

Steps	Additional Information
	<p>4-18 years</p> <p>BMI above the 85th percentile (see Overweight and Obesity and Appendix 7: Overweight & obesity)</p> <p>Iron deficiency anaemia - See Appendix 5: Iron-deficiency anaemia</p> <p>Constipation - See Appendix 4: Constipation</p> <p>Consider using the 'Be Smarter' intervention for children who are above the 85th percentile (see Overweight and obesity)</p>

Nutrition in infancy and childhood

Birth – 6 months

Infants require no substances other than breastmilk or infant formula to meet hydration and nutrition requirements from birth to 6 months of age.⁴

In Australia, it is recommended that infants are exclusively breastfed until around 6 months of age when solid foods are introduced, and that breastfeeding is continued until 12 months of age and beyond, for as long as the mother and child desire.⁴ If an infant is unable to breastfeed or partially breastfeeds, commercial infant formula is the only suitable alternative to breastmilk.⁴ Infant formula can meet all the infant's nutritional requirements for growth for the first 6 months.⁴ See [Breastfeeding protection, promotion and support](#) for more information on the non-nutritive benefits of breastfeeding

Infant feeding cues

Responsive feeding has been identified as important in both the initiation and maintenance of breastfeeding and in the prevention of overfeeding of formula/bottle fed infants.^{5 6} Therefore, it is appropriate for all healthy, full-term infants, regardless of milk type and feeding mode be fed on demand, following infant feeding cues.⁴ Infant feeding cues can include:⁴

- Stirring/rousing from sleep
- Rooting/turning of the head
- Opening and closing of the mouth
- Sucking on fingers/hands

- Smacking the lips

Satiety cues can include:

- Relaxation of the hands and facial muscles
- Unlatching from the breast/discontinuation of sucking from teat
- Discontinuation of feeding cues whilst awake
- General contentedness

Cluster feeding is common in newborns and young infants may not follow any particular schedule.⁷ Frequent feeds in newborns are necessary due to small stomach size and rapid growth.⁴

Breastmilk

Breastmilk provides a source of energy and nutrition for infants, as well as compounds which guide the development of major organs, infant's immune system and microbiota.⁸ Breastmilk protects the infant from infection and inflammation.⁹ The composition of breastmilk varies over a single feed, in a 24 hour period and over the course of lactation to match the infant's needs at that time.⁸ The composition of breastmilk can also be influenced by time since last feed, diurnal variation, birth weight and maternal factors such as age and ethnicity.⁸

- Water in breastmilk provides hydration (87-88%)⁸
- Fats are the largest energy source in breastmilk (4%), containing a large variety of fatty acids which allow for a variety of functions⁸
- Carbohydrates (7%), including lactose, help meet the energy needs of the infant's brain. Human Milk Oligosaccharides (HMOs) feed the microbiota which, in turn, protect the infant from pathogenic bacteria which cause diarrhoeal disease and respiratory tract infections.⁸
- Protein (1%) – many of which are bioactive compounds assisting in immune function.⁸

Colostrum

Antibodies in breastmilk protect the infant whilst its own immune system is maturing.⁸ From around 16 weeks' gestation, colostrum is produced in the breast (lactogenesis I) so that it is available to the infant immediately after birth.⁵ Colostrum contains lower levels of carbohydrates and fat than mature breastmilk.⁸ Additionally, it is higher in protein, minerals, fat soluble vitamins and contains white cells and antibodies conferring immune protection for the newborn.⁵ Colostrum is produced in small amounts of around 40-50 mL on the first day which can be distributed over many feeds (usually 8-12 in 24 hours but can be up to hourly).⁵ Observing the infant's feeding cues and allowing feeding whenever feeding cues are observed is recommended.⁵

Transitional and mature milk

Between days 3 and 5 post-partum, milk usually 'comes in'.⁵ By day 3-5, average milk production is 300-400mL.⁵ Breastmilk production gradually increases from the milk coming in to an average of 800 mL/24 hours by day 14 post-partum (range of 478-1356 mL/24 hours).¹⁰

An infant's requirements should match milk production at every stage of development provided that there is frequent and efficient removal of milk and supplemental milk is not being provided.¹¹

When an infant is unable to breastfeed, they can be offered expressed breastmilk.⁴ Breastmilk can be expressed by hand or by using a manual or electric pump.⁴ Expressed breastmilk can be fed to an infant by finger feeding, cup, spoon or bottle.⁴

Alcohol and other drugs, prescription medications and smoking

Prescription medications

Most medications can be consumed by a lactating mother without posing danger to the infant.¹² The safety of any medication, prescribed or otherwise (including herbal medicines), can be checked by contacting the King Edward Memorial Hospital (KEMH) Obstetric Medicines Information Service, a pharmacist or medical practitioner before being taken by a lactating woman.

KEMH Obstetric Medicines Information Service can be contacted via (08) 6458 2723.

Alcohol

Alcohol is excreted into the breastmilk in the same concentrations as blood levels because alcohol moves freely between blood and breastmilk.¹³ The NHMRC guidelines recommend that 'maternal alcohol consumption can harm the breastfeeding baby.'⁴

For lactating mothers who choose to drink alcohol:

- Be guided by the *Feed Safe App* on what a safe interval is between drinking alcohol and breastfeeding.¹³
- Express some milk prior to drinking alcohol to feed the baby while mother is drinking.¹³
- If feeds are missed while drinking alcohol, mothers can be encouraged to express in order to maintain milk volume (the expressed milk will be discarded).¹³

Other drugs

Maternal use of nicotine, alcohol, ecstasy, amphetamines, cocaine and related stimulants has been demonstrated to have harmful effects on breastfed babies.¹⁴ Marijuana, heroin and methadone are excreted in breastmilk and the active components of these drugs are fat-soluble and concentrate in the breastmilk.¹⁴ A mother who is not fully alert can present hazards while breastfeeding, preparing infant formula or sleeping near her infant.¹⁴

Smoking

There is significant evidence that maternal and paternal smoking is negatively associated with breastfeeding outcomes, including initiation and duration.¹⁴ If a mother smokes, it is advised she give up or limit her smoking as much as possible.¹⁴ However, breastfeeding is still recommended over formula feeding. If the mother smokes, it is recommended that she smokes after a breastfeed and in another room or avoids smoking in the house completely.¹⁴

Infant formula

Infant formula can meet all the infant's nutritional requirements for growth for the first 6 months.⁴ However, it lacks the living cells, human protein, enzymes and the wide range of other bioactive substances that breastmilk contains.⁴ Although research into the development of formula is continuing, it is impossible that these products could ever duplicate the variety of nutrients present in breastmilk.^{4, 8}

The constituents of human milk are used as a reference in developing infant formula.¹⁵ All infant formulas sold in Australia must meet nutritional and safety standards set out in the Australian New Zealand Food Standards Code.¹⁵ The Standard also allows for voluntary addition of permitted forms of nutritive substance, e.g. nucleotides, lutein and other ingredients such as lactic acid cultures.^{16, 17} Manufacturers continually develop and produce new products; however, more evidence is required to indicate clear long-term benefits or dangers for the use of additional nutritive substances voluntarily added to infant formula.^{16, 17}

Cow's milk-based formula is recommended for healthy, term infants. It is recommended over formula made from soybeans, rice or goat's milk, modified lactose formula, or specialised formulas, unless medically indicated.⁴



Table 1. Infant formula types, uses and contraindications ^{4, 16-18}

Formula type	Description	Indication	Contraindications
A2 (Cow's milk-based)	Contains different casein to regular cow's milk formula	Not medically indicated	Unsuitable for children with cow's milk protein allergy
Organic (Cow's milk-based)	Made from certified organic ingredients	Not medically indicated	Unsuitable for children with cow's milk protein allergy
Goat's milk-based	Made from goat's milk	Not medically indicated	Unsuitable for children with cow's milk protein allergy
Soy-based	Made from soy protein	Suitable for use Cow's milk protein allergy Note: Children with cow's milk protein allergy may also have concomitant soy protein allergy Lactose-free Should be used under the guidance of a health professional	Unsuitable for babies aged 0-6 months
Rice/plant-based	Made with proteins from plant sources, such as pea, rice etc	May be suitable for children with Cow's milk allergy Should be used under the guidance of a health professional	

Lactose free (Cow's milk-based)		For specific medical conditions Should be used under the guidance of a health professional Note: lactose intolerance in infants is rare	Unsuitable for infants with cow's milk protein allergy
AR or anti-regurgitation		Thickened Thought to reduce reflux/vomiting Should be used under the guidance of a health professional	Not required unless infant has poor weight gain or significant discomfort
Partially hydrolysed	Contains partially broken-down proteins	No medical indication	Not suitable for infants with cow's milk protein allergy
Extensively hydrolysed		Contains proteins broken into peptides (smaller protein fragments) For diagnosed medical conditions Suitable for allergy in some cases	
Amino-acid based (elemental formula)		Contains proteins broken into amino acids (smallest possible units) For diagnosed medical conditions Suitable for allergy	
Added probiotics/prebiotics	Contains added pre and probiotics	No medical indication	



