and nuts. If a mother needs to exclude a whole food group e.g. milk and dairy products, then she should be referred to a registered dietitian for advice to make sure her diet remains adequate in all nutrients.

In December 2008 the Food Standards Agency advised that there is insufficient evidence to advise any breastfeeding mother to avoid eating peanuts and peanut products unless she is herself allergic to peanuts.

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Formula feeding

Breastfeeding should always be promoted as the first choice for feeding an infant. It is important however, that if the family choose to use infant formula to feed their infant they are to be shown / advised how to do this safely and correctly during the post-natal period. They should be given the Department of Health leaflet called 'Bottle Feeding'. They should also be shown how to make up a feed and sterilise equipment, even if they think they already know, as some of the advice may have changed from the last time they did this.

Consideration of the infant's individual needs and feeding on demand are important. Newborn infants need to feed frequently on demand. The volume should be gradually increased until weaning when frequency and number of feeds decrease. It is essential that an infant is never left unattended whilst feeding and they should always be held whilst bottle feeding. From six months of age a feeding cup should be introduced and encouraged. The use of bottles should be discouraged from the age of one year. Solids should never be added to a bottle feed.

Infant formula in the UK comes as dried powder to be mixed with water or as a sterile 'ready to feed' liquid which is more expensive. They are usually given in a bottle with a teat or in a cup - both should be sterilised prior to being filled with the formula milk due to the risk of bacterial contamination in feeding infant formula.

Choosing a formula

The standard formulas are made from skimmed cows milk powder with added fats and nutrients to make the composition nutritionally adequate for infants. Formulas are modified as knowledge and technology progresses. However their composition must always comply with strict criteria set by European Union regulations, which are updated as scientific research advances. These are published for each UK country and the current Infant Formula and Follow-on Formula (England) Regulations 2007 can be accessed on the IDFA website:

www.idfa.org.uk

These regulations allow standard formulas to be based on only cows milk protein or soya protein. Goats milk is not allowed as a source of protein as the evidence to support its use was considered insufficient by the European Food Safety.



Infant formulas - suitable from birth

There is a choice between whey or casein dominant formula. It is recommended that a whey dominant formula should be used because its amino acid and mineral content is closest to breast milk

Whey dominant infant formula is often labelled with a '1' and is promoted for new born babies. This type of formula is based on the whey of cows milk and the ratio of proteins in the formula approximates to the ratio of whey to casein found in human milk (60:40).

There is no evidence that changing from whey-based breast milk to any other type of formula is necessary or beneficial. First milk is nutritionally complete for bottle-fed babies until they are weaned around 6 months of age and can be continued alongside solid food until babies are a year old.

Casein dominant infant formula is often labelled with a '2' and promoted as suitable for hungrier babies. Although the proportions of the macronutrients (fat, carbohydrate, protein etc) are the same as is found in whey dominant formula, more of the protein present is in the form of casein (20:80).

The higher casein content causes large relatively indigestible curds to form in the stomach and is intended to make the baby feel full for longer. However, there is no evidence that babies settle better or sleep longer if given this milk (Taitz 1989, ThorkeIsson 1994).

Overall there is insufficient evidence to support changing from a whey to a casein dominant formula or for switching brands (DHSS 1998).



Differences between brands

The formula manufacturers research and develop their products in different ways (Carver 2003) and each company promotes the benefits of their formula to Healthcare Professionals based on different additions such as:

- **Long chain polyunsaturated fatty acids (LCPs)** are added to all infant formula except for organic formulae. The two LCP's that have been identified through research to be vital for optimum brain and eye development are Docosahexaenoic (DHA) and Arachidonic acid (AA) which are naturally found in breast milk
- **Nucleotides** may play a role in the development of the immune system and the gastro-intestinal system through enhancing a healthy gut flora
- **Prebiotics** are types of fibre that remain undigested in the gut and they promote the growth of bacteria (e.g. bifidobacteria) in the gut flora that have a positive effect on digestion and absorption. They are present in breast milk and those that are added to infant formula are usually galacto-oligosaccharides and fructo-oligosaccharides
- **Alpha lactalbumin protein** is the main type of whey protein in breast milk. Cows milk whey proteins are mainly beta lactalbumin

For nutritional components in breast milk and infant formula milks see Appendix 1.

The differences between brands are minimal and healthcare professionals cannot promote one brand over another.



Soya based infant formulae may be chosen by parents as an alternative to a cows milk formula but they are not recommended for infants under 6 months for the following reasons:

- Phytoestrogens found in soya have been linked with changes in the reproductive organs of experimental animals
- For infants with cow's milk allergy or intolerance there is a risk of cross reactivity with soya formula

However a GP or a dietitian may recommend Soya Milk if there is a clinical need while the infant is still under 6 months of age. In 2004 the Chief Medical Officer advised that:

'Soya-based formulae should only be used in exceptional circumstances to ensure adequate nutrition. For example, they may be given to infants of vegan parents who are not breastfeeding or infants who find alternatives unacceptable'

After six months the risk associated with using soya formula is likely to be reduced, as the dose of phytoestrogens per kg of body weight will be lower once the infant is taking solids.

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Follow-on formulas are only suitable for infants over 6 months as they are higher in protein, iron and vitamin D than infant formula.

Formula or follow-on formula can be given as the main milk drink between 6-12 months, however it's not necessary to change, as a balanced weaning diet along with a standard infant formula will provide adequate nutrition. Follow-on formula should not be used as a substitute for a good weaning diet.

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Cows milk should not be introduced as the main milk drink before 12 months of age. It is lower in iron than formula milks and infants who are given cows milk as their main milk drink before 12 months of age are at higher risk of iron deficiency anaemia. Cows milk can be used in the preparation of weaning foods such as milk puddings, white sauces and breakfast cereals.

There are also a range of specialised infant formulas for infants with certain medical conditions and they should only be used on the advice of a doctor or dietitian.

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Sterilisation of feeding equipment

Careful sterilisation of feeding equipment is essential to prevent bacterial contamination of infant formula which can cause gastroenteritis. Gastroenteritis is more common in formula fed infants than breast fed infants.

- All equipment used for bottle feeding infants needs to be sterilised because it is difficult to clean thoroughly and any remaining traces of milk can cause bacterial contamination
- Bottles containing plastic liners are for single use only and should not be reused. The cap and teat should be sterilised

Before sterilisation all bottles and teats should be thoroughly washed and rinsed. The practice of rubbing teats with salt to remove traces of feed is not recommended. Even after rinsing some of the salt may remain leading to the risk of hypernatraemia. Bottle brushes are preferable and should be sterilised regularly.



There are three acceptable Methods of sterilising equipment

1. Cold water sterilising

Follow the manufacturer's instructions.

The sterilising solution should be changed every 24 hours.

The feeding equipment should be left in the sterilising solution for at least 30 minutes.

Ensure there is no air trapped in the bottles or teats when putting them in the sterilising solution.

All parts of the equipment should be kept immersed in the solution with a floating cover.

2. Steam sterilising / microwave steriliser

Follow the manufacturer's instructions.

Ensure that the openings of the bottles and teats are facing down in the steriliser.

Once the steam steriliser has been opened, any equipment not used straight away should be re-sterilised before use.

3. Boiling water

Equipment is sterilised by boiling in water for 10 minutes. Equipment must remain completely immersed in the boiling water.

Unsuitable sterilising methods:

- Microwave ovens without a special steamer, as they do not sterilise feeding equipment
- Dishwashers as they cannot be guaranteed to reach high enough temperatures for an adequate time period to ensure sterilisation

Liquid ready to feed formulae

- Liquid ready to feed formula is sterile until opened
 - Once opened it can be stored in a refrigerator kept at 5°C or below for up to 24 hours
 - All feeding equipment must be sterilised as described above
-

Making up powdered formula

Powdered infant formula is not sterile. Current guidelines for making up powdered infant formula can be accessed on the Food Standards Agency website:

.....
www.food.gov.uk
.....

