GUIDELINE	
Nutrition for children – 1 to 11 years	
Scope (Staff):	Community health nurses
Scope (Area):	CAHS-CH, WACHS

This document should be read in conjunction with this DISCLAIMER

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Aim

To provide community health nurses guidance on healthy eating and nutrition issues for children aged 1 to 11 years. A companion guideline exists entitled *Nutrition for children – birth to 12 months*.

Risk

Failure to establish healthy eating patterns in these critical years will impact on normal growth and development, and increase the risk of lifestyle related chronic diseases in later life**.**

Background

What we eat has a significant impact on health. The quantity and quality of foods and drinks consumed has a major effect on the health and wellbeing of individuals, society and the environment; therefore better nutrition has huge potential to improve individual and public health and decrease costs to the healthcare system.[1]

Optimum nutrition is essential for the normal growth and physical and cognitive development of children. It is linked to the incidence of many common childhood conditions such as iron-deficiency anaemia, tooth decay and vitamin D deficiency. In all Australians, nutrition contributes significantly to healthy weight, quality of life and wellbeing, resistance to infection, and protection against chronic disease and premature death. Less than optimal nutrition is associated with ill health. Many diet-related chronic diseases such as cardiovascular disease, type 2 diabetes and some forms of cancer are major causes of death and disability among Australians.[1]

Most of the burden of disease due to poor nutrition in Australia is associated with excess intake of energy-dense and relatively nutrient-poor foods (high in energy, saturated fat, added or refined sugars or salt), and/or inadequate intake of nutrient-dense foods, including vegetables, fruit and wholegrain cereals.[1]

Nutrition is also considered as one of the main drivers in shaping the gut microbiota or microbiome (human digestive-tract associated microbes) across the life time.[2] The human gut microbiome and its role in both health and disease has been the subject of extensive research, establishing its involvement in human metabolism, nutrition, physiology and immune function. Imbalance of the normal gut microbiota has been linked with gastrointestinal conditions, such as inflammatory bowel disease (IBD) and irritable bowel syndrome (IBS), and wider systemic manifestations of disease, such as obesity and type 2 diabetes.[3]

Another aspect of nutrition in childhood is eating behaviour which is also influenced by the wider environment. Important factors include: parental food preferences and beliefs; food access and availability; child/parent interactions related to food; the behaviour of other role models; presence of food allergies/intolerances; and the media.[4] Other factors to consider include any mechanical feeding difficulties or sensory processing aspects that can affect a child's food intake and preferences.

Key Points

- Nutrition contributes significantly to healthy weight, quality of life and wellbeing, resistance to infection and protection against chronic disease and premature death. Optimum nutrition is essential for the normal growth and physical and cognitive development of infants and children.[1]

- Parents/caregivers can help children establish positive eating habits by setting regular meal patterns, modelling positive food behaviours and providing a wide range of tastes and textures in appropriate amounts.
- Nurses should make appropriate referrals if the child's appetite, growth or developmental milestones are impaired and further assessment is required.
- Nurses are expected to take CAHS-CH policies fully into account when exercising their clinical judgement. However, this guidance does not override the responsibility of nurses to make decisions relevant to the circumstances of each client, in consultation with the client and/or their caregiver.

Developmental stages

Toddler-aged children (1-3 years)

The toddler years (between the ages of one and three), are a busy time for children as they begin to explore life independently. It is a time when children are learning eating behaviours, skills, knowledge and attitudes relating to food. Providing appropriate amounts of a variety of nutritious foods and encouraging plenty of physical activity, in both a supportive and safe environment, will assist in building life-long healthy eating and physical activity practices which are essential for optimal growth and development.[5]

Compared to younger infants, toddlers grow at a slower rate and often have a reduced appetite. Limited and selective eating is common in this age group and can be considered a normal part of their development, although it may continue into early childhood. This may consist of fussy and picky eating. For specific information on these topics, food refusal and alternative food choices, see Appendix A. Developmentally, these children are at a stage where independence is very important to them and food refusal can provide a sense of control. These reasons can make meal and snack time challenging for parents/caregivers. Generally, toddlers will consume as much food as they require to satisfy their hunger.

Understanding normal toddler development is essential when assessing nutritional needs. During the toddler years, they may:

- want to explore and play; they may feel there are more exciting things to do than eating
    - advise parents that high chairs should meet Australian safety standards and toddlers are securely supported
- want some form of control in their lives and choosing not to eat is a way they can assert themselves. "No" can become their favourite word
- have small appetites and require a routine of small frequent meals and snacks rather than three larger meals per day
- have likes and dislikes and will be very firm about them, however, these are often transitory
- have bouts of independence and dependence where they can self-feed with no assistance one day, then want to be fed by their parent/caregiver the next.[6]

Choking prevention

Toddlers are at an increased risk of choking compared to older children as they are still learning to eat, have incomplete dentition, and have a small airway diameter.[7]

Anticipatory guidance to parents/caregivers to keep toddlers safe from choking, should include the following points:

- supervise meal and snack time
- have them seated when eating
- never force them to eat
- encourage them to chew their food slowly and well.

Food pieces should be kept small so they are easily swallowed and the following foods should be **avoided**:

- whole nuts and seeds
- popcorn and corn chips
- chunks of hard fruits and vegetables*
- sausages with skin on*
- whole grapes and cherry tomatoes*
- hard lollies and other hard food.[7]

*Keep in mind that some of these foods can be eaten if prepared properly, such as cutting in half lengthwise or into small pieces and, in some cases, removing skins.

Developmental feeding skills

Eating requires coordination and muscle strength and involves movement of mouth, lips, tongue, cheeks and jaw. These skills develop over time with experience and exposure to foods of difference textures which require: up-down; munching/chewing; side-to-side tongue movements; and rotary jaw movements.

The use of bottles, dummies, sippy-cups and frequent feeding of children from food pouches encourages a sucking action, and may not give children enough practice to develop other feeding skills, e.g. chewing. Sucking is something that they do very well already and children have been seen to have difficulty moving from purees to other textures if they use pouches for too long and may miss the window of opportunity to learn how to handle varied textures and self-feed. Studies show that the late introduction of lumpy food has been associated with feeding problems later on.[8] Food pouches also remove the touch, sight and smell of food and do not help to expand the palate. Most of them taste sweet, even those with kale, spinach, whole grains and other generally non-sweet tasting ingredients.[9, 10]

Refer parents/caregivers to *Toddler Tucker* pamphlet or *Raising Children Network* website for more specific information and ideas on these topics.