Parents/caregivers can be advised of the following guidance regarding formula feeding amounts in healthy, term infants who are growing appropriately:

- Bottle feeding according to need is appropriate, observing hunger cues and appropriate stool and urine output, consistent weight gain and a thriving, active infant.⁴
- Follow the formula manufacturer's preparation instructions carefully, with respect to formula reconstitution.⁴
- Information on formula packaging recommending amounts to feed infants (usually in accordance with body weight) is a guide only.⁴
- It is normal for there to be a variation in the amount of formula feeding occasions and volumes in each 24 hour period.⁴

Table 2. Guide to formula/EBM volumes for infants 0-6 months⁴

Days 1-4	<ul style="list-style-type: none">• Commence at 30-60 mL/kg/day and increase over the next few days
Day 5 to 3 months	<ul style="list-style-type: none">• 150 mL/kg/day• Some infants, especially those who were pre-term, will require up to 180-200 mL/kg/day
3 to 6 months	<ul style="list-style-type: none">• 120 mL/kg/day

It is well understood that infants who are formula fed have different patterns of weight gain compared to infants who are fed breastmilk.¹⁹ Infants who are formula fed are more likely to experience rapid weight gain during infancy, which is associated with a higher risk of overweight or obesity of childhood.¹⁹ There are various mechanisms which may be responsible for rapid weight gain in formula fed infants, for example:

- Protein content of the formula – Formula in Australia can have a protein content ranging from 1.3-2.0g/100mL^{4, 19, 20}
- Overfeeding (may be related to bottle size and misinterpretation of infant feeding cues)¹⁹
- Adding cereals to formula¹⁹
- Putting the infant to bed with a bottle¹⁹

Parents/caregivers can be advised to select an infant formula based on a protein content closest to 1.3g/100mL in line with the average protein content of human milk (1.1g/100mL) to prevent rapid weight gain.²⁰

Safe formula preparation

As powdered infant formula is not sterile, there is a risk of infection from *C.sakazakii* which is invasive and has a high mortality rate.⁴

To minimise the risk of contamination with bacteria, formula should be prepared, stored and transported correctly and safely.⁴ The WHO recommends water is heated to 70 degrees Celsius to destroy bacteria (and cooling to lukewarm prior to feeding).²¹

In certain towns in the Midwest and Goldfields, nitrate levels in the water are deemed unsafe for infants under three months of age to consume and therefore parents/carers are advised to use bottled water to prepare formula feeds. The Water Corporation provides bottled water for these families.²²

Bottle feeding

The action of breastfeeding allows babies to control the amount of milk they need, however when milk is fed from a bottle, they have less control which can increase the likelihood of overfeeding.¹⁹ Paced bottle feeding can give the infant more control over the amount of milk they drink at each feed.²³ Suggestions for parents/caregivers who are feeding their baby from a bottle can be provided with the following suggestions:²³

- Baby is held in an upright position with head and neck supported by the parent/caregiver's hand (rather than their arm)
- The bottle is held at a right angle and tipped up only far enough for milk to fill the teat. The baby will need to be gradually tipped back as the feed goes on, only so that milk just fills the teat
- The infant should be encouraged to rest every few minutes
- Allow the baby to decide when to finish the feed as they may not need to drink all of the milk in the bottle
- A smaller bottle size may also assist the infant to take in an appropriate volume for their needs.¹⁹
- Avoid putting an infant to bed with a bottle or leaving an infant unattended with a bottle containing liquids

Cleaning teats and bottles

An infant's immune system is not strong enough to fight off infection so it is important to ensure bottle-feeding equipment is cleaned in hot soapy water, rinsed well and air dried after every use.⁴

Where formula is being used, bottles should be sterilised by boiling, using chemicals, steaming or microwaving until the infant is 12 months of age. ⁴

Where expressed breastmilk is being used, it is necessary to clean, but not sterilise bottles and other feeding equipment as breastmilk contains antibacterial properties and is less vulnerable to bacterial contamination.⁴

6-12 months

Milk feeds

Breastmilk or formula continues to be the main source of nutrition until milk intake gradually reduces and is replaced by family foods as the main source of nutrition.⁴ This generally occurs by 12 months of age.⁴

Feeding bottles are recommended only for breastmilk or infant formula.⁴ Feeding cups or lidded cups are recommended for small amounts of water from six months of age, when complementary foods are introduced.⁴

Introducing complementary foods

At around six months, when an infant is showing signs of readiness, complementary foods can be introduced.⁴

An increasing variety and quantity of foods from the five food groups should be offered as the infant moves towards 12 months of age to ensure adequate energy and nutrient supply.⁴ The variety offered may assist enjoyment of a broader range of foods in later life.²⁴ Offering increasingly lumpy textures, progressing from purees through to family foods is essential for oro-motor development.⁴ Parents can be provided with reassurance as follows:

- Children are all individuals and learn to eat at different rates. Not all same-aged infants eat the same amount of food.
- Infants eating a balanced and varied diet do not usually require nutritional supplements; however, those with diagnosed deficiencies are an exception
- Infants can be trusted to regulate their own appetite. A variety of foods can be offered and the infant can choose what and how much

For more detailed information regarding the introduction of complementary foods see [Appendix 1: Introducing complementary foods](#).

1-3 years

As growth velocity slows, appetites of toddlers and young children can be variable from one day or week to the next.²⁵ Children of all ages can regulate their own appetites by following their hunger-satiety cues.²⁵ The following is a guide to how much food parents/caregivers might offer each day.

Table 3: Recommended number of serves of the five food groups each day Ages 1-2 and 2-3 years (see Appendix 10 for a description of serve sizes) ²⁶

	Vegetables & legumes & beans	Fruit	Grain foods	Lean meat, poultry, fish, eggs, nuts/seeds and legumes & beans	Milk, cheese and/or alternatives (mostly reduced fat)
1-2 years	2-3	0.5	4	1	1-1.5
2-3 years	2.5	1	4	1	1.5

Milk

Although most toddlers and young children will be receiving the majority of their nutrition from family foods, breastmilk plays an important role in providing immunity and contributing to beneficial development of the gut microflora.²⁷ After 12 months postpartum, the antimicrobial properties in breastmilk increase to accommodate for additional immune protection.²⁷

Toddlers and children who are not breastfed can receive full-fat cow's milk as part of their overall dairy serves each day up to the age of 2 (see Table 2).²⁶ Low-fat dairy foods should be provided after 2 years of age. If a child is consuming no other dairy that day, a maximum of 375 mL milk/day is recommended.²⁶ Toddler milks are not recommended as they contain higher levels of overall energy and total sugar than full-fat cow's milk per 100 ml and are considered ultra-processed.²⁸ Nutrients provided by toddler milks can be adequately supplied through whole foods when offered in accordance with the Australian Dietary Guidelines.²⁸

Parents/caregivers choosing to provide plant-based milk alternatives should choose soy milk fortified with a minimum of 120 mg of calcium per 100mL.¹⁸ Other plant-based milk alternatives are often lower in protein, fat and other micronutrients, therefore the diet may require overall assessment for adequacy by a Dietitian. For more information, see [Appendix 2: Vegan vegetarian eating patterns](#) and [Appendix 6: Food allergy and intolerance](#)

Discretionary foods

It is recommended that children of this age are not offered discretionary foods on a regular basis as they can contribute to overweight/obesity and dental caries.³ They may also displace foods from the five food groups which provide critical nutrients such as iron, zinc and fibre.³ Regular consumption of these foods can contribute to the development of taste preferences for sweet and salty foods which can persist into early childhood and beyond.²⁹ The majority of foods specially labelled as 'toddler foods' available in Australia are considered ultra-processed and do not align

with Australian Dietary Guidelines, thus are not recommended for regular consumption
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Eating behaviours

Eating behaviour develops rapidly during 12 months to 3 years.²⁵ The achievement of feeding independence builds confidence and self-esteem, develops cognitive and communication skills and contributes to social enjoyment at meal times.²⁵ By 12 months, most toddlers should be enjoying a wide variety of foods, textures and flavours.²⁵ By two years, most children will have completed the transition to family foods.²⁵ As such, this is a critical period which shapes eating behaviours throughout life.^{25, 29} During this time, children undergo a learning process around food preferences and self-regulation of intake which affects subsequent eating behaviours, growth and weight status²⁵

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.²⁵ Selective/picky eating is common and often related to a burgeoning sense of autonomy.²⁵ For more information regarding picky eating, see [Appendix 3: Eating behaviours, picky eating and food refusal](#)

4-8 years

Children aged 4 years and above can continue to be offered a range of everyday foods in line with the Australian Guide to Healthy Eating, as follows:

Table 4: Recommended number of serves of the five food groups each day Ages 4-18 years (see Appendix 10 for a description of serve sizes)²⁶

	Vegetables & legumes & beans	Fruit	Grain foods	Lean meat, poultry, fish, eggs, nuts/seeds and legumes & beans	Milk, cheese and/or alternatives (mostly reduced fat)
4-8 years					
Boys	4.5	1.5	4	1.5	2
Girls	4.5	1.5	4	1.5	1.5
9-11 years					
Boys	5	2	5	2.5	2.5
Girls	5	2	4	2.5	3
12-13 years					
Boys	5.5	2	6	2.5	3.5
Girls	5	2	5	2.5	3.5
14-18 years					
Boys	5.5	2	7	2.5	3.5
Girls	5	2	7	2.5	3.5

Children aged 4-8 have more developed motor skills, handle 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 less interest in food. 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. For information on serve sizes, see [Appendix 10: Serve sizes – The Australian Guide to Healthy Eating](#)

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.³⁰

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.³⁰

School-aged children (8+ years)

Older children experience slow and steady growth prior to the onset of puberty.³ 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.³ In this age group, it is appropriate to, offer a wide variety of foods from the five food groups and encourage children and adolescents to eat according to appetite and hunger/satiety cues.³

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.³ This is a time when children are strongly influenced by peer pressure as well as by information received from social and other media.³ 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.³

From around age 9, iron requirements for both girls and boys increases, due to another period of rapid growth (pubertal growth spurt).³¹ During this time, the iron requirement for girls is higher than that of boys, due to the onset of menstruation (menarche).³¹ Additional iron requirements, coupled with the displacement of foods from the five core food groups with discretionary foods, can give rise to iron deficiency anaemia.³² For more information, see [Appendix 5: Iron deficiency anaemia](#).

The main nutrition concern for children aged 4-18 is overweight and obesity, with 1 in 4 Western Australian children being overweight or obese. For more information, see [Overweight and obesity](#) and [Appendix 7: Overweight and obesity](#)

Cultural considerations

Cultural, social and medical factors can influence which foods are provided to children and different cultures have their own traditions about what food is most suitable. Some cultural groups within the Australian community have unique needs in relation to nutrition. This may be due to socioeconomic disadvantage; a diverse range of cultural practices, languages, or their life experiences prior to arriving in Australia. These factors should be considered when providing guidance to families from culturally diverse backgrounds.

For example, newly arrived refugees may be at increased risk of food insecurity, malnutrition, dental caries and vitamin deficiencies (particularly iron, vitamin D and B12) and may have low levels of literacy.

Traditional culturally-appropriate foods and preparation methods are often nutritionally adequate and should be encouraged when meeting children's needs.³³ Many cultures

follow vegetarian and eating patterns which can be nutritionally adequate for children when **well-planned** (See [Appendix 2: Vegetarian and vegan eating patterns](#))

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Related internal policies, procedures and guidelines
The following documents can be accessed in the Community Health Clinical Nursing Manual: HealthPoint link or Internet link or for WACHS staff in the WACHS Policy link
BMI assessment – child health
BMI assessment – School health
Breastfeeding and lactation concerns - assessment
Breastfeeding support service
Growth – birth to 18 years
Growth – static or downward trajectory

Overweight and obesity

Related external legislation, policies, and guidelines <i>(if required)</i>
Australian Society of Clinical Immunology and allergy (ASCIA)
Australian 24 hour movement guidelines for infants, toddlers and pre-schoolers (birth to 5 years)
Australian 24 hour movement guidelines for children and young people (5 to 17 years)
Eat for Health
Healthy food and drink in public schools policy
Infant feeding guidelines: Information for health workers

Useful resources (including related forms) <i>(if required)</i>
Australian Breastfeeding Association
Better Health Company
Crunch N Sip
Nutrition Australia
Raising Children Network
LiveLighter for Families
Nip Allergies in the Bub
Refresh.ED
WA School Canteen Association

This document can be made available in alternative formats on request.

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Appendix 1: Introducing complementary foods

Breast milk or infant formula provides sufficient nutrients for most infants' growth and development until around 6 months.⁴ At around 6 months, the addition of solid food is required to meet the infant's increasing nutritional and developmental needs.⁴ Stores of several nutrients including iron and zinc are often falling at around 6 months in exclusively milk-fed infants (both breast and formula), and these nutrients are best sourced from food.⁴

Introducing complementary foods to an infant's diet does not mean 'weaning' or stopping breastfeeding. Due to this potential misinterpretation, and the inconsistent use of 'weaning' in literature, this document will use the same terminology as the *Australian Infant Feeding Guidelines*, which is complementary feeding,⁴ and is defined as 'any nutrient-containing foods given to infants in addition to breast milk or commercial infant formula'.⁴

Timeliness of introducing complementary foods

At around 6 months of age most infants are able to adapt to different foods, food textures and modes of feeding.⁴ This age has been identified as a time when infants are developmentally and physically ready to cope with complementary foods.⁴ Parents/caregivers can be advised to observe for the following signs of readiness:⁴

- Being able to sit supported in a chair with trunk and head upright (to minimise choking risk)
- Feeding has developed from sucking to biting. Infants are often chewing by 7-9 months and can manage soft finger foods at 8 months.
- Loss of the tongue-extrusion reflex. This allows for greater manipulation of food in the mouth before swallowing (so thicker foods can be managed)
- Movement of gag reflex from the mid to posterior third of tongue, allowing for increased acceptance of lumpier/solid food textures
- Infant's interest in their external environment increases. The infant may be showing interest in those eating around them, and may reach out for food

Nurses should emphasise that the exact timing depends on signs of readiness in the individual child.

The timing of introduction to complementary foods for pre-term infants will vary from one baby to another.³⁴ Families with pre-term infants are encouraged to introduce complementary foods at around 6 months actual age, depending on individual developmental progress and signs of readiness.³⁴ Where possible, this should be guided by the overseeing paediatrician.³⁴

Problems with incorrect timing

Timing the introduction of complementary foods correctly is important, and problems may arise if complementary foods are introduced too early or too late.^{4, 35} Foods provide a variety of stimulation to infants and many important milestones are reached through meal-times and eating.³⁵ Parents/caregivers can be advised of the issues

which may be associated with early introduction of complementary foods.⁴ For example:

Too early

- Reduced maternal milk production and formula/breastmilk intake as a result of the infant spending less time at the breast. Extreme cases may result in under-nutrition
- Rejection of the spoon if the tongue-extrusion reflex is still strong. Early introduction of complementary foods does not result in earlier loss of this reflex
- Exposure to pathogens in foods, increasing the risk of diarrhoeal diseases and other problems in the infant
- Association with allergen sensitisation ³⁶

Too late

- Impaired growth, compromised immunity and micronutrient deficiencies (e.g. iron, zinc) can develop as breastmilk/formula alone can no longer meet dietary requirements
- Developmental delay of motor skills, such as, chewing and impairment of important developmental milestones such as, gross and fine motor skills and oro-motor skills
- An unwillingness to accept new tastes and textures; fussy eating and/or feeding difficulties
- Increased risk of food allergies.³⁶

What foods should be introduced?

Parents/caregivers can be advised that the introduction of solid foods at around 6 months should focus on foods high in iron ^{4, 35}, for example:

- Pureed meat, chicken and fish
- Cooked egg
- Pureed legumes (lentils, chickpeas, beans, split peas)
- Mashed silken tofu
- Iron-fortified breads and breakfast cereals e.g. Weetbix, wholegrain breads, baby rice cereal

Nutrient-dense foods from the five food groups can then be introduced. For example:

- A wide variety of pureed/soft vegetables (focus on iron-rich e.g. spinach, kale, green peas, silverbeet)
- Whole soft or pureed fruits
- Dairy products e.g. full-fat yoghurt, cheese and custard can then be added

For more information, see [Appendix 5: Iron-deficiency anaemia](#)

It is important to note that some foods may need to be introduced many times before they are accepted.³⁷

Common allergenic foods including peanut, egg, tree nuts, cow's milk and wheat should be introduced as early as possible, from 6 months of age. This applies to infants who are both at high risk and low risk of allergy.³⁸ There is strong evidence that introducing peanut between 6-11 months can prevent allergy in infants at high risk.³⁹ For more information about food allergy, see [Appendix 6: Food Allergy and Intolerance](#).

Drinks

Infants aged 6-12 months do not require any drinks other than breastmilk/formula and small amounts of cooled boiled water served in an open cup with a removable lid, alongside meals.⁴

It is important to note that breastmilk and formula is still an important source of fluid and nutrients until 12 months of age.⁴

How much food should be introduced?

