Training Programme
for Public Health Nurses and Doctors
in Child Health Screening, Surveillance and Health Promotion

Unit 7
Food & Nutrition
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Introduction and Rationale

The content of this manual is intended as a resource in the delivery of training in nutrition for children 0-12 years. Specifically it was developed by the Community Dietetics Service, in collaboration with PAC, to support a one-day nutrition training programme as part of the Child Health Screening and Surveillance Training Programme for Public Health Nurses and Area Medical Officers. It is intended that this nutrition module would complement and supplement the training modules in Health Promotion and Growth Monitoring.

It is also hoped that it can be a useful reference for community practitioners in their work with families when used with Health Promotion materials produced by the DOHC and other regionally produced evidence-based resources such as the CHISP information booklets for parents.

While there is some reference to nutrition for adolescents, that requires further work which PAC is committed to.

Rationale to the nutrition module:

• It is essential to recognise that children are dependent on others for the provision of food and nourishment as well as guidance on health and well-being for optimum growth and development that starts from as early as pre-conception.

• All health professionals should provide advice on healthy living to both the child and parents that is relevant, manageable and directed at individual circumstances.

• The link between diet and health has long been established, and the behaviour of children during the crucial years of development is key to establishing healthy eating practices for life.
Glossary

Additives: preservatives are added to many commercially produced foods to prevent deterioration of the food, and they are important in the prevention of food poisoning caused by bacterial contamination. Dyes are added for presentation purposes. Allergic reactions to food dyes and preservatives are rare

Anaemia: a deficiency of red blood cells, which can lead to a reduction of oxygen-carrying ability, causing unusual tiredness and other symptoms

Antigens: any substance that causes the immune system to produce antibodies against it

Casein: a milk protein which is the basis of infant feeding formula

Complementary foods: foods introduced to an infant’s diet when additional nutrients are required to supplement formula feeding or breast feeding. Not to be introduced before 17-18 weeks

Cow's milk protein intolerance (CMPI): Lactose intolerance results from impaired ability to absorb lactose (milk sugar)

Essential Fatty Acids (EFAs): nutrients that are important for babies’ brain and eye development.

Fibre: parts of plant foods that cannot be digested. There are two types: soluble and insoluble fibre

Gluten: is a particular type of protein found in wheat, rye, barley, oats and all foods made from these.

Hydrolysate formulae: feeds in which whole proteins are broken down to the building blocks of amino acids rendering the feed more digestible. Indicated for Cows milk protein intolerance

Immunoglobulins: are found in high numbers in breast milk. The mother’s immunity against several pathogens can be transferred to her breastfed infant (Lonnerdal, 2003). This allows the immature immune system of the newborns to be ‘boosted’ by acquired immunity in the mother
Listeriosis: a disease caused by the bacterium, *Listeria monocytogenes* that is rare but has a high mortality rate

Long chain polyunsaturated fatty acids (LCPUFA): are nutrients essential for healthy development of brain, eye and nervous system. Infants are not capable of producing sufficient LCPUFA’s to meet their full nutritional requirements therefore the supply obtained from breast milk or supplemented formula milk is crucial.

Macrophages: constituents of breast milk which produce lysozymes and lactoferrin. These proteins have antimicrobial properties (Lonnerdal, 2003) and thus offer protection to the infant.

Nucleotides: nitrogen containing molecules, present in breast milk, which link together to form DNA and RNA, the building blocks for cells. They are important in enhancing the immune system, decreasing the risk of diarrhoea and improving growth.

Partially Hydrolysate formulae: infant feeds in which whole proteins are broken down, rendering the feed more digestible.

Prebiotics: the selective substrates for favourable or ‘friendly’ bacteria. There are high levels of prebiotics in breast milk. A high level of friendly bacteria provides increased protection by reducing the risk of allergy and promoting digestion by producing softer stools. Note: Prebiotics are often confused with probiotics that are foods which contain live bacteria, e.g. yogurts

Whey: a milk protein which is the basis of infant feeding formula
Abbreviations

AA: Arachidonic acid
ALA: Alpha linolenic acid
DHA: Docosahexaenoic acid
DNA: Deoxyribonucleic acid
DoHC: Department of Health and Children
FSAI: Food Safety Authority of Ireland
LCPUFA: Long chain polyunsaturated fatty acids
NWHB: North Western Health Board
RNA: Ribonucleic acid
LA: Linoleic acid
UNICEF: United Nations Children’s Fund
WHO: World Health Organisation
Healthy eating during pregnancy
The time of greatest nutritional vulnerability is possibly before a woman even suspects that she may be pregnant and before the first antenatal appointment when advice and education may be offered (Stein et al 1995). A range of epidemiological studies has shown that poor intra-uterine growth is associated with an increased prevalence of cardiovascular disease, non-insulin-dependent diabetes mellitus and the metabolic syndrome in adult life (Edwards et al 2001). Extremely poor eating habits consequent to low educational attainment or low income, and/or the deliberate restriction of food as part of a weight loss regime can lead to an inadequate nutrient intake.

During pregnancy extra energy and nutrients are needed. It is not necessary to “eat for two”, but consuming regular meals with a variety of foods will ensure nutrient adequacy. The average weight gain during pregnancy is 11.5 to 12.5kg (25 to 28 pounds). Most of this weight gain will happen in the second half of pregnancy. It is not advised to attempt weight loss during pregnancy; as a gain of at least 7kg (15 pounds) is required to allow the growth of the baby. A balanced diet, as advocated by the food pyramid (see figure 1) is important for the healthy growth of the baby and the health of the mother.

Important nutrients during pregnancy
- Folic Acid (400 microgrammes) is needed for the healthy development of a baby’s brain and spine. All women of child bearing age are advised to take folic acid supplements whether they are planning pregnancy or not. Folate is an unstable nutrient and an intake of 400 g is not guaranteed, therefore a folic acid tablet is essential for 12 weeks before conception and the first 12 weeks of pregnancy. It helps prevent conditions such as spina bifida and other neural tube defects (NTD’s; MRC 1991). To prevent the recurrence of NTDs if there is a family history of spina bifida or NTD’s or if the expectant mother is taking medication for epilepsy a prescription is required for a higher dose of 5mg Folic Acid.
- Iron is important to manufacture the extra haemoglobin needed by the mother and the fetal red blood cells. Studies from the UK report that low iron stores in early pregnancy are strongly associated with multiparity, low socioeconomic grouping and low BMI (Robinson et al 1998). Adaptations during pregnancy to meet the iron demand include mobilization of maternal iron stores, increased dietary iron absorption, and savings made from the cessation of menses.
- Vitamin C is also important and it aids the body to use iron. There is more information on the food sources of iron and vitamin C in the section covering anaemia.
- Calcium is important for healthy bones and teeth and again, increased demands are usually met by maternal adaptations of pregnancy. A baby at birth will have 25-30g calcium, most of which is laid down in the last ten weeks of pregnancy (Reeve 1980). Good sources of calcium include milk, hard cheese such as cheddar, yoghurt, soft bones of tinned fish such as sardines and salmon. Some foods such breakfast cereals, bread, orange juice
and Irish flour have calcium added to them. Small amounts of calcium are found in dark green leafy vegetables such as broccoli and cabbage. At least 5 servings of calcium rich food should be eaten each day when pregnant and breastfeeding (refer to food pyramid).

- Vitamin D helps the mother’s body to use the calcium from food. During pregnancy, the concentration of biologically active vitamin D is raised increasing net calcium absorption (Misra & Anderson 1990). Food sources include oily fish such as herring, mackerel, sardines, egg yolks and butter. Some foods such as milk, breakfast cereal and margarines have Vitamin D added to them. Exposure to sunshine allows vitamin D to be made under the skin.

- Essential Fatty Acids (EFA’s) particularly Omega-3-alpha-linolenic acid and Omega-6-alpha-linoleic acid are important for baby’s brain and eye development. Good sources of Omega-3 fatty acid include oily fish such as herring, mackerel, salmon, sardines and trout. Vegetable oils such as flaxseed, rapeseed (canola), linseed and walnut (used when cooking), meat, grains and wheat-germ, and dark green vegetables are alternative sources of omega -3. Good sources of Omega-6 fatty acid include plant oils such as soya, corn, sunflower and safflower oil (used when cooking), seeds such as sunflower, safflower, pumpkin and sesame, poultry and eggs, vegetables, and grains (Lewin et al 2005).

**Food Safety**

Food safety is always important. During pregnancy it is particularly important as illness can harm the mother and baby. If eating out check that raw vegetables, salads and unpeeled fruits have been washed in clean water. If there is uncertainty about the safety or cleanliness of a food it should be avoided, for example whipped ice-cream from kiosks and ready-to-eat salads from delicatessen counters.

**Good food hygiene**

- Store foods at the correct temperature.
- Separate raw foods from ready-to-eat foods. Store raw foods on the bottom shelves of your fridge.
- Check expiry dates on foods before.
- Heat ready prepared meals, according to the manufacturers instructions, until they are steaming hot throughout.
- Cook all meat, poultry and fish until it is well-done.
- Never re-heat any food twice.
- Wash raw fruit and vegetables in clean water before eating.
- Wear gloves when gardening or handling cat litter.
- Wash and dry hands thoroughly before touching food and after handling raw food, particularly meat, poultry and fish.

**Food and drinks to avoid during pregnancy**
There are some foods that should be avoided during pregnancy. Although many are healthy foods, they have occasionally been linked with causing illness. Listeriosis is a disease caused by the bacterium, *Listeria monocytogenes* that is rare but has a high mortality rate (Gellin & Broome 1989). Therefore, pregnant women should avoid foods associated with *L. monocytogenes* contamination. Other common food borne infections include *Salmonellosis*, *Toxoplasma gondii*, and *Campylobacter* (Bishop et al 2001). All food borne infection can be minimised by avoiding the following:

Raw or lightly cooked eggs:
- Also avoid and foods that contain raw eggs such as home made mayonnaise, mousse and ice cream. Manufactured versions are often pasteurised and are safe – this will be shown on the label.
- When cooking eggs make sure to cook them until both the yolk and white are solid.

Unpasteurised milk and dairy products
- This includes soft, mould-ripened cheese such as camembert and brie, blue veined cheese and ricotta.
- The milk used to make hard cheese such as cheddar, cottage cheese and processed cheese is usually pasteurised so they are safe to eat – check the label.

Raw or undercooked meat, poultry, fish and shellfish
- Meat and fish that are ‘smoked’ or ‘cured’ are also unsuitable unless they are fully cooked before eating.
- Paté, including vegetable varieties.

Other foods that should be avoided:
Shark, swordfish and marlin
- These are not suitable as they may contain high levels of mercury.
- Tuna may also contain mercury so do not eat more than 2 medium sized cans (140g or 5 oz drained weight) or 1 fresh tuna steak (140g or 5 oz cooked weight) per week.

Excess Vitamin A and liver
- Vitamin A is an essential nutrient, but high intakes are not recommended during pregnancy.
- Liver is high in Vitamin A – avoid liver and other liver products such as fish liver oils, liver paté and liver sausage.
- Avoid multivitamin tablets that may contain high levels of Vitamin A

Peanuts
- *If there is a family history of allergy avoiding peanuts during pregnancy and while breastfeeding may prevent a baby from developing a nut allergy.*

Alcohol
- Heavy drinking and binge drinking are harmful and should be avoided.
- The less taken, the better for the mother and baby. By cutting out alcohol altogether any possible risk of damage from alcohol is removed.
Caffeine
- Do not drink more than 3 or 4 cups or glasses of caffeine containing drinks such as coffee, tea, cola or energy drinks each day.
- Some medications also contain caffeine – this will be shown on the label.

Herbal preparations and remedies
- There is little information about the safe use of herbal preparations and remedies during pregnancy. If chosen use varieties in tea bags and do not drink more than 2 cups each day.

Morning sickness
This feeling of sickness can happen at any time of the day. It usually settles after the first 12 weeks. The following may help alleviate symptoms (Bishop et al 2001):
- Eat small starchy snacks such as plain crackers or biscuits in between meals to settle the stomach.
- Drink plenty of fluids throughout the day – between meals rather than with meals.
- Get fresh air and avoid the smell of food cooking.
- Small meals at regular intervals may be easier to eat than 3 large meals a day.
- Get out of bed slowly, avoiding sudden movements.
- Suck something sour, such as a slice of lemon.

If the sickness is of concern and there is a reduction in food intake, then referral to a GP is required for further specialist advice.

Constipation
Constipation and piles (haemorrhoids) are common during pregnancy. A high fibre diet with lots of fluids can help. Its aetiology is complex and includes depressed gut mobility in pregnancy, increased fluid absorption from the large intestine, decreased physical activity and dietary changes (Bishop et al 2001):
- Choose high fibre foods such as whole wheat or wholegrain varieties of breakfast cereal, bread, pasta and rice.
- Reduce fat intake, particularly saturated/visible animal fat.
- Eat at least 5 servings of fruit and vegetables each day. Include at least one serving with meals and snack on fruit between meals.
- Drink at least 8 to 10 glasses of water or clear fluids each day.
- Regular, gentle exercise is helpful, such as walking or swimming.

Heartburn
Heartburn affects many women during pregnancy and is the result of increased abdominal pressure, combined with altered gastrointestinal motility.
- Eat small, light meals frequently rather than 3 large meals.
- Eat slowly and chew food well.
- Avoid fatty, fried or highly seasoned foods, caffeine and fizzy drinks.
- Avoid positions (e.g. slouching) that aggravate the problem.
Food cravings
If there is a craving for particular foods, it should be included in meals but eating too much of any one food should be avoided as it may displace necessary nutrients from other food sources. Cravings for a non-food item should be referred to the GP.

Most of the advice for healthy eating during pregnancy is the same during breastfeeding. Furthermore, making healthy food choices after birth will help the mother to keep up energy levels, build up her body's stores of nutrients, and reach and keep a healthy weight.
INFANT FEEDING

A substantial body of scientific literature exists to demonstrate the vast health, social and economic benefits of breastfeeding. It promotes health and prevents disease in the short and long-term for babies and mothers. Nonetheless, the national recommendation of the Department of Health and Children of exclusive breastfeeding in the first six months and continued breastfeeding into the second year of life and beyond, remains uncommon in Ireland.

Public Health Nurses and Area Medical Officers are uniquely placed to give guidance regarding breastfeeding and to reinforce breastfeeding messages conveyed by Midwives in the postnatal period. Mothers often identify support received from health care providers as the single most important intervention the health care system could have offered to help them breastfeed (Taveras, 2004). However, inconsistent advice has also been cited as a key barrier to initiating and continuing breastfeeding (NWHP, 2001, Fennessy, 1999; O’Sullivan, 1999). This section of the manual outlines the rationale for promotion of breastfeeding. Much of the evidence in this section is adapted from the Department of Health and Children’s Five Year Strategic Action Plan ‘Breastfeeding in Ireland’ October 2005. Guidance for management of breastfeeding and breastfeeding problems is beyond the scope of this manual. Local breastfeeding policies and accredited breastfeeding courses should be used for guidance in these areas. In addition a list of further references is included at the end of this section.

Human Milk is the ideal and complete feed ensuring optimum growth and development for infants and young children. (DOHC 2005) Babies not being breastfed should be given a formula feed up to the age of 1 year. (FSAI 1999) The information provided about formula feeding is for use with parents who are no longer breastfeeding, are partially breastfeeding, or have made an informed choice not to breastfeed.

Nutritional requirements of infants are high. It’s a period of rapid growth & development. In the first year of life, infants triple their birth weight and double their length.

Compared with adults, per kg birth weight, infants have a higher requirement for energy, protein, iron, and calcium. They have immature body systems – so it is important to receive food in a form they can digest and metabolise. (Briony Thomas 2001) The consequences of inadequate or unbalanced nutritional intake may not only affect growth and development during the early years but also influence disease in later life (Barker BMJ 1992)

Adequate nutrition during infancy can impact on many aspects of paediatric health. It determines growth, alters an infant’s susceptibility to disease and provides a major behavioural interaction between the infant and his or her mother, father or family. For these reasons, it is important that health care providers have a thorough understanding of the nutritional requirements and feeding patterns of infants in order to encourage those feeding patterns most likely to promote optimal growth and
development and to minimise the risk of diet related diseases in the future (Barker DJP, Fall CHD 1993)

**Breastfeeding**

**Evidence for benefits of breastfeeding**

Research demonstrates a dose response relationship for the benefits of breastfeeding (Cunningham, 1995, Pettitt et al, 1997, Shu et al., 1999, Oddy et al., 1999) strongly indicating that health and nutritional advantages can be maximised by:

- Exclusively breastfeeding in the first 6 months (Kramer & Kakuma, 2001)
- Extending the duration of breastfeeding into the second year and beyond (Mortensen et al., 2002)

Thus, the DoHC and the WHO recommend exclusive breastfeeding of infants for the first 6 months, after which mothers are recommended to continue breastfeeding, in combination with suitably nutritious and safe complementary foods - semi solid and solid foods until their children are 2 years of age or older (WHO/UNICEF 2002). Only 1% of Irish Infants are exclusively breastfed at 6 months of age – unpublished data Infant Weaning Study – Roslyn Tarrant.

**Importance of breastfeeding for Children**

Breastfeeding assists with the development of the infant immune system. Most studies show that the positive effects of breastfeeding are dose-related, with improved outcomes associated with longer breastfeeding duration and lasting for many years after breastfeeding has stopped (American Academy of Paediatrics, 2005, 1997).

Breastfed children show better outcomes in:

- Cognitive development
- Visual acuity & cognitive function
- Oral development
- Neurological development

Children who are not breastfed have a higher incidence and severity of:

- Diarrhoea
- Invasive bacterial infection
- Ear infections
- Otitis media
- Pneumonia
- Urinary tract infection
- Metabolic diseases
- Necrotizing enterocolitis
- Childhood leukaemia
- Chronic digestive and respiratory diseases
- Type 1 and type 2 diabetes
- Crohn’s disease
- Coeliac disease
- Obesity
- Inflammatory bowel disease
- Childhood cancer
- Allergic disease/asthma
- Cardiovascular disease

(Adapted from National Department of Health and Children’s Five Year Strategic Action Plan ‘Breastfeeding in Ireland’ October 2005- please refer to for references).

**Importance of breastfeeding for mothers**

Mothers who breastfeed show:
- Earlier return to pre-pregnancy weight
- Increased self confidence and enhanced bonding with their infants

Mothers who do not breastfeed are at greater risk of:
- Postpartum bleeding
- Pre and postmenopausal breast cancer
- Ovarian cancer
- Rheumatoid arthritis
- Postmenopausal osteoporosis

(Adapted from National Department of Health and Children’s Five Year Strategic Action Plan ‘Breastfeeding in Ireland’ October 2005- please refer to for references).