Preschool-aged children (3-5 years)

The preschool-aged child has more developed motor skills, handles utensils and cups efficiently and can sit at the table for meals. As growth has slowed, their interest in eating can be unpredictable with periods of no interest in food. In addition, their attention span may limit the amount of time they can spend sitting at mealtimes. They can be encouraged to join the family meals for reasonable periods of time (15-20 minutes) whether they eat or not.[7]

When children observe and interact with other adults and children, they become aware of when and where eating takes place, and of different foods consumed at each eating occasion. Gradually, their food selection and intake are influenced by

environmental cues, energy-dense foods, parental feeding styles/preferences and eating behaviours of importance to others.[7]

During this period, children also move from eating on demand to a more adult-like eating pattern, consuming three meals per day and several smaller snacks. Their intake may seem erratic or irregular, however, they do have the ability to adjust food intake so that their total daily energy intake remains fairly constant. They remain dependent on adults to offer them a variety of nutritious and developmentally appropriate food and to role model the consumption of these foods.[7]

School-aged children (5+ years)

Older children experience slow and steady growth prior to the onset of puberty. Their nutritional needs can be met by consuming a wide variety of nutritious foods, whilst gradually adjusting portion sizes to meet increasing energy needs for growth, development and physical activity.

After starting school, children begin to make some of their own lifestyle choices as they spend more time with friends, earn pocket money and access school canteens. This is a time when children are strongly influenced by peer pressure as well as by information they receive from the media. It is important for parents/caregivers and schools to provide consistent and healthy messages to help children adopt lifelong healthy eating and physical activity behaviours.

Energy requirements

A varied and nutritious diet is recommended for children. The *Australian Dietary Guidelines* provides the recommended number of daily serves from the five food groups with specific serve size amounts. Appendix B provides details of serves and serving sizes. Consuming the recommended amount of food daily provides the body with adequate energy to undertake functioning of metabolic processes, physiological functions, muscular activity, heat production, growth and synthesis of new tissues. One unit of energy is expressed as one kilojoule (kJ).[1]

The amount of energy required on a daily basis is dependent on factors such as age, gender, weight, height and physical activity. Over the age of three years, height and physical activity information is needed to calculate energy requirements; therefore a blanket estimate cannot be made in this context.[11]

Offering smaller serves can be more effective for toddlers. The accomplishment of finishing their plate and the autonomy in asking for more may assist with a higher success rate at meal and snack time. Food and drinks should be provided in easy to handle forms with appropriate sized utensils, including cups which are easy to hold.[12]

Some foods and drinks are not necessary for a healthy diet and are too high in saturated fat and/or added sugars or added salt and low in fibre. These are considered 'sometimes or discretionary' choices and should be limited in children's diets and not used as rewards.[1]

Drinks/Fluids

Children's fluid requirements depend on their body size and activity levels. Children who are very physically active are more prone to dehydration, thus fluids lost through perspiration need to be promptly replaced.

- From 12 months of age, water and cow's milk should be the main drinks offered. Breastmilk can continue to be offered as long as the mother and child desire.

- Where available, clean and safe tap water should be offered, especially if it contains fluoride.
- Toddlers should be offered milk and water in a cup rather than a bottle. Toddlers who drink from a bottle for too long are at an increased risk of tooth decay and ear infections.[8]

Water

Water is required for digestion, absorption, transportation, elimination of waste products and to regulate body temperature. Tap water helps to protect the teeth from decay and beginning a water drinking routine at a young age will instil good practice for later life.[1] The NHMRC *Nutrient Reference Values for Australia and New Zealand* resource contains guidance on the intake of water that can be consumed over the course of a day. However, there is no single recommended intake, as water requirements at any one time will vary depending on climate, physical activity, body surface area and individual metabolism. Total water requirements include the water content of foods as well as fluids. The following intakes can be used as a general guide for fluids:

- about 1.4 L (4–5 cups) of fluids a day for children up to 8 years, and
- about 1.6 L (6–8 cups) for adolescents.[11]

Most fluid needs can be met by drinking plain water. Australian tap water is an ideal option because it is inexpensive and meets high quality taste and hygiene standards. Most tap water in Australia is fluoridated, which has been shown to be a safe and effective public health measure. Fluoridation of tap water provides an additional benefit for development of strong teeth and bones, making it a good choice to ensure adequate hydration.[1]

Milk

Milk is a healthy drink for children, providing important nutrients such as calcium, protein, riboflavin and vitamin B_{12}. Calcium is important for skeletal growth and in the attainment of peak bone mass.[5] Milk, cheese and yoghurt provide a convenient and readily absorbable source of calcium, contributing around 60% of the calcium eaten. Few foods provide as much absorbable calcium per serve as dairy foods. Foods such as canned fish eaten with the bones, green leafy vegetables, nuts such as almonds, cereals and legumes, also contribute calcium to the diet, but in much smaller amounts than dairy foods.[13] Refer families to the *Better Health Channel* website for detailed information on calcium.

From 12 months of age:

- plain cow's milk in the full cream variety (4% fat) can be offered as a drink. The extra kilojoules in full cream milk are needed for growth.[8]
- the consumption of cow's milk should be limited to between 400-500 mL because of the high protein and low iron content. If a child has too much cow's milk it can inhibit appetite for other nutrient rich foods and reduce diversity in the diet.[8] Refer to Appendix B for the recommended number of serves and serving sizes.)
- A child should be referred to a medical practitioner if they show any signs of milk allergy or intolerance.

From 2 years and older:

- reduced fat milk is recommended - Low-fat and reduced-fat milks (including skim milk) have a fat content of 0.1–2.5% compared to the usual 4% in full cream milks.[8]
- A child should be referred to a medical practitioner if they show any signs of milk allergy or intolerance.

The following tips will assist with healthy and safe milk consumption.

- Pasteurised milk is recommended for children. Unpasteurised milks have additional risks and have been associated with the development of infections such as Q fever, toxoplasmosis, brucellosis and E.coli–associated haemolytic uremic syndrome.[1, 8]
- Sweetened flavoured milk provides nutrients, however, can be energy dense, thus plain milk is recommended.
- 'Toddler milks' or 'follow on' formulas are not required for healthy children. These formulas are not a suitable alternative to a balanced diet.[8]

NB: **Goat's milk is not superior to cow's milk.** An exclusive, whole goat's milk diet can cause severe morbidity, and potentially mortality, in infants. Like cow's milk, goat's milk has high electrolyte and protein concentrations giving it a high renal solute load.[8]

For children who do not drink cow's milk, other dairy and non-dairy sources of calcium are listed in Appendix A.

