



Guide to: Complementary feeding

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Around 80% of UK infants are breastfed immediately after birth, with breast milk providing all their nutritional needs (Scientific Advisory Committee on Nutrition (SACN), 2017). It is recommended that mothers breastfeed exclusively for the first 6 months and continue up to age 2 years while solid foods are introduced (World Health Organization (WHO), 2009). Evidence suggests that breastfeeding is associated with a reduced risk of gastrointestinal infections in the first year of life and some respiratory infections (SACN, 2017). Complementary feeding is the process of adding foods and drinks other than breast or formula milk to a child's diet (WHO, 2009). The WHO recommends the term 'complementary feeding' in preference to 'weaning' to avoid confusion with the cessation of breastfeeding (WHO, 2009).

When it is time to introduce solid food, key nutrients to include are iron, calcium, protein, vitamin D, zinc, vitamin B12, calcium, potassium and selenium, plus omega 3 fatty acids. The microbiota of the gut affects health, including the immune system and vitamin K production. The intestinal microbiota of newborns is sterile while in the womb and rapidly colonised by microbes through birthing, feeding and environmental factors. By the age of 2 years, the microbiota resembles that of an adult (SACN, 2017).

Breast milk contains complex oligosaccharides with prebiotics that influence the microbiome, leading to a difference in the gut bacteria of formula-fed and breastfed babies. Complementary feeding will also influence the microbiota, so it is important for babies to be offered a varied diet to expose them to a variety of prebiotics and to help them develop their immune system (SACN, 2017). The requirements for individual nutrients can seem confusing to many parents, but focusing on the balance of an infant's diet and allowing the child to lead the way as part of an intuitive

eating process are key. Infants should be offered a selection of starchy carbohydrates, which are not all wholegrain, a range of colourful vegetables and fruits, healthy fats, dairy foods several times a day and differing protein sources.

Iron status is of importance for the development of the brain and nervous system, and iron deficiency can have long-term effects on cognitive, motor and behavioural development, including delayed attention and social withdrawal (SACN, 2017). During the last trimester of pregnancy, the foetus increases its iron stores, taking on up to 2 mg per day. These levels track through early infancy, so babies born with low iron stores will continue to have lower ferritin concentrations for up to 2 years (SACN, 2017).

Although breast milk has a low iron content of 0.2–3 mg/d, it is highly bioavailable and is not affected by iron supplementation in the mother (British Dietetic Association (BDA), 2013). Therefore, infants who are breastfed do not need extra iron in the first 6 months of life. All infant formula is supplemented with iron, with a minimum content of 0.3 mg/10 ml. After 6 months, there is an increased need for iron, and the key is to have a diverse diet including plant foods and animal products. Iron-rich foods include red meat, lentils, pulses, beans, tofu, eggs, chicken and spinach. Other important nutrients are listed in *Table 1*.

Introducing solids

Milk should be the sole source of nutrition until around the age of 6 months (breast milk is optimal) (WHO, 2009; BDA, 2013) and milk feeds should continue alongside complementary feeding. Breast milk helps to protect babies from illness and infections (NHS Choices, 2018). From 6–12 months, infants' needs change as they grow and become more physically active. By 6 months, the digestive system has matured to a stage where it is able to absorb adequate amounts of micronutrients from solid foods, so now complementary feeding can commence (WHO, 2009; SACN, 2017). The SACN notes that there is wide variation between individuals in the age at which fine and gross motor skills are attained as well as varying expectations between cultures (SACN, 2017). Indeed, some products on the market state 'from 4 months'

Table 1. Key nutrients and their benefits

Nutrient	Sources	Benefits
Iron	Meat, oily fish, dark green vegetables, beans and pulses, dried fruit, fortified breakfast cereals, eggs	Cognitive, behavioural and motor development
Zinc	Meat, chickpeas, milk, cheese, bread and cereal products, dark green leafy vegetables, mushrooms, peas, fish, tahini, nut butter	Immune system, wound healing, growth and development
Calcium	Milk, cheese, dairy foods, green leafy vegetables, soya beans, ground nuts, oily fish with bones (pilchards, tinned salmon)	Teeth, bones and cellular signalling
Potassium	Fruit and vegetables, beans and pulses, milk, meat, fish	Muscle function and fluid balance in the body
Selenium	Meat, fish, eggs, ground Brazil nuts	Important antioxidant and immune system function

on the packaging. However, although it can be exciting for parents to start solid foods earlier than 6 months, waiting means that the baby's digestive system is better developed and they are able to swallow and feed themselves (NHS Choices, 2018).