**Economic Importance of breastfeeding**

A higher rate and duration of breastfeeding is associated with reduced cost for the family, the health care system, and society in general:
- Breastfeeding is cost beneficial to families
- Breastfeeding reduces the health care costs for care attributable to childhood illnesses
- Breastfeeding reduces hospital maternity costs for teats and formula purchases
- Breastfeeding eliminates health service costs for free supplies of infant formula to low-income mothers

(Adapted from National Department of Health and Children’s Five Year Strategic Action Plan ‘Breastfeeding in Ireland’ October 2005- please refer to for references).

**Environmental Importance of breastfeeding**

- Reduction in environmental costs as a result of the reduction in packaging, transport costs and wasteful by-products of both the production and use of artificial feeding

(Adapted from National Department of Health and Children’s Five Year Strategic Action Plan ‘Breastfeeding in Ireland’ October 2005- please refer to for references).
Beneficial Components of Breast Milk

Human milk is a complex living changing fluid that ensures optimum growth and development for infants and young children. Components of breast milk confer nutritional and immunological benefits. The supply of breast milk is stimulated by frequent rather than prolonged suckling. It takes 3-6 weeks of 'feeding on demand' to establish good lactation; after this, feeds may be spaced further out. Breast milk matures after birth as outlined below:

<table>
<thead>
<tr>
<th>Days</th>
<th>Type</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Days 1 – 3</td>
<td>Colostrum</td>
<td>Thick, yellow milk, high in protein, antibodies (protect against infection) and certain vitamins &amp; minerals; low in fat and energy</td>
</tr>
<tr>
<td>Days 3 – 7 +</td>
<td>Transitional</td>
<td>Thinner, white appearance; composition approaching mature milk</td>
</tr>
<tr>
<td>Days 7 – 10 +</td>
<td>Mature</td>
<td>More watery appearance, almost blue in colour as the feeds begins and becoming white by the end of a feed as the fat content increases</td>
</tr>
</tbody>
</table>

Furthermore, the bioavailability of the nutrients it contains is high (Thomas, 2001). These beneficial components include long chain polyunsaturated fatty acids (LCPUFA’s), nucleotides, prebiotics, macrophages and immunoglobulins.

Components of infant feeds (breast and formula)

(LCPUFA, Nucleotides and prebiotics are in both breast and formula but are more bioavailable from breast milk. Macrophages and immunoglobulins are only found in breast milk so its immunoprotective properties exceed that of formulae)

LCPUFAs / Long chain polyunsaturated fatty acids

LCPUFA’s are essential for healthy development of brain, eye and nervous system. Long chain polyunsaturated fats include arachidonic acid (AA) and docosahexaenoic acid (DHA). These are derived from essential fatty acids i.e. fatty acids which cannot be made in the body. Adults are capable of synthesizing AA and DHA from their essential fatty acid precursors: AA is synthesized from linoleic acid (LA), an omega-6 essential fatty acid and DHA is synthesized from alpha linolenic acid (ALA), an omega-3 essential fatty acid. Infants, however, are not capable of producing sufficient LCPUFA’s to meet their full nutritional requirements therefore the supply obtained from breastmilk or supplemented formula milk is crucial. These LCPUFA’s accumulate dramatically in last trimester and first year and may be 'conditionally essential' fatty acids in infancy (Faquharson, 1995).

LCPUFAs occur naturally in breastmilk, which forms the basis for the ‘Munich Consensus’ recommendations on supplementation of infant formulae. The majority of infant formulae (esp. (Low birth weight) LBW/ preterm) are supplemented but not all with the amount recommended in this consensus. (SanGiovanni et al 2000). A
baby's brain actually goes through a "growth spurt," from the third trimester to 18 months of age, during which time the brain can increase in size by 10-fold. DHA and ALA are important during this period of development. Deficiencies in these fatty acids may be associated with slow growth, skin lesions and decreased visual and cognitive function. (Faquharson, 1995).

**Nucleotides**
Nucleotides are important in enhancing the immune system, decreasing the risk of diarrhoea and improving growth. Nucleotides are nitrogen containing molecules which link together to form DNA and RNA, the building blocks for cells. In other words they are low-molecular-weight precursors of nucleic acids, deoxyribonucleic acid (DNA), and ribonucleic acid (RNA) (Yu et al, 1998)
The addition of nucleotides to formula promote Immunoglobulin A concentrations and decrease the risk of diarrhoea thus supplementing in some part for the immunoprotective effects of breast milk. (Pickering, 1998)

**Prebiotics**
The bacterial flora of breastfed infants is different from that of formula-fed infants. Breastfed infants have fewer potentially pathogenic bacteria and have higher levels of favourable or ‘friendly’ bacteria. (Kleesen et al, 1995). This is thought to be due to the high levels of prebiotics in breastmilk. Prebiotics are the selective substrates for these friendly bacteria. A high level of friendly bacteria provides increased protection by reducing the risk of allergy and promoting digestion by producing softer stools (Ghisolfi, 2003)
Note: Prebiotics are often confused with probiotics that are foods which contain live bacteria, e.g. yogurts

**Macrophages**
Macrophages in breastmilk produce lysozymes and lactoferrin. These proteins have antimicrobial properties (Lonnerdal, 2003) and thus offer protection to the infant.

**Immunoglobulins**
Immunoglobulins are found in high numbers in breastmilk. The mother’s immunity against several pathogens can be transferred to her breastfed infant (Lonnerdal, 2003).This allows the immature immune system of the newborns to be ‘boosted’ by acquired immunity in the mother.

Formula feeds **cannot** provide the same immunological benefits as breast milk.

**Formula feeding**

**Types of Formula**
All infant formulae & follow on formulae must comply with EU regulations for same (FSAI 1999)
**Marketing of infant formula is prohibited under Irish law** but marketing of follow on formula is permitted (FSAO 1999).new FSAI leaflet on marketing of formula is in packs. The two main types of formula feed are whey based formula and casein based formula. These are both modified Cows milk. **Whey** and **Casien** are milk proteins.(Briony Thomas 2001)
**Whey based Formula**

Has a ratio of whey to casein (60:40) similar to that in breast milk and is therefore the first choice formula for an infant, suitable for birth to 1 year. (Briony Thomas 2001)

Examples; SMA Gold, Premium (C&G), Farley’s First milk, Aptamil First (Milupa), Infant Formula 1 (Boots), Hipp Organic Infant milk (Hipp), Omneocomfort 1 (C&G), Organic First Milk (C&G)

**Casein Based Formula**

Ratio of whey to casein is 20:80. A ratio similar to cow’s milk, suitable for birth to 1 year.

Examples ;SMA White, Plus (C&G), Farley’s Second Milk, Aptamil Extra (Milupa), Milumil (Milupa), Infant Formula 2, Organic Second Milk (C&G)

It is not necessary to move from whey based to casein based formula as may be suggested by product packaging at 6-8 weeks. (Briony Thomas 2001) Casein based formulae are often advertised as ‘satisfying the hungrier baby’ and there is a common misconception that casein based milks contain more energy which makes the baby feel more full. There has been no demonstrable difference detected between the biological value of either whey or casein based formulas to support this theory. Casein is insoluble and so is absorbed more slowly than whey rich formula, but there is no scientific evidence that it will satisfy a hungry baby. (Taitz LS & Scholey E 1989)

If an automatic change in formulae type is made without investigating the cause of an unsettled baby, the possible underlying reason may be missed e.g. problem may be with frequency/ volume/ concentration etc. of feeds or there may be another organic cause. (Twomey et al. 2000) However, changing formulae is preferable to the premature introduction of solids.

**Follow on milk**

Follow on milk is modified cows milk which is casein dominant. It is suitable for 6 months to 2 years. It has a higher content of iron than infant formula. (Briony Thomas 2001)

Examples include; Progress (SMA), Step Up (C&G), Forward (Milupa), Follow On Milk (Boots), Farley’s Follow On Milk, Hipp Organic Follow-on Milk (Hipp), Omneocomfort 2 (C&G), Next Steps (C&G), Organic Follow On Milk (C&G)

Follow on milks may have a role to play among at risk group in preventing iron deficiency anaemia but are not required if a baby is eating well and including iron rich foods in the weaning diet (lean meat, cereals, beans or green vegetables). Although only 2.6% of one-year-old Irish infants were found to be anaemic, by age two years the number had increased to 9%. (Freeman VE 1996)
Follow on milks contain more iron than regular infant formulae but it is agreed that the iron content of follow on milks are *unnecessarily high* & the World Health Assembly, 1986 concluded that they were not necessary. (World Health Assembly 1986) The EU has published recommendations permitting the use of follow on formulae after the age of 4 months but companies who market these in Ireland have agreed voluntarily to market them only from the age of 6 months (FSAI 1999).

**Specialist infant formulae**

**a. Preterm/ Low birth weight formula**
These are higher in energy and nutrients for catch up growth in pre-term or Low-birth weight babies. These infants have limited nutritional stores as most are gained in last trimester. (Briony Thomas 2001).
- Preterm baby is one born before 36 weeks
- Low birth weight <2500g

Formula for preterm infants are more usually prescribed in the hospital rather than the community. Breast milk fortifiers are for hospital use only (FSAI 1999) On discharge from hospital preterm infants will be prescribed a nutrient enriched formula.

Examples used in the hospital include *Nutriprem 1*(C&G), *Pre-Aptamil (Milupa)* and *Low birthweight (SMA)*. Examples used on discharge include *Nutriprem2 (C&G)* and *High Energy (SMA)*.

**b. Anti-reflux formula** (PIG INDI 2005)

**Relevant definitions**
- *Regurgitation* - the effortless return of the gastric contents to the mouth and is less common than GOR.

**Gastroesophageal reflux (GOR)** – is when gastric contents return to the oesophagus. It affects up to 50% of all infants but generally resolves by 12-15mths. Symptoms may include irritability, dysphagia, vomiting, and/or food refusal. Oesophageal pH monitoring is a valid and reliable measure of acid reflux -normal pH 5-6.8 (pH<4 is diagnostic). Often related to parental anxiety, poor feeding technique & generally managed with parental reassurance and practical tips as outlined later in this section.

**Gastroesophageal reflux Disease (GORD)** – Symptoms are those of GOR and severe oesophagitis, growth faltering, apnoea, aspiration or persistent cough/wheeze. Generally a referral to paediatric gastroenterologist is warranted as pharmacological agents such as H2 receptor antagonists to reduce acid secretion e.g. ranitidine/ cimetide, proton pump inhibitors e.g. Omeprazole, prokinetic drugs to increase gastric emptying e.g. Domperidone (Cisapride is NOT recommended for infants) may be required.

**Anti Reflux Formula**

**Prethickened feeds**
Pre thickened formulae have convenient use for mild-moderate Gastro-oesophageal reflux. They contain rice/corn starch which thickens when it comes into contact with
stomach acids. Therefore, the teat hole does not have to be enlarged. (Omneocomfort however is prethickened needing larger teat hole). If there is no improvement in symptoms after two weeks on prethickened formula, consult GP

Examples include Staydown (SMA) and Enfamil (Mead Johnson),

Thickeners
- Thickeners are added to feeds for moderate-severe reflux (eg. Thick and easy, instant Carobel, Cornflour).
- Powdered thickeners have extra calories so they are not recommended for use with infant formulae (unsuitable for infants less than 1 year unless faltering growth). Also, maltodextrins may cause diarrhoea (Thick & Easy, Instant Carobel).
- A larger teat hole is needed with thickeners and an infant may swallow more air. Generally, Thick & Easy will be avoided among infants due to its higher sodium content.

‘Posseting’ or vomiting – if extreme should be investigated for cause.

Antacids may be prescribed and should be used under medical supervision e.g. Infant Gaviscon which is an alginate that thickens gastric contents.

Note - If symptoms remain unresolved after trying with pre-thickened feeds/ thickeners / medication – hypoallergenic formula may be considered as often reflux can be symptom of CMP allergy. (Refer to allergy section)

C. Soya-based formula
Examples include
(Infasoy (C&G), Farley’s Soya Formula, Prosobee (Mead Johnson), Wysoy (Wyeth), Nutrison Soya (C&G))

Soya base formula provides a nutritionally complete alternative to modified cows milk formula. They should not be used unless necessary as it may be more cariogenic due to use of glucose polymers and due to the unknown effect of phytoestrogen content on future fertility and sexual development.

In infants under 6 months (refer also to allergy section) recommend that it be used only in the following groups: BDA 2004)
- Infants with galactosaemia: the lactose content of low lactose formulas may be too high for the treatment of galactosaemia and the use of extensively hydrolysed formulas is not appropriate for this condition.
- Cows milk protein intolerance (CMPI), only where a hydrolysed formula is not tolerated.
- Infants of Non-breastfeeding vegan mothers.

Soya formula is often used inappropriately, and more widely than necessary, for the treatment of colic, CMPI and lactose intolerance. (FSAI 1999)

Also 50% of infants who are allergic to cows’ milk protein may also develop a sensitivity to soya protein. (American Academy of Paediatrics Committee 1998)
d. Lactose free formula

Examples include Lactose free (SMA) Enfamil lactose free (Mead Johnson)

Indications: lactose intolerance/ lactase deficiency but can tolerate cows milk protein.

Lactose intolerance can be diagnosed by

- Observation of symptoms (Diarrhoea, frothy stools, irritability, wind, nausea etc)
- Positive hydrogen test
- Presence of reducing substances in stool.

Congenital lactase deficiency is rare however secondary lactose intolerance is more common following damage to the Gastrointestinal tract e.g. gastroenteritis, untreated celiac disease. Lactose can be reintroduced after 6-8 weeks once the gut has healed

Note
There is no evidence for the use of lactase containing drops.
Lactose free feeds are not indicated for infants with eczema.
All Soya formula are lactose free but not recommended for use in lactose intolerance for the reasons mentioned above.

e. Goat and Sheep’s Milk (FSAI 1999)

There is no evidence to support their use for allergies. The allergic component is similar in goats and sheep’s milk to cows milk.
Most importantly they are not nutritionally complete. Their production is not covered by EU legislation.

If the parent wishes, goat and sheep’s milk can be included in a diet that is nutritionally complete after 1 year of age.

f. Partially Hydrolysed Feed

Examples include Omneocomfort (C&G). Partially Hydrolysate formulae are feeds in which whole proteins are broken down to the rendering the feed more digestible.

g. Hydrolysed/ Elemental Formulae

Examples include Nutrilon pepti (whey based C&G), Pepti plus (Follow on; C&G), Pepti –junior (semi-elemental; C&G), Nutramigen, (Mead Johnson), Pregestamil. (Mead Johnson), Neocate (SHS).

Hydrolysate formulae are feeds in which whole proteins are broken down to the building blocks of amino acids rendering the feed more digestible. Indicated for Cows milk protein intolerance, and disaccharide intolerance (though lactose free formula is the inexpensive option; Clinical Paediatric Dietetics).

Equipment, Preparation and Feeding (awaiting DoHC confirmation advice is changing re making up bottles in advance of feeding)

Reference Book
A detailed booklet will be available shortly, developed by the Irish Nutrition and Dietetic Institute and published by the DoHC. It is evidence based and references are available from the INDI on request. (INDI, DOHC)

Change in practice when preparing formula feeds
A new recommendation for preparation of infant formulae is expected from the FSAI; This is expected to recommend that infant formula is not sterile and should not be prepared in bulk/ in advance of feeding. In other words the previous recommendation that feeds could be made up, stored in the fridge and used with in 24 hours is no longer advised. (ESPHAN 2003)

Feeding
How much milk does a baby need?
- From 1 week until weaning (4 – 6 months) the recommended volume is 150ml/kg body weight per day, feeding on demand. As an infant grows it consumes more fluid on a less frequent basis.
- 1 level scoop to 30ml (1 fluid oz.) of cooled boiled water – using the scoop given in the pack and level off carefully as manufacturers instructions.
- Suitable still bottled water should also be boiled. Sodium content should not exceed 20mg/L. (INDI DOHC)

Monitoring
The Growth of an infant can be monitored using Weight and Height Centile charts and will be presented at that module. The most important factor to consider is the growth rate (weight gain in relation to length) & baby’s contentment. Following birth the average growth pattern for all babies is as follows:

- 200g (~7oz) per week for the first 3 months
- 150g (~5oz) per week for the second 3 months
- 100g (~3.5oz) per week for the third 3 months
- 50-75g (~1.5 –2.5 oz) per week for the fourth 3 months

There are slight differences between formula fed babies and breast fed babies but the above represents the average growth pattern for all babies. The very rapid growth a baby experiences during the first 3 months typically slows down during the 4th-12th month. The average milk intake from 1 week of age is 150mls (6ozs)/ kg/ day. Some babies will take more milk. A baby regularly taking significantly less is likely to be underfed. As with breast fed, mothers should be encouraged to feed babies on demand. Most will feed 3-4hourly. (Manual 2001 pg 238)
Always double-check that feeds are being made up correctly even if baby is thriving.

- Inadequate weight gain may be due to:
  - Feeds being either too few or too small
  - Feed being over diluted
  - Underlying illness
  - Intolerance to a component of the meal

- Excessive weight may be due to:
  - Feeds being either too frequent or too large
• Feeds being over concentrated
• Rusk or cereal being added to the bottle. (BMJ; 302)

Common problems of infant feeding

a. Wind, regurgitation and vomiting

Checks:
• Parental reassurance
• Wind on the shoulder and rub babies back
• Allow baby to rest during feeding in a vertical position so that swallowed air can escape.
• Reduce flow of feed from bottle or try different teat size
• Use smaller volumes of feed more frequently
• Use of formulae which thicken in the stomach (described earlier)
• May need pre thickened feed such as Omneo Comfort, SMA staydown or Enfamil AR.
• If not resolved seek medical advice. Thickeners for standard feeds can be used e.g. locus Bean Gum (Carobel) or modified starch (Thick and Easy or Nutilis). The latter is not suitable for children under 3. (Briony Thomas 2001; Y Vandenplas et al 1998)

b. Stools

• Yellow stools are common in breastfed babies
• Green stools common in babies fed formula feeds
• Loose stools are often normal for a baby
• Breastfed babies tend to have looser stools
• Babies have looser stools while teething.
• Sudden onset of loose stools associated with vomiting or other signs of illness is probably due to infection and requires medical advice

Bowel movements may be frequent in breast fed babies, many babies <6 wks have 2-5 bowel movements every 24 hrs. However, some healthy babies have more frequent bowel movements, perhaps one with every nursing. After 6 wks, babies may have less frequent movements, even as seldom as once/ wk (normally profuse). If the baby is gaining weight adequately, 2 bowel movements/day in a baby <6wks is not cause for concern.

Reassure the mother that if the stools are soft ,the baby is not straining and is content then all is well.

Refer to section on constipation for specific advice

C. Colic

Infantile colic (excessive crying in healthy thriving infants) is a common problem during the first ew months. It typically occurs in the evenings, with episodes starting in the first weeks of life and ending at the age of 4-5 months.
Wessel’s criteria = ‘crying lasting for at least 3hrs a day on at least 3 days a week, for at least 3 weeks.’