Other drinks

- **Fortified calcium-enriched plant-based drinks (soy, rice and oat).** These can be used after 12 months of age in the management of cow's milk protein allergy. They should be used under health professional supervision, and as long as other sources of protein and vitamin B_{12} are included in the diet. It is recommended that they are fortified with calcium to a minimum value of 100mg of calcium per 100g and contain the age-appropriate fat content.[1, 8]
- **Fruit juice** (100% juice) is only recommended occasionally, as it is a concentrated source of sugar. Whole fruit should always be recommended as an alternative to fruit juice, due to the low fibre content and high energy density of fruit juice. If juice is offered, it should be diluted to a one-in-three concentration and limited to no more than one small glass (125mL) in a day. Too much fruit juice, in particular, can cause toddler diarrhoea and displacement of food, and can lead to problems such as obesity and dental caries.[1]
- **Coffee, cola drinks, soft drinks, cordials, energy drinks** have low nutrient density, are high in sugar, cause tooth decay and can displace other nutritious foods in the diet. **Caffeine is not suitable for young children**.[1]
    - There is no recognised health-based guidance value, such as an Acceptable Daily Intake, for caffeine. However, a Food Standards Australia and New Zealand (FSANZ) Expert Working Group analysed the available literature and concluded that there was evidence of increased anxiety levels in children at doses of about 3mg of caffeine per kilogram of bodyweight per day in children aged 5-12. The anxiety

level for children aged 5-12 equates to a caffeine dose of 95mg per day (approximately two cans of cola).[14]

- Diet soft drinks are often promoted as a healthy alternative as they are lower in calories and sugar; however, they retain many of the components of regular soft drinks which have been associated with negative effects such as high levels of acidity which can cause tooth erosion.[1]

- **Tea** contains tannins and other compounds that bind minerals (e.g. iron) and impair the body's ability to absorb them. In addition, sugar is often added to tea, which increases the risk of dental caries. Excessive tea intake may also displace intake of other nutrient-dense foods in the diet.[8]
- **Sports drinks** are flavoured beverages that often contain carbohydrates, minerals, electrolytes (e.g. sodium, potassium, calcium, magnesium) and sometimes vitamins and other nutrients. They are designed to replace lost electrolytes in long duration/intense exercise. Most children do not participate in such high levels of activity and therefore sports drinks are unnecessary. Routine intake of sports drinks can increase overall daily energy intake without significant additional nutrient value, thus leading to a greater risk of overweight and obesity.[1]

Eating behaviours

Eating routine and structure is particularly important for the young child. During preschool years, young children begin to transition to adult-like eating behaviours in which consumption should focus on the provision of routinely scheduled meals and snacks (4-6 eating occasions per day).[7] The physical environment is important and should be structured to promote healthy eating with limited distractions, such as television, screen-based activities or other activities.

The toddler and preschool years can present challenges for parents/caregivers. A model regarding the division of responsibility in feeding is helpful when discussing this with parents/caregivers.[15] This guidance is illustrated in Table1 below.

Table 1: Feeding guidance for parents/caregivers[15]

Parent's responsibilities include:

- choosing food
- setting mealtime routines
- creating positive mealtime environments with appropriate physical components (chairs, tables, utensils, etc.) that are free from distractions (television, loud music, computers)
- learning how to offer developmentally appropriate serving sizes for children
- modelling behaviours they would like their children to learn
- regarding mealtime as a time for mastery and learning in relation to social and eating skills, and with respect to community and family time.

Child's responsibilities include:

- Deciding *which of the foods* (offered by parents/caregivers) they will consume and *how much* to eat.[15]

Parents/caregivers can be reminded that:

- Foods should be offered repeatedly (up to 8-10 times), and patiently, to establish children's acceptance of the food. Sampling small quantities of new foods may fall short of the parent's expectations, however is required to build food acceptance.
- Children need a routine schedule of around 3 meals and 2-3 snacks per day.
- Mastery of skills such as holding and using a spoon, drinking from a cup and helping prepare meals when they are able, helps children's learning and sense of accomplishment.
- Pressure and coercion may have short-term benefits but in the end will make feeding more difficult, and eating less pleasurable and rewarding.

Eating patterns

There appear to be complex relationships between dietary patterns established in childhood and dietary quality over time.

Breakfast

Breakfast is the most important meal of the day as it influences how much energy children have for physical activity and their concentration, memory and learning at school. However, children skip breakfast more than any other meal. The reasons cited are predominantly lack of time or not being hungry.[7]

Breakfast foods should be high in carbohydrates and fibre (such as breads and cereals), and protein and include as many food groups as possible. Whole grain cereals such as wheat biscuits and oats (porridge) are nutritious breakfast foods that are high in fibre and low in sodium and sugar. High sugar cereals are often marketed towards children but should be limited. Some cereals also contain high amounts of sodium so label reading is encouraged. An increasing number of studies have reported a protective association of consuming breakfast on body mass index (BMI) in children, particularly for ready-to-eat cereal.[7] Refer families to the *Raising Children Network* website for information on label reading.

If children don't feel hungry at breakfast time, parents/caregivers can provide a small breakfast, e.g. a piece of fruit) until the body adapts to eating in the mornings.[7] Nourishing drinks (milk/fruit smoothie, or food items like boiled egg, raisin toast or baked beans can also be provided instead of cereal options.

Snacks

Young children have small stomachs and cannot consume a wide variety of foods in just three main meals. They often need to top up their energy between meals and this can be done with snacks. Some of the studies indicate that up to a quarter of daily energy needs are met with snacks in young preschool age children. Most commercial snack foods are high in fat, sugar and/or salt, provide few nutrients and are high in energy. Therefore it is important for parents/caregivers to offer healthy snacks which could include: fresh fruit, wholegrain crackers, cheese, bread products, milk, sandwiches, peanut butter and yoghurt.[7]

Nutrition related issues

Healthy bowels

Being 'regular' is a way of describing good bowel habits or normal bowel function. The term regular is often misunderstood to mean going to the toilet to pass faeces every day. It's common for people to empty their bowel once a day, although it's still

normal to do so more or less often. Being regular really means that soft, yet well-formed bowel motions are easily passed and that this happens anywhere from 1–3 times a day to 3 times a week. The *Bristol Stool Chart* (listed in the *Useful external resources* section) is an easy way to identify what faeces should look like.The bowel usually wants to empty about 30 minutes after a meal (commonly breakfast), but this can vary from person to person.[16]

Constipation is a condition in which a child passes infrequent bowel movements (fewer than three complete stools per week), has painful defecation, or passes large calibre and hard stools that may require excessive straining.[17]

Constipation is common throughout childhood and often accepted as a normal variation that will resolve as children get older. It is seen more often when children are being toilet trained and/or starting school.The opportunity for early intervention is often missed, and may result in complications, such as anal fissure, stool withholding, and fecal incontinence (also known as encopresis).[18]

The prevention of constipation focuses on timely anticipatory guidance regarding diet, toilet training, and toileting behaviours. The treatment of constipation depends upon the age of the child and the duration of symptoms. It may involve education, dietary changes, behaviour changes, and pharmacotherapy, alone, or in combination.[18] If hard stools persist, referral to a medical practitioner should be considered.