Care should be taken not to over or under concentrate the feed:

- Always use the scoop supplied in the tin with the milk powder
- 1 level scoop of powder should be added for each 30ml (1 fl oz) boiled water
- Care should be taken not to over pack the milk powder in the scoop as this will over concentrate the feed

Over concentration of feeds can result in constipation, hypernatraemia, vomiting and excess weight gain. Under-concentrating feeds will not provide the infant with sufficient calories or nutrients for growth and development.





Suitable water for making up powdered feeds

- Water for feeds, whether freshly drawn tap water or bottled water, should be boiled, but only once, and allowed to cool, covered, for up to 30 minutes
 - Water filters should not be used for infants until more research is available on the risks of the potential ingestion of silver (found in the cartridges) and on the levels of sodium (found in the resin)
 - Water softeners should be avoided for infant feeds because this may increase the sodium content of the water
 - Bottled water labelled as mineral water should not be used to make up formula feeds due to potentially high levels of carbon dioxide, sodium, nitrate, fluoride and sulphate
 - Bottled waters other than those labelled 'Natural Mineral Water' are expected to conform to essentially the same standards as the public water supply and are therefore suitable for preparing formula feeds for infants: the sodium content should be less than 200mg/l
-

Preparing formula feeds abroad

The customer care line of each formula company can advise whether their formula is available in the country to which the family are travelling.

Parents should always be advised to take at least one unopened can of powder with them to allow some time in which to establish a supply abroad.

As in the UK, tap water and bottled water should be boiled for making up a formula feed using powdered formula. The label on the bottled water should be checked to make sure that the sodium level is less than 200mg/l. Bottled water should be still and unflavoured.

Storing prepared infant formula

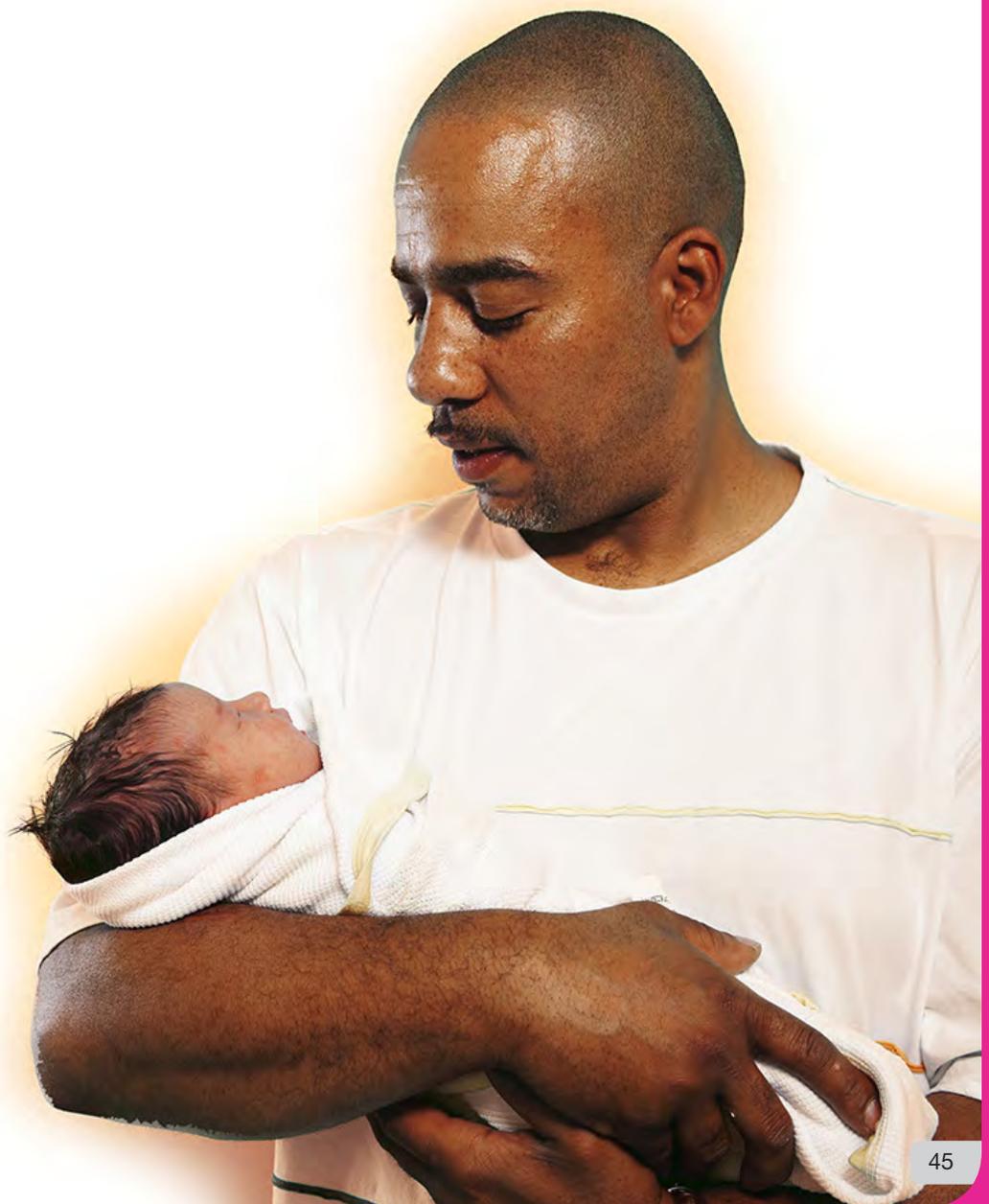
Storing prepared infant formula is no longer recommended but there may be times when feeds need to be prepared in advance. The prepared feeds must be stored in the main part of a refrigerator (not in the door) and kept at 5°C or below. The maximum storage time is 24 hours and any prepared feed not used after this time should be discarded.

Warming refrigerated feeds

Refrigerated feeds should be warmed by standing the feed in a jug of hot water for a few minutes.

Microwaving formula feeds is NOT recommended practice and should be discouraged for the following reasons:

- Ongoing cooking – the milk/food will continue to heat after removal from the microwave
- 'Hot Spots' – hot fluid in the centre of the bottle may be undetected and scald the infant



Feeding milk formula to infants

As with breast fed infants, infants who are bottle fed, particularly newborns, should be allowed to regulate their own intake of formula feeds and parents should be advised:

- On cues that show the infant is hungry
- To allow their infant to stop feeding when he/she has had enough rather than encouraging him/her to finish each bottle
- Skin to skin contact is still possible whilst feeding from a bottle
- To cuddle their infant when feeding from a bottle to ensure the same closeness found with breastfeeding
- Young infants have small tummies so will feed more frequently
- A baby usually pauses from time to time whilst feeding from a bottle, and may need to be sat up to be winded during the pauses

Key points for feeding from a bottle:

- The teat should not be forced into the baby's mouth, the baby should open its own mouth
- The bottle should be tilted so there is always milk in the teat
- **A baby should never be left alone with a bottle for example prop feeding; they should always be held whilst bottle-feeding**
- When the infant has had enough of a feed, any left over formula should be discarded
- Solid foods should never be added to a bottle of milk
- After the age of six months a cup can be gradually introduced so that bottles can be discontinued by around the age of 12 months



Formula amounts to offer

Fluid Requirements:

Age	ml/kg body weight/24 hours
Pre-term	150-200
0-6 months	150
7-12 months	120

(Adapted from, Nutritional Requirements for Children in Health and Disease. Great Ormond Street Hospital for Children NHS Trust. 2000)

Newborns may take very small volumes of formula. The volume of feeds demanded will gradually increase until weaning when the frequency and number of feeds should be decreased.

Average feeding amounts and frequency are:

Approximate age	Approximate single feed volume		Number of feeds day
	mls	ozs	
1-2 weeks	50-70	2-3	7-8
2-6 weeks	75-110	3-4	6-7
2 months	110-180	4-6	5-6
3-5 months	170-220	6-7	5
6 months	220-240	7-8	4

Extra fluid

In exceptionally hot weather infants may become thirsty in between their usual feeds. They can be offered drinks of cooled, boiled water. Flavoured or sweetened waters should not be offered.

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Introducing a cup

From about six months of age a feeding cup can be introduced and encouraged for milk feeds. Breastfeeding should be encouraged to continue. If a mother decides to change to formula from this age or older she could use a cup rather than a bottle.