Causes
- Behavioural problem resulting from less than optimal parent-infant interaction.
- Extreme end of normal crying
- Collection of aetiologically different entities that are not easy to discern clinically
- Can be as a result of painful gut contractions caused by allergy to cow’s milk, lactose intolerance or excess gas.

Advice to parents
- Reassure parents

Management:
- Check volume & conc. of feed
- Assess feeding technique
- Has there been a recent change of feed.
- Behaviour intervention
  - Check for hunger when crying
  - Check nappy for evidence of constipation/extremely loose stools
  - Avoid carrying & holding for long periods, do not over stimulate baby
  - Try to establish a regular pattern during the day
  - Do not intervene immediately when infant cries
- Also effective are Infacol (contains dimethicone), gripe water now alcohol free but contains dimethicone
- If problem persists refer for further investigation e.g. allergy/intolerance

d. Underweight / Overweight
This will be identified by correct plotting on appropriate centile charts but should not ideally be confirmed on the basis of an isolated measurement. Breast fed babies & bottle fed babies have different growth patterns. The normal birth weight for a baby in the UK varies between 3.3-3.5kg for both girls and boys. It is normal for all babies to lose some weight during the first week. The weight loss is due to the shedding of excess fluids from the baby’s tissues at birth and the passing of the meconium (the first stool). The birth weight is usually regained by the 10th – 14th day (Paediatric Dietetics) however it may take 2-3 weeks (Breast feeding Answer Book). Weight gain should always be determined from the lowest weight rather than the birth weight. Refer to Growth Monitoring Module.

e. Cows milk protein intolerance (CMPI)
- Signs/symptoms include vomiting, diarrhoea, irritability and faltering growth
- Incidence of 2-3% of infant population
- Confused with colic & reflux
- Remission of about 50% at 1y to 90% at 3y
- CMPI is commonly associated with a family history of atopy and can exacerbate eczema, asthma and rhinitis (Host A 1997)
Food allergy and intolerance in older children are discussed in more detail later. Feeds indicated are hydrolysed milk formula eg. Whey: Pepti Junior (C&G), Pepdite (SHS), Casein: Nutramigen, Pregestimil (Bristol-Myers), Elemental/hypoallergenic: Neocate (SHS)

Lactose intolerance is often secondary to CMPI/CMPA and will resolve once the cow’s milk protein is removed from the diet. Lactose intolerance results from impaired ability to absorb lactose (milk sugar). Food avoidance measures are the same as those for CMPI/CMPA.

f. Constipation
As this is a common presentation at clinics, it is discussed in more detail later in the module.

g. Other problems
Upper respiratory tract infection can interfere with feeding – parents should be encouraged to contact their GP.
Gastroenteritis – continue to feed and complement with oral re hydration solution as prescribed by the GP.

Further information
For more information on the management of breastfeeding, expressing and storage of breast milk, problems associated with breastfeeding see local breastfeeding policies and accredited breastfeeding courses by contacting your lactation specialist.

Recommended Reading
Department of Health and Children, 2005; ‘Breastfeeding in Ireland, A five Year Strategic Action Plan’.

Weaning / Introducing Complementary Foods
Learning to eat foods, from the first bites of baby cereal to regular table foods is a long process for any child. Before a baby is offered a first bite from a spoon they get all their nourishment from breast or bottle-feeding. The mechanism for swallowing
during this time is called suckling. Suckling is accomplished by thrusting the tongue out and pulling it back, making forward and backward jaw movements, and loosely closing the lips around the nipple or bottle teat. This movement is a reflex children are born with. Babies learn to eat voluntarily through the reflexive movement of suckling.

Throughout the first months of breast or bottle-feeding, baby’s build strength in their tongue and mouth and a new swallowing pattern called sucking begins to emerge. Such includes a more rhythmic up and down jaw movement, an elevation of the tip of the tongue, and a firm closure of the lips around the nipple, which creates a negative pressure in the baby’s mouth. In most children this usually begins between four and six months of age and when the first bites of baby food are introduced.

**What is weaning?**

The correct term for weaning is “the introduction of complementary foods” (FSAI 1999). As an infant grows it requires a more varied diet to meet his/her growing needs. Solid foods are added to complement breast or formula milk – complementary feeding. As the various systems of the infant mature, the introduction of complementary serves to meet the increased demand for energy and nutrients which is imposed by rapid growth. This gradually reduces the reliance on milk as the primary energy and nutrient source, encourages the development of neuromuscular co-ordination and introduces the infant to an increased variety of tastes and textures. Milk remains the major part of the infant’s diet throughout the first year and continues to be important in the diet after that time.

**At what age should complementary foods be introduced?**

There may be wide physiological variation in the needs of individual infants and the recommendations for breast fed babies differ to those for formula fed infants. Breastfeeding provides all the nutrients a baby needs for the first six months of life (Kramer & Kakuma, 2001). In Ireland the current recommendation is 4 – 6 months for the Introduction of complementary foods in formula fed babies (Barker 1992). For all infants, the introduction of solid foods becomes necessary at some point, usually not before 4 - 6 months. However, it is common practise among parents to introduce complementary foods earlier than the recommendations as evidencing in a current Irish study of infant weaning practises (Publication Pending) **Solids should not be introduced before 17 – 18 weeks as described below.** While the ability to suck and swallow are already developed in utero during the first few months an infant is unable to chew. Before they’re 3 or 4 months old, babies automatically push out their tongues when anything enters their mouth: extrusion reflex. It indicates a child can only swallow fluid. Post natally the extrusion reflex is strong to prevent an infant from choking on chunks of food but this reflex weakens during the first half of infancy. By the age of 6 months, neuromuscular co-ordination has matured, allowing an infant to maintain an upright head position and begin to take food from a spoon.

**Complementary foods should not be introduced early because (FSAI 1999):**

- Breast milk is adequate as the sole food up to the age of 6 months
Breast feeding enhances the maturation of the gastrointestinal tract and the immune system.
- Cow's milk based formula can be used as a substitute for the infant who is not breastfed.
- Other foods or fluids displace the essential nutrients supplied by breast or formula foods.
- Solid foods increase the renal solute load on the infant's immature kidneys.
- Antigens may be introduced to the infant's immature gastrointestinal tract.
- Early introduction of complementary foods to either breastfed or formula fed infants before the age of 15 weeks increases the risk of wheezing.
- Early introduction of solids increases the risk of obesity in later life.
- The onset of certain diseases may be precipitated e.g. celiac disease and allergy.

Complementary foods should not be introduced too late because:
- By 6 months of age an infant's levels of nutrient stores are becoming depleted and complementary foods are needed to meet the infant's increasing demand for energy and nutrients.
- The infant's gastrointestinal and renal systems have developed sufficiently to allow for digestion and absorption of a more complex range of foods.
- The mucosal barrier to foreign antigens has developed and the production of enzymes, such as pancreatic amylase, which is necessary for the digestion of complex carbohydrates is fully developed.
- The timely introduction of complementary foods encourages the development of gross and fine motor control, exploratory behaviour and manual dexterity.

Which foods?
Suitable first weaning foods include gluten free cereals, mashed potato, pureed meat, pulses and fruit (See Table). Gluten is a protein found in wheat, barley, oats and rye. Although pure oats do not contain gluten there is a risk that oats in manufactured products may be contaminated with gluten from other cereals. The recommendation to delay the introduction of gluten until 6 months is designed to prevent or postpone the onset of celiac disease, although the precise relationship between disease onset and diet is yet to be clarified.

How to start?
- First foods should be pureed and of a soft runny consistency, with out lumps, and be introduced one at a time leaving a few days between the addition of each new food. The spoon should be introduced in to the baby's mouth gently and slowly allowing the baby to suck food from the spoon.
- As babies' get accustomed to strained, pureed foods they develop a strong sucking action, which is a sign to move to thicker consistency foods.
- While eating these thicker foods babies will learn to move food side to side in their mouth. Moving food from side to side is one of the skills needed to be able to move foods in the mouth to the molars to be chewed.
- Iron containing foods should be started from 6 months including meat and iron fortified cereals, as iron is needed at this age.
- Cereals (gluten free to 6 months), fruits or vegetables are also suitable first foods. Expressed breast milk, infant formula or cooled boiled water to mix
foods. Infants and young children have high-energy demands. Full fat dairy products should be used until age 2 years.

- High fat and high sugar processed foods should be used sparingly.
- In families where there is a confirmed diagnosis of allergy and atopy, breastfeeding should be encouraged and medical advice provided on the introduction of complementary foods, especially potentially allergenic foods.
- If the introduction of complementary foods is delayed past 6 months or foods are excluded – the diet may need to be assessed by a Dietician for nutritional adequacy.
- When introducing complementary foods, babies are learning the skills of eating so it is important to be patient. Infants should be encouraged to try different tastes, although food acceptance is unlikely to occur before 8 – 10 exposures to a food. Breast fed infants are more inclined to try new foods than their formula fed counterparts because they have been introduced to increased variation in tastes via their mothers breast milk.
- Infants have a preference for sweet tastes and a child’s preference for certain foods is related to the frequency of exposure to certain tastes. Exposure to sugary foods should be limited in an infant’s diet both to reduce the risk of dental decay and obesity.
- Salt intakes should be kept to a minimum and parents advised to avoid adding salt to home prepared meals.

Tips and Tricks for Early Feeding

**Check the child’s positioning.** The best position is as near a sitting position as possible, with legs, head, back, and feet supported as needed.

The baby should be able to look straight ahead at the person feeding them. Looking up to see the person feeding them causes him to lift their head back making swallowing more difficult.

For the very first bites of food, parents should use an infant-sized spoon with a shallow bowl to feed the child. Avoid using spoons designed to entertain the feeder. As children begin to hold a spoon, even if only to play with encourage the parent to give the child a spoon with a thick, easy to hold handle.

Food should be heated until piping/streaming hot and allow to cool to room temperature, like breast milk or formula for the first feedings.

**Spoonfuls of food should be small.** Too much food makes the process more tiring and frustrating for parent and child. It is easier for baby’s to move a small amount of food around his mouth than a large one. It is less messy also.

Present the spoon from slightly below the baby’s mouth. As the baby accepts the spoon, the bowl of the spoon should be placed firmly (but do not press hard) on the centre front of their tongue. This helps keep the jaw and tongue from thrusting forward.
Remove the spoon straight out of the mouth (do not lift the spoon to scrape the food off). This encourages baby to use their lips to close around the spoon to get the food.

**Watch the baby’s cues.** Learning to handle foods is not easy. Wait for the baby to completely finish the bite before offering another.

**Watch for signs of fatigue.** Try not to push a baby past their limit to frustration. All children are different and some take to spoon-feeding faster than others, it is not a race.

**Moving On – The Cues.**
As baby’s become more proficient with thickened pureed foods they develop a phasic bite reflex. This is a rhythmic bite and release pattern that looks like a child is opening and closing their mouth when something touches the gums e.g. toy, spoon. Allowing a baby to explore chewing on different things has a purpose with two goals: to develop the chew, and expose the mouth to a variety of textures.

The next chewing stage is munching when a baby moves food in their mouth by flattening and spreading their tongue while moving the jaw up and down. When a child is beginning to munch it is time to introduce foods like cooked mashed vegetables, scrambled eggs, minced meats. This is baby’s first experience with texture and mess is part of the process!

When a baby is able to move foods from side to side with their tongue, it is time to introduce finely chopped foods. Starting with foods that are easy to chew e.g. pasta, cooked vegetables, ripe fruits. Family foods should be encouraged. As baby’s become comfortable with finely chopped foods, the size of the foods can be increased gradually. When a child is comfortable with all textures, mixed textures can then be introduced.

**Other Stages of Eating**

Developing the physical skills of eating – getting the food into the mouth, moving it around in the mouth and swallowing it are central. Successful eating has three prongs physical, sensory – managing the smell, taste, feel, sight and sound of food and emotion – feelings about eating. A child’s taste depends on the food they are given.

**Sensory Stages of Learning to Eat:** Eating is one of the few things we do that uses all our senses. It is helpful to parents to know this is a process and later problems like faddy eating can be linked to missed opportunities during this stage.
- We smell the food while it’s cooking and when it’s on our plate.
- We hear it being prepared and when we chew it.
- We see food when it is presented to us and while it is being prepared.
- We feel it when we pick it up in our hands and in our mouth when we eat.
- We taste it when we put it in our mouth.
- We need to be able to balance ourselves to co-ordinate the movements required to pick it up and eat it.
When we eat we need to know where the food has gone in our bodies from entering the mouth, chewed and pushed back by the tongue. And lastly we need to agree to swallow it. Swallowing a food is a commitment to allowing it become a part of us.

When we look at eating in this way, it is easy to see that eating a food is far more than learning to chew or picking it up and putting it in your mouth. It is a big commitment for a child to agree to put a foreign object into their mouth. Swallowing it is an entirely different decision. The stages of sensory eating can be thought of as a stairs with each forward movement leads to another, which eventually leads to eating the food.

These steps are:

1. Tolerating the food
2. Smelling the food
3. Handling the food
4. Tasting the food
5. Eating the food

Introducing a child to a new food requires a child to tolerate the existence of a food in the same space as they are – not always easy in a child with a food fad or phobia. Smelling a food is important as many foods have an odour when being prepared but a food may not have an obvious odour until they are right under the nose. Handling food allows a child to learn what a food is made of. The goal of this stage is to allow a child experience food in so many ways that it is no longer foreign and less challenging to the child to put it in their mouth. Letting a child see that food can be fun without eating it can make them curious enough to try it! Tasting food doesn’t always mean a child will chew and swallow it despite putting it in their mouth. Think of a time you put something in your mouth and being overwhelmed by the taste or how it felt in your mouth - too spicy or slimy and then spitting it out before realizing it. When a child spits something out it is no different. The food didn’t taste or feel the way they thought it would. It doesn’t necessarily mean they don’t like it. It can take many exposures to a food, trying it over and over again before a child eats it! When a child is comfortable with a food, chews and swallows it comfortably then it is time to try new foods. They won’t need the same amount of time to accept every food. The more foods added – the easier to add more.

**Emotional Stages of Eating:** Eating and learning to eat are pleasant experiences and should create a nurturing bond between parent and child. It is important to have a positive feeding relationship for children to feel comfortable with eating and choosing foods. However for some children eating is not a pleasant experience quite often due to a single incident. Children may associate a particular meal or food with a choking episode or vomiting when unwell. These aren’t conscious decisions, nor are they unreasonable. Remember that the sensory stages of eating has many steps. Re-introduce children to these foods and given time they will learn to tolerate them. Keep in mind it can take a long time and that it is normal to dislike some foods.

All of these stages are important in weaning children and each child will progress at their own rate – some faster than others. Experiencing all these stages is important in preventing fussy eating and difficult feeding. (See section on Difficult Eaters).
Important!
A delayed introduction to a variety of food textures may have an impact on speech development.

Many of the skills needed to eat i.e. oral motor skills not only assist with texture progression but also the development of muscles and skills needed for speech.

Commercial versus home prepared weaning foods
While commercial weaning foods are convenient, they can be expensive. Also many children end up disliking table food and prefer the bland nature of the commercial foods. The sooner a child is introduced to family food the easier long-term on the parents! If using commercial made weaning foods it is essential that strict food hygiene is observed. The amount needed should be taken out and served from a plate or bowl. If the feeding spoon is dipped in and out of the jar – the remaining food should be disposed of.
Guidelines for introducing complementary foods

<table>
<thead>
<tr>
<th>Stage 1</th>
<th>Stage 2</th>
<th>Stage 3</th>
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</thead>
<tbody>
<tr>
<td>Introducing Complementary Foods</td>
<td>Over 6 months</td>
<td>9 – 12 months</td>
</tr>
</tbody>
</table>

**Cues to feeding**
- Postnatally the extrusion reflex is strong to prevent an infant from choking on chunks of food but this reflex weakens during the first half of infancy. By the age of 6 months, neuromuscular coordination has matured, allowing an infant to maintain an upright head position and begin to take food from a spoon.
- As baby’s become more proficient with thickened purred foods they develop a phasic bite reflex. This is a rhythmic bite and release pattern that looks like a child is opening and closing their mouth when something touches the gums e.g. toy, spoon.
- When a baby is able to move foods from side to side with their tongue, it is time to introduce finely chopped foods. Starting with foods that are easy to chew e.g. pasta, cooked vegetables, ripe foods.