Anticipatory guidance for parents/caregivers includes the following:

- Establish a regular toilet routine.
- Encourage the child to be active every day.
- Drink plenty of fluids and encourage water as a drink.
- Offer foods that are high in fibre such as fresh fruits and vegetables and wholegrain breads and cereals.

Refer parents/caregivers to *Raising Children Network* website and the *Continence Foundation of Australia* website, both of which are listed in the *Useful external resources* section of this guideline.

Dental health

Dental decay occurs when plaque, an almost invisible film of bacteria that forms on teeth, uses available sugars to produce acids that attack teeth. When the acid attack occurs often, teeth can decay over time. Other factors that impact on dental decay are oral hygiene, dental care, fluoridated water supplies and the type of food eaten. The more often foods containing added sugars are consumed, the greater the risk of caries, since frequent consumption does not allow remineralisation of the teeth. The duration of exposure depends on how long sugary foods stay in the mouth and the number of eating occasions.[1]

According to the National Health and Medical Research Council, the advice on sugar intake for preventing dental caries should include *frequency* of intake as well as the *amount*. The acid content of sweetened drinks is also relevant to dental erosion which is a major factor in dental decay. This applies equally to sugar-sweetened or diet soft drinks, since their acidity is comparable.[1, 19]

Key messages for parents/caregivers regarding prevention of tooth decay include:

- Offer a wide variety of nutritious foods, plenty of fresh fruit and vegetables, wholegrain cereals, plant-based protein sources, lean meats and high-calcium foods (dairy products)
- Avoid high acid and sugar containing soft drinks and fruit juices
- The calcium in milk and cheese can protect teeth
- Limit sugary snacks, including sultanas and other dried fruit, and boiled lollies/ lolly pops that sit in the mouth for periods of time
- Water should be the main drink
- If using a bottle, avoid giving any drink in a bottle in bed
- Clean a toddler's teeth by brushing morning and night until they turn 5 years of age or when they can do it themselves.

Anticipatory guidance for parents/caregivers regarding oral health care should begin even before the teeth start to erupt.[20]

From 12 to 18 months[21]

- A child's teeth should be cleaned from the time they appear in the mouth. At first, a moistened soft cloth may be used to gently wipe the teeth around the gum line.
- When a few teeth are present, the cloth should be replaced by a toothbrush with a small head and soft bristles. Cleaning should be done at least *twice* a day following the last feed with plain water only.
- No toothpaste should be used for children under 18 months of age.[22]
- A toddler's first visit to the dentist should take place no later than their second birthday. See *Lift the Lip (Dental) Referral Options* in the *Related internal resources and forms* section of this document and the *Child Dental Benefits Schedule* in the *Useful external resources* section.

From 18 months of age[21]

- Use a small pea-sized amount of low-strength fluoride toothpaste. Too much fluoride exposure affects young teeth and milk mottling of permanent teeth can occur.
- Parents/caregivers should continue to brush a toddler's teeth, once in the morning and again before going to bed, ideally for a total of two minutes per brushing session.
- Encourage the toddler to spit out, not swallow and not rinse after brushing.
- This routine should continue until the child is five years old along with continued supervision to ensure the toothpaste is not swallowed; as some children enjoy the taste of toothpaste.

The *Oral health examination* procedure provides more information on oral health issues and the role of the nurse in conducting the *Lift the Lip* examination and resources for parents/caregivers.

Food allergy and food intolerance

Food allergy is an abnormal immune-mediated reaction to ingested food, resulting in clinical symptoms.

Symptoms of food allergy and anaphylaxis

Parents/caregivers should be aware of the symptoms of food allergy classed as mild to moderate reactions, or as anaphylaxis, which is severe and requires immediate treatment with adrenaline and emergency medical aid.

Mild to moderate symptoms of food allergy include:

- swelling of lips, face, eyes
- hives or welts
- tingling mouth
- abdominal pain, vomiting
- eczema or rashes.[23]

Anaphylaxis is defined by any one of the following, which may occur in isolation or in conjunction with the mild to moderate symptoms listed above:

- difficult/noisy breathing
- swelling of tongue
- swelling/tightness in throat
- difficulty talking and/or hoarse voice
- wheeze or persistent cough
- persistent dizziness or collapse
- pale and floppiness in young children.[23]

The incidence of food allergy in children under 5 years of age is around 4 to 8%. While any food can cause an allergic reaction, around 90% of food allergic reactions are caused by the foods below:

- eggs
- peanuts
- tree nuts (most other nuts)
- cow's milk
- fish
- shellfish
- sesame
- soy
- wheat

Around 85% of children with allergy to cow's milk, egg, soy and wheat will outgrow their allergy sometime in childhood. Allergies to peanut, tree nuts, sesame, fish and shellfish tend to persist into adulthood.[23]

Risk factors for developing a food allergy

Children have a higher risk of developing food allergy if:

- a parent or sibling has current allergic disease, or a history of allergic disease (this includes food allergy, asthma, eczema, allergic rhinitis).[24]
- the child has moderate to severe atopic dermatitis. The risk is even higher if the infant developed early onset severe eczema (within the first 3 months of life).[24]

Management of food allergy

In the school environment, it is important that all staff (including canteen and relief staff) are informed about the specific health needs of the child. It is recommended that a health care plan (according to the *Student health care plans* guideline) be completed, involving specialist medical advice and a medical emergency response in case of an allergic reaction.

Parents/caregivers of children who suffer from allergies and anaphylaxis are strongly advised to always seek specialist advice and diagnosis for the condition.

Nurses in schools are encouraged to advise parents/caregivers:

- of the importance of receiving proper diagnosis of a food allergy, anaphylaxis and intolerance from paediatric allergist or immunologist
- to attend training or be informed about the use of an adrenaline autoinjector
- to seek further information from health professionals.