It is appropriate to allow the infant to guide the amount of food they will eat in accordance with appetite.⁴ For example, guidance can be provided as follows:

- Parents/caregivers can offer 2-3 teaspoons of each food once per day and gradually increase amount according to appetite.
- From 8-9 months the infant can be offered 2-3 small meals per day according to appetite
- By 12 months, 3 small meals and 2-3 snacks may be offered each day
- Breast milk or formula continues to be an important source of nutrients until 12 months of age, however breast milk and formula intake will naturally decrease between the ages of 6 and 12 months in line with an increase in complementary food consumption.

Unsuitable food and drinks

A number of foods need to be offered with care as they may be unsafe, increase the risk of short or long-term illness.⁴ Excessive consumption of fluids other than breastmilk/formula, or small amounts of water can displace the consumption of more nutrient dense foods.⁴

Parents/caregivers can be advised that the following food and drinks are unsuitable for infants and young children and can pose a health or safety risk.⁴

- **Honey** (and foods containing honey) can contain the spores of *Clostridium botulinum*. The bacterium can cause serious illness known as infantile botulism and should not be offered to children under 12 months of age
- **Raw or partially cooked eggs and egg products** can cause salmonella poisoning. All eggs and egg products offered to infants should be well cooked.

- **Raw or undercooked meat**, particularly minced meat, poultry, fish and shellfish
- **Unpasteurised milk and products made from unpasteurised milk** such as raw milk cheese
- **Nuts** are not suitable for small children because of the risk of aspiration and choking. Smooth nut pastes can be introduced at around 6 months of age
- **Discretionary and ultra-processed foods** are high in energy but have low nutrient density and are not recommended for infants (see Appendix 9: Discretionary and ultra-processed foods)
- **Tea** contains tannins which impair the body's ability to absorb iron (and other minerals)
- **Coffee, cola drinks, soft drinks, cordials, energy drinks** have low nutrient density, are high in sugar and can cause tooth decay. Caffeine is not suitable for children.
- **Unmodified milk from an animal source** e.g. cow's milk, goat milk should not be given as the main drink for infants under 12 months (small amounts of cow's milk added to food and texturally appropriate dairy foods can be given from 6 months eg: custard, yoghurt, pasteurised cheeses)
- **Fruit juices** Fruit juice should not be given under 12 months. Whole fruit presented in a manner which is texturally appropriate for the infant's stage of development is recommended from 6-12 months

Development of feeding skills

There is no universal model of feeding recommended for the introduction of complementary foods, provided that the infant's nutritional requirements are met and the texture of foods provided are appropriate to match the infant's development.⁴

Learning to eat is a skill which develops over time and is essential to physical development of the teeth and jaw. Eating requires coordination, muscle strength and involves movement of mouth, lips, tongue, cheeks and jaw which contribute to the speech development.⁴ Foods provide a variety of stimulation to infants and many important milestones are reached through meal-times and eating.⁴

Increasing and varying food texture assists with this development and as such, infants should progress quickly from pureed, lumpy, mashed and chopped to family food during the first 6-12 months of life.⁴

Parents/caregivers can be guided through this process as follows:⁴

- Start with soft, pureed textures at around 6 months of age
- Cook and mash hard fruits and vegetables initially, e.g. peas, zucchini, sweet potato, broccoli, carrots and apple, then reduce cooking time or extent of mashing as eating skills progress
- Progress to chopped foods (around 8- 9 months)

- Offer a combination of finger foods and appropriately textured foods from around 8-9 months

Parents/caregivers can be advised of the benefits of preparing home-cooked complementary foods (where feasible), as follows:⁴

- Homemade food offers more variety, taste and texture and is nutritionally superior
- Ability to increase lumpy textures in accordance with the infant's feeding skills and developmental readiness
- Food pouches encourage continued sucking rather than muscle development required for chewing. They also remove the sight and smell of the food, limiting the sensory experience of eating. If pouches are used, parents/caregivers can offer the food on a spoon, rather than allowing the child to suck from the pouch.

Baby-led weaning

Baby-led Weaning (BLW) refers to a specific method of introducing solids which promotes infant self-feeding from 6 months of age, instead of conventional spoon feeding.¹ Parents/caregivers may use multiple strategies to introduce solids which are baby-led.

The concept of BLW is based around the infant managing their own introduction to complementary foods in his/her own time by self-feeding and exploration of usual family foods. BLW's key messages are:¹

- Infants participate in family mealtimes.
- Whole (baby fist-sized) pieces of food are offered and the infant self-feeds from the introduction of complimentary foods
- Infants decide what, how much and how quickly to eat.

Whilst some aspects of BLW are evidence-based and should be encouraged (Division of Responsibility principles, participation in family mealtimes), there is insufficient evidence to draw conclusions about Baby-led Weaning in terms of its safety, benefits and implications.¹ Additionally, concerns persist around the BLW approach in terms of adequacy of energy and nutrient intake (particularly iron and zinc) and safety e.g. choking. However, it is important recognise that many parents and caregivers choose this approach.¹ As such, parents can be provided with the following guidance:¹

- Additional iron and zinc are required from six months to complement breast or formula feeding. Therefore, foods high in iron need to be ingested and not just used for exploration or for play
- Safety should remain paramount. Choking hazards (e.g. raw carrot, chunks of apple) should never be offered to an infant and should always be supervised while eating
- Some infants need more time than others to explore the food before they are willing to put it into their mouths; anything from a few minutes to multiple exposures over a few months.
- The transition through food textures needs to be flexible to suit the development of the child.

Nurses are well placed to discuss methods of introducing solid foods in a safe and appropriate way with parents/caregivers, so the nutritional and developmental needs of the child are met.

Gagging and choking

Gagging is a reflex which protects the airway and prevents choking. As oro-motor feeding skills develop, infants are able to better control increasingly solid food textures and become less likely to gag during eating over time. Parents/caregivers may panic and mistake gagging for choking.¹ This can increase parent/caregiver anxiety and delay the progression through textures.¹ Parents can be supported as follows:

- Reassured that gagging is common during complementary feeding
- provided with information regarding how the signs of gagging differ to those of choking
- re-offer foods regularly
- be encouraged to be calm and patient (anxiety can cause the infant to associate eating with panic).

Hard, small and round, smooth and sticky solid foods are not recommended for infants and young children as they can cause choking and aspiration. Foods that are not suitable include whole nuts and seeds; popcorn and corn chips; chunks of hard fruits and vegetables; sausages with skin on; whole grapes; cherry tomatoes; hard lollies.⁴

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

- Encourage supervised meal and snack times
- ensure that infants are seated when eating
- discourage parents from forcing their infants to eat
- remove small bones and gristle from meat, fish or poultry
- ensure the food being offered is texturally appropriate for developmental phase
- cut grapes lengthways, and cherry tomatoes in half, and check they are well chewed.

Parents/caregivers should be encouraged to learn emergency first aid to manage choking.

*MP 0097/18 - Within Western Australia, the term Aboriginal is used in preference to Aboriginal and Torres Strait Islander, in recognition that Aboriginal people are the original inhabitants of Western Australia. No disrespect is intended to our Torres Strait Islander colleagues and community.

Appendix 2: Vegetarian and vegan eating patterns

A vegetarian eating pattern is one which excludes meat, fish, seafood and poultry and any products derived from these foods.⁴⁰ It consists of fruit, vegetables, legumes and grain-based foods, and may include eggs and/or dairy products.⁴⁰ A vegan eating pattern is similar, but excludes eggs, dairy products, and animal by-products such as gelatine and honey. Vegetarian and vegan eating patterns can meet the nutritional requirements of children and adolescents **if well-planned**.⁴⁰⁻⁴² The demands of physical activity, growth and development in children and adolescents consuming a vegetarian or vegan diet are of special consideration.^{40, 41}

Infants 0-6 months

Breastmilk or infant formula (where provision of breastmilk is not possible) provides adequate nutrition for infants aged from 0 to 6 months.⁴ As vitamin B12 is only found in foods of animal origin, breastfeeding mothers should consult with their GP and/or a dietitian as they will require B12 supplements to achieve an adequate intake.⁴³

Parents/caregivers choosing a vegan/vegetarian formula should do so under the guidance of a medical practitioner or dietitian. Soy formula is not suitable for babies under the age of 6 months.⁴

Infants 6-12 months

Infants being fed a vegan diet who are not breastfed or are only partially breastfed should be provided with a commercial soy-based infant formula from 6 months and for the first 2 years of life.⁴

It is important to note that vegetarian and vegan eating patterns may not provide sufficient iron, zinc or vitamin B12 to meet the needs of an infant or young child aged 6-12 months,^{4, 41} and there is a high risk of nutrient deficiencies and concomitant growth issues where diets are not well-planned.⁴⁴ In addition, after dietary assessment, an infant consuming a vegan diet may require nutritional supplementation or dietary intervention, especially iron and vitamin B12,^{4, 45} as advised by a GP and/or Dietitian. Parents/caregivers providing a vegetarian or vegan diet to children aged 6-12 months should be strongly encouraged to consult their GP and a Dietitian.