Some research suggests a link between a higher BMI in childhood and starting complementary feeding before 4 months, but this is inconsistent (SACN, 2017). Introducing solids at 3–4 months is not thought to add additional energy to the infant's diet but displaces some milk intake so is not of benefit (SACN, 2017). Signs babies exhibit such as chewing their fists, waking in the night when they were previously sleeping through or wanting extra milk feeds are all normal baby behaviours and are not necessarily a sign that they are ready to start solid food (NHS Choices, 2018).

First foods

Mashed or soft cooked vegetables or fruits (parsnip, potato, sweet potato, carrot, apple or pear) can make good first foods. Some parents may like to start with purée, mashed foods or baby-led weaning with soft cooked chunks of foods they can self-feed, or a combination of all three. Suitable finger foods include finger-sized pieces of avocado, banana and cooked sweet potato (NHS Choices,

2018). In a UK cohort study, half the infants were reported to be reaching for food and able to eat finger foods by 6 months of age (SACN, 2017). It is important to progress to different textures quickly, moving to soft cooked meat, mashed fish (no bones), pasta, noodles, toast, lentils, rice and mashed hard-boiled eggs (NHS Choices, 2018). If parents use manufactured baby foods, they should choose products that contain different textures to help babies progress. Full-fat dairy, including yoghurt and custard with no added sugar, can be given too. There are four types of age-related feeding behaviours: suckling, sucking, munching and chewing. Munching and chewing are learnt as a result of exposure to different textures of foods. Munching can develop at 4–7 months and chewing from 7 months upwards (SACN, 2017). From 8–9 months, most babies will eat three meals a day with a mixture of textures. Offering a balance of carbohydrates (bread, rice, pasta, potatoes, cereals, grains), protein (meat, fish, beans, eggs), dairy and vegetables and fruits is important (NHS Choices, 2018). At 12 months, babies should be eating three meals a day with a small, healthy snack two to three times a day (British Nutrition Foundation, 2014).

Newborns have a preference for sweet tastes—a preference for salty foods develops at 6–24

months. Bitter and sour tastes are the least accepted by infants, and this is thought to be an innate response to protecting them against eating toxic foods. Offering tastes of these foods early on may help with acceptance (SACN, 2017). Starting babies with a vegetable first approach has been demonstrated to be beneficial and there is ongoing research into this approach (Barends et al, 2013). In the first few months of complementary feeding, infants are more likely to accept new foods with fewer exposures, so this is a good point to offer bitter foods (SACN, 2017). Parents can be advised not to mix vegetables and fruits to make vegetables more acceptable. Children are strongly influenced by their caregiver's attitudes, beliefs and behaviour about food, which they learn to mirror. Restricting unhealthy foods can lead to poor self-regulation of appetite and children may over-consume these foods later on. Parenting style is a factor, with greater maternal responsiveness (warmth and supportiveness instead of behavioural control over the child) improving acceptance of foods (SACN, 2017).

Foods to avoid

Some babies may be allergic to certain foods, and it is important for parents to introduce these with caution (SACN, 2017; NHS Choices, 2018). Allergenic foods include cows' milk, eggs, gluten wheat, ground nuts and seeds, fish and shellfish (NHS Choices, 2018). If there is a family history of allergy, mothers should be encouraged to breastfeed for 6 months or longer and introducing solid foods before 4 months should be discouraged (NHS Choices, 2018). Good advice is to introduce these foods one at a time, earlier in the day and when someone else is around in case medical help is needed.

The guidance has now changed on peanuts and there is no need to avoid them, even if there is a history of allergy in the family, as there is no clear evidence that avoidance will help to reduce the risk of developing peanut allergy (NHS Choices, 2018). Honey should not be given to infants until they are 1 year old due to the risk of infant botulism. Other foods to avoid before 6 months of age are raw or undercooked eggs, shellfish and fish with high levels of mercury (shark, marlin

Parents' frequently asked questions

What if my baby is not putting on weight?

Babies grow at different rates, and while it is good to keep an eye on weight it is more helpful to look at the baby's general health. Are they content, with plenty of wet and dirty nappies and meeting other developmental milestones? If parents are concerned about their baby's weight, they should seek advice from health professionals and could consider adding more energy-dense foods to the diet, such as cheese, full-fat yoghurt or nut butter

How many times should I try vegetables before I accept my child does not like them?