Food intolerance can result in similar clinical reactions to food allergy, but the reaction is not mediated by the immune system. These reactions can be metabolic, pharmacologic, toxic or idiopathic/undefined. The prevalence of food intolerance in children is unknown.

Diagnosis and management of a food allergy

If an infant or child has symptoms suggestive of an adverse food reaction, the child should be referred to a specialist paediatric clinical immunology/allergy specialist for diagnosis. If there are signs of anaphylaxis, parents/carers should seek urgent medical attention and call an ambulance.

Families with allergic children need medical and health professionals to provide: individualised advice and support regarding emergency action plans; environmental controls; monitor/optimise treatment of asthma and eczema; allergen avoidance education and nutritional counselling by a dietitian to ensure the child's diet is nutritionally adequate for growth and developmental needs.[23]

Food allergies are managed by complete avoidance of single or multiple food allergens that cause reactions. Families with food allergic children need appropriate health professional care and follow up, such as a paediatric allergist or immunologist, paediatrician and dietitian.

Food intolerance

Food intolerance and food allergy are commonly confused due to similarity and overlapping in some symptoms. It is important to note that the symptoms of food intolerance are not a result of an immune mediated reaction.

Most food intolerances are:

- Metabolic – such as lactose intolerance which is the result of an enzyme deficiency and can cause bloating and diarrhoea.
- Pharmacological – reactions to components in food such as caffeine, monosodium glutamate and, uncommonly, naturally occurring food chemicals such as salicylates and amines. Diets restricting these substances are not well substantiated in the literature and should be used with caution in children.[25]
- Toxic - such as scombroid fish toxin.

- Ideopathic/undefined - such as reactions to sulphite preservative.

The exception to this is coeliac disease, which is an immune mediated intolerance to the dietary protein gluten.[23] This is one of the most common autoimmune illnesses in Australia with 1.5% of Australians having coeliac. However, coeliacs' broad and often subtle presentation makes detection challenging, and means 80% of Australians with coeliac disease remain undetected.[26]

There are no reliable skin or blood tests to diagnose food intolerance (apart from coeliac disease). It is therefore imperative that diagnosis of food allergy and risk of anaphylaxis is medically confirmed for an infant or young child before proceeding to investigate whether symptoms are due to a possible food intolerance.

Diagnosis of food allergy or intolerance can be difficult and should be supervised by a medical practitioner and a dietitian, with experience in food allergy and intolerance, as elimination of foods from the diet and rechallenge with foods is likely to be involved. As highly restrictive diets can adversely affect nutritional status and affect feeding development, it is important to exclude the presence of true food allergy or other underlying medical conditions that could be responsible for symptoms in the infant or child, prior to conducting exclusion diets for the investigation of food intolerance. Poor growth and poor nutritional status in children on long term exclusion diets have been documented.[27] Feeding disorders in children with food allergy are common.[23]

There are a number of scientifically unvalidated tests conducted by alternative health practitioners that claim to diagnose food allergy. These include: IgG testing, Vega testing and cytotoxic testing. More information on *unorthodox allergy tests* can be found at the ASCIA website. For more information, see Appendix C on these topics.

Food safety/foodborne illness

Foodborne illness appears to be increasing in incidence in Australia and worldwide, and is a significant public health problem. Foodborne illness is caused by contaminated foods. Contaminants include pathogens, environmental contaminants and adulterants. Food poisoning generally occurs when pathogenic micro-organisms multiply to harmful levels as a result of incorrect handling of food, particularly when temperature control is inadequate. Prevention of contamination is the key to avoiding foodborne illness. Once pathogens contaminate food they can multiply and/or produce toxins if not handled correctly. Heat can kill many bacteria and viruses and is the basis for many food safety strategies. However, even reheating food to high temperatures will not destroy all toxins. Lack of access to quality food, as well as lack of refrigeration and suitable storage, poses threats to vulnerable groups. Isolated and poorer communities can be at higher risk as a result of inadequate storage facilities or limited access to regular food supplies.[7]

A number of foods increase the risk of infection and/or illness in infants and young children, and should be avoided, including: raw or partially cooked eggs (even in home-made ice cream or mayonnaise), raw meat, raw sprouts, freshly prepared juice from juice bars, unpasteurised milk and products made from unpasteurised milk.

Encourage families to practice hand hygiene principles when preparing and handling foods. Detailed information on this can be found in the appendices of the *Nutrition for children - birth to12 months* guideline. In addition, parents/caregivers can be referred to the *Raising Children Network* website for more information on 'food poisoning'.

Iron deficiency anaemia

Iron deficiency is the most common nutritional deficiency in childhood. The most likely cause for iron deficiency in childhood is an inadequate amount of iron in the diet, coupled with the extra requirements for growth. Children may be at risk of iron deficiency in the following situations:

- Prematurity and low birth weight
- Mothers who had low iron stores when pregnant
- Vegetarian/vegan diets
- Excessive intake of cow's or other milks (more than 500mL/day)
- Tea drinkers – Tannins in tea inhibit iron absorption
- Rapid growth and inadequate iron intake
- Restricted diets which may be due to selective eating (fussy or picky eating)
- Chronic disease, such as coeliac.[28, 29]

Parents/caregivers should be encouraged to seek a diagnosis of iron deficiency anaemia from a medical practitioner. Dietary modification is the main treatment of iron deficiency in children, with an emphasis on iron-rich food sources, especially sources of haem iron (such as red meat, chicken and fish) consumed with foods high in vitamin C. High consumption of absorption inhibitors should be avoided (such as tea, coffee or fibre).

Some general guidance on foods with the highest sources of iron include:

Animal foods (haem iron); these are the best sources of iron and are most easily absorbed by the body and include:

- Lean red meats such as beef, lamb and veal
- Chicken, pork (including ham), fish, tuna, salmon and shellfish
- Offal meats such as liver and kidney
- Eggs.

Plant foods (non-haem iron); these are not as easily absorbed but are still important, and include:

- Iron-fortified breakfast cereals (check the label to see if iron is added)
- Wholemeal/wholegrain breads, also some white bread brands have iron added
- Legumes e.g. lentils, baked beans, soybeans, kidney beans, chickpeas
- Tofu
- Leafy green vegetables e.g. spinach, parsley, broccoli
- Dried fruit e.g. apricots, sultanas
- Peanut butter and nuts (whole nuts are not recommended for children under five)
- Tahini and hommus
- Seeds, e.g. sesame seeds
- Malt based drink for older children.