Alongside GP/Dietitian support, parents/caregivers providing infants with a vegetarian/vegan diet can be supported to introduce iron-rich complementary foods as follows:

- Silken/mashed/firm tofu (as texturally appropriate)
- Pureed/mashed lentils, beans, split peas, chick-peas

- Hommous/tahini
- Nut/seed butters and pastes
- Eggs (not for children following a vegan eating pattern, or children following a vegetarian eating pattern where eggs are not consumed)
- Custards (not for vegan children or where eggs are not consumed)
- Soy cheese
- Pureed vegetables, especially leafy green vegetables e.g. spinach, kale, silverbeet, green peas
- Pureed fruits, especially those high in vitamin C to assist iron absorption e.g citrus fruits, kiwi fruit

At around 8 months, the following can be added:

- Soft finger foods e.g. cubed tofu
- Cheese or soy cheese
- Pureed/lumpy/mashed lentils, chick-peas/beans (as texturally appropriate)
- Legume, nut and seed spreads (peanut, hummus, and tahini)
- Soft chunks of fruits and vegetables (vegetables can be lightly steamed if hard)

For further information, see [Appendix 1: Introducing complementary foods](#)

Children 12 months + and adolescents

Children and adolescence following a vegetarian or vegan diet can be provided with guidance as follows:

- Follow the Australian Guide to Healthy Eating, substituting with appropriate plant-based sources of protein (legumes, tofu, nuts, seeds and eggs/dairy foods where acceptable)
- It is important to ensure that the eating pattern is **well-planned**, particularly in adolescents to ensure that foods from the five core food groups are not replaced with vegan/vegetarian discretionary foods
- Plant-based milk and other dairy alternatives should be calcium fortified where possible (plant-based milk alternatives should have a minimum of 120 mg of calcium per 100mL)
- Particular attention should be given to adolescents who have recently changed to a vegetarian or vegan eating pattern. A person-centered conversation exploring their food preferences may be required as it is common for adolescents to use vegetarian and vegan eating patterns as a method of weight management. Be alert for signs of emotional disturbances or unexpected weight loss, as all these factors could indicate an eating disorder.⁴⁰

If eating disorders, poor growth or nutritional deficiencies are suspected, parents/caregivers should immediately be referred to a GP or other appropriate medical service for further investigation. Where dietetic referral is required, in addition to GP referral:

- WACHS nurses can refer to local dietetic services available in each region;
- In CAHS-CH, GP may consider paediatric dietetic providers where appropriate.

For further information see [Appendix 5: Iron deficiency anaemia](#)

Appendix 3: Eating behaviours, picky eating/food refusal

Eating behaviours

It is well understood that food consumption preferences are developed in early life and the family is an important context where children learn and adopt eating behaviours.⁴⁶ In addition to providing healthy food, parents/caregivers can influence a child's food choices through a range of practices around how children are fed which can influence eating behaviours through the life course.⁴⁶

In early childhood, responsive feeding practices have been shown to promote healthy growth and development and prevent under and overweight.⁴⁷ Responsive feeding fosters a bidirectional relationship between caregiver and child by dividing tasks and responsibilities of feeding between the child and parent/caregiver, thus allowing the child to form positive feeding experiences and promote trust and autonomy.⁴⁷ The basic principles of responsive feeding are that the parent/caregiver will provide nutritious food and a conducive environment in response to hunger and satiety cues from the child.⁴⁷ The child is given the responsibility of choosing what to eat (within the provided options) and how much.⁴⁸

Conversely, non-responsive or controlling feeding practices, such as restriction and pressure to eat can lead to increased fussiness, emotional eating behaviours and an increased tendency to respond to external food cues.⁴⁹ Pressure and coercion may have short-term benefits but may contribute to difficulties with eating over the long-term.⁴⁹

Care planning

Nurses providing anticipatory guidance to parents and caregivers around the behavioural aspects of feeding throughout the course of infancy and childhood can offer strategies based on principles which promote responsive feeding and mealtime structure. For example:^{29, 46, 47, 50}

0-12 months

- Allow infants to demand feed (regardless of whether they are breast or bottle fed) and follow signs of hunger and satiety in response to the offer of complementary foods

12+ months

- Follow the child's hunger/satiety cues and allow them to regulate their own intake
- Role model positive food consumption behaviours to children
 - Parents can enjoy a wide variety of healthy foods themselves
 - Parents can share positive messages about their own enjoyment of food
- Make healthy foods available in the home and limit the availability of discretionary foods
- Promote a structured and consistent mealtime environment

- Consistent/dedicated mealtime location
- Reduce distractions e.g. switch off the television and avoid the use of devices during mealtimes
- Try to eat meals with all family members present
- Try to foster an enjoyable, relaxed and sociable occasion where food is seen as enjoyable
- Avoid the use of food as a reward for behaviours, particularly discretionary foods
- Avoid coercive feeding practices, such as pressure to finish all the food on the plate or a particular food e.g. vegetables
- Encourage eating routines and meal-time structure, particularly for young children

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.⁵¹ Parents/caregivers can be guided in these principles as follows:

Parent’s responsibilities include:

- choosing the variety of food to be served at each meal-time
- 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.⁵¹

Parents/caregivers can be reminded that:

- Foods may need to be offered repeatedly throughout childhood to establish children’s acceptance of the food. Sampling small quantities of new foods may fall short of the parent’s expectations; however a slow approach may be required to build food acceptance.
- Children may respond well to a flexible routine of 3 meals and 2-3 small snacks per day (in accordance with appetite)

- 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.

Picky eating/food refusal

Picky eating is common in early childhood. It can be defined as the consumption of an inadequate variety of foods due to rejection of both familiar and unfamiliar foods.⁵² Food neophobia is considered separate but interrelated and can be defined as the avoidance of or reluctance to eat new foods.⁵² Signs of picky eating in a child can include:

- Child-restricted intake of specific food groups e.g vegetables
- Strong food preferences
- Provision of meals that are different from those of the caregiver
- Special methods of food preparation
- Consumption of inadequate amounts of food
- Disruption of daily routines that are problematic to the child/family

It is difficult to determine the prevalence of picky eating, as its definition is controversial.⁵³ As such, there are a lack of validated tools for its assessment and diagnosis. Picky eating is thought to peak between the ages of 2 and 6 and decline with age.⁵³ The causes of picky eating are largely unknown and can have complex causes.⁵⁴

Contributing factors are thought to occur in the first and second years of life and are likely a complex interaction of child, parent/caregiver and child-parent/caregiver interaction.⁵⁴ Some of the factors thought to be related to picky eating are fixed e.g. birthweight, maternal pre-pregnancy BMI, familial similarity, cognitive flexibility,⁵⁵ however many factors can be influenced by behavioural intervention.⁵⁴

Picky eating and food refusal can often occur alongside neuro-developmental disorders e.g. Autism Spectrum Disorder, ADHD.³⁷ This can be severe in nature and can co-occur with the psychological disorder Avoidant Restrictive food intake Disorder (ARFID).³⁷ Nutrition-related issues associated with developmental disorders and/or ARFID should be referred to a GP and managed by a multi-disciplinary feeding team.

Care planning

Picky eating and food refusal not associated with sensory issues or a developmental disorder can be addressed using the general eating behaviour strategies listed above. In addition, parents/caregivers can be supported with the following guidance:³⁷

- Have **Realistic expectations** of appropriate food amounts for each age and stage (particularly for infants and children under 3). Nurses can guide parents/caregivers in the appropriate portion sizes for each age and encourage parents to follow their child's appetite and hunger/satiety cues. A child with a small appetite is not necessarily a 'bad eater'

- **Accept where the child is at**, moving slowly and patiently from that point. Foods which are close to already accepted items can be introduced first e.g a new flavour of yoghurt. This can build the child's confidence and increase the chances of success
- **Repeated exposure.** Children often need more than 15 exposures before they will accept a food. They may accept and reject the same food at different points throughout childhood and may accept the same food in other forms e.g. fried vs boiled egg. The key is to continue to offer the food and experiment with the same food in different forms
- **Desensitise before tasting.** There are many ways the child can familiarise themselves with the food prior to tasting it. For example, if the target food is raw apple, they could shop for the food, play with a whole apple before touching or smelling a cut apple. They could then be encouraged to lick, bite, chew or swallow small amounts
- **Non-food rewards.** Children can be encouraged with non-food rewards for trying a food, such as stickers, a trip to the park or a game
- **Positive approach.** Encourage parents to speak positively about food and take a positive approach to mealtimes e.g. 'well done, you are learning to like that food' or 'you might like it tomorrow'. Encourage cooking and gardening e.g growing fruits, vegetables and herbs to foster positive experiences around food preparation and eating
- **Positive taste sensation.** Foods with limited acceptance can be prepared with accepted ingredients which increase acceptance for limited periods, with the goal of slowly reducing the accepted ingredient e.g. carrots can be prepared with small amounts of honey, with the honey gradually reduced until carrots are an accepted food
- **Promoting appetite.** Encourage regular exercise and discourage unscheduled grazing or excessive consumption of beverages, especially milk
- **Focus on long-term goals and consistency.** If picky eating and/or food refusal is not impacting growth or other aspects of nutritional status, parents can be reassured that short periods of nutritional inadequacy are unlikely to impact their child in the long-term
- **Consistency.** Addressing picky eating requires long-term commitment, effort and consistency from parents/caregivers which can take time. Progress can be slow, so parents/caregivers should be encouraged, supported and acknowledged.