Bottles of milk should be phased out from around the age of one year as toddlers may begin to associate bottles of milk with comfort and can become stubborn about giving them up.

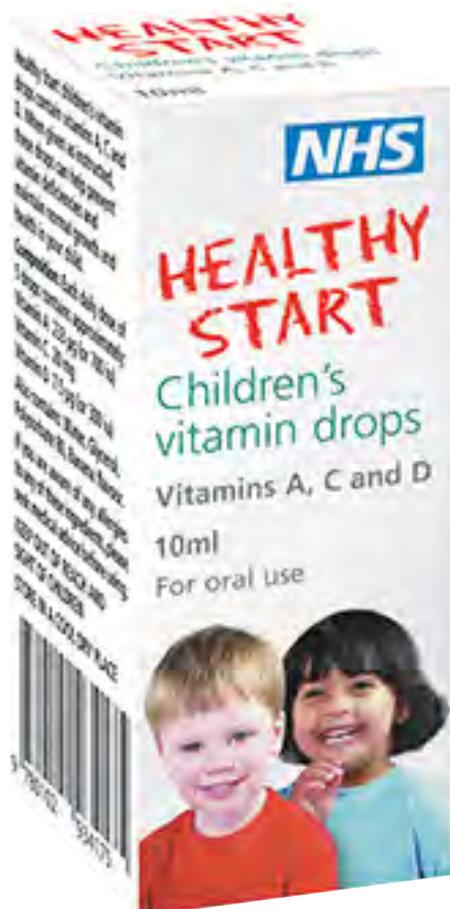
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Vitamin supplementation

All formulas are fortified with vitamins A & D and most formula fed infants will receive enough of these two vitamins in their formula milk during the first 6 months of life. All formula fed infants should begin a supplement of vitamins A & D from 6 months once they are drinking less than 500mls formula per day (DH COMA 1994).

Families should be advised where to access the NHS Healthy Start children's vitamin drops. Those families who are entitled to receive Healthy Start vouchers are entitled to these vitamin drops free.

www.healthystart.nhs.uk



Introduction of solid food

Weaning is the process that begins the transition from breast or infant formula feeding to eating a balanced family diet. The Department of Health has made the following recommendations on infant feeding and the introduction of solid foods:

- Exclusive breastfeeding is recommended for the first six months of an infant's life for all healthy infants
- Six months is the recommended age for the introduction of solid foods for a normal healthy infant, whether they have been breastfed or given infant formula milk
- Weaning onto solid foods should begin around 6 months and never before 4 months
- Breastfeeding (and/or breast milk substitutes, if used) should continue through out the first year along with appropriate types and amounts of solid foods
- Mothers who are unable or choose not to follow these recommendations should be supported to optimise their infant's nutrition

The introduction of solid foods alongside an infant's milk feeds is to:

- Provide extra energy (calories) and nutrients when breast milk or infant formula no longer supplies them in sufficient amounts to sustain normal growth and optimal health and development
- Give infants the opportunity to learn to like new tastes and textures, based on family foods, at a time when they are receptive to them

Mothers should all be encouraged to continue breastfeeding throughout weaning (Agostoni et al. 2008).

When to introduce solid foods

At about 6 months they are ready to move onto a mixed diet – whether breast or infant formula fed. At this age a baby's digestive system and kidneys are still developing and weaning too soon may increase the risk of infections and allergies there is good evidence that delaying weaning until 6 months is beneficial in reducing obesity (Hunt and Rudolf 2008).

In practice the developmental signs that suggest that an infant is ready to move onto solid food when they:

- Stay in a sitting position and hold their head steady
- Co-ordinate their eyes, hands and mouth so that they can look at the food, pick it up and put it their mouth all by themselves
- Swallow food. Babies who are not ready will push their food back out, so they get more food around their faces than in their mouth

It is rare for these signs to appear together before 6 months.

Signs often mistaken for a baby being ready to start solid food:

- Chewing fists
- Waking in the night when they have previously slept through
- Wanting extra milk feeds

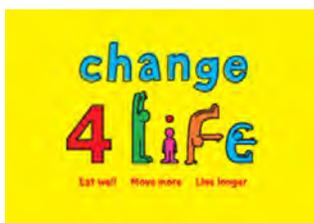
These are normal behaviours for a baby aged three to five months and aren't necessarily a sign of hunger, nor being ready to start solid food. Starting solids will not make them any more likely to sleep through.

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www.nhs.uk/start4life
.....

Weaning before six months

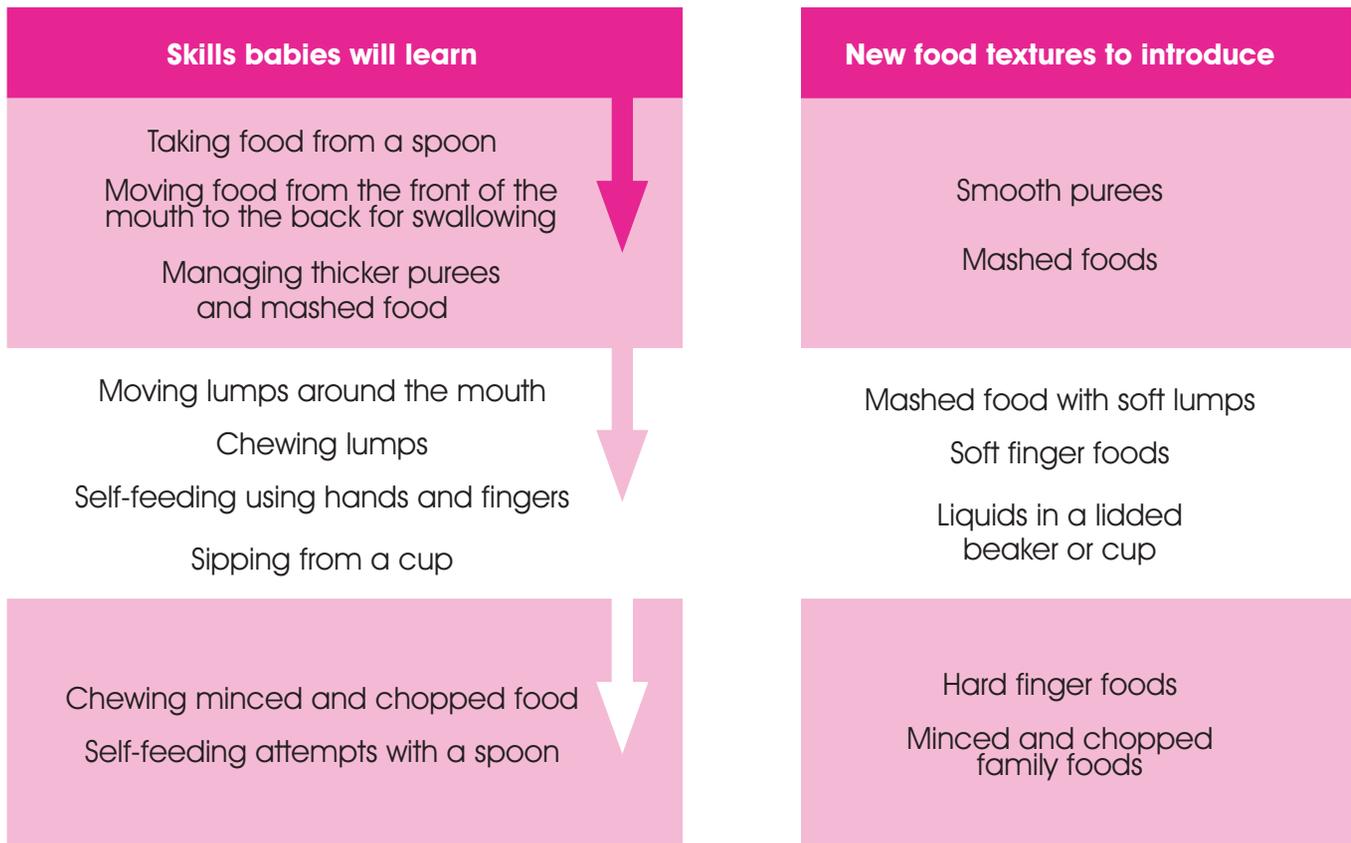
Around six months is the ideal time to introduce solid foods. If babies are introduced to solid foods before six months, the following foods should be avoided as they may cause allergies or illnesses.