**Suitable foods**
- Pureed meat, peas and beans
- Pureed fruit and vegetables
- Pureed potato
- Gluten free cereals e.g. baby rice, pureed with breast milk, formula milk, boiled water or water from cooking vegetables
- Food as previous column but can also include
  - Well cooked eggs
  - Other breakfast cereals (containing gluten)
  - Bread and pasta
  - Cheese (pasteurised)
  - Yoghurt
- Pasteurised cow’s milk can be used in small amounts in foods
- Increase the variety of food in the infants diet
- Most family foods are now suitable

**Consistency**
- Pureed and of a soft consistency with out lumps
- Start with a thin puree and make thicker as baby learns to take food from a spoon
- Minced or mashed to a less fine texture
- Chunky mashed texture, moving to food chopped into bite size pieces. Serve some finger foods that can be picked up for self feeding
### Suitable Drinks

<table>
<thead>
<tr>
<th>Foods to be avoided</th>
<th>Growing Up!</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breast milk</td>
<td>As the child grows older they will gradually tolerate more servings from each shelf of the food pyramid as outlined in the table below. These portion sizes are only a guide as children’s appetites vary. If the child eats all the serving, offer some more food. For young children, start with smaller and fewer servings and increase up to the guidelines, according to the child’s own growth and appetite.</td>
</tr>
<tr>
<td>Formula milk</td>
<td>It is important to include foods from each of the shelves of the Food Pyramid so the child will receive the variety of nutrients needed for growth and health. There are a variety of choices within a food group or shelf; for example, a child could choose bread instead of breakfast cereal, or potato instead of pasta. Encourage children to try different food tastes.</td>
</tr>
<tr>
<td>Cooled, boiled water</td>
<td>Adults are encouraged to eat more fibre and less fat. This results in a diet that is lower in energy and more filling. This advice is not suitable for very young children as their stomach is small and high fibre foods will fill it too quickly.</td>
</tr>
<tr>
<td>(if necessary)</td>
<td>After two years of age, children can gradually eat lower fat foods, such as low fat or semi skimmed milk, and foods with more fibre, provided the child is a good eater and has a varied diet. Skimmed is not recommended in children under 5 years of age.</td>
</tr>
</tbody>
</table>

| Whole Peanuts             | Whole Peanuts |
| Unpasteurised cheese     | Unpasteurised cheese |
| (will state made with raw milk on label) | |
| Undercooked eggs          | Undercooked eggs |
| Salt/Gravy/Packet Sauces | Salt/Gravy/Packet Sauces |

### Growing Up!

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<thead>
<tr>
<th>Foods to be avoided</th>
<th>Growing Up!</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breast milk</td>
<td>As the child grows older they will gradually tolerate more servings from each shelf of the food pyramid as outlined in the table below. These portion sizes are only a guide as children’s appetites vary. If the child eats all the serving, offer some more food. For young children, start with smaller and fewer servings and increase up to the guidelines, according to the child’s own growth and appetite.</td>
</tr>
<tr>
<td>Formula milk</td>
<td>It is important to include foods from each of the shelves of the Food Pyramid so the child will receive the variety of nutrients needed for growth and health. There are a variety of choices within a food group or shelf; for example, a child could choose bread instead of breakfast cereal, or potato instead of pasta. Encourage children to try different food tastes.</td>
</tr>
<tr>
<td>Cooled, boiled water</td>
<td>Adults are encouraged to eat more fibre and less fat. This results in a diet that is lower in energy and more filling. This advice is not suitable for very young children as their stomach is small and high fibre foods will fill it too quickly.</td>
</tr>
<tr>
<td>(if necessary)</td>
<td>After two years of age, children can gradually eat lower fat foods, such as low fat or semi skimmed milk, and foods with more fibre, provided the child is a good eater and has a varied diet. Skimmed is not recommended in children under 5 years of age.</td>
</tr>
</tbody>
</table>

| Whole Peanuts             | Whole Peanuts |
| Unpasteurised cheese     | Unpasteurised cheese |
| (will state made with raw milk on label) | |
| Undercooked eggs          | Undercooked eggs |
| Salt/Gravy/Packet Sauces | Salt/Gravy/Packet Sauces |

### Foods to be avoided

<table>
<thead>
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<th>Growing Up!</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breast milk</td>
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</tr>
</tbody>
</table>

<p>| Whole Peanuts             | Whole Peanuts |
| Unpasteurised cheese     | Unpasteurised cheese |
| (will state made with raw milk on label) | |
| Undercooked eggs          | Undercooked eggs |
| Salt/Gravy/Packet Sauces | Salt/Gravy/Packet Sauces |</p>
<table>
<thead>
<tr>
<th>FOOD SHELF</th>
<th>1-3 YEARS</th>
<th>3-5 YEARS</th>
<th>PORTION SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meat, Fish and Alternatives Shelf</td>
<td>2 small</td>
<td>2</td>
<td>An average sized pork/lamb chop</td>
</tr>
<tr>
<td></td>
<td>servings</td>
<td>servings</td>
<td>2 slices (60 g) of lean roast/boiled/grilled meat or chicken/turkey</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2 fish fingers or medium sized fillet of fish</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2 eggs</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>9 dessertspoons of baked beans, peas, lentils</td>
</tr>
<tr>
<td>Milk, Cheese and Yoghurt Shelf</td>
<td>3</td>
<td>3</td>
<td>1 glass of milk (150 ml)</td>
</tr>
<tr>
<td></td>
<td>servings</td>
<td>servings</td>
<td>125g carton of yoghurt (standard carton)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>30 g of hard cheese</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2 cheese slices</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 bowl of milk pudding (100g)</td>
</tr>
<tr>
<td>Fruit and Vegetables Shelf</td>
<td>2-4</td>
<td>4 - 5 or</td>
<td>1 medium sized fruit (50g) e.g. apple, orange, banana</td>
</tr>
<tr>
<td></td>
<td>servings</td>
<td>more servings</td>
<td>½ glass of unsweetened fruit juice, diluted (25ml pure juice)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3 dessertspoons of stewed fruit/tinned fruit in fruit juice/ fresh fruit salad</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3 dessertspoons chopped raw or salad vegetables</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3 dessertspoons of vegetable</td>
</tr>
<tr>
<td>Breads, Cereals, and Potatoes Shelf</td>
<td>4</td>
<td>4-6 or</td>
<td>1 slice of bread (white or wholegrain)</td>
</tr>
<tr>
<td></td>
<td>servings</td>
<td>more servings</td>
<td>1 small bread roll</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 small bowl of cereal</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 small scone (plain/brown/fruit)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 medium potato (60gm) – boiled or baked</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3 dessertspoons of boiled rice or pasta (80g)</td>
</tr>
</tbody>
</table>

**Healthy Eating**

Recommended Dietary Allowances (RDAs) are the level of intake of nutrients that, on the basis of scientific knowledge, are judged to be adequate to meet the known nutrient needs of practically all healthy persons. The Irish RDAs for Irish children and adults are outlined in Table 1. The RDAs for infants (0 to 12 months) are outlined in Table 2 (FSAI, 1999).

The Food Pyramid (*Figure 1*) is a visual guide to a healthy diet and achieving the RDAs. The pyramid is made up of five food shelves.
Figure 1: The food pyramid (Department of Health & Children)

The wide bottom shelf contains foods that form the foundation or base of all meals. This is the *bread, cereals and potatoes* group. These foods provide energy. As often as possible, high fibre varieties of these foods should be consumed. Fibre has beneficial properties that aid digestion, prevent constipation and diarrhoea, and protect against hypercholesterolemia and certain cancers. The next widest shelf is the *fruit and vegetable* group. These foods give vitamins and minerals for good health, bright eyes and good skin. Frozen fruit or vegetables are just as good as fresh. Remember potatoes are not on this shelf. The next shelf is the *milk, cheese and yoghurt* shelf. The group of milk products provides calcium rich foods for strong bones and teeth. Milk products also give protein and energy. Butter and cream come from milk but are not on this shelf as they contain only fat with no calcium or protein. Those over the age of 2 years are encouraged to consume low fat or semi skimmed products to protect against the risk of heart disease. The fourth shelf has *meat, fish, poultry and other protein foods such as beans*. These foods provide iron and protein to help the body function well. The *small top shelf* of the pyramid contains foods such as sweets, chocolate, biscuits, cakes, fizzy drinks and salt. This shelf is small to show these foods should only be eaten in small amounts occasionally. Filling up on these foods spoils the appetite for more nutritious foods. This shelf also includes butter, oils and fats. As explained later, young children are growing very fast and need some fat in their diet to provide the energy for this growth and development.

The food pyramid also provides a guide as to how many servings should be chosen from each shelf everyday. Healthy eating for children is essential for normal growth and development. After a child is weaned the aim is move to an adult type diet – however portion sizes are smaller depending on the age of the child.
<table>
<thead>
<tr>
<th>Age</th>
<th>Protein</th>
<th>n-6 PUFA</th>
<th>n-3 PUFA</th>
<th>Vitamin D</th>
<th>Thiamin Riboflavin</th>
<th>Niacin</th>
<th>Vitamin B6</th>
<th>Folate</th>
<th>Vitamin B12</th>
<th>Calcium</th>
<th>Phosphorus</th>
<th>Potassium</th>
<th>Iron</th>
<th>Zinc</th>
<th>Copper</th>
<th>Selenium</th>
<th>Iodine</th>
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<tbody>
<tr>
<td>Children</td>
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<td></td>
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</tr>
<tr>
<td>1-3</td>
<td>1.1</td>
<td>3</td>
<td>0.5</td>
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<td>0.8</td>
<td>1.6</td>
<td>45</td>
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<td>0.9</td>
<td>800</td>
<td>350</td>
<td>60</td>
<td>1100</td>
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<td>900</td>
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<td>200</td>
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<td>600</td>
<td>100</td>
<td>1.4</td>
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<td>1.6</td>
<td>60</td>
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<td>18-64</td>
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<td>700</td>
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<td>1.6</td>
<td>60</td>
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<td>300</td>
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<td>65+</td>
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<td>1.6</td>
<td>80</td>
<td>15</td>
<td>500</td>
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<td>1200</td>
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<td>Lactation†</td>
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<td>1.6 (+2)</td>
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<td>1200</td>
<td>950</td>
<td>3100</td>
<td>15</td>
<td>12</td>
</tr>
</tbody>
</table>

*Second half of pregnancy. †First six months of lactation

** Polyunsaturated fatty acids; †† Retinol equivalents (µg RAE)
†† Nontissue defects can be prevented by panencephalitis supplementation of folic acid

Recommendations for infants (0-12 months) are outlined in Table 2.
The role of parents

Parents retain much control over the food choices of children pre-adolescence and predominately most of the reported eating occasions (94%) among Irish children occur at home (Thomas 1991; www.iuna.net). From the introduction of solid foods to infants, children learn to like and eat what is familiar to them. Obviously, what is familiar is what is present in their environment. Parents tend to have foods in the home that they like and eat, and with repeated opportunities to eat these foods, young children include many of their parent’s foods in their diet. However, the more
a choice of food is available and accessible to a child the more they choose it (Birch & Fisher, 1998).

Research has also led us to believe that young children are adept at regulating their own energy intake during a day so that they eat enough food that is required to maintain their health. But this responsiveness can be modified by child-feeding practices that attempt to control the child’s intake, thereby limiting opportunities for the child to exert self-control (Birch & Fisher, 1998). There is a low level of perceived need among European adult populations to alter their eating habits for health reasons, 71% surveyed believing that their diets are already adequately healthy (Kearney et al. 1997). The key driver for eating is of course hunger but food choice is not determined solely by physiological or nutritional needs. Some of the other factors that influence food choice are outlined in figure 2.

Parents are the gatekeepers of their children’s diets.

**Figure 2: Determinants of food choice (EUFIC Review no. 17)**

The social context in which children’s eating patterns develop becomes important because the eating behaviour of people in that environment serves as a model as the child grows older. Providing a stable eating environment, the family together for meals, without distractions in the background (TV, radio) will promote the importance of eating and enable a social learning of food preferences. This can also include establishing rituals of meal preparation and learning about healthy eating (Westenhoefer, 2001).
Vegetarianism

Rational: A vegetarian is someone living on a diet of grains, pulses, nuts, seeds, vegetables and fruits with or without the use of dairy products and eggs (preferably free-range). A vegetarian does not eat any meat, poultry, game, fish, shellfish or crustacea, or slaughter by-products such as gelatine or animal fats (Briony Thomas, 2002).

Types of Vegetarian (The vegetarian society www.vegsoc.co.uk)

Lacto-ovo-vegetarian. Eats both dairy products and eggs. This is the most common type of vegetarian diet.

Lacto-vegetarian. Eats dairy products but not eggs.

Vegan. Does not eat dairy products, eggs, or any other animal product. A vegan is a strict vegetarian who does not eat any dairy products or eggs. Most vegans do not eat honey. A well-balanced vegan diet can provide all the essential nutrients required and share the same health advantages as a vegetarian diet. Nutritional guidelines for vegans are essentially similar to those for vegetarians. However, vegetarians gain certain nutrients from dairy products and eggs. Vegans need to ensure their diets contain plant food sources of these nutrients, the main ones of which are discussed below.

Fruitarian. A type of vegan diet where very few processed or cooked foods are eaten. Consists mainly of raw fruit, grains and nuts. Fruitarians believe only plant foods that can be harvested without killing the plant should be eaten.

Macrobiotic. A diet followed for spiritual and philosophical reasons. Aims to maintain a balance between foods seen as ying (positive) or yang (negative). The diet progresses through ten levels, becoming increasingly restrictive. Not all levels are vegetarian, though each level gradually eliminates animal products. The highest levels eliminate fruit and vegetables, eventually reaching the level of a brown rice diet.

Other terms can be used in describing various vegetarian diets, though their exact meaning can differ. The term strict vegetarian may refer to a vegan diet, though in other cases it may simply mean a lacto-ovo-vegetarian diet. The terms common or broad vegetarian may be used to refer to lacto-ovo-vegetarians. Demi-vegetarian is a term sometimes used to describe persons who eat no or little meat but may eat fish. Persons consuming fish but no meat are sometimes called pescetarians.

Many foods contain ingredients derived from the slaughter of animals. Gelatine is made from animal ligaments, tendons, and bones etc., which have been boiled in water. It is often found in confectionery, ice cream, and other dairy products. Animal fats refer to carcase fats and may be present in a wide range of foods, including biscuits, cakes, and margarines. Suet and lard are types of animal fats. Certain food additives (E numbers) may be derived from animal sources. Cheese is generally made with rennet extracted from the stomach lining of slaughtered calves. Vegetarian cheese is made with rennet from a microbial source. Many vegetarians
that eat eggs will eat only free-range eggs. This is due to moral objections to the battery farming of hens.

A well-balanced vegetarian diet can provide all the nutrients the body needs and there is much scientific evidence to indicate vegetarians may be healthier than meat-eaters. A vegetarian diet is healthy because it is typically low in saturated and total fat, high in dietary fibre and complex carbohydrate, and high in protective minerals and vitamins present in fresh fruit and vegetables.

**Vegetarian food groups are:**
- Cereals/grains - wheat (bread & pasta), oats, maize, barley, rye, rice, etc. Potatoes are a useful cereal alternative.
- Pulses - kidney beans, baked beans, chickpeas, lentils, etc.
- Nuts & Seeds - almonds, walnuts, hazelnuts, sesame seeds, sunflower seeds, etc.
- Fruit & vegetables.
- Dairy products or Soya products - tofu, tempeh, soya protein etc.
- Vegetable oils and fats - margarine or butter.

**Specific Nutrients Important in Vegetarian and Vegan Diets**

**Protein:** Meat supplies protein, fat, some B vitamins and minerals (mostly iron, zinc, potassium and phosphorous). Fish, in addition to the above, supplies vitamins A, D, and E, and the mineral iodine. Vegetarians easily obtain all these nutrients from other sources such as:
- Nuts: hazels, brazils, almonds, cashews, walnuts, pine kernels etc.
- Seeds: sesame, pumpkin, sunflower, linseeds.
- Pulses: peas, beans, lentils, peanuts.
- Grains/cereals: wheat (in bread, flour, pasta etc), barley, rye, oats, millet, maize (sweet corn), rice.
- Soya products: tofu, tempeh, textured vegetable protein, veggie burgers, soya milk.
- Dairy products: milk, cheese, yoghurt (butter and cream are very poor sources of protein).
- Free range eggs.

**Dietary Fibre**

Dietary fibre or non-starch polysaccharide (NSP), as it is now termed, refers to the indigestible part of a carbohydrate food. Fibre can be found in unrefined or wholegrain cereals, fruit (fresh and dried) and vegetables.

**Vitamin B2 (Riboflavin)**

Certain studies have found vegans to have a low intake of the vitamin, riboflavin. Riboflavin is important in converting protein, fats and carbohydrates into energy, and the synthesis and repair of body tissues. Good sources of riboflavin include whole grains, mushrooms, almonds, leafy green vegetables and yeast extracts.

**Vitamin B12**

Vitamin B12 is the only one that may cause some difficulty, as it is not present in plant foods. It is found primarily in meat, dairy products and eggs and is absent from plant foods. Only very tiny amounts of B12 are needed and vegetarians usually get
this from dairy produce and free-range eggs. Considerable research has been carried out into possible plant sources of B12. Fermented soya products, seaweeds and algae such as spirulina have all been proposed as containing significant amounts of B12. However, the present consensus is that any B12 present in plant foods is likely to be in a form unavailable to humans and so these foods should not be relied upon as safe sources.

Vitamin B12 is important in the formation of red blood cells and the maintenance of a healthy nervous system. When deficiency does occur it is more likely to be due to a failure to absorb B12 from the intestine than a dietary deficiency. It is sensible for vegans and vegetarians who consume few animal foods to incorporate some B12 fortified foods in their diet. Vitamin B12 is added to yeast extracts, soya milks, veggie burgers and some breakfast cereals.

Iron: Needed for red blood cells. Found in leafy green vegetables, wholemeal bread, molasses, eggs, dried fruits (especially apricots and figs), lentils and pulses. Vegetable sources of iron are not as easily absorbed as animal sources, but a good intake of vitamin C will enhance absorption.

Vitamin D
Is present in oily fish, eggs and dairy products in variable amounts. It is not found in plant foods. However, vegans can obtain vitamin D from vegetable margarines, some soya milks and certain other foods, which are fortified with the vitamin. Vitamin D is also synthesised by the skin when exposed to sunlight. Synthesis of vitamin D in this way is usually adequate to supply all the body's requirements. Most vegans will obtain sufficient vitamin D providing they spend time outdoors on bright days. Fortified foods further ensure adequate amounts. Vegans who may be confined indoors may be recommended a vitamin D supplement. Also, infants who are seldom outdoors or who are dark-skinned may require supplements. Asian vegans may also be at risk of deficiency, particularly Asian women who may be required to keep their skin covered for cultural reasons.

Calcium
The major source of calcium in the diets is generally milk and dairy products. Vegans can obtain adequate calcium from plant foods. Good sources include tofu, leafy green vegetables, watercress, dried fruit, seeds and nuts. Also, white bread is fortified with calcium, as are some soya milks.

Iodine
Milk is the primary source of iodine in diet and studies have indicated some vegans may have a low iodine intake. Seaweeds are a good source of iodine, and vegetables and grains can contain iodine depending on the amounts in the soil.

Weaning Vegan & Vegetarian Babies
Progression of weaning is the same as that of non-vegetarian/vegan infants and foods should only be given when the infant is developmentally able.

Bringing up a child as a vegetarian, they need to get used to the vegetarian food groups: cereals, beans, nuts and seeds, dairy and soya produce, fruit and
vegetables. Young babies may reject stronger-tasting foods, such as broccoli, cauliflower and cabbage at six months but may like them several months later.

It is perfectly possible to bring up a child on a vegan diet. Vegan children should be given plenty of nutrient rich foods and need good sources of protein, calcium, vitamin B12 and vitamin D.

The pre-school child, whether vegetarian or not, is almost totally dependent on others for its food. The eating habits of parents and other carers will be the ones that the child imitates and acquires. Some pre-school children are naturally sensitive to the use of animals for food and occasionally refuse all meats even if their parents aren't vegetarian.

Whether vegetarian or not, it is vital that children have a well balanced diet. This is particularly important during the pre-school years, as this is a time of rapid growth and development. The nutrients to particularly watch are calcium, iron, zinc, protein, vitamin B12 and vitamin D.

As they are growing very rapidly, young children need a lot of dietary energy (calories) relative to their small size. A diet that is too high in fibre or very low in fat will not provide sufficient concentrated energy or nutrients. Frequent meals containing food of relatively high nutrient and energy density are important, although young children often have marked fluctuations in appetite.

Planning Diets/Menus for Vegetarian/Vegan Children
Daily Servings: one to five years
Vegetables: 2 servings, preferably including leafy dark green vegetables each day.
Fruit: 1-3 servings, with dried fruit every few days or more.
Grains/cereals: 4-5 servings, including wholegrain bread, rice, pasta, breakfast cereals (and potatoes).
Pulses, Nuts and Seeds: 1-2 servings, including nut butters, tahini (sesame seed paste), lentils, mashed beans.
Dairy or Soya: 3 servings, including milk, cheese, hard-boiled free-range eggs, yoghurt, fortified soya milk, tofu.