It can take 10–15 attempts for a child to know if they like a food or not. It may be the child is not in the mood for it or is unused to the flavour or texture. It is important not to pass judgement or react negatively to food refusal, and to try it again another time

How can I ensure my baby is getting enough of a balance of foods and is full?

Offering starchy carbohydrates, protein, dairy, and vegetables and fruits at every meal, including iron-rich foods, will provide the right balance. Responsive feeding and looking out for signs that the baby has had enough are important, in addition to keeping mealtimes relaxed and not forcing children to eat foods if they do not want them

and swordfish), soft or unpasteurised cheese and milk, and sugar and sweeter foods. Infants under 1 year should have <1 g/d salt. Whole nuts should not be given to children under 5 years due to the risk of choking (NHS Choices, 2018).

Supplements

Vitamin D is important for calcium and phosphorus metabolism, and bone health. Although it can be made in the skin through exposure to UVB radiation, this is limited in the UK. From birth to 1 year, a daily vitamin D supplement of 8.5–10 mcg is recommended for breastfed babies or those taking <500 ml formula milk a day. This recommendation stands even if the mother is taking supplements herself and is breastfeeding (BDA, 2013). Children aged 1–4 years should be given a

daily supplement containing 10 mcg of vitamin D. Infants aged 6 months (breastfed babies or those taking <500 ml formula milk a day) to 5 years should also be given daily supplements of vitamins A and C as a precautionary measure to ensure their requirements are being met (SACN, 2017).

The role of milk in the diet

Milk provides most nutritional requirements at the beginning of complementary feeding and the recommendations are that babies should continue to be fed on demand throughout the process (SACN, 2017). Breastfed babies naturally regulate their intake of milk. Whole cows' milk should not be given as a drink until after 1 year of age, although it can be mixed with food and used in cooking (NHS Choices, 2018). Full-fat dairy is the best choice until age 2 years as infants need the extra fat and vitamins. At age 2, a switch to semi-skimmed milk can be made if the child is eating well and there are no weight concerns (SACN, 2017; NHS Choices, 2018). Skimmed milk and rice milk drinks should not be given to children under the age of 5 years. There is no evidence for follow-on milks providing extra benefits, so these should not be recommended (NHS Choices, 2018). Parents can be advised to introduce a cup from which the baby can sip water at 6 months, as this is far better for dental health than a bottle (SACN, 2017). An open or free-flow cup without a valve is preferable for babies' teeth and helps them learn to sip (NHS Choices, 2018).

Practical tips for parents

First complementary foods are all about tastes. Parents can be advised to start with a few teaspoons or a finger food and once the baby is happy with this, can build up to offering a bigger variety of tastes. How much to give can be led by the infant, so parents can be advised to watch their signals. If spoon feeding, start with a smooth purée texture, which can be made thicker as the baby becomes more skilled at eating. By 9–12 months, this should have progressed to a minced or mashed texture. Pouches can be convenient for parents but these should be given sparingly; using a spoon when feeding purées will help the baby learn to swallow and practise self-feeding (Cer-

nansky, 2018). If the baby is coping with a texture well, it is time to progress to the next stage. By the age of 7–9 months, infants should be getting a significant amount of their nutrients from food and the amount of formula milk consumed should be around 600 ml a day. This decreases to around 400 ml milk per day at 10 months (First Steps Nutrition, 2018). Allowing babies to play with their food is important. Part of complementary feeding is messy play, so encourage parents to allow baby to play with the spoon, to self-feed and to use their hands. Using finger foods can be a great way for baby to learn hand to mouth co-ordination and practise their pincer grip, and some babies will eat more when they self-feed. Babies are very much in tune with their internal cues, so it is important to let them listen and respond to these. If a spoon is being used parents should wait for the baby to open their mouth before the food is given, and allow them to go at their own pace.

Summary

During complementary feeding the needs of infants change as they develop. Milk remains a major source of nutrients, but it is not sufficient to provide enough nutrition for growing children. Infants are good at self-regulating their intake and choosing what they need from a range of foods, and parents should be advised to let them lead when they are able.

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We want all parents to feel super HiPP about weaning. It's why we pack our products full of tasty organic ingredients.



The Department of Health recommends that you should breastfeed your baby until they're six months old, before weaning onto solids. Milk continues to be an important source of nutrients throughout weaning.

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