- Wheat-based foods and other foods containing gluten (for example bread, rusks and some breakfast cereals)
 - Eggs
 - Fish and shellfish
 - Liver
 - Nuts and seeds
 - Soft and unpasteurised cheeses
-



Introducing new foods

Weaning is a learning process and infants will only learn to accept and enjoy new tastes and textures if they are given the opportunity to try them. Some infants are kept on pureed foods for too long and those who are not offered lumps and finger foods by 9 months are more likely to be fussy eaters at the age of 3 years compared to those that were weaned appropriately (Northstone 2001).



Getting started

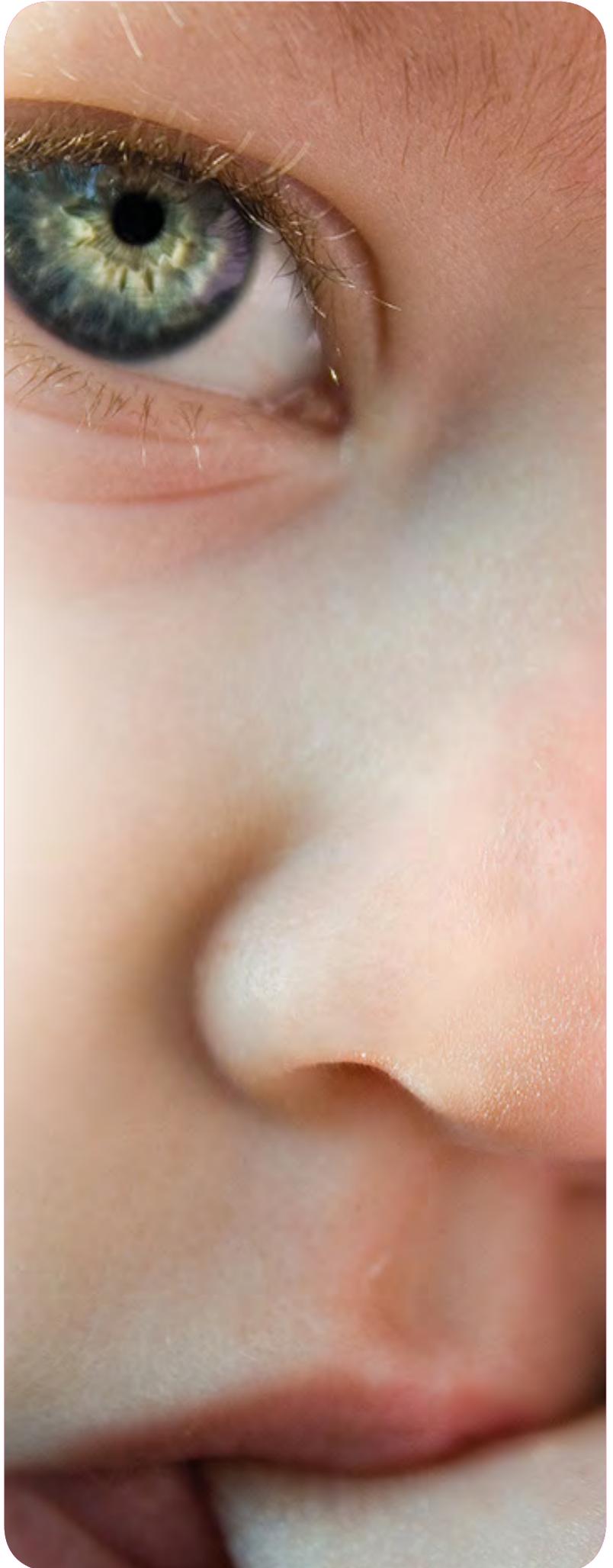
Solids may be introduced at any time during the day that is convenient for the carer and infant. The infant should be wide awake and not too hungry so either between feeds or mid way through a feed.

Small amounts of mashed vegetable, mashed fruit or cereal mixed with milk after or in the middle of a milk feed should be offered. Mix a little of the baby's usual milk to the food to achieve desired consistency.

If the food is hot, it should be allowed to cool, stirred, and tested before being given to the baby.

At first, only offer the equivalent of a couple of teaspoons of food once a day.

Babies can help themselves to mashed foods. Some mothers may spoon-feed their baby but they will soon be able to do it themselves. Babies should be allowed to feed themselves, using their fingers, as soon as they show an interest. If a spoon is being used, wait for the baby to open their mouth when offering the food.



First foods

- Food can be puréed (using a sieve, hand blender or liquidiser), mashed or offered as a finger food
- Finger foods should be given even if babies don't have teeth (foods containing sugar should be avoided)

Examples of finger food

Soft fruit pieces

e.g. mango, melon, banana, soft ripe pear, peach, papaya and kiwi

Cooked vegetable sticks

e.g. carrot sticks, green beans, courgette sticks, potato and sweet potato

Cooked vegetable pieces

e.g. cauliflower and broccoli florets

Cooked pasta pieces

Fingers of toast

Cheese cubes

Soft roasted vegetable sticks.

e.g. potato, sweet potato, parsnip, pepper, carrot, courgette

Feeding hints for parents

- **Allow plenty of time** for feeding
- **Don't force feed babies.** If food is rejected, wait and try again later
- **Go at the baby's pace** - babies have to learn how to move food from the front of their tongue to the back so that they can swallow it. Some babies learn this quicker than others and most babies know when they've had enough to eat
- **Talk to babies whilst they are being fed**
- **Let babies touch food**
- Babies often like to start by holding foods such as vegetables cut into sticks
- **Give a range of foods** and textures to taste
- Foods should be introduced **one at a time**
- Freshly prepared foods may be prepared in large quantities and frozen in small amounts such as ice cube trays or small containers for convenience
- Herbs and mild spices can be used to flavour food but **salt should not be added**
- Infants can chew soft lumps with their hard gums
- Their teeth, for those that have them at this age, are mainly used for biting
- **Hard and crunchy foods should be avoided** as infants at this age can bite off lumps but not yet chew them properly, which could lead to choking

Introducing more foods

Once babies are used to eating vegetables and fruit, a range of foods from the following groups should be offered over the day. Suitable foods from each group are:

- Potatoes and cereal based foods including bread, rice, couscous, pasta, porridge and other breakfast cereals
- Fruits and vegetables
- Milk products such as yogurt, cheese, custard and milk puddings
- Meat, fish, well-cooked eggs, pulses (peas, beans and lentils) and vegetables

By the age of 6 months, an infant's iron stores that were laid down during pregnancy are no longer adequate to meet the infant's iron requirements. It is therefore important to encourage the iron rich foods from the meat and alternatives as well as iron fortified breakfast cereals and green vegetables. To increase absorption of iron from plant based foods, food or drink rich in vitamin C should be given at the same meal.

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Drinks with meals

- A free flowing beaker should be introduced for drinks around 6 months of age
- Water is the ideal drink to be offered at meal times from 6 months and should be offered and available at all times
- Continue to offer breast milk or formula milk

As babies eat more solids, the amount of milk they want will reduce. Once babies are eating plenty of solids several times a day, they may take less milk at each feed or even drop a milk feed altogether.