Numerous studies on the growth of vegetarian children show that they grow just as well and in some cases better than their meat-eating counterparts. In later life vegetarians suffer less of the modern nutritional diseases particularly heart disease, cancer and high blood pressure. A carefully balanced vegetarian or vegan diet can provide all the nutrients needed for normal growth and development. If there is concern regarding a child’s diet a Dietitian can advise parents on nutritional adequacy.
Problems of poor eating habits

Constipation

Constipation in young children is common and normally due to a lack of fibre and fluid in the diet (Corkins, 2005). Technically defined as hard or thick, pasty stools that are difficult to pass. Some infants/children can pass a bowel motion a couple of times a day – others may one go once every few days. Just because an infant or child does not go every day does not mean they are constipated. Chronic constipation can lead to rectal pain, rectal bleeding, and sometimes stretching of the intestine wall making it difficult to feel ready for a bowel motion. This can lead to bowel accidents and behaviour issues related to toileting, and sometimes intestinal blockage (San Giovani et al 2000).

What is fibre?

Fibre is the parts of plant foods that cannot be digested. There are two types soluble and insoluble fibre.

Soluble fibre is found in peas, beans, fruit, vegetables, lentils and oats.

Insoluble fibre is found in wholegrain and has an important role in bowel function and preventing constipation. It acts like a sponge soaking up water and bulk out the waste in bowel.

Constipation can make anyone miserable. It can make children miserable, complain of stomach pain and dread going to the toilet. The digestive tract is a long muscular tube lined with small muscles. At the end of this – the large intestine and colon these muscles are important in pushing waste (faeces) out of the anus. When a child is constipated these muscles struggle to get the waste through and out, mainly because the waste is too hard. Occasionally it can be due to their being a lack of waste for the muscles to push against.

Advice to alleviate constipation

Large soft stools are the answer. They can be pushed through the bowel easily and with out pain. It is essential to ensure that both adequate fibre and fluid are consumed to both prevent and treat constipation.

Infants

Constipation is rare in breastfed babies.

In a constipated formula fed infant – check the formula is being made to the correct dilution. Over concentrating a formula can cause constipation. In periods of warm weather infants may need additional fluids e.g. cooled boiled water between feeds.

Treating constipation in infants (0-1 year)

Over 6 weeks - offer very dilute unsweetened fruit juice (1 teaspoon fruit juice in 50 ml cooled, boiled water)

Over 3 months - 2-3 teaspoon unsweetened fruit juice in 50 ml cooled, boiled water

Brown Sugar should not be added to the bottle. It can cause tooth decay and cause dehydration.
Children
In older children increasing fluid and fibre intake can help treat and prevent further bouts of constipation. However when constipation is severe a child’s appetite may decrease making it difficult to instigate adequate dietary changes. Increasing physical activity encourages the intestine to propel the stool through the intestine. In troublesome constipation laxatives and stool softeners can help but should not be used on a long-term basis if possible as their effectiveness will be lost.

Increase fruit and vegetables
Aim for 2-3 portions of fruit daily
- Ideally fruit should be eaten with the skin on as it offers more fibre.
- Alternatively offer stewed fruit, tinned fruit, dried fruit
- Fruit as part of a smoothies drink

Increase vegetables by
Aim for minimum of 2 servings daily
- Cooked or raw.
- Disguised as thick vegetable soup, in stews or as part of pasta dishes.
- Use as toppings on pizza

Encourage high fibre foods e.g. weetabix, wholemeal breads. However these foods can be quite filling in young children and cause them to feel full quickly. A good compromise is often mixing and matching foods e.g. weetabix for breakfast and a slice of white toast. Increase fibre in the diet gradually.

It is essential to increase fluids when increasing fibre intake
A good guide to fluid requirements is the Childs age + 5 cups of fluid
Suitable drinks for young children with constipation
- Water
- Milk
- Diluted fruit juice (1 or 2 parts water to 1 part juice) with a meal only for children with constipation.

Avoid sweet fizzy drinks, as they are associated with dental decay and obesity

Unprocessed bran/linseeds should never be given to young children or infants as they may interfere with absorption of some micronutrients, cause excessive bloating and flatulence.

Other causes of constipation
- Ignoring normal stimuli or delay of bowel motion can exaggerate problem of constipation in children.
- Lack of exercise
- Lack of routine for children especially when being toilet trained or dislike of strange toilets at school.

Use of laxatives
Use of laxatives can be beneficial in making it easier for a child to pass a stool especially when constipation has been a problem for a long while. However their use
long-term is not encouraged. Children with chronic constipated should medically investigated for an underlying cause.

**Toddler Diarrhoea**

This is a common problem in children who are otherwise healthy (Hoekstra 1998). Frequent loose stools containing recognizable food matter e.g. carrots and sweetcorn can be passed up to 8 times a day. Typically the first stool is passed after the child first eats or drinks. The stools often become looser over the day – but are not passed at night. The condition is thought to be due to a degree of immaturity of gut function and often improves spontaneously at the age of 3 – 4 years (Briony Thomas 2002).

**Useful resources**

Starting to spoon feed your baby DoHC  
Food for young children DoHC
Signs of nutritional deficiency

It helps to be aware of the following signs that may appear if poor eating habits are followed:

- Physical appearance: emaciation, pale complexion and hair loss are features of chronic under-nutrition. Sunken eyes, dry mouth and reduced skin elasticity are indicative of dehydration.
- Mood: apathy, lethargy and poor concentration are features of under-nutrition and also exacerbate disinterest in food.
- Breathlessness: can be a symptom of anaemia, and can make it more difficult to eat.
- It would be helpful to develop a picture of dietary intake, food choice and overall balance. This can be obtained by careful questioning; particular aspects can be explored further if intake seems limited.

Anaemia

Anaemia is a deficiency of red blood cells, which can lead to a reduction in oxygen-carrying ability, causing unusual tiredness and other symptoms (ESPGHAN, 2002). The deficiency occurs either through the reduced production or an increased loss of red blood cells. These cells are manufactured in the bone marrow and have a life expectancy of approximately four months. To produce red blood cells, the body needs (among other things) iron, vitamin B12 and folic acid. If there is a lack of one or more of these ingredients anaemia will develop. Iron is an important dietary mineral that is involved in various bodily functions, including the transport of oxygen in the blood, essential in providing energy for daily life. Iron is also vital for brain development. Babies, toddlers, preschoolers and teenagers are at high risk of iron deficiency, mainly because their increased needs for iron may not be met by their diets. Without intervention, a child whose diet does not provide them with enough iron will eventually develop iron deficiency anaemia (San Giovani et al 2000).

The WHO defines iron deficiency anaemia as a haemoglobin concentration < 11g/dl – many iron deficient toddlers may have a concentration just below this.

Prevalence

The prevalence of iron deficiency and iron deficiency anaemia is surprisingly high in developed countries among apparently healthy children and young adolescents. Iron deficiency and iron deficiency anaemia are established causes of reduced immune response (Dallman 1987). Both conditions are also known to be associated with less than optimal behaviour and poorer performance in intelligence tests among schoolchildren (Pollitt 1990).

The signs and symptoms of iron deficiency anaemia in children can include:
  - Behavioural problems
  - Repeated infections
  - Loss of appetite
  - Lethargy
  - Breathlessness
  - Increased sweating
  - Strange 'food' cravings (pica) like eating dirt
failure to grow at the expected rate.

Major risk factors for the development of iron deficiency in children include:
- Prematurity and low birth weight
- Exclusive breast-feeding beyond six months
- Introduction of cow's milk as the main drink before 12 months
- High intake of cow’s milk
- Low or no meat intake
- Poor diet in the second year of life.
- Possible gastrointestinal diseases.

What causes iron deficiency?
Eating a poor diet containing little iron causes most cases of iron deficiency in children (Briony Thomas 2002). In adults, however it is most commonly caused by losing blood faster than the body can remake it.

A lack of iron in the diet is common in vegetarians/vegans because the main general dietary source is red meat. Babies can develop iron deficiency, especially if they have been born prematurely. Their storage of iron is usually not completed until the final stages of pregnancy.

An increased need for iron arises when a large amount of cell divisions occur, such as during periods of rapid childhood growth.

Reduced absorption from the intestine of iron can be caused by diseases of the small intestine such as gluten intolerance.

Always consult a doctor for unexplained iron deficiency. A loss of blood from the digestive tract may be so slight as to be undetected on its own.

Other vitamins that are needed to manufacture red blood cells include folate (folic acid) and vitamin B12.

Iron requirements
Refer to FSAI table
Babies, children and teenagers undergo rapid growth spurts, which increase their need for iron. The main causes of iron deficiency in children by age group include:

Babies less than six months old - newborns receive their iron stores in the uterus (womb), which means the mother's diet during pregnancy is very important. Low birth weight or premature babies are at increased risk of iron deficiency and may need iron supplements.

Babies aged six months to one year - baby's iron stores run low in the second half of their first year. Iron deficiency can result if their diet doesn't include enough iron-rich solid food. At age four to six months, two servings per day of plain, iron-fortified infant cereal should be given. By approximately six months of age, plain pureed meats can be offered. Late introduction of solids into the baby's diet is a common cause of iron deficiency in this age group.
**Children aged one to five years** - breast milk contains iron but prolonged breastfeeding can lead to iron deficiency if breast milk replaces solid foods in the diet. Low iron milks such as cow’s milk; goat’s milk and soymilk should not be given until 12 months of age. Children who drink milk in preference to eating solid foods are in danger of iron deficiency.

**Children aged five to twelve years** – faddy eating, vegetarian/veganism, poorly balanced diet or early menstruation in children.

**In general** - gastrointestinal disorders, such as coeliac disease, are a rare but possible cause of anaemia in children.

**Prevention**
The best way to prevent anaemia is to eat a healthy, balanced diet. The main nutrients needed to make healthy red blood cells is Iron.

The are two different type of iron in food: haem iron, found in red meat seafood and poultry, and non-haem iron found in breads, fruits, breakfast cereals, vegetable, legumes (e.g. baked beans), nuts and eggs.

**Haem iron** foods are rich in iron and contain iron in the form that is easily absorbed by the body. Red meat also has a special effect on iron absorption. The meat when eaten together with the vegetables can boost the absorption of non-haem iron by up to four times. Vitamin C also has a similar positive effect on the absorption of iron.

In other words, the key to an iron rich diet is to eat a combination of iron rich foods high in both haem and non-haem iron.

**Practical ways to prevent Anaemia in babies**
Suggestions to prevent or treat iron deficiency in babies less than 12 months of age include:

- Eating an iron-rich diet during pregnancy. Red meat is the best source of iron. If iron supplements were prescribed check the mother took them.
- Breastfeeding baby or choosing an iron-fortified milk formulas.
- Do not give cow’s milk or other fluids that may displace iron-rich solid foods before 12 months of age.
- Don’t delay the introduction of solid foods. Start giving your baby pureed foods when they are around four to six months of age. Include iron rich foods such as red meat.
- If the mother wants to continue breastfeeding beyond six months of age it is essential to check the mothers iron stores.

**Practical ways to Prevent Anaemia in children**
Suggestions to prevent or treat iron deficiency in toddlers, preschoolers and children include:

- Meat, poultry and fish are an important part of the daily diet. Red meat is a source of easily absorbed iron.
- Vitamin C helps the body to absorb more iron, so make sure a child has plenty of fruit and vegetables.
• If a child drinks milk instead of eating food, limit the amount of cow's milk consumed.
• Goat's milk, soymilk, fruit juices, cordials and soft drinks can also cause iron deficiency if they replace solid foods in the diet. Strictly limit all milks and juices. Encourage plain water as your child's main source of fluids.
• Fussy eaters are at risk because their diet is inadequate, encourage a wide variety of foods.
• Offer iron-rich foods and meals, such as iron-fortified breakfast cereals and breads, and serve meat, poultry or fish with the evening meal.
• The phytate in bran and other fibres can severely reduce the body's ability to absorb iron. While fibre is important, discourage your child from going on high fibre diets. The problem can be avoided by eating foods that contain vitamin C with iron containing plant foods like wholegrain cereals.
• If a child insists on severely limiting meat or avoiding meat altogether, make sure you offer plenty of iron-rich alternatives such as peas, beans and grains.
• Limit the amount of tea and coffee, since tannins interfere with iron absorption.

**Vitamin B12**
Is found primarily in meat, dairy products and eggs and is absent from plant foods. Considerable research has been carried out into possible plant sources of B12. Fermented soya products, seaweeds and algae such as spirulina have all been proposed as containing significant amounts of B12. However, the present consensus is that any B12 present in plant foods is likely to be in a form unavailable to humans and so these foods should not be relied upon as safe sources.

Vitamin B12 is important in the formation of red blood cells and the maintenance of a healthy nervous system. When deficiency does occur it is more likely to be due to a failure to absorb B12 from the intestine than a dietary deficiency.

Vegans can obtain B12 from a wide range of foods, which have been fortified with the vitamin. These include certain yeast extracts, veggie burger mixes, breakfast cereals, vegetable margarines and soya milks. You should check the packaging to see which individual products are fortified with B12.

**Folate** is found in raw green vegetables, oranges, wholegrain cereals, some fortified foods such as breakfast cereals and bread. It is an important nutrient for the prevention of anaemia.

**Practical ways to increase iron in the diet of children with anaemia**
• Include red meat three to four times per week
• Give children half to one serving of meat or meat alternatives per day
• Offer meat alternatives including dried beans, lentils, chickpeas, canned beans, fish, eggs and small amounts of nuts and nut pastes.
• Include foods rich in vitamin C like oranges, mandarins, berries and tomatoes.
• Encourage young children, toddlers or fussy eaters to try minced meats, fortified breakfast cereals, eggs and smooth nut pastes
- Limit cow's milk to 600 ml per day.

**Treatment may include:**
- Iron supplements in syrup form, which are available for babies and young children. However iron supplements can be hard on the stomach and cause constipation.
- Treatment for infection, as infection is sometimes the cause of mild anaemia in children.

If the above information does not resolve anaemia then further medical investigation is required.
Oral Health

Good infant weaning and drinking practices should be perceived as going hand in hand (Avery, 2001). From a nutritional and dental perspective a good start is fundamentally important. When a varied weaning diet and using a cup are introduced at an appropriate time the infants' chewing and sipping skills are encouraged (COMA 1994). Well-established habits are difficult to break especially removing a bottle from an older child (Errant 1992). The introduction of complimentary foods to an infants diet coincides with the appearance of the first teeth. Numerous studies have established the potential to predispose young infants to the development of caries when exposed to inappropriate weaning practices (Holt 1996).

Dentition

Humans have two generations of teeth: the deciduous (or primary) dentition and the permanent (or secondary) dentition. There are no teeth in the mouth at birth but by the age 3 years the deciduous dentition is complete. By 6 years the first permanent teeth appear and thence the deciduous teeth are exfoliated one by one to be replaced by their permanent successors. A complete permanent dentition is present at or around the age of 18 years.

In a complete deciduous dentition there are 20 teeth - 10 in each jaw. In the complete permanent dentition there are 32 teeth – 16 in each jaw. In both dentitions there are three basic tooth forms: incisiform, caniniform and molariform. Incisiform teeth (incisor) are cutting teeth having thin, blade like crowns. Caniniform teeth (canine) are piercing or tearing teeth, having a single pointed, cone shaped crown. Molariform teeth (molars and premolars) are grinding teeth possessing a number of cusps on an otherwise flattened biting surface. Premolars are particular to the permanent dentition and replace the deciduous molars.

Baby Bottle Tooth Decay

Among infants and young children this may also be known as Nursing Bottle Caries, Baby Bottle Caries and Nursing Bottle Syndrome. Caries can occur at any age (Ripa 1978). It is a severe form of decay that can affect either milk or permanent teeth. It is characterised by its speed of onset, progression and cause. Destruction of teeth is rapid and extensive. The pattern of which echoes tooth eruption order (Mohan 1998). Acid produced by bacterial metabolism of carbohydrate causes the demineralisation of dental enamel resulting in caries. The primary bacterium implicated is Strep. Mutans. It is present in infants from six to twelve months of age. Colonisation is more common in infants that consume sweetened drinks in a bottle. The quantity and frequency of exposure is also an important factor. The inappropriate weaning practice of prolonged bottle-feeding is associated with the development of rampant caries.

It is important to care for children’s teeth from the very start. All infants should be introduced to a cup or beaker at 6 months of age and bottle-feeding should cease by one year of age (FSAI 1999).
**Dental Decay:** Tooth decay in first teeth can be very painful and can affect the development of permanent teeth. Tooth decay is linked with the frequency and the amount of high sugar containing foods taken. These foods include table sugar, sweets, honey, cakes, chocolate, biscuits, bars, soft drinks, and squashes.

If sugary foods and drinks are provided it is important that they should be given *with meals* rather than between meals. Many snack foods contain sugar and can cause tooth decay so it is important to choose wisely.

**Dental Erosion:** Tooth erosion is a wearing away of the enamel. It is caused by high consumption of acidic foods, fizzy drinks, and undiluted fruit juice. Children who drink fizzy drinks or fruit squashes once or more a day are twice as likely to suffer from tooth erosion as children who consume these drinks less often. Using a straw for these drinks can reduce the damage as the drink goes towards the back of the mouth. However, limiting these drinks is a better solution.

Children should be encouraged to use their teeth. Give foods such as raw apples, carrots, crusts, toast and other foods in a form that encourages chewing.

**Bottles and Dummies**

**Why is it important to wean baby from the bottle or dummy?**

* In the first few months of life, babies have a natural sucking reflex. This makes breastfeeding, bottles and dummies very comforting for them.
* As babies grow they need to learn how to make different movements with their mouths to learn how to speak and eat properly.
* Using a bottle or dummy for too long can cause many health problems for babies.

Using a bottle or dummy for too long can cause problems with:

* **Speech** – Problems with talking
* **Dental health** – Decayed and crooked teeth
* **Development & Behaviour** - Tantrums, not wanting to grow up
* **Health** – Increased risk of infection

Using a bottle or dummy for too long can also cause dietary problems such:

* **Fussy eating**
* **Anaemia**
* **Constipation**

**Helpful hints for giving drinks to babies.**

* A baby can be given drinks from a cup from 4 - 6 months old when they are offered their first solid foods.
* Breastfed babies can be offered extra fluids e.g. if weather is warm from a cup rather than a bottle.
* A cup with out a lid is the best choice. It encourages the baby to develop a sipping action when drinking.
* Spills and accidents are part of the learning process, encourage parents to be patient and give baby plenty of encouragement to learn how to drink from a
cup. The aim is to make the changeover from bottle to cup by the first birthday.

* A baby should never be left alone when drinking because of the risk of choking.
* Breast, formula milk and water are the only safe drinks for teeth.
* Do not prop baby bottles and avoid leaving with a night-time feed.