Refer to *Anaemia in childhood* guideline for more information on the issue and iron content of foods. Iron supplements may be recommended by a medical practitioner in the short term to correct iron deficiency. Refer families to the *Better Health Channel* website for detailed information on iron.

Overweight and obesity

Refer to the *Overweight and Obesity* and *Growth – birth to 18 years* guidelines for more information.

Vegetarian/Vegan diets

Vegetarian and vegan diets are appropriate, if well-planned, and can meet the nutrient needs and promote normal growth at all stages of the life cycle, including pregnancy and lactation, infancy, childhood, adolescence and for athletes.[30] Care needs to be taken with a plant-based diet to ensure that supplies of iron, B_{12} and zinc are adequate. This is an important issue as iron is vital for neurocognitive development.[8]

Children on vegetarian diets should obtain iron from foods such as legumes, nuts, tofu, wholemeal pasta, cereals, grains, eggs, brown rice and wholemeal bread. Vitamin C-rich foods should be included as part of the meal to increase the non-haem iron absorption. Children eating a vegetarian diet should consume protein-rich foods such as tofu, cottage cheese, yoghurt or soy yoghurt, eggs, nuts and seeds and legumes (e.g. beans, peas, chickpeas and lentils) to ensure they receive nutrients otherwise obtained from meat.[8] Strict 'protein combining' is not necessary, providing energy intake is adequate and a variety of plant foods are eaten each day.[30, 31]

Vegan mothers should be advised to breastfeed their infants for as long as possible, up to two years or more. Toddlers on a vegan diet who are not breastfed or are partially breastfed, should be given a commercial soy-based infant formula during the first two years of life.[8]

The advice from an accredited practicing dietitian (or medical practitioner where dietetic advice is not available) is required for infants following a vegan or restricted diet. Following dietary assessment, some vegetarian infants and mothers (particularly those on vegan diets) may require nutritional supplements, particularly vitamin B_{12} and iron.

Documentation

Document advice, information provided and actions, according to local processes.

Referrals

In addition to the GP, support from other supplementary services may be considered.

Suitability of supplementary support services will depend on the growth status of the child and the capacity and preferences of the family. Availability of support services will be varied across the State.

Recommendations for supplementary support and actions taken, should be clearly documented in progress notes.

- Public dietetic services - some local health services (hospitals or community health centres) provide dietetic services for children.

- Private dietetic services - see the Dietitians Association of Australia website to locate private dietetic services.

- Child Development Services (CDS) – Children with developmental mealtime difficulties persisting after universal services (e.g. child health) and/or attempting common management strategies may be eligible for CDS. Please note, that the CDS does not provide medical investigation/services for feeding difficulties.

Related internal policies, procedures and guidelines
The following documents can be accessed in the Community Health Manual via the HealthPoint link or the Internet link
Anaemia in childhood
Breastfeeding deviations from normal
Breastfeeding protection, promotion and support
Child health services
Clinical Handover Nursing
Groups for parents
Growth – birth to 18 years
Growth faltering
Nutrition for children – birth to 12 months
Physical assessment 0 – 4 years
Oral health examination
Overweight and obesity
Student health care plans
Universal contact guidelines

Related internal resources and forms
The following resources and forms can be accessed from the HealthPoint CACH Intranet link
Clinical Handover/Referral Form
Food for kids

Give your child's teeth a healthy start
Health promotion in schools: Healthy eating
Health promotion in schools: Physical activity
How Children Develop – 0-12 years Resource
Keeping children healthy (5-12 years) - CAH-001025
Kindy and pre-primary *Lift the Lip*
Lift the Lip (Dental) Referral Options
Newsletter items
Tips to support healthy choices (2 - 5 years) - CAH-000994
Toddler tucker
Triple P brochure - CAH-011287

Useful external resources
Australian 24-Hour Movement Guidelines for Early Years (birth to 5 years)
Australian 24-Hour Movement Guidelines for Children and Young People (5 to 17 years)
Australian Dietary Guidelines
Australian Society of Clinical Immunology and Allergy (ASCIA)
Better Health Channel – Victoria Department of Health website. Information on various health topics, including calcium and iron.
Better Health Program - a multi-component healthy lifestyle program for overweight and obese children aged 7-13 years and their families. Available free of charge to families in various locations in WA.
Bladder and Bowel Health Australia– resources for staff and families
Bristol stool chart – Continence Foundation of Australia
Child Dental Benefits Schedule (CDBS) -The Commonwealth provides assistance for 2-17 year olds through the (CDBS). The CDBS provides individual benefits for a range of services including examinations, x-rays, cleaning, fissure sealing, fillings, root canals and extractions. Benefits are not available for orthodontic or cosmetic dental work and cannot be paid for any services provided in a hospital.
Continence Foundation of Australia

Dental Health Services - Oral health promotion material
Eat for Health - Australian Dietary Guidelines
Go for 2&5 - Fruit and veg recipes
Healthy Food For All - Food Sensations program - practical nutrition education for schools, adults (families) and communities
Healthy food and drink - Department of Education
Kidsafe WA – Toddlers and Preschoolers 1-5 years - CAH-000993 – includes information on safe use of equipment, such as highchairs
Livelighter – *Packed with Goodness* lunchbox resource and other healthy eating ideas for the whole family
Nip Allergies in the Bub – Allergy prevention website with specific information on introducing solid foods
PCH Healthy Weight Program (formerly known as CLASP) – Weight and lifestyle management program for children and adolescents with complicated and/or significant obesity and their families.
Raising Children Network – parent information on various nutrition-related topics
Refresh.ED - Food and nutrition teaching resources
Student Health Care Policy and Procedures – WA Department of Education
Triple P Program - (Group or Seminar Series) or other locally available, quality parenting programs.
WA School Canteen Association - Healthy lunch box ideas and label reading tips
Why no sweet drinks for children - resource for parents produced by Royal Children's Hospital Melbourne

Appendix A: Limited and selective eating

As children enter their second year of life, they often become wary of trying new foods. Limited and selective eating may consist of fussy and picky eating along with food refusal. It usually peaks around 18 months and is more evident in toddlers than older children. It is important that toddlers are *offered* a wide variety of foods by around 12 months so they will enter the next year of life with more foods they recognise, like and accept.[32]

Young children may develop 'disgust' fears and stop eating foods they have previously enjoyed. This response usually dissipates slowly throughout childhood and adolescence. Role modelling and eating with others can help them pass through this stage as they learn by copying others. Some toddlers need to be offered a food more than 8 - 10 times before they accept it as a food they like.[32]

Parents who are anxious when children eat only limited foods can make the problem worse, especially if they try to force feed the child with foods they are unsure of, or dislike. Therefore, it is important to support parents to understand food refusal and finicky or fussy eating as developmentally appropriate behaviour in healthy young children. Experience is the only established positive predictor of acceptance and liking. The important message is to encourage learning by using all senses and various models for learning (shopping and preparation, as well as tasting).[7] Food refusal related to sensory preferences needs to be explored by an appropriate trained health professional such as a paediatric Occupational Therapist. When food refusal relates to children not liking certain foods, alternative choices may be offered. These are discussed at the end of this Appendix.