Appendix 4: Constipation

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/or hard stools that may require excessive straining.⁵⁶ In children, the following stooling pattern may be indicative of constipation:

<12 months of age

- Fewer than 3 complete stools per week - this does not apply to exclusively breastfed babies after the age of six weeks
- Hard large stool
- 'Rabbit dropping' stool can be indicative of constipation.⁵⁷

>12 months of age

- Fewer than three complete stools per week
- 'Rabbit dropping' stool
- Overflow soiling (loose, smelly and passed without sensation)
- Large, infrequent stool that may block the toilet

Symptoms of constipation may be present on defecation, as follows:

<12 months of age

- Distress on stooling
- Bleeding associated with hard stool
- Straining

>12 months of age

- Poor appetite that improves with passage of large stool
- Intermittent abdominal pain

Diet has been identified as a key contributor of childhood constipation in Australia.⁵⁸ After the age of three, children consume less fibre as they get older. The consumption of discretionary foods (high energy, low nutrient snack, fast and takeaway foods) rises with increasing age which displaces fibre-rich foods.⁵⁹ Insufficient physical activity can also contribute to constipation.⁵⁶

Care planning

If constipation is suspected, parents/caregivers should be referred to a GP or other appropriate medical service, to investigate underlying causes. Where dietetic referral is required, in addition to GP referral:

- WACHS nurses can refer to local dietetic service available in each region
- In CAHS-CH, the GP may consider paediatric dietetic providers where appropriate.

Birth to 6 months

Parents/caregivers can be reassured that there is a wide variation in colour, frequency and consistency of normal bowel movements in babies during the first 12 months.⁶⁰ The number of bowel motions of breastfed infants will decrease between 6 weeks and 3 months; it is also common for an exclusively breastfed infant to go several days between stools.⁶⁰ Constipation is rare in infants who are exclusively breastfed even though they may appear uncomfortable or 'straining' before passing stools.⁶⁰ This is normal and does not indicate constipation.⁶⁰ While formula-fed infants tend to pass firmer and fewer stools than breastfed infants, hard, dry stools may indicate incorrect preparation of formula.⁶¹

Parents/caregivers should be advised that their infant will not need any food or drinks other than breastmilk or commercial infant formula until around 6 months of age.

- Nurses should investigate whether breastfed infants are receiving adequate amounts of breastmilk – see *Breastfeeding and lactation concerns - assessment*
- Parents/caregivers should be advised to follow the instructions carefully when preparing infant formula
- Parents/caregivers can be advised that stool consistency and frequency can change as a result of the introduction of formula

6 to 12 months

Constipation is common in this age group, and may develop when formula is introduced, as well as after the introduction of solid foods and cereals.⁵⁸

To prevent constipation in this age group, parents/caregivers can be guided as follows:

- Provide adequate fluids
 - breastmilk
 - cooled, boiled tap water
- Provide small amounts of sorbitol containing fruit purees or juices e.g. prune juice/puree to help soften stools
- Regularly monitor the infant's progress
- Provide fibre-rich, texturally appropriate solid foods, for example:
 - Pureed fruits, vegetables and legumes

- Wholegrain breads and cereals

Toddlers, children and adolescents

Toddlers

Whilst inadequate fibre in the diet is a common cause of constipation, it can develop in toddlers during toilet training, particularly if the training begins before the child is developmentally ready. It can also develop following an episode of painful defecation.^{58, 62}

Toilet training is a developmental milestone. A toddler must have the interest and ability in temporarily holding a bowel movement until they can go to the toilet. This can lead to less frequent defecation and may lead to hard and/or painful bowel movements; further voluntary withholding may ensue.⁶¹ This can become a larger problem if toilet training is too strenuously encouraged before the child is developmentally ready.⁵⁸

Parents/caregivers can be provided with the following guidance to prevent constipation related to toilet training:

- Watch for signs that the toddler is ready before commencing toilet training.
- Avoid coercing the child
- Establish a regular toilet routine
 - encourage your child to sit on the toilet for 5 minutes, after waiting 20-30 minutes following breakfast, lunch or dinner.⁶³

Pre-school and school-aged children

Constipation is common throughout childhood and can develop in pre-school aged children when starting school.^{58, 62} Early intervention is recommended, as it can prevent complications, such as anal fissure, stool withholding, and faecal incontinence (also known as encopresis).⁵⁶

If left untreated in early childhood, chronic constipation can develop in older children and adolescents. Stressful life events, sexual abuse, eating disorders, autism spectrum and attention deficit hyperactivity disorders may promote or worsen constipation in children.⁶¹ Older children and adolescents may also be reluctant to discuss their bowel habits, thus may go unrecognised.^{56, 58, 62}

Parents/caregivers can be provided with nutrition-related strategies to support families:

- Encourage children to be physically active every day.
- Offer foods that are high in fibre. For example:

- fresh fruits and vegetables (particularly)
 - nuts and seeds
 - legumes e.g. beans, lentils and chickpeas
 - wholegrain and wholemeal breads
 - high fibre breakfast cereals.
- Drink plenty of fluids and encourage water as a drink. The following intakes can be used as a general guide for fluids, to be adjusted depending on climate and physical activity:
 - 1 to 3 Years – 1 L (about 4 cups)
 - 4 to 8 years - 1.2 L (about 5 cups)
 - 9 to 13 years, boys – 1.6 L (about 6 cups); girls – 1.4 L (about 5-6 cups)
 - 14 to 18 years, boys – 1.9 L (about 7-8 cups); girls – 1.6 L (about 6 cups)
 - Reduce consumption of low fibre discretionary foods (as they can displace fibre-rich foods in the diet)
 - It is important to increase intake of fluids (preferably water) when increasing dietary fibre intake, as fibre and fluid work together to facilitate laxation.

Appendix 5: Iron deficiency and iron deficiency anaemia

Iron is a key component of haemoglobin, the protein responsible for delivering oxygen to tissues, muscles and skin.⁶⁴ Iron is required for energy production, and to maintain a strong immune system.^{64, 65} In addition, iron is critical for neurodevelopment.⁶⁴ Over time, insufficient iron intake can lead to iron deficiency anaemia.⁶⁴ Untreated iron deficiency can impact growth, neurocognitive and behavioural development.⁶⁶

The most likely cause for iron deficiency in childhood is an inadequate dietary iron intake, coupled with the extra iron required during periods of rapid growth.⁶⁵ Other mechanisms of iron deficiency include malabsorption and blood loss.⁶⁵ In young children, iron deficiency can also be found where the introduction of solid foods is delayed and milk intake is excessive⁶⁵.

Iron is present in the diet in two forms: haem iron, and non-haem iron. Haem iron is derived from animal-based foods and is more easily absorbed by the body. Non-haem iron is derived from plant-based food and is less readily absorbed by the body.⁶⁴

Prevalence

Iron deficiency is the most common nutritional deficiency of childhood and adolescence.⁶⁷ Data indicates an increased prevalence of iron deficiency during the neonatal period, in pre-school children and in adolescents, where it affects females in particular.⁶⁵

The prevalence of iron deficiency and iron deficiency anaemia in Australia is unknown. The WHO estimated the prevalence of iron deficiency anaemia in Australia to be approximately 8% in pre-school aged children in 2005.⁶⁸ Populations with comparable socio-economic backgrounds, prevalence is estimated between 2 and 6% of preschool children and 8 and 20% of female adolescents.⁶⁵

Iron deficiency anaemia is common in Aboriginal children.⁶⁹ The prevalence of iron deficiency anaemia is higher in Aboriginal children than in non-Aboriginal children, particularly those living in remote Australia.⁶⁹

Clinical implications

Children may be at risk of iron deficiency in the following situations:⁷⁰

- Prematurity and low birth weight
- Mothers who had low iron stores when pregnant
- Consuming vegetarian/vegan diets
- Excessive intake of cow's or other milks
- Tea drinkers – the tannins in tea inhibit iron absorption
- Rapid growth and inadequate iron intake

- Restricted diets which may be due to selective eating
- Chronic disease, such as coeliac disease

Signs and symptoms of iron deficiency with or without anaemia may include:⁶⁵

- Lethargy, malaise and weakness
- Shortness of breath
- Headache
- Poor growth
- Loss of appetite
- Pica
- Poor concentration
- Behaviour changes
- Pallor
- Pale conjunctivae
- Weakness
- Dry and damaged skin, hair and nails

Care planning

Where iron deficiency anaemia is suspected, parents/caregivers should immediately be referred to a GP or other appropriate medical service for further investigation.