It is best to avoid fruit juices or baby drinks. They allow babies to become accustomed to sweet drinks, are not good for their teeth, and animal research tells us that they produce metabolic changes that promote the laying down of fat. Sugary drinks increase the energy content of the diet without contributing any nutritional benefit. Drinks with artificial sweeteners (diet drinks), are also not recommended. (Hunt and Rudolph, 2008)

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From about nine months

- Aim for 3 meals per day
- Infants should take part in as many family meals as possible
- Encourage a wide variety of tastes and textures
- Offer a snack between meals at mid-morning and mid-afternoon - for example fingers of fruit, vegetables or toast
- Continue to offer breast milk or formula milk
- Babies eat different amounts on different days therefore allow them to eat to appetite
- Harder finger foods such as raw ripe fruit and vegetable sticks and family foods such as sandwiches are also suitable

How big is a portion:

Meat, fish, eggs and pulses

2-3 portions each day:
1 portion is 1 tbsp beans, meat, or 1 egg

Fruit and vegetables

5+ portions each day:
1 portion is 1 tbsp mashed veg,
1 slice melon, 1/2 apple

Bread, rice, pasta

3-4 portions each day:
1 portion is 1 tbsp mashed potato,
3-4 chips, 1 tbs porridge

Milk and dairy

2-3 portions and no more than 1 pt
equivalent each day:
3 dice sized pieces of cheese,
2 tbsp yogurt, 1 cup full fat milk

Foods high in fat and/or sugar

no more than 2 portions each day:
1 biscuit, 1 small piece of cake

See Hunt And Rudolph (2008) for full recommendations

Food Portions Book for 1-4 year olds

This resource supports childminder's who have requested clear guidance on portion sizes to feed children 1-4 years. The book is a photographic resource that shows typical portion sizes across each food group and is available to download at:

www.bristol.nhs.uk

Learning to like foods

Some infants will respond with surprise to a new taste. Parents should be reassured that infants will learn to like new tastes if they are offered them on a regular basis. Parents who do not offer foods that their infant has refused the first or second time may narrow the range of foods the infant will accept.

Gagging and coughing

Gagging is a normal reflex present at birth. It is a protective reflex preventing objects from obstructing the airway. Initially the gag may be stimulated by touching the mid-section of the tongue. When infants are learning to manage new textures they may gag or cough up food that needs more chewing. This is part of the learning process and parents should be advised not to panic; the infant might just need more experience to cope easily with that texture. If an infant gags or coughs frequently, families may need further assessment from a Speech and Language Therapist.

Infants must never be left unattended with foods as they can choke.

Children should be seated in a supported chair with their legs at right angle to their body and in a calm atmosphere when eating. When parents or carers are feeding children they should be facing them. Cutting food into short lengths rather than small pieces will also reduce the risk of choking and are easier for infants to manage if they are self-feeding.

Parents' cooking skills

Commercial baby foods, such as cans, jars and dried food may be convenient in some circumstances but their exclusive use should be discouraged as learning to like family foods is a key aim of weaning.

Health professionals and Early Years staff need to encourage and support any parents who would like to improve their cooking skills.

The Cook it service offers 1 to 1 and group based courses for parents lacking in skills and confidence in cooking healthy meals for their families, as well as helping with menu planning on a budget and understanding food labels.

www.sirona-cic.org.uk
01225 831852

(click on **healthy lifestyles**)

Low-fat foods

Low-fat foods are not suitable for babies or children under two. Fat is an important source of calories and some vitamins which they need.

Suitable drinking cups

Drinks can be offered from a cup from about 6 months.

- Either in a free flowing lidded cup or an open cup
- Avoid lidded cups with valves as these are often difficult for infants to get liquids out
- Bottle drinking should be phased out around an infant's first birthday. This is to help prevent tooth decay known as 'bottle caries' in the toddler years

Milk feeds

Breast milk or formula milk continue to be an important part of an infant's nutritional intake, however, these feeds should naturally decrease as the quantity of solid food increases.

Follow-on formula can be given in place of infant formula after 6 months, however this is not necessary. Formula intake should be about 500-600ml per day (DH 1994).



Learning about food through play

Infants should be able to see and to explore their food at mealtimes - sitting them in a highchair will enable them to do this

Finger foods should be offered at each meal

Infants should be allowed to touch and play with soft or liquid foods in their bowl or plate

Feeding infants can be messy, however this is an important part of the learning process

Developing self feeding skills

Self feeding should be encouraged from the beginning of weaning by offering finger foods and allowing infants to have their own spoon even when they are being fed by a carer.

Infants who are allowed to become involved in learning to self feed will feel more engaged in the feeding process and will be less likely to want to end the meal because they have become bored.

Some infants need help with feeding as they may not be able to feed themselves adequate quantities of food fast enough to satisfy their hunger.

Responding to children's feeding cues

Adapted from the HENRY Approach, Hunt and Rudolph, 2008)

From birth, most children have a natural 'fuel gauge' which tells them how much they need to eat.

Babies only means of communicating hunger is by crying. This does not mean that every time a baby cries it is hungry.

During the first few weeks of life parents / carers will get to know their baby, and learn their babies' individual cues.

As infants grow they find other ways of communicating their feelings of hunger and fullness.

Parents and childcare providers need to be responsive to these cues.

All possible causes of discomfort should be investigated before food is offered, especially if it is not long since the last feed.

Excessively controlling and restrictive feeding, as well as indulgent and neglectful feeding, are linked to obesity.

Structured social family mealtimes generate healthier patterns of eating, than frequent snacking or grazing through the day.

Using food to reward good behaviour, as treats and to comfort distressed children contributes unhelpfully to children's attitudes towards food.

Using sticker reward charts to encourage children to finish their food can be unhelpful as children learn they must finish all the food on their plate, despite being full.

Food safety

- **Hand washing** should always be the first step in preparing food or drinks
- **Bottles and teats** for formula milks should always be sterilised
- **Plates, bowls, drinking cups and cutlery** do not need to be sterilised but should be scrupulously cleaned
- **Freshly cooked food** can be stored for up to 24 hours in the fridge
- **Food for infants should be heated until piping hot right through and then cooled before feeding.** Food should not be reheated more than once
- **Frozen food** should be thawed in the fridge. Thawed frozen food should not be refrozen
- **Eggs, meat, fish and shellfish** should all be well cooked right through
- **Shark, sword fish and marlin** should not be given because of their high mercury content
- **Honey** should not be given until the age of 1 year as very occasionally it may contain spores of botulinum. After 1 year of age the gut is mature enough to prevent the botulinum bacteria from multiplying
- **Unpasteurised soft cheeses** should not be given until after 1 year as they may cause food poisoning
- **Liver**, if offered, should be limited to one small serving per week because of the high levels of vitamin A



Foods to limit

Sugar

Sugar should not be added to milk or manufactured baby foods. In home made puddings and cooked fruit a small amount may be added if necessary to reduce the tart flavour of sharp fruits.

Salt and salty foods

Breast milk, formula milks and most foods naturally contain some sodium which infants need to grow. The Food Standards Agency recommend that infants should have no more than 1g of salt (equivalent to 400mg sodium) per day.

To avoid excess sodium:

- Salt should not be added to food for infants either during cooking or at the table
 - Limit the amount of processed foods that are made for adults and older children such as bacon, sausages, sausage rolls and pasta sauces
 - Salty snack foods such as crisps should not be given to infants. As well as being high in salt they are low in key nutrients
-

Nuts

Whole nuts, including peanuts, should not be given to children under five in case of choking.

For infants of atopic families where the potential risk of nut allergy is increased, current advice is that food containing peanuts (groundnuts) and peanut butter, should be avoided until the child is 6 months of age. Advice should be sought from the child's health visitor or GP if the parent is worried. Childcare providers should have nut and seed policies - and follow parent's instructions for individual children.