**Helping baby’s speech**

* You can help your baby’s speech by taking the bottle out of their mouth when they are learning to talk.

**Tips for healthy teeth and gums**

**DO**

✓ Reduce the frequency and the amount of contact that sugary foods and drinks have with the teeth.
✓ Encourage calcium rich foods, for example, milk, cheese and yoghurt. These foods will protect and help to build strong teeth.
✓ Give milk and water, as between meal drinks, these are the most tooth friendly drinks.
✓ Dilute pure unsweetened fruit juice to a ratio of 1 part juice to 4-5 parts water and offer with meals.
✓ Encourage a feeding cup from 6 months of age. This is important, particularly for children who take high sugar drinks, for example, soya infant formula.
✓ Stop using baby bottles at 1 year of age.
✓ Frequent use of paediatric medicines containing sugar can promote tooth decay – use sugar free alternatives.
✓ Teeth should cleaned at least twice a day.
✓ Contact a dental practitioner for additional information on dental hygiene.
✓ Play games and tell stories that encourage children to see visits to the dentist as normal checks for their oral health, not as frightening or painful.

**DON’T**

× Do not give sweet drinks in baby’s bottle – this can result in tooth decay.
× Children should not be put to bed with a bottle as this can cause ‘Nursing Bottle Syndrome’. Fed and put to bed, not put to bed and fed.
× If a child uses a soother, do not dip it into sugar or sugary drinks (honey, jams or syrup) to encourage the child to use it.
× If giving sugary foods and drinks occasionally, try to give with or straight after meals, not between meals.
× Avoid acidic fizzy drinks and sugary snacks and sweets. If given they are best given with a meal.
× Do not put food such as rusks in baby bottles.
Food refusal and fussy eating

Many children go through phases of refusing to eat certain foods or foods that are served in certain ways (Bernett 2002). Sometimes they will eat very little at some meals. This is often a way of showing independence and is very common in children under the age of five (Smith, 2005).

Children can refuse food for a variety of reasons and these can include:

- Poor appetite
- Disliking the particular food
- Illness
- Limited food appeal
- Emotional upset
- Manipulative behaviour

Remember: Healthy children will not voluntarily starve themselves. Children’s health will not suffer if they do not eat a healthy, variety diet for a short while. Even if a child appears to be eating very little it is more than likely they are getting enough calories for growth but could be deficient in vitamins and minerals if it continues for a long period.

Simple helpful tips for parents

- Serve meals at regular times so children know when to expect food.
- Avoid distractions – turn off the TV and radio.
- Where possible sit at the table with the child and eat with them.
- Encourage parents to make mealtimes fun!
- Watch for high intakes of snacks or drinks especially milk, juice or squash and reduce if interfering with appetite.
- Remember that children have only little tummies and fill up easily. Keep portions small and offer more as needed.
- Watch for an “off” day becoming an “off” week. Children’s appetites are not constant.
- Keep healthy food visible – and encourage parents to lead by example.
- Make food look interesting - colours, taste and textures are very important.
- Be prepared to offer the food in another form, for example, pasta with the sauce beside it rather than on top of it.
- Praise when food is eaten.
- Encourage the child to feed him/herself, if possible. Also offer finger foods.
- Take time over meals and talk to children about different foods. Give them time to eat without being rushed.
✓ Limit meals to a maximum of 20 minutes, after this food is cold and unappetising.

✓ When it is obvious that no more food is going to be eaten, remove the food without fuss or comment. Do not offer an alternative.

If a child won’t eat meat

Possible causes

Taste aversion due to bitter taste
Solution Serve with gravy or sauce

Problem with texture
Solution Cut meat into small thin pieces
Combine meat with sauce i.e. spaghetti bolognaise, shepherds pie, stews etc.
Liquidise meat in soups, stews and gravies
Use meat in sandwiches or as burgers

Vary meat type – chicken and fish
Use alternative protein sources – peas, beans, lentils, pulses and eggs.

If a child won’t eat vegetables

Solution Replace vegetable portions with fruit
Use vegetables disguised as purees in soups, stews
Avoid giving greens, try softer less strong varieties - beans, corn, soft peas
Mash vegetables with potatoes and gravy

If a child won’t take milk

Solution Give milk in disguised form
Sauces
Desserts, milk pudding
With breakfast cereals
Milk shakes, smoothies

Alternatives to milk
Yoghurt or yoghurt drinks
Fromage frais
Cheese
Tinned fish with edible bones – sardines
Is there a high intake of sweets, crisps, biscuits and cakes as snacks?
Solution: Make sure snacks are healthy and small mainly fruit, bread, sandwiches, plain biscuits, yoghurts, cheese. Milk can be given as snack.

How much juice, fizzy drinks or fruit squash does the child drink?
Solution: Limit milk intake to 500-600ml daily and no more than 200mls juice daily. Offer water freely. Avoid sweet fizzy drinks as they can cause feeling of fullness due to excess gas and are also associated with dental caries and obesity.

**DON’T**
- Don’t force a child to eat or to clear their plate of food.
- Don’t get upset with the child.
- Don’t criticise the child in front of other children.
- Don’t bribe with sweet foods or other foods you know the child will eat as this gives a wrong message.

Parents can lead by example – if a parent doesn’t eat fruit and vegetables then it is likely their child won’t. Parents should be encouraged to eat a healthy and varied diet as described in the food period as recommended by the Department of Health & Children.

*Remember: Faddy eating is a phase and most children grow out of it. However some children can develop a “feeding difficulty”.*

**What is a feeding difficulty?**
A feeding difficulty is different from “faddy eating” and usually doesn’t go away by itself. If often means that children are eating too little to grow and develop normally. For families who have a child with feeding difficulties, food and meal times often become unpleasant and uncomfortable experiences for everyone.

The child will often:
- Refuse to eat
- Get upset at mealtimes
- Eat very small amounts
- Play/act up at meal times
- Is often miserable or poorly

Mealtimes will be described as:
- A war zone or battle ground
- Long
- Frustrating and extremely stressful
- Worrying
- Non existent
Improving meal times

Find out what is currently happening – put yourself in the child’s shoes.

- Is there a regular meal pattern?
- How often is food and drink offered?
- Is the child drinking a lot of fluids?
- Does the child know when to eat and what to do?
- Does the child know how to do what the parents want it to do e.g. use a spoon?
- Does the child know when the parents are pleased with them?

Do things differently

- Are there distractions around that are preventing the child from concentrating on their food e.g. is the TV on, does the child bring toys to the table, what are other people doing? **Very young children can only concentrate on one thing at a time. Avoid distractions.**
- Is the child getting lots of attention for not eating? **Because parents worry that their child is not eating enough and is playing up at mealtimes they often (with out realising it) give lots of attention to a child when they are not eating.** Children are more likely to carry on doing the things, which get noticed – even when the attention is being cross or fed up with them. Even talking to someone else about worries in front of the child is a form of attention.
- Encourage parents to give the child attention for the type of behaviour that they want so that the child will behave in that way more often. **The types of behaviour, which are not wanted, are likely to happen less and less as time goes by.**
- Parents need to give clear praise to children when they are pleased e.g. “Good girl you have eaten all you beans!” **It can feel quite odd doing this to parents. Advise them to remember that praise and attention includes looking at the child, turning towards them, smiling at the child and letting them hear you telling someone how pleased you are with them.**

Managing meal times

- Young children need to receive very clear messages about what they need to do at different times. Signals and routines let them know that a meal is about to begin or end e.g. putting the plates on the table, or saying “When you have finished all your milk you can go and play”.
- Parents should not leave food and drinks around all day as it gives a mixed message when trying to establish a mealtime routine.
- Get parents to eat with their children. Parents can be a good role model by eating a variety of foods.
- Children like to know the rules and the limits – this applies not only to behaviour in general but also to mealtime behaviour.

If a child is underweight and not eating well they need as much energy (calories) as possible. Encourage parents to choose the high calorie foods and drinks they know the child will eat and avoid using low fat/low calorie foods. If there are particular high calorie foods that a child likes provide them at meal or snack time. Knowing that children are eating a lot of calories can help reduce the stress for parents at mealtimes while trying to sort out the underlying feeding difficulty. Where necessary
referral to a Dietician for appropriate advice on how to practically manage the feeding difficulty and optimise nutritional intake for optimum growth and development can help parents.

Young children have small appetites so offer regular meals and snacks. Offer two courses at the main meal e.g. dinner and pudding. Be clear that the pudding is not a reward for eating the first course – it’s just another chance to take in calories. Give a small portion to a child to eat, seconds can always be offered. Young children often find large servings off putting.

It can take many attempts to introduce new tastes and textures or a new food to a child. Encourage parents not to give up!

Advise parents
- Make a plan and stick to it. Consistency is the key to success.
- All parents/careers need to stick to the same rules.

There is no miracle overnight cure to dealing with difficult eaters. Parents must be reminded that it takes time and hard work to make the changes which will enable their child to eat more.

Helpful Documents

*Healthy eating for children* DoHC Literature

*My child still won’t eat -Feeding matters: helping children to thrive*

The children’s society
Food Allergy and Intolerance

Food allergy and intolerance are both types of food sensitivity. When a person has a food allergy, their immune system reacts to a particular food as if it isn’t safe. If a reaction is severe, the result can be a life threatening reaction called anaphylaxis. Most allergic reactions to a food are mild, but some times they can be serious. Anaphylaxis affects the whole body often with in minutes of eating the allergenic food. If someone has a food allergy they can react to just a tiny amount of the food they are sensitive too. This happens within seconds to minutes and no more than 1 – 2 hours after eating (Holgate, 1999).

Food intolerance does not involve the immune system and is generally not life threatening. However it can make a person feel unwell or affect their long-term health if left untreated. Whether it is intolerance or an allergy, complete avoidance of the food causing the sensitivity is necessary.

Treatment of a food allergy or intolerance is complete avoidance of the offending food(s) (DOHC 2005., FSAI 1999)

Allergy and Children

The prevalence of food hypersensitivity is greatest in the first year of life, affecting 4–6% in the first year. Up to 8% of children less than 3 years of age experience food induced allergic disorders.

Food induced allergic reactions are responsible for a variety of symptoms including the skin, gastrointestinal tract and the respiratory tract, and these can be caused by IgE-mediated and non IgE-mediated mechanisms (Burtriss, 2002).

IgE-mediated

The presence of specific IgE (as established by skin prick testing (SPT) or radioallergosorbent (RAST)) and a reliable clinical history (i.e. a clear temporal relationship between the ingestion of a food and the onset of symptoms) constitutes the two most important criteria in the diagnosis of food allergy.

Non-IgE-Medicated

These are reproducible reactions to a specific food or food ingredient without any detectable specific IgE. Also know as a food intolerance. The precise underlying mechanisms leading to such reactions are not well understood.

Food Allergens

Although we eat hundreds of different foods only a small number account for the vast majority of food induced allergic reactions. In young children milk, eggs, peanuts, soya bean and wheat account for approximately 90% of hypersensitive reactions. However the increased accessibility of fresh fruit and vegetables from all over the world and our insatiable appetite for a more diversified and natural diet have resulted in an increase in allergic reactions of fruits (such as kiwi and papaya) and seeds (such as sesame, poppy and rape). The foods found to cause IgE-mediated reactions in children are eggs, milk, peanuts, nuts, fish and soya bean. Cooking can alter the allergenicity of a food making it more or less allergic to an individual. A
person can be allergic to several foods as a result of a specific IgE that can cross react with other foods.

Order of frequency of food allergens in Childhood
1. Cow’s milk
2. Hen’s eggs
3. Soy bean
4. Peanut
5. Tree nut
6. Fish
7. Crustaceans

Clinical Features
Food allergy usually effects the skin, respiratory system, gastrointestinal tract and, in the severe forms, the cardiovascular system.

Symptoms of allergic reaction
The symptoms of an allergic reaction can vary and the reaction can be more or less severe on different occasions. Even when great care is taken to avoid an offending food, it can still be eaten by accident.

Gastrointestinal food hypersensitivity reactions
Since the gastrointestinal tract is the first system to confront food allergens; it is not surprising that a variety of gastrointestinal symptoms develop during an allergic reaction. These include nausea, vomiting, cramping pain, diarrhoea, abdominal distension and flatus. Symptoms typically develop within minutes to 2 hours of consuming the responsible food allergen and consist of nausea, abdominal pain, colic, vomiting and/or diarrhoea. These can be accompanied with symptoms such as urticaria, angioedema, breathlessness/wheeze, and in severe forms, hypotension leading to collapse.

Cutaneous food hypersensitivity reactions
The skin probably represents the second most frequent target organ in food hypersensitivity reactions. Ingestion of food allergens may provoke the rapid onset of cutaneous symptoms or aggravate more chronic conditions. The most common symptoms are urticaria and angioedema. Onset of symptoms is within minutes of ingestion of the responsible allergen. Symptoms are caused by the activation of IgE-bearing mast cells in circulating food allergens, which are absorbed and circulate rapidly throughout the body. There is substantial evidence to link food allergy with eczema.

Food induced generalized anaphylaxis
Generalized anaphylactic reactions have long been recognized as a complication of food allergy. The time of onset of the reaction after food ingestion is variable, but symptoms are typically noted within a few minutes. Initial symptoms are likely to be swelling or itching of the lips, tongue or throat, nausea and vomiting. In some patients the initial symptoms can be rapid loss of consciousness and cyanosis. Patients may develop cardiovascular symptoms, including hypotension, vascular
collapse and cardiac dysrhythmias in addition to cutaneous, respiratory and gastrointestinal symptoms. The foods most frequently associated with severe reactions in the western world are peanuts, tree nuts, seafood, eggs and milk. It is essential that in the case of a severe/life threatening food allergy that the child is appropriately medically managed with in a specialist paediatrician/allergy service.

The most common symptoms of an allergic reaction in infants include:
- Persistent diarrhoea and/or vomiting
- Poor weight gain and faltering growth
- Atopic dermatitis
- Colic
- Blood stools
- Reflux

Food Allergy in Children
Food allergy in children is not common and while many parents may feel their child is allergy to a food the true incidence is much smaller. 6 – 8 % of children under 3 years of age show evidence of an allergic reaction 85% of which are to milk, egg and peanut.

Why is allergy/intolerance important to diagnose and manage appropriately in children?
Diagnosis of a food allergy is based on a clinical history and laboratory investigations (Specific IgE) and occasionally Skin Prick Testing (SPT). The essence of dietary management is avoidance of the suspected food(s) or ingredients. However, avoiding certain foods can result in dietary deficiencies if not done properly. Children have high demands for nutrients to allow for growth and development – foods should only be removed from the diet if there is a diagnosed allergy and appropriate substitutes be recommended. It is essential that a Dietitian see any child with a proven allergy to educate and advise parents and advise on supplementation as necessary. As a child grows they may be challenged with the offending food to see if they have outgrown their allergy.

Dietary Management
When a food is removed from the diet it has nutritional and practical implications. It is essential that a child with a diagnosed food allergy/intolerance receives nutritional advice to ensure nutritional adequacy for growth and development. Given the complexity of food allergy/intolerance advice from a Dietitian is essential and appropriate management is often in the hospital setting where a child can be food challenged as required.

Cow’s Milk Allergy
Generally allergic reactions to cow’s milk are mild but a small number of infants can experience serious reactions. Cow’s milk protein intolerance is common in infancy and occurs in 2 – 5 % of infants but decreases with increasing age. 80% of infants lose their reactivity to cow’s milk. Studies have shown that several protein’s in cow’s milk are involved in causing reactivity including casein’s, a-lactalbumin and b-lactoglobulin. Cow’s milk and dairy products are important sources of calcium,
magnesium, phosphorous as well as vitamin D and B12. They are important for bone development. It is a high biological value food.

Infant formula is made from modified cow’s milk protein. In an infant with cow’s milk allergy or intolerance standard infant formula can not be used and a substitute such as a hydrolysed cow’s milk formula or an elemental formula e.g. Nutramingen (Mead Johnson) or Neocate (SHS) is recommended.

Goat’s milk, sheep’s milk and soya milk are not suitable alternatives to cow’s milk as they share many proteins similar to cow’s milk. 50% of infants allergic to cows milk are also allergic to soya.

Soy based formula is also not recommended as they have a high phytoestrogen content which could pose a risk to the long term reproductive health of the infant.

In children under 1 an extensively hydrolysed or elemental formula is recommended as explained in the section on formula feeding. In children over 1 year, Nutramigen can be continued or a calcium fortified soya*/rice or oat milk can be used.

*Soy allergy common in children allergic to milk

It is essential to avoid milk derivatives they include:
- Butter/butter fat/butter oil/ghee
- Cow’s milk/dairy milk/pasteurised milk
- Milk formula/whey/whey solids/whey powder
- Yoghurt/yoghurt drinks/frozen/fromage frais
- Cream/sour cream/ crème fraiche
- Ice cream/milk solids/milk fat/ice milk/chocolate milk/flavoured milk
- Evaporated milk/skimmed milk/fortified milk/semi skimmed milk/buttermilk/sour milk/lactose free milk/reduced allergenicity milk/coffee whiteners
- Lactalbumin/ lactoglobulin/bovine serum albumin
- Casein/sodium and calcium carbonate/hydrolysed casein/rennet casein
- Cheese/cream cheese/cheese strings/cheese dips/cheese snacks/cheese popcorn/cheese powder/curds

Foods that may contain milk products
- Cakes/biscuits/pies/bread
- Crisps/savoury snacks/pancakes/rolls/waffles
- Processed meats/ sausages/frankfurters
- Ready made meals/ takeaway meals/ restaurant meals
- Seasonings/some natural flavourings/ binding agents
- Vegetable margarines/butter substitutes
- Canned fish/gravy mixes/ sweets/ lollies/ deserts
- Lactobacillus acidophilus capsules
- Some washing up liquids/shampoos and creams
- Many tablets and calcium supplements/capsules/vaccines
- Coconut cream/ creamed coconut
**Egg Allergy**
Egg allergy is a relatively common trigger of eczema in young children. It is often outgrown in childhood. Eggs are a source of high biological value protein and contain vitamins A, B6, B12, D and E as well as biotin and folic acid. The yolk is a source of cholesterol. 50% of children outgrow an egg allergy.

**Food and Ingredients to avoid**
- Hen’s eggs/duck, goose or quail eggs
- Mayonnaise
- Fried Rice
- Quiche/omelette/frittata/egg wash/meringue
- Yorkshire pudding/toad in the hole/crepes/pancakes
- E322 lecithin (can be egg or soya based – usually egg)
- Medications – check with the pharmacist
- Albumen/lysozyme

**Foods that may contain egg**
- Cakes/pastry/desserts/glazes
- Meat products/pasta/battered and crumbed foods
- Salad dressings
- Ice cream/chocolate/sweets

**Peanut Allergy**
Peanut allergy can be extremely severe, life threatening and doesn’t always resolve. Allergic reactions to nuts can occur within minutes of eating or touching a nut containing food. The best treatment is the avoidance of all nuts as often peanuts are stored with other nuts. Only 20% of children will outgrow a peanut allergy. Contact your local resuscitation training officer for basic lifesaving skill updates.