Parents' concerns can be lessened when the focus becomes the adequacy of the child's growth rather than behaviour at individual eating occasions. The way in which parents approach feeding has important implications for their child's behavioural, dietary and weight outcomes. Structure and routine are important for the young child, i.e. scheduled meals and snacks (4-6 occasions per day). The physical environment can also promote healthy eating patterns by not having distractions such as TV, screen-based devices or other activities. Ideally, eating should be in a designated area in the home with a developmentally appropriate chair for the child. Family meals and eating the same foods as children provide occasions to learn and develop healthy eating habits.[7]

Anticipatory guidance for parents/caregivers regarding fussy eating or food refusal includes the following messages:

- Offer meals and snacks at regular times as toddlers have short attention spans and small appetites. Offer healthy snacks between meals to give children all the nutrients they need.
- Offer a food that the child will eat with new foods.
- If food is refused, stay calm and clear it away. Try not to force, fuss or offer bribes.
- Give the child some choices, for example 'would you like some fruit, or a sandwich, for morning tea'.
- Offer finger foods – often more readily accepted by 1-3 year olds.

- Allow the child to refuse some foods.
- If child is tired at meal times – offer meal times earlier.
- Offer praise for eating well.
- Make food fun; for a toddler, enjoying food means touching, feeling and playing with it. Encourage children to feed themselves.
- If the food refusal starts to impact on growth, or nutritional deficiencies are suspected, refer to appropriate health professional (GP, dietitian).

If a child refuses certain foods, there are other alternatives to get similar nutrients.

If the child won't drink *milk*, try:

Dairy foods that provide a readily absorbable source of calcium, such as:

- Hard and soft cheeses
- Yoghurt
- Custard and pudding.

Other foods that also contribute calcium, but in smaller amounts and not as readily absorbable:

- Canned fish with bones
- Green leafy vegetables
- Almonds
- Cereals
- Legumes.[13]

If the child won't eat *vegetables*, try:

- Fruit and salad vegetables
- Crisp vegetables as in a stir-fry or grated carrots
- Finely chopped vegetables in a sauce, e.g. Bolognese.

If a child won't eat *meat*, try:

- Iron-fortified cereals and wholemeal bread
- Legumes (baked beans, peas and lentils)
- Milk,cheese, yoghurt, eggs, peanut butter.

Additional tips and suggesting for parents on these topics are in the client pamphlet *Toddler Tucker* or on the *Raising Children Network* website .

Appendix B: Australian Dietary Guidelines, serve size and amount

Dietary guidelines for children

The Australian Dietary Guidelines provide the basis for a healthy diet. They highlight the types and quantities of foods, and lifestyle patterns that are vital for good nutrition and health.[1] Parents/caregivers are encouraged to follow the Australian Dietary Guidelines, outlined below.

Guideline 1

To achieve and maintain a healthy weight, be physically active and choose amounts of nutritious food and drinks to meet your energy needs.

- Children and adolescents should eat sufficient nutritious foods to grow and develop normally. They should be physically active every day and their growth should be checked regularly.

Guideline 2

Enjoy a wide variety of nutritious foods from these five food groups every day:

- Plenty of vegetables of different types and colours, and legumes/beans
- Fruit
- Grain (cereal) foods, mostly wholegrain and or high fibre varieties, such as breads, cereals, rice, pasta, noodles, polenta, couscous, oats, quinoa and barley
- Lean meat and poultry, fish, eggs, tofu, nuts/seeds and legumes/beans
- Milks, yoghurts, cheeses and/or their alternatives. Reduced-fat varieties should be chosen, where possible.
- Drink plenty of water.

Guideline 3

Limit intake of foods containing saturated fat, added salt, added sugars and alcohol.

- Limit intake of foods high in saturated fat and replace high fat foods (which contain predominately saturated fats) with foods containing predominately polyunsaturated and monounsaturated fats
- Limit intake of foods and drinks containing added salt by choosing lower sodium options among similar foods and not adding salt to foods in cooking or at the table
- Limit intake of foods and drinks containing added sugars.

Guideline 4

Encourage, support and promote breastfeeding. *Nurses should refer to the Community Health Breastfeeding policies listed on page 17.*

Guideline 5

Care for your food: prepare and store it safely.

Vitamin and mineral supplements are not necessary for healthy children if their dietary intake is adequate.

Recommended serves

Table 2 shows the recommended number of serves for children of average height with sedentary to moderate activity levels.

Table 2: Daily number of serves with recommended serving sizes of foods for children aged 1- 11 years