Vegetarian diets in infancy

Infants can successfully be weaned onto a vegetarian diet as long as a good source of iron food is offered at each meal for example:

- Iron fortified breakfast cereal, oats or egg at breakfast
 - Eggs/pulses/finely ground nuts along with green vegetables at lunch and tea
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Vitamin supplements

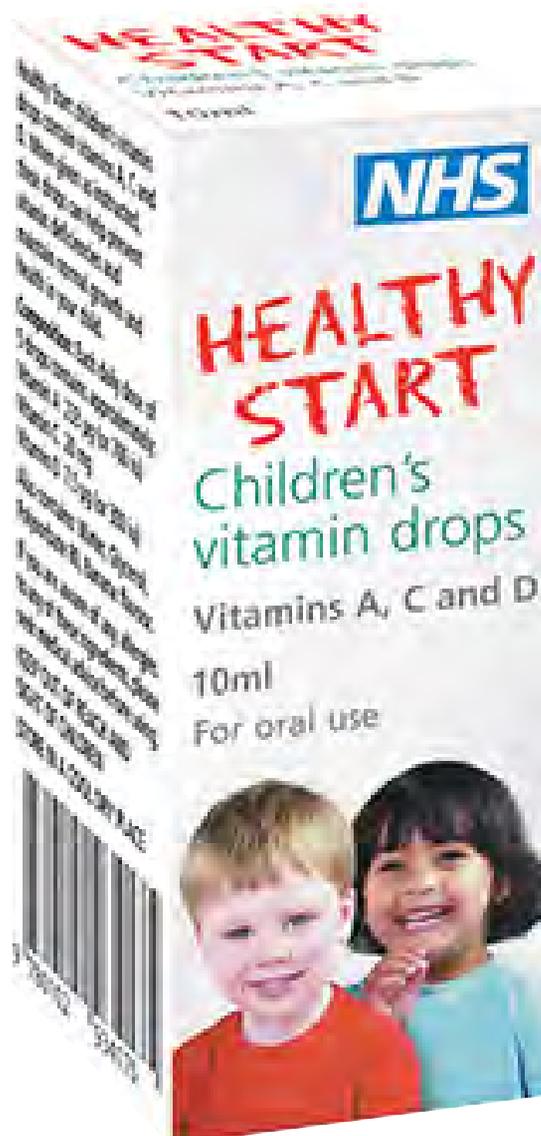
The Department of Health recommend that all infants begin a vitamin A & D supplement:

- Breast fed infants should begin from 6 months if their mother was well nourished during pregnancy. If there is any doubt about a mother's vitamin status during pregnancy then breast fed infants should begin this supplement at one month of age
- Formula fed infants should begin taking a supplement once they are over 6 months and drinking less than 500mls formula per day

All families of infants should be advised how to access the Healthy Start Children's vitamin drops.

In B&NES vouchers can be exchanged for vitamins at some children's centres, ask local health visitors for more information.

www.healthystart.nhs.uk



Common feeding challenges in infants

Unsettled infants / Colic

Many young infants have a period during the day when they are unsettled and cry with discomfort but appear not to be hungry. This is often referred to as colic. It occurs commonly in the late afternoon and evening.

Causes of colic are unknown, but it is thought to be due to swallowing large amounts of air during feeding which then becomes trapped in the digestive tract and causes bloating and severe abdominal pain. Comforting and soothing the baby with a massage or a warm bath sometimes helps.

Healthcare professionals should:

- Ask about the infant's feeding routine and bowel movements
- Observe a feed
- If indicated correct positioning and attachment in breast fed infants
- Check that formula feeds are being made up correctly
- If bottle fed consider the size flow of the teat
- Check that infants are being winded correctly during and after the feed

Colic preparations are available in retail pharmacies but there is no scientific evidence base to support their use.



Possetting and Gastro-oesophageal reflux

Possetting is seen in most young infants. It occurs when the stomach contents regurgitate back up into the mouth without any harmful effects. Infants with mild possetting will gain weight and thrive normally (Puntis, 2000).

More severe reflux/regurgitation, resulting in distress to the infant is called gastro-oesophageal reflux disease (GORD). In this case the stomach contents come up into the oesophagus but not always into the mouth. This causes discomfort or pain to the infant but the carer will not necessarily be aware that it is happening.

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GORD usually resolves with time but may continue throughout infancy and beyond in some children. Management by the primary health care team is usually sufficient and should include reassurance to the parent.

- In breast fed babies better positioning and attachment may help improve GORD. Observe a feed to check the feeding technique. If necessary refer to a breastfeeding adviser (see page 28)
- Do not recommend infant formula for breast fed infants
- Check that formula fed infants are not being overfed with large volumes or over concentrated feeds
- For a formula fed infant consider use of a thickened feed. This can be done in one of two ways:
 - 1: Adding a thickener, such as Thixo-D or Instant Carobel (Cow & Gate) to the normal formula just before feeding
 - 2: Changing to a formula that thickens in the stomach e.g. Enfamil AR (Mead Johnson) or SMA Staydown (SMA Nutrition)
- A medical practitioner may sometimes prescribe anti-reflux medications such as Gaviscon. Note: Gaviscon works in a similar fashion to the formulae Enfamil AR (Mead Johnson) or SMA Staydown (SMA Nutrition)

If the problems persist, despite having taken the above measures, or if the infant has faltering growth it is recommended that the Health Visitor or GP should make a referral to the paediatrician.

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Gastro-enteritis and diarrhoea

Acute gastro-enteritis is an infectious disease of the alimentary tract, producing damage to the mucosa, either structural or functional and of variable extent and severity (Cade, 2000). The main aim in managing gastro-enteritis in infants is the correction of dehydration and maintenance of hydration and electrolyte balance. Infants of less than 6 months are particularly vulnerable to gastro-enteritis and dehydration and may require hospital admission.

Gastro-enteritis is uncommon in infants who are exclusively breast fed. In the rare event, it is important that breastfeeding is continued, as discontinuation of breastfeeding is a major risk factor for the development of dehydration (Faruque, 1992). Severe cases may require the addition of oral rehydration fluids.

Infant formula feeds **may** be stopped for a short time (6–24 hours) **but only under the guidance of a medical practitioner** and an oral rehydration solution (e.g. Dioralyte or Rehydrat) given to replace lost fluids (i.e. after vomiting or diarrhoea) to meet the infant's fluid requirement. Formula feeds should then be re-commenced at full strength and not diluted (Walker-Smith et al. 1997). If infants have started solids, it may also be necessary to discontinue these for a similarly short period of time.

Diarrhoea or loose stools can occur in infants who are unwell for example when they are teething. Continued diarrhoea (>7days) after acute gastroenteritis may be associated with a temporary intolerance to lactose in some infants. Breast feeding should continue but formula fed infants could be changed to a lactose free formula (McDonald, 2007). Advice on excluding foods containing milk and lactose will be needed for infants who are already being weaned.

This should only be undertaken under the supervision of a medical practitioner and following the advice from a dietitian.



Constipation

Constipation is defined as difficulty, delay or pain when opening bowels. In the first 3-4 months infants should pass frequent, loose, bright yellow stools, at least 2-3 times in 24hrs. From 3-4 months, stools will become less frequent. It is not unusual for an infant to go several days without a bowel movement and providing the infant is well and happy this is of no significant concern. After the introduction of solid food, stools may change in frequency and colour.

Constipation is rare in breast fed infants but if it occurs it may indicate inadequate milk intake due to poor attachment and/or positioning. A breastfeed should be observed by someone experienced in breastfeeding management to check positioning and attachment and to ensure the infant is able to access breast milk efficiently. Additional fluids other than breast milk are not recommended.

Constipation is a more frequent problem in formula fed infants. Infants changing from breastfeeding to formula feeding often develop constipation. One cause may be the calcium salts in the formula which can harden stools in some infants. Other causes may be:

- Over concentrating of the infant formula
- inadequate fluid intake, including under feeding
- Cows milk protein intolerance however this is rare

NICE Guidelines on constipation in children have been released and are available from:

.....
[guidance.nice.org.uk/CG99](https://www.guidance.nice.org.uk/CG99)
.....

Management of constipation In formula fed infants

- Fluid intake: ask parents to keep a feed diary for 2-3 days. Check the volume of feed given /kg actual body weight/24 hours against recommended quantity tables (see page 47). If it is inadequate then feeds should be increased to the recommended requirement
- Check that the infant formula is being made up according to the manufacturer's instructions and not being over concentrated or under concentrated
- Casein dominant milks can be more constipating than whey dominant milks so a change from casein dominant to whey dominant formula may help
- Additional drinks of cooled boiled water should be offered in hot weather
- In infants being weaned check that the following are included in their diet:

Fruit and vegetables

Cereals are being offered including wholegrain varieties such as porridge, Weetabix and Shreddies

Bran should not be given to infants as it may cause abdominal discomfort, bloating and diarrhoea

Drinks or water are being offered with meals

Over the counter treatments for constipation such as syrup of figs and milk of magnesia are dangerous to infants and should not be used. If conservative management with diet fails to resolve constipation, then the infant should be referred for further medical opinion.