**Peanut has a number of other names including:**
- Monkey nut
- Earth nut
- Ground nut
- Goober nut/goober pea
- Mixed nut
- Peanut butter
- Arachia hypogea
- Chinese nut
- Pinda

**Which nuts to avoid?**
- Peanut
- Almond
- Brazil
- Cashew
- Hazelnut (filbert, cob nut)
- Macadamia (Queensland nut, candle nut)
- Pecan (hickory nut)
- Pistachio
- Walnut
Read labels carefully and avoid:

- Nuts (whole, chipped or flakes), ground nuts, monkey nuts, earth nuts
- Peanut butter, nut butters, nut pastes
- Unrefined peanut oil, ground nut oil, Arachis oil, other nut oils
- Nut flavours, nut extract, nut essence

**Cross contamination**

Cross contamination is a risk for people with nut allergy. It occurs when a supposedly nut free food comes in contact with nut protein (e.g. in the supply chain or on a work surface).

**Soy**

Soy allergy is more common than people think. 50% of children allergy to milk will be allergy to soy also. While soy is not a common food in the diet except in vegetarian foods – it is often an additive in foods. Often soy is used to replace milk in suspected allergy –but is not appropriate and a hydrolysed feed is more appropriate.

Sources of soy:

- Soy based flavouring
- Hydrolysed (vegetable) soy protein
- E322/lecithin (soy base)
- Cold pressed soy oil
- Miso
- Soy sauce
- Soybean
- Textured vegetable protein
- Tofu
- Tamari
- Temph

**Wheat**

Wheat is a common food in the diet but allergy to wheat is not common in children. Wheat is the primary grain in the western world and a good source of B vitamins. It is a good source of dietary fibre.

Wheat or wheat by products can be found in:

- Bread crumbs
- Batter/ Coating
- Hydrolysed wheat protein
- Raising agent
- Rusk
- Bran
- Binder
- Wheatgerm
- Wheatgerm oil
- Gluten
- Starch
Celiac disease is common in Ireland with 1 in 12 people being affected. The symptoms of celiac disease are the result of the inability of the gut to absorb nutrients from food as it is digested.

The most common symptoms include:
- Frequent diarrhoea/foul stools
- Vomiting
- Unexplained weight loss
- Poor growth despite a good calorie intake
- Excessive gas
- Abdominal Pain
- Anaemia

Management of celiac disease is by a gluten free diet for life.

Gluten is a particular type of protein found in wheat, rye, barley, oats and all foods made from these. All foods containing these cereals must be avoided completely if the damage to the intestine is to be repaired. These cereals, especially wheat, are found in a wide range of manufactured products. Examples of these include bread, biscuits, cakes, pastries and puddings.

Food labels
It is important to carefully study the listed ingredients on all food packet labels, keeping a lookout for terms such as cereal binder, malt extract, noodles, starch/modified starch, cereal filler etc. Take special care with pre-packed and processed foods.

Cooking
It is important when cooking that care is taken not to use breadcrumbs, or to dust meat, fish or poultry with flour (*other than permitted flours- see table) before cooking. Sauces and gravies that are thickened with flour or starch containing gluten also should be avoided.

Finally always be careful that a gluten-free food is not ‘contaminated’ with gluten e.g. ordinary breadcrumbs in a butter dish or toaster may contaminate gluten-free bread or using the same cooking oil to cook gluten-free food and foods containing gluten.

<table>
<thead>
<tr>
<th>Basic Foods Allowed</th>
<th>Common Foods to exclude</th>
</tr>
</thead>
<tbody>
<tr>
<td>✓ Rice, sage, tapioca, maize, corn, soya, buckwheat and millet and flour and bran made from these. Any gluten-free products such as gluten free bread, biscuits, pasta, flour.</td>
<td>❌ Wheat, rye, oats and barley and flour or bran made from these. Ordinary bread, biscuits, pasta, noodles, crackers flours.</td>
</tr>
<tr>
<td>Rice cakes.</td>
<td></td>
</tr>
<tr>
<td>Rice, potatoes-homemade chips</td>
<td></td>
</tr>
<tr>
<td>Ordinary pasta, eg. Pasta shapes, noodles or spaghetti. Frozen and 'takeaway chips'. Potato croquettes/ potato cakes/ potato salad*/instant potato*</td>
<td></td>
</tr>
<tr>
<td>Fresh or unprocessed meat, poultry, fish etc.</td>
<td></td>
</tr>
<tr>
<td>Gluten free sausages</td>
<td></td>
</tr>
<tr>
<td>Peas, beans, lentils, chickpeas</td>
<td></td>
</tr>
<tr>
<td>Soya beans, nuts eg, salted.</td>
<td></td>
</tr>
<tr>
<td>✓ All fresh, frozen, stewed and dried fruit and vegetables. Most tinned vegetables* Fruit juice Pickled vegetables</td>
<td></td>
</tr>
<tr>
<td>✓ Claras Kitchen porridge and muesli.</td>
<td></td>
</tr>
<tr>
<td>✓ Milk, cream, Hard cheese and cottage cheese, ice-cream, yoghurts*, eggs</td>
<td></td>
</tr>
<tr>
<td>✓ Home-made soups and sauces thickened with gluten-free flour or cornflour. Knorr stock cubes/ marmite/ Bovril.</td>
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<tr>
<td>✓ Sugar/ jam/ honey/ marmalade/ plain &amp; milk chocolate*/ jellies/ boiled sweets</td>
<td></td>
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<tr>
<td>✓ Tea/coffee/fruit squash/ Build-up/ Complan/ Cocoa</td>
<td></td>
</tr>
<tr>
<td>✓ Butter/ margarine/ oils/ salt/ pepper/herbs/spices</td>
<td></td>
</tr>
<tr>
<td>✓ Spirits, wines, sherry, port, Ritz, ciders. Liquors</td>
<td></td>
</tr>
<tr>
<td>✗ Fruits coated in breadcrumbs or batter sausages, black/white pudding, meatloaf, processed meats, Cornish pasties, pate, fish spreads, beef burgers*, kebabs. Dry roasted Nuts. Scotch eggs, processed cheese*, peanut butter.</td>
<td></td>
</tr>
<tr>
<td>✗ Fruit or vegetables in pastry breadcrumbs, batter or sauce. Vegetables tinned in a sauce thickened with flour</td>
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<tr>
<td>✗ Other breakfast cereals</td>
<td></td>
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<tr>
<td>✗ Cream cheese and cheese spreads*, ice-cream/ muesli yoghurts made with cereals or biscuits.</td>
<td></td>
</tr>
<tr>
<td>✗ Tinned and packet soups and sauces* Oxo/ Salad dressings and mayonnaise*</td>
<td></td>
</tr>
<tr>
<td>✗ Chocolates or sweets with a biscuit or cream filling* Liquorice*</td>
<td></td>
</tr>
<tr>
<td>✗ barley drinks/ drinking chocolate/ malted drinks/ hot drinks from vending machines</td>
<td></td>
</tr>
<tr>
<td>✗ Curry powder*/ custard powder* soy sauce/ Worcester sauce</td>
<td></td>
</tr>
<tr>
<td>✗ All types of beer and lagers</td>
<td></td>
</tr>
</tbody>
</table>

* Need to check label. Gluten free alternatives available.

Due to the complexity of this diet – dietary advice from a Dietitian is essential to ensure normal growth and development and prevent complications such as osteoporosis in later life. All celiacs should be encouraged to join the Ceoliac Society of Ireland [www.ceoliac.ie](http://www.ceoliac.ie).
Additives
Preservatives are added to many commercially produced foods to prevent deterioration of the food, and they are important in the prevention of food poisoning caused by bacterial contamination. Allergic reactions to food dye and preservatives are rare.

Important Points!
- Food allergy is common in young children especially with atopic dermatitis.
- Relatively few foods are responsible for the vast majority of allergic reactions.
- It is rare for a child to react to more than 3 foods.
- When a child with a food allergy has a “new” or “multiple” food allergies it is most likely that they are ingesting hidden sources of common food allergens.
- Except in gastrointestinal allergies, most food induced allergic reactions develop within minutes to a few hours of ingesting the food allergen.
- True food allergies generally involve classical signs and symptoms affecting the gastrointestinal and/or respiratory systems.
- Adverse reactions to dyes and additives are rare.

Attention deficit hyperactivity disorder
Parents often believe that their child has ‘allergies’ or behavioural problems related to food. While it is important to take parent concerns seriously, it is equally important that diagnosis is based on detailed dietary enquiry and diet-symptom records before foods are excluded. Imposed dietary restrictions often include foods that are a major source of nutrients and could put a child at risk of nutritional deficiency.

Attention deficit hyperactivity disorder (ADHD) is the most commonly diagnosed behavioural disorder of childhood, estimated to affect 3 to 5 percent of school-age children in the U.S. Its core symptoms include developmentally inappropriate levels of attention, concentration, activity, distractibility, and impulsivity. Children with ADHD usually have functional impairment across multiple settings including home, school, and peer relationships. ADHD has also been shown to have long-term adverse effects on academic performance, vocational success, and social-emotional development. Despite the progress in the assessment, diagnosis, and treatment of children and adults with ADHD, the disorder has remained controversial (NIH 1998).

A wide variety of treatments have been used for ADHD including, but not limited to, various psychotropic medications, psychosocial treatment, dietary management, herbal and homeopathic treatments, biofeedback, meditation, and perceptual stimulation/training. From evidence-based guidelines, current treatment includes longterm stimulant medication and behavioural therapy (American academy of Paediatrics 2001). With respect to diet, interventions include dietary replacement, exclusion, or supplementation; various vitamin, mineral, or herbal regimens; biofeedback; perceptual stimulation; and a host of others. The American Academy of Paediatrics reviewed the area of treatment of ADHD but could not find sufficient evidence to support such interventions (American Academy of Paediatrics 2001).
Nutrition in Down Syndrome

Like all infants and children, those with Down Syndrome need a nourishing diet. However their nutritional requirements are different. While there are few studies on the dietary needs of those with Down Syndrome – studies suggest that children and adults have a lower basal metabolic rate (BMR). This can be 10-15% lower. This means that overall, people with Down Syndrome need fewer calories to maintain their body weight than someone of the same weight and height with out Down Syndrome (10 – 15% less). The implications of this are two fold:

1. To maintain a healthy weight, children and adults with Down Syndrome must eat smaller quantities of foods and be wary eating high calorie foods.
2. Since they require fewer total calories, it can be a challenge to meet nutrient intakes from food.

Children with Down Syndrome compensated for the lower calorie requirement than their non-disabled peers by naturally making lower calorie choices. However these foods can have a lower nutritional density and lower micronutrient content. Nutritional intake can also be influenced by chewing concerns (e.g. only taking soft foods) or a developmental eating dysfunction.

The vitamin and mineral requirements for infants and children with Down Syndrome is the same as that of normal children. Nutritional supplements have not been shown to improve mental function. A nutritional supplement is only necessary if there is a dietary deficiency, with a good understanding of nutrition a parent should be able to ensure their child has an adequate diet for growth and requirement.

Feeding a baby or child with Down Syndrome can present a number of problems. Eating is one of the most complex things that we do. While we assume that everyone is born knowing what to do – it is actually a culmination of many developmental stages, experiences and sensory skills. For children with Down Syndrome successful eating happens but with a few bumps on the way. Children with Down Syndrome develop eating skills at their own pace like other children. Many children have difficulty co-ordinating tongue and mouth movements and some choke and gag frequently. If a child is having problems with feeding referral to a speech therapist for a feeding assessment is essential (Guthrie Medlan, 2002).

Breast/Formula Feeding for Down Syndrome Babies

A common obstacle in feeding babies with Down Syndrome is low muscle tone in the mouth and tongue. This affects the way a baby and “attach” to the nipple of a breast or bottle. Consulting a lactation consultant can provide practical support and help for the mother wishing to breast-feed. In bottle-fed babies the choice of nipple (teat) can help (slow/fast flow) baby suck milk out of the bottle more easily. For most infants a standard cow milk protein based formula is perfectly suitable. Occasionally a paediatrician or Dietitian may advise a specialist formula or additions to a feed (e.g. Duocal, thickener).

Sometimes a baby with Down Syndrome is unable to get adequate nourishment form breast or bottle-feeding especially infants born with a medical problem e.g. heart defect. These infants may require nutritional intervention such as tube feeding as the
energy requirement is enormous to sustain growth and development. Mothers can be encouraged to express breast milk for tube feeding. Once these children have recovered from surgery generally they can breast or bottle-feed. It maybe a little delayed but will come with time.

**Spoon feeding**

For most infants with Down Syndrome all that is needed is help promoting oral-motor development needed for eating. This is the process of developing the muscles and co-ordination to move foods around the mouth, chew and swallow them. The ages recommended for introducing different textures reflect the typical age that certain tongue and jaw movements develop (See section on weaning). Some children will follow the normal progress and experience no problems with the introduction of foods or with chewing. Others will experience delay because of lower muscle tone, difficulties learning to co-ordinate their tongue movements, apraxia, or smaller mouth cavity. Rather than using a child’s age to decide when to introduce new textures, watch the child eating and look for emerging skills that a child is ready to progress.

Encourage parents to be patient – children with Down Syndrome may be more likely to choke, gag or aspirate foods than other children. This can due to a sensitive gag reflex, difficulty co-ordinating mouth movements for swallowing or being distracted. Generally children will make great noises that they are having difficulties. This is a sign that the child is not physically ready for the foods they are being given.

If a parent is anxious that their child chokes or gags frequently, or takes a few swallows for a swig of milk then refer to a speech therapist for a swallowing assessment. Silent aspiration can happen when children are drinking – the parent may describe chirpy noises as if they are swallowing air, after taking a drink from a bottle or cup. Some of the liquid may be going down the child’s throat before they are ready. It can go into the lungs, which can result in aspiration pneumonia.

**Teeth and Eating**

Children with Down Syndrome do not always lose their baby teeth and when they do they are not always replaced with permanent teeth. This can cause problems with eating later on e.g. missing front teeth – biting problems, missing molars on one side – may only be able to chew on the other side. The delayed eruption of teeth in the beginning of life can continue in to childhood. Tooth eruption will affect food choices. When teeth are erupting, child will more than likely choose softer foods to avoid aggravating the gums.

Some children with Down Syndrome grind their teeth and over time this grinding may flatten the shape of the molars, making it difficult to chew some foods – consider this if a child is avoiding foods that are hard to chew, crunchy or chewy.

Encourage parents to consult with their dentist about their child’s oral health from a young age. Good dental health and good nutrition are partners in children’s overall health. A well balance diet is one of the primary defences against gum disease and problems with tooth development.
Common Problems in People with Down Syndrome

- **Constipation**

**Important!**
Constipation is one of the early symptoms of hypothyroidism – if the child has trouble with constipation for the first time in a long-time check the thyroid function.

- **Gastro-esophageal reflux**

- **Thyroid Disorders:** People with Down Syndrome have a great risk of thyroid disorders. If the thyroid makes too much T3 (thyroxine), metabolism increases, making it difficult to use calories for growth. When there is too little T3, metabolism slows, causing weight gain.

  **Hypothyroidism:** is the most common thyroid dysfunction in people with Down Syndrome and is recommended that children are screened on a regular basis (e.g. every six months). Thyroid replacement therapy will normalise growth and unexpected weight gain will decrease or stop. However any weight gained while untreated will likely remain.

  **Hyperthyroidism:** is less common in people with Down Syndrome but unexplained weight loss can be a symptom.

- **Celiac Disease:** There is an increased incidence of celiac disease among children with Down Syndrome affecting as much as 4 – 5% of people with Down Syndrome.

- **Diabetes:** People with Down Syndrome have a greater risk for developing diabetes. Studies state the incidence is anywhere between 3 – 10% among people (mainly adults). Young children can develop diabetes at any age. The type of medication required depends on the type of diabetes – all children require insulin for type 1 but older children with type 2 diabetes may need to take an oral hypoglycaemic. A healthy diet is the cornerstone of diabetes therapy. It is essential that a multidisciplinary team manages anyone with diabetes.

- **Obesity:** Generally children with Down Syndrome have a slower rate of growth in the first few years then those that don’t. This can be due to many health and medical influences. Many infants and toddlers are smaller and lighter than average. In general they are shorter and huskier although each child grows at a different rate. In addition to differences in growth rate, there are also differences in basal metabolic rate (BMR). This means that overall, people with Down Syndrome need fewer calories to maintain their body weight than someone of the same weight and height without Down Syndrome (10 – 15% less). The reduced BMR tends to catch up at adolescence when children tend to naturally gain weight just before a growth spurt. For children with Down Syndrome, the actual rate of growth during the growth spurt maybe slower than it is for other children and they do not grow as tall as their non-disabled peers. Some studies show that children with Down Syndrome finish growing sooner than the typical child. Consequently the extra weight an
adolescent needs for their growth spurt is less then expected. Growth spurts can end before parents are even aware that it was in full swing.

**Growth Monitoring**
All infants and children with Down Syndrome should have their weight and height checked on a regular basis and plotted on centile charts. Special growth charts are available for Down Syndrome from the Child Growth Foundation and similar in style to the UK90 charts. Identifying excess weight gain early is key to preventing obesity. A healthy weight for children is one that promotes optimal growth when leading a healthy lifestyle. While a child is growing the goal is to promote healthy eating and activity, and to slow the rate of gain or maintain the present weight until it is grown into. If a child’s weight is of concern then referral for Dietician support maybe required.
Food customs of different cultures

Some ethic communities may have different food customs from those that we are used to. The food customs may involve what foods are eaten, how the foods are prepared, what combinations of foods or when particular foods are eaten. Periods of celebration and celebration foods may bring new events to the pre-school. There may be periods of fasting, though very young children do not normally fast. However, the meals eaten at home may be different during fasting periods, such as a main meal late at night or breakfast very early. Check with parents about their individual food preferences and customs. Depending on the culture time of weaning can differ as can the first weaning foods.

Some food customs are listed in the table below. This is not a comprehensive list and there may be differences in food choices between families of the same ethnic community. If the exact source of the food is not known, such as the source of the fat in a product, families following a particular practice may avoid this food.