Where a dietetic referral is required, in addition to GP referral:

- WACHS can refer to dietitian pending regional availability;
- In CAHS-CH, GP may consider paediatric dietetic providers where appropriate.

Dietary modification is the main supportive 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).⁶⁵ Non-haem iron can be consumed in the same meal with a source of vitamin C to increase its absorption.⁶⁵

Parents can be provided with the following nutrition-related guidance in conjunction with support from their GP and/or dietitian:

For infants 0-6 months

Breast milk contains sufficient quantities of all the nutrients required for this age group, including iron. In Australia, infant formula is iron-fortified, to meet the iron intake requirements of infants up to 12 months of age.⁴

For infants 6-12 months

The iron stores infant has acquired during pregnancy are usually exhausted by 4-6 months, so an infant's first foods should be iron-rich.⁷¹ In addition, transitioning to solid foods from approximately 6 months onwards to around 3 years appears to be a time of decreased iron intake.⁷²⁻⁷⁵

When introducing complementary foods to infants, advise parents/caregivers to:

- Focus on foods rich in haem and/or non-haem iron. For example:
 - Pureed meat, chicken and fish
 - Cooked egg
 - Pureed legumes (lentils, chickpeas, beans, split peas)
 - Mashed tofu
 - Iron-fortified breads and breakfast cereals e.g. Weetbix, wholegrain breads, baby rice-cereal
 - Nut pastes and ground nuts (as texturally appropriate)
 - Make sure foods are well cooked and pureed
- Supplement with iron-fortified baby cereals

For children and adolescents

Apart from the pre-teen years (9-13), females of all age groups do not meet to the required daily intake of iron.^{45, 59} Children have higher dietary iron requirements during periods of increased growth, for example at 7-12 months, and at 14-18 years.⁶⁵ Adolescent girls are at increased risk of iron deficiency due to blood losses associated with onset of menstruation.⁶⁵ Particular attention should be paid to ensuring good intake of iron-rich foods during these times.

Animal foods (haem iron) sources:

- 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) sources:

- Iron-fortified breakfast cereals (check the label to see if iron is added) e.g. Weetbix™, Kellogg's® Corn Flakes, regular and gluten free varieties
- Wholemeal/wholegrain breads, also some white bread and gluten free brands have iron added

- Legumes e.g. lentils, baked beans, soybeans, kidney beans, chickpeas
- Tofu
- Leafy green vegetables e.g. spinach, parsley, broccoli
- Dried apricots
- Peanut butter and nuts (whole nuts are not recommended for children under five)
- Tahini and hummus
- Seeds, e.g. sesame seeds
- Malt based drink for older children eg. Milo®

The following can inhibit iron absorption and should be avoided:

- Excessive consumption of cow's milk and other milks (for children over 12 months of age, the Australian Dietary Guidelines recommendations should be followed for maximum milk intakes, taking into consideration other dairy consumed each day)
- Tea contains tannins which can inhibit iron absorption

Parents/caregivers can be advised to include fruit and/or vegetables with their child's meals, as pairing iron-rich foods with foods containing vitamin C can improve iron absorption⁴⁵. Good sources of vitamin C include:

- oranges, mandarins, berries, kiwi fruit, strawberries.
- capsicum, tomato, broccoli, cabbage.

Appendix 6: Food allergy

Food allergy is an abnormal reaction to food which involves the immune system and results in clinical symptoms.⁷⁶ Whilst food allergy always involves the immune system, there are different mechanisms involved, therefore different 'types of food allergy, which can be classified as follows: ⁷⁶

- IgE mediated
- Non-IgE mediated
- Mixed IgE and non-IgE mediated
- Cell mediated

Food allergy occurs in 5-10% of children and 2-4% of adults in Australia and New Zealand. ⁷⁷ The most common triggers of food allergy are listed below, however any food can cause an allergic reaction:⁷⁸

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

Most food allergy in children will be outgrown, however allergies to peanut, tree nuts, seed and seafood allergies tend to persist into adulthood.⁷⁷

IgE-mediated food allergy

IgE mediated reactions usually occur within 30 minutes of ingestion of the causative food. ⁷⁶ 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.⁷⁶

Mild to moderate symptoms of food allergy include:⁷⁶

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

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
- paleness? and floppiness in young children.

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 or loose, frequent bowel actions
- Blood or mucus in stools
- Irritability and unsettled behaviours 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.

Some allergic syndromes are classified as 'mixed IgE and non IgE mediated' and include eosinophilic oesophagitis and eczema.

When the skin integrity is compromised in children with eczema, the food allergen can enter the body when the allergenic food comes into contact with the disrupted skin barrier and leads to allergic sensitisation (compared with early oral exposure which induces tolerance). This can result in the child developing an allergy to that food.⁷⁹

Prevention of food allergy

Other factors that are currently under investigation for their role in the development of food allergy include ethnicity, exposure to cigarette smoke and other environmental factors, the role of dietary nutrients including vitamin D, gut microbiota and the role of probiotics and prebiotics, and omega 3 and omega 6 long chain polyunsaturated fatty acids.

Introduction to solid foods for infants at high risk of allergy

Parents/caregivers with infants at high risk of allergy can be provided with guidance as follows:⁸⁰

- Breastfeeding during the period that foods are first introduced may help prevent the development of allergy to those foods
- Common allergy causing foods should be introduced before 12 months in age appropriate form, such as well-cooked egg and smooth nut pastes. Include foods containing the most common allergens (listed above)

- There are no particular allergenic foods that need to be avoided (unless the infant is already allergic to that food).⁸¹
- Foods containing the top 10 allergens should be given to babies who do not have a reaction to them at least twice weekly, as part of a varied diet
- Parents/caregivers may choose to introduce allergenic foods during the day-time rather than before bedtime so that any potential reactions can be observed.
- Avoid any food which produces an adverse reaction and seek assessment by a medical practitioner
- Infantile eczema should be well managed prior to the introduction of complementary foods. Allergens can enter the body via the compromised skin barrier and increase the risk of allergic sensitisation and food allergy⁷⁹

Food intolerance

Food intolerance is an abnormal reaction to the ingestion of food which does not involve the immune system.⁷⁸ 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.

The exception to this is coeliac disease, which is an immune mediated intolerance to the dietary protein gluten. This is one of the most common autoimmune illnesses in Australia with 1.5% of Australians having coeliac disease. However, coeliacs' broad and often subtle presentation makes detection challenging, and means 80% of Australians with coeliac disease remain undetected.⁸²

There are no reliable clinical tests to diagnose food intolerance (apart from coeliac disease). Most guidelines on the diagnosis of food intolerance recommend elimination of suspected foods (resulting in symptom resolution), followed by re-introduction of the food/s (resulting in symptom recurrence). Poor growth and poor nutritional status in children on long term exclusion diets have been documented.⁸³ Feeding disorders in children with food allergy are common.

Care planning

Families with food allergic children need appropriate health professional care and follow up, such as a paediatric allergist or immunologist, paediatrician and dietitian.

In the school environment, it is important that all school 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 and seek further information from health professionals.

Appendix 7: Overweight and obesity

In 2017-18, the Australian Institute of Health and Welfare (AIHW) estimated 1 in 4 (25%) Australian children and adolescents aged 2–17 were overweight (17%) or obese (8.2%).⁸⁴ Data derived through the West Australian Health and Wellbeing Survey suggests similar rates in WA⁸⁵. Analysis of 2018 School Entry Health Assessment results suggested 22% of Kindergarten children in the Perth metropolitan area were above a healthy weight range, including 9% in the obese range.⁸⁶ These rates have remained relatively stable over the last decade.⁸⁴

Aboriginal* children aged 2-17 are significantly more likely to be overweight or obese (38%) than their non-indigenous counterparts (24%), a disparity which increases further among older Aboriginal adolescents. Additionally, overweight and obesity disproportionately affects children from socioeconomic disadvantage and those who live outside metropolitan areas.⁸⁴

As the causes of overweight and obesity in children are complex, more information regarding additional strategies to prevent overweight and obesity in children are addressed in the *Overweight and obesity* guideline. This guideline addresses the referral process to external services such as GP, paediatrician and dietitian who may be required in the care of overweight and obese children.