Food hypersensitivity (food allergy and food intolerance)

About 2-5% of infants are sensitive to certain foods but many more parents suspect that a food is causing problems for their infant (Venter 2006).

The foods that most commonly cause problems are milk, eggs, soya, fish, wheat and peanuts (COT 2000). Many infants grow out of it by 12 months so it is important that the condition is monitored carefully to ensure special diets are not continued for longer than necessary.

Symptoms

Symptoms of immediate onset allergy may occur up to 1 hour after food ingestion and include skin manifestations (urticaria, itching, rash), vomiting, angioedema and anaphylaxis. Delayed onset reactions are harder to diagnose and may not manifest until hours or days after the ingestion of the offending food. Possible symptoms include eczema, chronic diarrhoea, colic / abdominal pain and faltering growth.

Diagnosis

The gold standard test is the placebo-controlled double blind challenge. In clinical practice, however, open challenges are usually performed. Food challenges are an integral part of diagnosis in order to:

- Detect a specific food which causes symptoms - a positive result confirms the need to exclude that food from the diet
- Prove that a specific food is not responsible - an absence of symptoms confirms that a restricted diet is not needed

Once diagnosed a food causing symptoms should be excluded, however this should only be carried out under the supervision of a medical practitioner.

Advice from a registered dietitian is needed to ensure the infant's milk and weaning food intake continues to provide all the necessary nutrients for optimising growth and development.

In breast fed infants the mother may need to exclude foods from her diet. Breastfeeding mothers who are excluding dairy foods may need a calcium supplement to ensure adequate calcium: 1250-1350mg daily.

Formula fed infants can usually be changed to an appropriate specialised feed available on prescription. Soya formula is not recommended for infants with cow's milk allergy or intolerance as there is a risk of cross reactivity with soya formula.

NICE Guidelines on allergy in children have been released and are available from:

guidance.nice.org.uk/CG116

Monitoring growth

The new UK-World Health Organisation (WHO) 0-4 years growth charts were introduced in England for all new births from May 2009. The charts, which have been developed for the Department of Health by the Royal College of Paediatrics and Child Health, are based on the growth of breast fed infants and will replace growth charts that were based on the growth of predominantly formula-fed babies.

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When to weigh

- Babies should be weighed in the first week as part of the assessment of feeding and thereafter as needed
- Some degree of weight loss is common in the first week – **a weight loss of 10% or more needs careful assessment**
- Recovery of birthweight by 2 weeks indicates that feeding is effective and that the child is well
- Babies are routinely weighed by midwives at birth, 5 days and 10 days. GPs weigh again at 6-8 weeks
- According to the Healthy Child Programme after the GP check weighing should only be offered where there is parental or professional concern about a baby's growth, or risk to normal growth
- A B&NES healthy weight for children 0-5 pathway has been developed which includes additional resources to support brief intervention, training resources, identifies appropriate materials to use with families and provides information about local interventions /services

When to measure length or height

- Length or height should be measured whenever there are any worries about a child's weight gain, growth or general health

What is a normal rate of weight gain and growth?

- Babies do not all grow at the same rate, so a baby's weight often does not follow a particular centile line especially in the first year. Weight is most likely to track within one centile space
- In infancy acute illness can lead to sudden weight loss and a weight centile fall, but on recovery the child's weight usually returns to its normal centile within 2 to 3 weeks. However a sustained drop or increase through two or more weight centile spaces is unusual (fewer than 2% of infants) and should be carefully assessed by the primary care team, including measuring length/height

Training and education from the Royal College of Paediatrics and Child Health – educational materials can be downloaded from the website

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www.growthcharts.rcpch.ac.uk *

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* They include PowerPoint slides, video clips, notes for tutors and growth chart plotting exercises.



Faltering growth

The term “faltering growth” is applied to infants and young children who do not achieve normal or expected rates of growth. This could include:

- Falling across centiles
- Height and weight centiles markedly discrepant

Indications of faltering growth are:

- Poor and erratic weight gain or no weight gain
- Apathetic or weakly crying infant
- Poor muscle tone and skin turgor
- Concentrated urine, a few times/day
- Infrequent, scanty stools

The management of faltering growth is quite different for breast and formula fed infants.

Management of faltering growth in breast fed infants

Bath & North East Somerset is in the process of developing guidelines for breast fed infants. In the meantime, please refer to the 'Prevention and management of poor weight in the breastfed baby' guidelines.

Management of faltering growth in formula fed infants

Take a diet history and/or ask parents to keep a feed and food diary.

- Check frequency and volume of feeds taken
- Check that an appropriate formula is being used and that it is being made up correctly with good hygienic practices
- Check the size of the teat on the bottle is suitable
- Check the infant is not constipated
- If weaning foods are being offered check suitability

If there are no obvious dietary causes of faltering growth or the above measures do not result in improvement in weight gain, the infant should be referred to a paediatrician.



Feeding pre-term infants

Infants born pre-term (less than 37 weeks gestation) or with a low birth weight (LBW), below 2.5kg, have special nutritional needs, which vary according to the infant's maturity and any subsequent complications.

A comprehensive review of the nutritional requirements of pre-term and LBW infants has been published by Tsang et al. (Tsang et al. 2005).

Breastfeeding pre-term infants

Breastfeeding or giving the mother's own expressed breast milk (EBM) is particularly encouraged because of the growth factors within it and because it reduces the risk of necrotising enterocolitis (NEC). For this reason, all mothers are encouraged to express breast milk until their infant is old enough or well enough to feed directly from the breast. Low birthweight infants may benefit from infant breast milk fortifiers to enhance growth and bone mineral density.

Formulas for pre-term infants

For pre-term infants requiring formula, a low birth weight version should be used if birth weight is less than 2.0kg. These formulae have a higher nutrient density than standard infant formulae

A nutrient enhanced discharge formula may be used once the infant weighs 2-2.5kg. This is available on prescription when the infant is discharged from hospital. This formula can be continued until 6 months, corrected age or advised by dietitian or paediatrician.

Vitamin supplementation for pre-term infants

Pre-term infants may require additional vitamin and iron supplements, as directed by the consultant paediatrician or dietitian.



Weaning pre-term Infants

The time to begin weaning a pre-term infant may be a clinical decision made by the paediatrician. Pre-term babies have high nutritional needs that are unlikely to be satisfied from milk alone for the 4-6 months after their Estimated Date of Delivery (EDD). Current recommendations are that weaning should begin at an earlier post conception age than for term infants. It is usually between five and eight months old, the age from the pre-term infant's birth date and not from their corrected age date (King & Aloysius 2009, King 2009). As the infant's gut is being used for milk feeds from an earlier age, it matures earlier and will have adapted to cope with solid foods. Weaning should then progress as for term babies, introducing new textures to give infants the opportunity to learn to manage them in their mouth. Pre-term babies are more likely to have feeding problems than term babies.