<table>
<thead>
<tr>
<th>FOOD</th>
<th>JEW</th>
<th>SIKH</th>
<th>MUSLIM</th>
<th>HINDU</th>
<th>BUDDHIST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eggs</td>
<td>No bloodspots</td>
<td>Yes</td>
<td>Yes</td>
<td>Some</td>
<td>Some</td>
</tr>
<tr>
<td>Milk/ Yogurt</td>
<td>Not with meat</td>
<td>Yes</td>
<td>Not with rennet</td>
<td>Not with rennet</td>
<td>Yes</td>
</tr>
<tr>
<td>Cheese</td>
<td>Not with meat</td>
<td>Some</td>
<td>Some</td>
<td>Some</td>
<td>Yes</td>
</tr>
<tr>
<td>Chicken</td>
<td>Kosher</td>
<td>Some</td>
<td>Halal</td>
<td>Some</td>
<td>No</td>
</tr>
<tr>
<td>Mutton/ Lamb</td>
<td>Kosher</td>
<td>Yes</td>
<td>Halal</td>
<td>Some</td>
<td>No</td>
</tr>
<tr>
<td>Beef</td>
<td>Kosher</td>
<td>No</td>
<td>Halal</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Pork</td>
<td>No</td>
<td>Rarely</td>
<td>No</td>
<td>Rarely</td>
<td>No</td>
</tr>
<tr>
<td>Fish</td>
<td>With scale, fins and back bone, no shellfish</td>
<td>Some</td>
<td>Halal</td>
<td>Some</td>
<td>No</td>
</tr>
<tr>
<td>Nuts, Pulses, Fruits &amp; Vegetables</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>
ETHNIC DIETARY INFORMATION

This section provides information on ethnic diets only and does not form part of the recommended food guidelines.

ANGOLA: The diet of people from Angola is similar to that of the Portuguese. The main meals are generally made up of gravy with 'fumge', dry fish and meat. Other common foods are rice, potatoes and various tropical fruits such as mango.

DEMOCRATIC REPUBLIC OF CONGO: Common staple foods include cassava, plantain, rice maize, vegetables and fish.

NIGERIA: There is no specific diet in Nigeria and no specific foods are forbidden. The most common foods used are rice, yams, cassava, meat, fish and vegetable stews, which are prepared according to one's own taste. People of the Muslim faith do not eat pork or pork products. Each ethnic group has particular foods for particular special occasions. (Above information provided by Access Ireland-Refugee Social Integration Project)

EASTERN EUROPE
Eastern European cooking often consists of foods such as goulash, sausages, dumplings, groats and schnitzel, but is also well known for its use of soups, game, forest products like mushrooms and wild berries and extravagant pastries. More details of some of the eastern European countries are outlined below: (Source: Lonely Planet Guide to Eastern Europe)

• ROMANIA: After many years of food shortages a wide variety of foods are now available in Romania but often at prices that most people cannot afford. The main influences are Mediterranean, Greek and Russian. Potatoes, maize, pork and chicken are the usual staples. Traditional dishes are sarmale, bors, tochitura, tocanita, mamaliga and ciorba de burta.

• ROMA: Roma gypsies eat a diet similar to the Romanian diet. All foods are allowed unless it is specifically prohibited by their religion; for example if they are Muslim, they do not eat pork. (Above information provided by Access Ireland-Refugee Social Integration Project)

• UKRAINE: Much of Ukraine's cooking is based on grains and vegetables such as potato, cabbage, beet and mushroom. Beef, pork, chicken and fish are widely used, and most dishes are boiled, fried or stewed. Desserts are usually laden with honey and fruit and baked into sweet breads. (Source: Lonely Planet Guide to Eastern Europe)

• RUSSIA: The essential components of Russian cooking provide more carbohydrates and fat than proteins because of their long cold winters. Fresh fruits and vegetables are rarely used in food. The top five components of a Russian meal are: Potato (boiled, fried, baked, potato chips, potato pancakes, potato soup, smashed potato) Bread (bread, toasts, bread-crumbs) Eggs (boiled, fried) Meat (pork and beef - chops, steaks)
Butter (usually added to all meals and spread on bread)
Also popular: cabbage, milk, sour cream, curds, mushrooms, lard, cucumbers, tomatoes, apples, berries, honey, sugar, salt, garlic, onions. Source: www.waytorussia.net/WhatIsRussia/RussianFood.html

Reference:

These guidelines were developed by the Community Nutrition & Dietetic Service, Health Promotion Department, Co Meath. HSE Dublin North East.

Often the role of the extended family is important culturally in feeding. Grandparents occasionally take responsibility for feeding older children to allow the mother focus on a younger child. In a family where the grandparents are not living in close proximity – a young mother can be sometimes overwhelmed and require support to successfully feed their child. In addition some cultures have particular breastfeeding practises in the first few days after birth – where the mother may not feed the baby.

It is possible on all these diets to ensure optimum nutrition for normal growth and development. However some of the typical foods of a home country may not be available in locally to them – and individuals may not know a suitable alternative. If there is any doubt about the nutritional adequacy of a diet and suspicion of a deficiency a Dietician can advise on appropriate and/or alternative suitable foods.
Growth and nutrition during childhood

After 2 years of age, growth continues at a slower but steady rate of 2.5 in. (6 cm) per year until about the age of 11 in girls and 13 in boys, when the growth spurt that accompanies adolescence usually begins. Optimal growth requires optimal health and nutrition.

Figure 1: Typical Pattern of Growth Rate (Reisner & Underwood, 2002)

![Girls' and Boys' Growth Rates](chart)

The growth rate (how fast the child is growing) is shown on the left side of the chart. The child's age in years is shown along the bottom. The most valuable tool for assessing a child's growth is a well-kept growth chart made up of accurate height and weight measurements. In the new growth charts for Irish children, the 91st and 98th BMI centile will be highlighted to give an indication of overweight and obesity levels (PAC Report, 2005). Although growth is slower than in infancy or early adolescence, school-aged children still have high nutritional needs, but fairly small appetites. Therefore, it's crucial that all meals and snacks are nutrient-dense.

Classical studies have shown calcium, iron and zinc to be essential micronutrients for growth and sexual maturity, and their retention by the body increases significantly during the growth spurt (Olmedilla and Granado 2000). Maximising peak bone mass within an individual’s genetic potential requires optimal calcium intakes throughout growth, but especially during adolescence when the rate of calcium accretion is highest (Weaver 2000). Calcium sources include dairy products, tofu, enriched Soya milk, sardines, dark-green leafy vegetables, and calcium-enriched orange juice. A reduced supply of both vitamin D and calcium is common among individuals who do not consume adequate amounts of dairy products and may have particularly deleterious effect on bone tissue accumulation (Docio et al 1998).

Ensuring nutritional quality

The link between diet and health has long been established, and the behaviour of children during the crucial years of development sets a pattern for a future of ill health if unhealthy dietary habits are established. Unhealthy eating and disordered eating behaviours among young adolescents are of concern in that they have the potential to adversely affect nutrient intake, mental health status, and long-term health outcomes (McPherson et al 1995; Improvements in concentration, attention, school attendance, physical activity and lesson grades have been attributed to better nutrition. The Irish National Teachers Organisation recognised the importance of
balanced diet in a published report (1994) on poverty and educational disadvantage. They reported that children who came to school without breakfast had the poorest attention span and concentration levels in the classroom. Neumark-Sztainer et al. (1999). Major barriers to eating more fruits, vegetables, and dairy products and eating fewer high-fat foods among adolescents include a lack of sense of urgency about personal health in relation to other concerns, and taste preferences for other foods. Suggestions for helping adolescents eat a more healthful diet include making healthful food taste and look better, limiting the availability of unhealthy options, making healthy food more available and convenient, teaching children good eating habits at an early age, and changing social norms to make it "cool" to eat healthily (Neumark-Sztainer et al. 1999).

The recent National Children’s Food Survey of 594 children aged 5-12 years old reported habitual food and beverage consumption (www.iuna.net) of Irish children. The main conclusions included a low intake of fruit and vegetables, a high intake of fat and salt and an inadequate fibre intake. The nutrients most at risk of deficiency included calcium, iron, vitamin D and folate. It also documented perceived barriers to providing healthy diets for children. The main barrier noted was the child’s own likes and dislikes of food, followed by convenience, food advertising and cost of food. A healthy growing child needs energy which must be supplied by the diet. Therefore, energy requirement expressed per kilogram of body weight are higher for prepubertal children than for adults and guidelines are given at particular ages rather than over a range of ages (FSAI 1999). Children should be encouraged to be as active as possible and their diet should supply enough energy through frequent meals and snacks based on the main food groups.

**Overweight and obesity**

Overweight and obesity among children is reported to have increased over the last 15 years since the Irish National Nutrition Survey (Hurson & Corish, 1997). Among boys, overweight increased 2.4-fold and obesity increased 1.3-fold. Among girls, overweight declined by 1% but obesity increased by almost three-fold. Of further concern is the amount of TV viewing documented with 36% and 68% watching more than 2 hours on a weekday and weekend day, respectively (www.iuns.net). The complications and risks to health are comprehensively described in Ebblings review (Ebbling et al. 2002) and include clustering of cardiovascular risk factors, type 2 diabetes, pulmonary complications and psychosocial consequences.

Bodyweight is precisely controlled and any factor that raises energy intake or decreases energy expenditure by even a small amount will cause obesity in the longterm (Ebbling et al. 2002). Cited causes of childhood obesity include genetic, prenatal, and early life factors, lack of physical activity, diet and family factors (Ebbling et al. 2002). Forty percent of Irish schoolchildren were found to consume more than the recommended daily amount of fat of 25-35% of total energy (www.iuna.net). One-fifth of the contribution to fat from foods was in the form of confectionary and snacks. There are several pervasive environmental factors that promote energy intake and limit energy expenditure in children and undermine individual efforts to maintain a healthy body weight (Ebbling et al. 2002). For example, the portion sizes of food have increased over the last twenty years, so what was considered a standard size twenty years ago may now be 2 to 5 times
larger. Set against the background of doing less activity, these increased portion sizes have led to what we call passive over consumption (Young & Nestle, 2003). In terms of managing childhood obesity, several systematic reviews have agreed that more research is necessary to determine best practice, particularly given the prevalence of the condition and the impact on their psychosocial and physical wellbeing (Summerbell et al 2003; Ebbling et al 2002). To date, evidence supports preventative interventions that encourage physical activity and a healthy diet, restrict sedentary activities and offer behavioural support. However, these interventions should not only involve the child but the whole family, school and community (Barlow & Dietz, 1998; Ells et al 2005).

**Dissatisfaction with body weight**

Fear of fatness, expressed as a desire to be thinner, is evident particularly among young girls and is associated with unhealthy behaviours that carry long-term health risks, for example smoking (Flynn 1997). Comparing the desire to be thinner in a study among young girls (39%, mean age 12 years) to that reported among older adolescent Dublin girls (59%, mean age 15 years) suggests that negative body image increasingly pervades progression to womanhood (Griffin et al 2004; Ryan et al 1998). Internationally, children as young as 8 years have reported dissatisfaction with their bodies. Available evidence suggests that at age 7 years and possibly earlier, children have acquired adult cultural perceptions of attractiveness (Feldman et al 1988). Three decades of population surveys of teenage girls in Western communities have documented that between a third and two-thirds of teenage girls are 'on a diet' at any one time (Patton et al 1997). Even among normal weight Dublin girls, aged 11 and 12 years, approximately one-third reported trying to lose weight (Griffin et al 2004).

In light of this, public health initiatives that aim to tackle the rising trends in obesity must also tackle the negative body image culture that pervades adolescence, particularly among girls. The most successful interventions are likely to be those that recognise that body image dissatisfaction is influenced by many social and environmental factors including media, peer and family (Field et al 2001; Shapiro et al 1997), and promote environments (for example, in schools and communities) that support active living and healthy eating (Ebbling et al 2002).

**School setting**

A child spends a large proportion of his/her time in school and it is estimated that a third of a child’s daily nutrient requirements need to be provided by their school lunch and snacks. Other benefits of having a healthy eating policy in the classroom include the development of socialisation skills (table manners and social skills around eating), and putting the lessons learned about healthy eating (that can incorporate elements of science, nature, maths, geography, etc) into practice. In order for food preferences and behaviour to change, two elements of memory need to be involved. Declarative memory retains information and facts about food and its effects, while procedural memory records skills and actions. Educational strategies need to engage both these areas of memory – education to improve knowledge (declarative) and opportunity to experience healthy eating such as cooking and tasting (procedural). Nutrition education needs continuous efforts and year-long programmes, not isolated actions (Westenhoefer, 2001; Summerbell et al, 2005).
The social, personal and health education (SPHE) as part of the curriculum supports the personal development, health and well-being of young people and helps them create and maintain supportive relationships (www.sphe.ie). In the Primary School Curriculum, SPHE provides specific opportunities to enable the child to understand himself or herself, to develop healthy relationships, and to establish and maintain healthy patterns of behaviour (www.ncca.ie). The SPHE Food & Nutrition curriculum for primary schools outlines key issues relating to food and nutrition and recommends that these are explored to the depths that are appropriate for the class. Teachers play a valuable role in communicating and supporting the healthy eating message, especially through the adoption of a whole school approach to healthy eating.

Assessment, techniques and referral criteria

Weight, height & Body Mass Index
Weight and height should be measured correctly and recorded on appropriate centile charts (refer to growth monitoring module). Body mass index (BMI) can be calculated from observed weight and height as follows:

\[
\text{Body mass index (kg/m}^2\text{)} = \frac{\text{Weight (kg)}}{(\text{Height (m)})^2}
\]

Requiring further investigation
Risk of overweight taken as a BMI > 91st percentile and < 98th percentile; overweight taken as ≥ 98th percentile using the Child Growth Foundation Charts as in the current Personal Health Record (HSE MWA; Cole et al 1995). These centiles will also be used in the new growth charts for Irish children that are currently being developed. Always follow the detailed instructions for use which are printed on the centile charts. The same centile chart should be used each time to be comparable.

An isolated measurement on a centile chart does not necessarily mean a great deal; there is considerable variability in normal height, weight or rate of growth and it is only a measurement that falls above the 99.6th or below the 0.4th centile which is a matter of concern (Cole 1994). Deviation of growth from a centile line is more indicative of impaired growth and a growth curve which crosses a centile line between two annual measurements (e.g. crossing from the 25th to 9th centile) warrants further investigation.

A community dietitian will accept a referral from Public Health Nurses, Area Medical Officers, General Practitioners, and Practice Nurses. An appropriate and standard referral form is available from your local community dietitian (see list provided).

Involving parents and family
Intervention should begin early as the risk of persistent obesity increases with the age of the child. Furthermore, change in adolescents was much more difficult to facilitate and sustain. The family must be ready for change. Lack of readiness would probably lead to failure which will frustrate the family and perhaps prevent further weight-control efforts. Families should be educated about medical complications of obesity. The child and family should understand the long-term risks of obesity, including hypertension, high cholesterol, and diabetes. Family history of these
diseases will identify children at particular risk and may help motivate the parents to try to prevent these problems in the child. The family and all caregivers should be involved. If the child is the only member of the family who changes eating habits or who must exercise, the child may feel deprived, scape-goated, or resentful and relapse is more likely. Regular caregivers who do not participate in the changes may undermine the treatment. Involvement of the entire family and all caregivers will create new family behaviours consistent with the child’s new eating and activity goals. Such environmental change will be essential to the long term success of the treatment. Treatment should institute permanent changes, not short-term diets or exercise programmes aimed at rapid weight loss. Slow, gradual, long-term changes will be more successful than multiple, frequent changes.

The family should learn to monitor eating and activity. Monitoring ensures that change has occurred and is maintained. This skill is the first step in independent problem solving. Common problems identified by monitoring include “saboteurs” (people who interfere with the changes with family is making), food consumption outside the home, lack of time for physical activity and food preparation, and identification of safe environments for activity. Periodic weight measurements at home may help the child maintain awareness of treatment goals and reinforce success, especially if frequent visits are not possible. However, weighing at home can be harmful if punitive attitudes or scape-goating, or if the child and family focus more on body image and less on the more important goals of healthier eating and lifestyle. The treatment should help the family make small, gradual changes. Health professionals should recommend 2-3 specific changes in diet/activity at a time and recommend additional changes only after child and family have mastered these changes. Health professionals should encourage and empathise and not criticise. Health professionals who are sensitive and not critical about ‘failure’ are in a position to help families try again (Barlow & Dietz, 1994).

**Considerations for obesity management**

As parents/caregivers institute the changes needed for successful treatment, they need support and guidance in basic parenting skills. The following principles should be emphasised in the management of eating and activity behaviours (Barlow & Dietz, 1998):

- Find reasons to praise the child’s behaviour. Remind parents that although children’s behaviours can be good or bad, children are always good. Therefore, praise and correction should focus on the behaviour and not on the child.
- Never use food as a reward. Instead activity and time spent with parents should reward desired behaviour.
- Parents can ask for ‘rewards’ from children in exchange for the changes in their own behaviours such as increasing time with the child or modifying activity and meals. For example, children could agree to allow parents to sleep late to reward them for playing football with them.
- Establish daily family meal and snack times.
- Parents/caregivers should determine what food is offered and when, and the child should decide whether to eat.
• Offer only healthy options. Parents can ask the child to choose between an apple or popcorn for a snack, not an apple or a biscuit, or ask the child to choose between outside play going to the park rather than to choose between outside play or TV. When children can choose, they are less likely to view the alternative they select as unattractive.
• Remove temptations. Parents can control the food that is purchased and limit or eliminate high fat or high sugar foods.
• Be a role model. Parents should improve their own eating habits and levels of activity.
• Be consistent. A parent may perpetuate undesirable behaviour by inconsistently ‘giving in’ to it.

Promoting healthy eating messages in the school setting

The following points should be considered when planning a healthy eating initiative within schools:
• Good nutrition is essential for school children. They need to receive sound understanding about why a variety of food is important for their optimum growth, development and health.
• They should be encouraged to have practical experience in preparing their own lunches and meals.
• A positive attitude to food should be encouraged. Children should enjoy their food. It is important to communicate the message that all foods have a place in a balanced diet. Foods should not be labelled as ‘good’ or ‘bad’. Food should never be used as a reward.
• Schools should be encouraged to develop their own policy on healthy eating. Children’s appetites vary with age and according to times of accelerated growth, therefore, it is important that the food intake of school children should not be limited unnecessarily. Children need energy and nutrients to fulfil growth needs and requirements for everyday activities.
• Children may need three meals a day and three snacks each day to ensure that their appetite and energy needs are met. The size of the meals and the number of the snacks required will depend on the child’s age and stage of development.
• Physical activity is integral to any healthy eating programme, and hence should also be promoted and encouraged.
• Involving teachers, parents and older children (each important role models) in any healthy eating training will ensure that children receive consistent messages at home and at school.

Available Resources

‘Healthy Eating for Children’ – HPU leaflet
• Children’s Food Pyramid
• Do’s and Don’ts for achieving healthy eating
• Suggested meal plans

‘Food & Nutrition Guidelines for Primary Schools’ – HPU booklet
• Promoting healthy eating in schools via SPHE curriculum
• The Food Pyramid and lunch suggestions
• Other meals that impact on the school day
• Vegetarian foods and alternative diets

Personal health record (HSE MWA)
• Monitoring a child’s growth using growth charts
• History of consultations with other health professionals.
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