Food group	Daily serves for 1-2 years	Daily Serves for 2-3 years	Daily Serves 4-8 yrs old	Daily Serves 9 –11 yrs old	Recommended serve size…	Approx. energy per Serve (kJ/serve)
Breads, cereals, rice, pasta, noodles	4	4	**4**	**4-5**	= 1 slice (40 g) of bread = ½ medium (40g) roll or flat bread = ½ cup (75-120 g) cooked rice, pasta, noodles, barley, buckwheat, semolina, polenta, bulgur or quinoa = ½ cup (120 g) cooked porridge = $^2/_3$ cup (30 g) wheat cereal flakes = $^1/_4$ cup (30 g) muesli = 3 (35g) crispbreads = 1 (60g) crumpet = 1 small (35g) English muffin or scone	500
Vegetables, legumes	2-3	2.5	**4 ½**	**5**	= ½ cup cooked green or orange vegetables (for example, broccoli, spinach, carrots or pumpkin) = ½ cup cooked dried or canned beans, peas or lentils = 1 cup green leafy or raw salad vegetables = ½ cup sweet corn = ½ medium potato or other starchy vegetables (sweet potato, taro or cassava) = 1 medium tomato	100-350
Fruit	0.5	1.0	**1 ½**	**2**	= 2 small apricots, kiwi fruits or plums = 1 medium apple, banana, orange or pear = 1 cup diced or canned fruit (no added sugar) Or only occasionally: 125ml (½ cup) fruit juice (no added sugar) 30g dried fruit (for example, 4 dried apricot halves, 1½ tablespoons of sultanas)	350
Milk, yoghurt, cheese	1-1.5	1.5	**1 ½ -2**	**2 ½ - 3**	= 1 cup (250 mL) fresh, UHT long life, reconstituted powdered milk or buttermilk = ½ cup (120ml) evaporated milk = 2 slices (40 g) or 4x3x2cm cube (40g) of hard cheese, such as cheddar = ½ cup (120g) ricotta cheese = ¾ cup (200g) yoghurt = 1 cup (250ml) soy, rice or other cereal drink with at least 100mg of added calcium per 100ml	500-600
Meat, fish, poultry, eggs, nuts, legumes	1	1	**1½**	**2½**	= 65g cooked lean meat such as beef, lamb, veal, pork, goat or kangaroo (about 90-100g raw) = 80g cooked lean poultry such as chicken or turkey (100g raw) = 100g cooked fish fillet (about 115g raw) or one small can of fish = 2 large (120g) eggs = 1 cup (150g) cooked or canned legumes/beans such as lentils, chick peas or split peas = 170g tofu = 30g nuts, seeds, peanut or almond butter or tahini or other nut or seed paste	500-600
Unsaturated spreads and oils	1	0.5	**1**	**1**	= 10g polyunsaturated/monounsaturated spread and 7g monounsaturated or polyunsaturated oil	250

Additional serves for more active, taller or older children

For older, taller or more active children (who are not overweight) in each age and sex group, additional serves of foods from the five food groups and/or unsaturated spreads and oils and/or discretionary food choices may be consumed to meet energy requirements. It is important to note that less than half of Western Australian children aged 5-15 years meet the physical activity recommendations, thus it is unlikely children will require additional energy. The number of additional serves is outlined in Table 3.

Table 3: Approximate additional serves for older, taller or more active children.

	4-8 years	9-11 years
Boys	0-2½	0-3
Girls	0-1	0-3

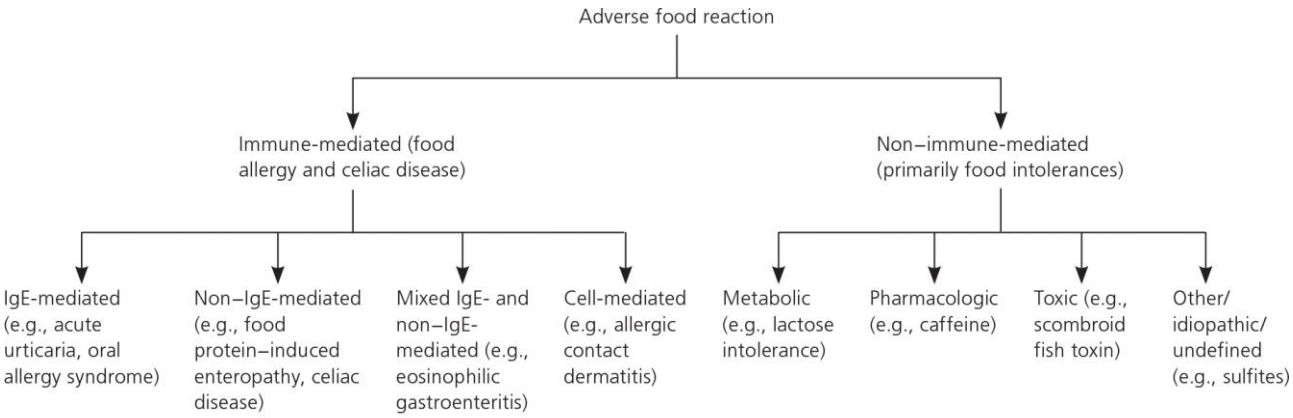
Examples of discretionary choices and unsaturated spread and oils are listed in Table 4. Discretionary foods and drinks are high in saturated fat and/or sugars or salt and can contribute many kilojoules and displace other more nutritious foods from the diet.

Table 4: Examples of discretionary choices

	Recommended serve size	Approximate energy per Serve (kJ/serve)
Discretionary choices (foods which should only be consumed sometimes and in small amounts)	= 2 scoops (75g) ice-cream = 2 slices (50-60g) processed meats,e.g. salami = 1½ thick or 2 thin (50-70g) regular sausages = ½ snack-size packet (30g) salty crackers or crisps = 2-3 (35g) sweet plain biscuits = 1 (40g) doughnut = 1 slice (40g) plain cake/small cake-type muffin = 5-6 (40g) sugar confectionary/small lollies = 1 tblsp (60g) jam or honey = ½ bar (25g) chocolate = 2 tblsp (60g) cream = 1 tblsp (20g) butter = 1 can (375ml) soft drink (sugar-sweetened) = ¼ pie or pastie (60g) commercial meat pie or pastie (individual size) = 12 (60g) fried hot chips	500-600

Appendix C: Food allergy and food intolerance

Food allergies are classified as IgE-mediated, non IgE-mediated, or mixed IgE and non-IgE mediated. Adverse reactions to foods are shown in the diagram below.[24]



IgE-mediated food allergy

IgE mediated reactions are usually of rapid onset and, in children, usually occur within 30 minutes of ingestion of the causative food. The reactions result from the release of histamine and other inflammatory mediators which are released from mast cells when allergens bind to IgE antibodies on the mast cells.[23]

Non IgE-mediated food allergy

Non IgE mediated food allergy usually results in symptoms 2-24 hours after ingestion. These reactions are the result of an immune response that results in delayed inflammation in the skin or gastrointestinal tract. Symptoms include delayed eczema; delayed vomiting and diarrhoea; loose, frequent bowel actions;blood or mucus in stools; irritability and unsettledness in infants; and include conditions such as eczema; food protein induced proctocolitis; food protein induced enteropathy and food protein induced enterocolitis (FPIES), a condition characterised by profuse vomiting 2-4 hours after ingestion of the causative food and may result in hypovolemic shock.[23]

Some allergic syndromes are classified as ‘mixed IgE and non IgE mediated’ and include eosinophilic oesophagitis and eczema.[23]

For more information refer to the *Australia Society of Clincal Immunology and Allergy* for further details on symptoms and causative foods for the various allergic syndromes. Families wanting more information on food labelling can be directed to *Raising Children Network* website.

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