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Growth monitoring of pre-term infants

Please refer to page 65 for guidance on growth monitoring. Key new features of the new UK-WHO growth charts:

- For preterm infants born from 32 to 36 weeks gestation plot all measurements in the preterm section
 - For infants born before 32 weeks use the separate low birth weight charts
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References

- Aberblom H.K et al (1999) Emergence of diabetes associated auto antibodies in the nutritional prevention of IDDM (TRIGR) project. 59th Annual Scientific Sessions of the American Diabetes Association. June. San Diego.
- Agostoni C, Decsi T, Fewtrell M, Goulet O, Kolacek S, Koletzka B, Fleischer Michaelsen F, Moreno L, Puntis J, Rigo J, Shamir R, Szajewska H, Turk D, van Goudoever J (2008) Complementary Feeding: A Commentary by the ESPGHAN Committee on Nutrition Journal of Pediatric Gastroenterology and Nutrition 46:99-110.
- Aniansson G, Andersson B et al (1994). A prospective cohort study on breastfeeding and otitis media in Swedish infants. *Pediatric Infectious Diseases Journal* 13:183-8.
- Ball T. M. & Wright A. L. (1999) Health care costs of formulae fed infants in the first year of life. *Paediatric*;103 (4pt2) 807-6.
- Bolling K, Grant C, Hamlyn B and Thornton A (2007) Infant Feeding Survey 2005.
- Carver JD (2003) Advances in nutritional modifications of infant formulas. *American Journal Clinical Nutrition*;77(6):1550S-1554S
- Coutsoudis A et al. (2001) Method of feeding and transmission of HIV-1 from mothers to children by 15 months of age: prospective cohort study from Durban, South Africa. *AIDS* 15: 379-87.
- Coutsoudis A et al (2002). Free formula milk for infants of HIV-infected women: blessing or curse? *Health Policy and Planning* 17: 154-160.
- COT 2000 Committee on Toxicity of Chemicals in Food, Consumer Products and the Environment. Adverse Reactions to Food and Food Ingredients. Food Standards Agency July 2000 p.92
- Cummings R and Klineberg R (1993). Breastfeeding and Other Reproductive Factors and the Risk of Hip Fractures in Elderly Women. *International Journal of Epidemiology* 22 (4), pp 684-691.
- Davis M K (1998) Review of the evidence for an association between infant feeding and childhood cancer *International Journal of Cancer Suppl*;11:29-33.
- Department of Health (1994) Weaning and the weaning diet. HMSO, London.
- Department of Health (2007a) Weaning London: DH.
- Department of Health (2007b) Off to the best start. London: DH
- Department of Health and Social Security (1998) Present Day Policies in Infant Feeding – 3rd Report on Health and Social Subjects No 45. London. HMSO
- Dewey K, Heinig M and Nommsen L (1993) Maternal weight-loss patterns during prolonged lactation *American Journal of Clinical Nutrition*, Vol 58, 162-166.
- Duncan B, Ely J et al (1993) Exclusive breastfeeding for at least 4 months protects against otitis media. *Pediatrics*; 91: 867-72.
- Faruque A. S, Mahalanabis D, Islam A et al (1992) Breastfeeding and oral rehydration at home during diarrhoea to prevent dehydration. *Arch Dis Child* 67: 1027 – 1029.
- Ford R.PK, Taylor B.J. (1993) et al Breastfeeding and the risk of sudden infant death syndrome. *Int J Epidemiol*; 22: 885-9.
- Home R S C, Parslow P M, Ferens D, Watts A-M and Adamson T M. (2004) Comparison of evoked arousability in breast and formula fed infants. *Archives of Disease in Childhood* 89 :22-25.
- Horta BL, Bahl R, Martines JC et al. (2007) Evidence on the long term effects of breastfeeding: systematic reviews and meta-analyses. Geneva: World Health Organization.
- Howie, R.W. et al (1990) Protective effect of breastfeeding against infection. *BMJ*; 300: 11-6.
- Hunt, C. and Rudolf, M. (2008) Tackling Childhood Obesity with HENRY UNITE / Community Practitioners' and Health Visitors' Association.
- Ip S, Chung M, Raman G et al. (2007) Breastfeeding and maternal and infant health outcomes in developed countries. Evidence report/technology assessment 153. Rockville: Agency for Healthcare Research and Quality.
- King CL & Aloysius A (2009) Joint consensus statement on weaning preterm infants. <http://bapm.org/nutrition/guidelines.php>
- King CL (2009) An evidenced based guide to weaning preterm infants. *Paediatrics & Child Health* 19:9, pg 405-414.
- Kull I, Wickman M, Lilja G, Nordvall S L, and Pershagen G.(2002) Breastfeeding and allergic diseases in infants - a prospective birth cohort study *Archives of Diseases in Childhood*: 87; 478-481 .
- Lawrence R. Breastfeeding A guide for the medical profession (1994); 4th Edition Mosby. St. Louis. M1 USA pg 273.
- Li L, Parsons T.J, Power C.(2003) Breast feeding and obesity in childhood: cross sectional study *BMJ* 327: 904-5.
- Lucas A et al. (1994) A randomised multi-centre study of human milk versus formula and development on pre-term infants. *Archives of Diseases in Childhood*; 70: 141-146.
- Lucas A. and Cole T.J. (1990) Breast milk and necrotising enterocolitis. *Lancet*; 336: 1519-23.
- Puntis J W L (2000) Possetting Professional Care of Mother & Child.10,(5), 2000.
- Northstone K, Emmett P, Nethersole F and the ALSPAC study team (2001): The effect of age of introduction to lumpy solids on foods eaten and reported feeding difficulties at 6 and 15 months. *J Hum Nutr Diet* 14, 43-54.
- McDonald S 2007 *Gastroenterology in Shaw V and Lawson M Clinical Paediatric Dietetics* 3rd ed. London Blackwell
- Marild S et al (2004) Protective effect of breastfeeding against urinary tract infection. *Acta Paediatric*; 93(2): 164-8.
- Quigley MA, Kelly YJ, Sacker A (2009) Infant feeding, solid foods and hospitalisation in the first 8 months after birth. *Archives Diseases in Childhood*; 94:148-150.
- Sadauskaitė-Kuehne V et al (2004) Longer breastfeeding is an independent protective factor against development of type 1 diabetes mellitus in childhood. *Diabetes Metab Res Rev*; 20(2): 150-7.
- Sears G, Greene J.M. et al (2002) Long-term relation between breastfeeding and development of atopy and asthma in children and young adults: a longitudinal study. *Lancet*; 360: 901-907.
- Shaw V and Lawson M 2007 *Clinical Paediatric Dietetics* 3rd ed. London Blackwell.
- Sheard N. F. and Walker W.A. (1998) The role of breast milk in the development of the gastro-intestinal tract. *Nutrition Review*; 46: 1: 1-8.
- Shu Xo, Linet M, Steinbuch M et al. (1999) Breastfeeding and risk of childhood acute leukaemia. *Journal of National Cancer Institute*;91:1765-72.
- Taitz L.S, Scholey E. Are babies more satisfied by casein-based formulae? *Archives of Disease in Childhood*. 1989; 64: 619-62.
- Thorkelsson T, et al. 1994. Similar gastric emptying rates for casein- and whey-predominant formulas in preterm infants. *Pediatr Res*. 1994 Sep; 36(3):329-33
- Tsang, R.C. Uauy R Koletzka B et al. Nutrition of the Preterm infant: Scientific Basis and Practical Guidelines, 2nd edn. Cincinnati, Ohio: Digital Educational Publishing, 2005.
- UNICEF (1998) Preventing Iron Deficiency in Women and Children. A UNICEF/UNU/WHO/MI Technical workshop October 1998: 44.
- Venter C, Pereira B, Grundy J, Clayton CB, Roberts G, Higgins B, Dean T. 2006 Incidence of parentally reported and clinically diagnosed food hypersensitivity in the first year of life. *J Allergy Clin Immunol* 117:1118-24
- Walker-Smith JA et al. (1997) Recommendations for feeding in childhood gastroenteritis. European Society of Paediatric Gastroenterology and Nutrition. *J Paediatric Gastroenterology and Nutrition* 24 619-20
- WHO (2003) Global Strategy for Infant and Young Child Feeding.

Further information is available from:

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www.bliss.org.uk

British Dietetic Association

Weaning Fact Sheet

[/www.bda.uk.com](http://www.bda.uk.com)

Department of Health

Birth to Five Book
Off to Best Start Leaflet
Bottle Feeding Leaflet
Weaning – starting solids
Best Beginnings DVD

www.dh.gov.uk

Food Standards Agency website

www.eatwell.gov.uk/agesandstages/baby

Healthy Start

www.healthystart.nhs.uk

NHS Choices

www.nhs.uk/planners/breastfeeding

www.nhs.uk/conditions/bottle-feeding

www.nhs.uk/conditions/babies-weaning

Royal College of Paediatric and Child Health

UK – WHO Pre-term Growth Charts

www.rcpch.ac.uk

Start4life

[/www.nhs.uk/start4life](http://www.nhs.uk/start4life)

Twins and Multiple Birth Association

www.tamba.org.uk

UNICEF UK Baby Friendly Initiative

www.babyfriendly.org.uk