Nutrition-related care-planning for children with overweight and obesity

Nurses should be aware that weight loss diets for children and young people are discouraged unless supported by a paediatric specialist or dietitian advice.⁸⁷ Where possible, children should be encouraged to maintain their weight, growing into it as they get taller until a healthier height-weight ratio for their age is achieved.⁸⁷ In general, this can be achieved through regular healthy eating patterns in line with the Australian Guide to Healthy Eating, focussing on reducing intake of discretionary food and drinks, along with regular physical activity as per current national guidelines.^{3, 87}

Care Planning

In addition to strategies and interventions offered in the *Overweight and Obesity* guideline (e.g. Be Smarter, where appropriate), nurses can offer the following basic nutrition-related guidance to parents/caregivers where a child over the age of two has been identified as overweight or obese (if they are not under the care of a GP, Dietitian or paediatrician):

- Follow the Australian Dietary Guidelines recommended servings for each age group
- Encourage the consumption of plenty of fresh fruit and vegetables
 - Include an age appropriate serving of vegetables at each main meal

MP 0097/18 - Within Western Australia, the term Aboriginal is used in preference to Aboriginal and Torres Strait Islander, in recognition that Aboriginal people are the original inhabitants of Western Australia. No disrespect is intended to our Torres Strait Islander colleagues and community.

- Encourage vegetables and whole fruit as snacks in between meals in accordance with recommended daily servings for age
- Involve the whole family in following the Australian Dietary Guidelines and encourage parents/caregivers to role-model these eating patterns and behaviours (particularly fresh fruit and vegetable consumption according to recommendations)
- Avoid processed foods high in fat and/or sugar, for example:
 - Potato crisps
 - Chocolate bars
 - Lollies
 - Ice-cream
 - Pies & sausage rolls
 - Processed meats and sausages eg: salami, polony, sausages
 - Muesli/health food bars
 - Sweet biscuits
 - Fried and takeaway foods
- Encourage water as the main drink for children and avoid energy drinks, fruit juices soft drinks, sports drinks and cordials
- Reduced fat dairy products are recommended for children over the age of 2 years

Appendix 8: Nutrition support for static or downward growth trajectory

Nurses should refer to the *Growth – Static or downward trajectory guideline* for the full background, referral and intervention process for infants and children with a static or downward growth trajectory.

Parents/caregivers with children who have a static or downward growth trajectory should be advised to follow the feeding plan provided by a GP, Dietitian or Paediatrician.

Research suggests that growth faltering is caused primarily by inadequate nutrition. Only 5-10% of cases are caused by underlying disease and approximately 5% caused by neglect-related issues.⁸⁸

In Australia the prevalence of growth faltering is higher in the Aboriginal population.⁸⁹

Care planning

Nurses can provide parents/caregivers with the following general nutrition strategies for children over the age of 12 months with a static or downward growth trajectory:

- Offer regular meals and snacks with a wide variety of foods from the five food groups (sometimes children will eat more if offered 6 small meals, rather than 3 large meals)
- Avoid filling up on drinks as this can make the child feel full, displacing consumption of other foods
 - Limit cordial, soft drinks, sports drinks and fruit juice
 - Offer milk (or plant-based milk alternatives) within the age-specified limits for dairy, in line with the Australian Guide to Healthy Eating

Toddler milks are not necessary and can be expensive. Toddlers and young children can be offered cow's milk or plant-based milk alternatives within the age-specified limits for dairy, in line with the Australian Guide to Healthy Eating – See [Appendix 10: Serve sizes and the Australian Guide to Healthy Eating](#)

- Offer high energy/high protein options from the Australian Guide to Healthy Eating, for example:
 - Meat, fish and chicken
 - Full-fat dairy foods (eg: cream, yoghurt, custard, milk and cheese)
 - Beans and legumes
 - Nuts and seeds eg: nut and seed butters (whole nuts are not recommended for children under the age of 5)
 - Eggs
 - Avocado

- Shelf-stable options where food security is an issue, such as tinned tuna in oil, tinned sardines, tinned baked beans, nut pastes, long-life custards
- Suggest meal and snack ideas as follows:
 - Porridge made with full-fat milk with chia seeds or LSA (Linseed, sunflower almond) mix
 - Cereal with added nuts/LSA mix and dried fruit
 - Scrambled eggs/omelette made with cream and cheese
 - Toasted ham and cheese sandwich (with margarine on the bread)
 - Peanut butter or cream cheese on toast
 - Tuna, egg or chicken sandwich with mayonnaise or margarine
 - Toasted sandwich with baked beans and cheese
 - Add extra cheese/cream to casseroles, soups, stews and pasta sauces

Appendix 9: Discretionary and ultra-processed foods and drinks

Discretionary foods and drinks are those that are high in overall kilojoules and often high in added sugar, saturated fats and added salt.³ These foods are readily available in the Australian food supply and are not essential in the diet.³ They can displace healthier foods in the diet and add unnecessary kilojoules.³

These foods are not necessary in the diet as they provide high energy but low nutrient contribution, however they do provide enjoyment and are part of Australian food culture.

Excessive consumption of discretionary foods are thought to be a major contributor to the high rates of overweight and obesity in children in Australia.³ In 2011, data suggests that Australian children were not meeting recommended daily intake of the five core food groups, however discretionary foods accounted for around 35% of daily energy intake.⁸⁴ As children's age increases, energy from discretionary food intake also increases.⁸⁴

A serve of discretionary food is any food which provides more than 600 kJ per serve. The following are examples of a serve of discretionary food:⁸⁴

- 2 scoops of ice-cream
- 2 slices of processed meat, salami or polony
- 1.5 thick or 2 thin sausages
- ½ snack-sized packet of salty crackers or crisps
- 2-3 sweet biscuits
- 1 small (plain) doughnut
- 1 slice of plain cake or muffin
- 1 tablespoon of jam or honey
- ½ small bar of chocolate
- 2 tablespoons of cream
- 1 tablespoon of butter
- 1 can of soft drink
- ¼ of a commercial pie, pastie or sausage roll
- 12 fried hot chips

Parents can be provided with guidance around inclusion of these foods in the diet as follows:

- Children aged between 1-3 who are largely inactive should avoid regular/habitual consumption of these foods in the diet

- Children aged between 3-8 should also avoid regular/habitual consumption or limit to ½ serve/day
- Older children and adolescents who are very active/tall and in a healthy weight range could consume up to 2.5 serves per day, however extra kilojoules for these children are best consumed within the five core food groups

Appendix 10: Serve sizes – The Australian Guide to Healthy Eating

Serve sizes

Modified from the Australian Guide to Healthy Eating



Vegetables and legumes/beans

Serves per day

	1-2 years	2-3 years	4-8 years	9-11 years	12-13 years
Boys	2-3	2½	4½	5	5½
Girls	2-3	2½	4½	5	5

A standard serve of vegetables* is about 75g (100-350kJ) or:

- 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

*with canned varieties, choose those with no added salt



Fruit

Serves per day

	1-2 years	2-3 years	4-8 years	9-11 years	12-13 years
Boys	½	1	1½	2	2
Girls	½	1	1½	2	2

A standard serve of fruit is about 150g (350kJ) or:

- 1 medium apple, banana, orange or pear
 - 2 small apricots, kiwi fruits or plums
 - 1 cup diced or canned fruit (with no added sugar)
- Or only occasionally:
- 125ml (½ cup) fruit juice (with no added sugar)
 - 30g dried fruit (for example, 4 dried apricot halves, 1½ tablespoons of sultanas)



Grain (cereal) foods, mostly wholegrain and/or high cereal fibre varieties

Serves per day

	1-2 years	2-3 years	4-8 years	9-11 years	12-13 years
Boys	4	4	4	5	6
Girls	4	4	4	4	5

A standard serve (500kJ) is:

- 1 slice (40g) bread
- ½ medium (40g) roll or flat bread
- ½ cup (75-120g) cooked rice, pasta, noodles, barley, buckwheat, semolina, polenta, bulgur or quinoa
- ½ cup (120g) cooked porridge
- ½ cup (30g) wheat cereal flakes
- ½ cup (30g) muesli
- 3 (35g) crispbreads
- 1 (80g) crumpet
- 1 small (35g) English muffin or scone



Lean meats and poultry, fish, eggs, tofu, nuts and seeds, and legumes/beans

Serves per day

	1-2 years	2-3 years	4-8 years	9-11 years	12-13 years
Boys	1	1	1½	2½	2½
Girls	1	1	1½	2½	2½

A standard serve (500-600kJ) is:

- 66g cooked lean meats 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 weight) 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 (no added salt)
- 170g tofu
- 30g nuts, seeds, peanut or almond butter or tahini or other nut or seed paste

*weekly limit of 455g



Milk, yoghurt, cheese and/or alternatives, mostly reduced fat

Serves per day

	1-2 years	2-3 years	4-8 years	9-11 years	12-13 years
Boys	1-1½	1½	2	2½	3½
Girls	1-1½	1½	1½	3	3½

A standard serve (500-600kJ) is:

- 1 cup (250ml) fresh, UHT long life, reconstituted powdered milk or buttermilk
- ½ cup (120ml) evaporated milk
- 2 slices (40g) or 4 x 3 x 2cm cube (40g) of hard cheese, such as cheddar
- ½ cup (120g) ricotta cheese
- ½ cup (200g) yoghurt
- 1 cup (250ml) soy, rice or other cereal drink with at least 100mg of added calcium per 100ml