Healthy Eating Guidelines

for New Zealand Babies and Toddlers (0–2 years old)

Released September 2021

MINISTRY OF HEALTH
MANATŪ HAUORA

Citation: Ministry of Health. 2021. *Healthy Eating Guidelines for New Zealand Babies and Toddlers (0–2 years old)*. Wellington: Ministry of Health.

Published in September 2021 by the Ministry of Health
PO Box 5013, Wellington 6140, New Zealand

ISBN 978-1-99-100738-4 (online)
HP 7784

This document is available at www.health.govt.nz

Kupumua
Foreword

Being provided with age-appropriate foods and drinks in the first two years of life gives babies and toddlers the best start and sets them up for good health across their lifespan. The consequences of poor nutrition during this period may result in an increased risk of developing obesity and other diet-related diseases later in life.

Healthy Eating Guidelines for New Zealand Babies and Toddlers (0–2 years old) provides updated population-health recommendations for feeding children who are under two years of age, to promote healthy growth and development and help establish healthy eating behaviours.

The foods that young children receive and are exposed to in their first two years of life form the basis of their eating patterns and behaviours and food preferences. Having reliable information on optimal feeding practices for babies and toddlers, built on evidence and expert advice, is key to positively influencing a child's health and wellbeing over their lifetime.

Findings from the Growing up in New Zealand (GUiNZ) cohort study, a nationally representative sample, show that too many young children are not eating a diet that is consistent with the nutrition guidelines. Among the feeding practices of concern is the early introduction of foods and drinks that are high in sugar, salt or fat. This is concerning as these foods add excess energy to the child's diet, may accustom the child to their taste and displace nutrient-dense healthy foods.

Advice in these guidelines reinforces current recommendations that breast milk is all a baby needs until around six months of age, at which time, a variety of foods should be introduced to meet the child's increased nutrient requirements. Repeated exposure to a range of nutritious foods, for example bitter tasting vegetables, helps children to learn to like a variety of healthy foods and, when provided in the context of a positive eating experience, increases food acceptance.

I am grateful for the support and advice from the Maternal, Infant and Toddler Technical Advisory Group. This group of maternal and child nutrition specialists advised the Ministry of Health on the statements and the evidence on which those statements are based. My thanks also for the valuable input from members of the public, the health sector, non-government organisations and industry who gave feedback on the draft guidelines.

These evidence-based guidelines are intended to underpin all advice provided to parents and caregivers about babies and toddlers food and nutrition needs. They will guide public policies and programmes strengthening the food environment for young children.

The guidelines are also the basis of nutrition messaging currently being developed for priority groups.

Deborah Woodley
Deputy Director-General
Population Health and Prevention

Ngā whakamihi **Acknowledgements**

Healthy Eating Guidelines for New Zealand Babies and Toddlers (0–2 years old) was written by Dr Sarah Gerritsen and Dr Sally Mackay, School of Population Health at The University of Auckland, and Anna Jackson, Ministry of Health, with guidance from Louise McIntyre and Dr Harriette Carr, Ministry of Health, and the Maternal, Infant and Toddler Technical Advisory Group (MAT0-2 TAG).

The Ministry of Health would like to acknowledge the valuable input from members of the public who participated in the focus groups and the health professional and non-governmental organisations that participated in the stakeholder consultation and peer-review process.

Maternal, Infant and Toddler Technical Advisory Group

Professor Clare Wall (Chair), Nutrition and Dietetics, The University of Auckland

Associate Professor Cath Conlon, School of Sport, Exercise and Nutrition, Massey University

Mafi Funaki-Tahifote, Pacific Heartbeat, Heart Foundation

Associate Professor Anne-Louise Heath, Department of Human Nutrition, University of Otago

Anne Hodren, Plunket

Kass Jane, Principal Clinical Advisor Maternity, Ministry of Health

Emily Jones, Speech and Language Therapist, Massey University

Robyn Lawrence, Liggins Institute, The University of Auckland

Sande Mareroa-Gates, Toi Tangata©

Professor Lesley McCowan, Obstetrics and Gynaecology, The University of Auckland

Ngā ihirangi
Contents

Eating Statement 1

See page 9

Eating Statement 2

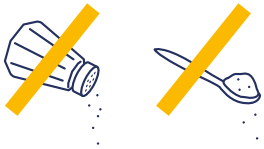
See page 22

Eating Statement 3

Once you have started complementary feeding, offer your baby or toddler a variety of nutritious foods every day, including:

- **vegetables and fruit**
- **grain foods (such as iron-fortified infant cereal, oats (porridge), bread, rice, noodles and pasta)**
- **milk and milk products (such as yoghurt and cheese)**
- **legumes (such as lentils, tofu and beans), nut butters, eggs, fish, seafood and chicken, or lean red meat** **37**

See page 37



Eating Statement 4

When preparing food for your baby or toddler, do not add salt or sugar. If using commercially prepared foods, choose those that are low in salt (sodium) and with no added sugars **48**

See page 48

Eating Statement 5

See page 55

Eating Statement 6

See page 63

List of tables

List of figures

Kupu whakataki
Introduction

Nutrition in the first 1,000 days

Nutrition in a child's first 1,000 days of life (from conception to their second birthday) has the potential to affect their health and wellbeing over their lifetime.

Appropriate feeding of babies and toddlers is central to early health, wellbeing, growth and development. The first two years of life are a period of rapid growth and present a key window of opportunity to protect and promote good nutrition and healthy eating patterns.

Many adult eating behaviours, food preferences and attitudes toward food have their roots in childhood (Lipsky et al 2015). There is strong evidence of dietary pattern tracking from infancy to preschool (Lioret et al 2015), from early childhood through later childhood (Wall et al 2013), from late childhood to adolescence (Emmett et al 2015), and from adolescence into adulthood (Lipsky et al 2015).

A healthy start to life relies on a child experiencing safe, supportive environments and stable, responsive relationships with their caregivers. Mothers, fathers and/or partners, whānau and other caregivers need support (including support with baby and young child feeding) to raise healthy and thriving children.

Barriers to adequate early nutrition

A range of factors contribute to food choices, and not all of these are within a family's control.

While most New Zealand babies and toddlers experience a good start to life, too many live in households that face social challenges, like poverty, inequality, family violence, addiction and poor mental wellbeing (DPMC 2019). These social challenges can result in household food insecurity and make it difficult for parents and whānau to provide adequate nutritious foods.

The 2015/16 New Zealand Health Survey[1] estimated that 53,000 children under five years old (17.4 percent of children aged 0–5 years) were living in households experiencing severe-to-moderate food insecurity (Ministry of Health 2019a). Parents and caregivers living in households facing food insecurity may struggle to consistently provide enough food with sufficient nutrients and variety. As a result, household food insecurity can impact a child's health and development (Ministry of Health 2019a). Previous New Zealand research has shown that household food insecurity is more common in the first year of a baby's life and that it independently affects the nutrition children receive over the preschool period (Gerritsen at al 2020).

Overview of the guidelines

Healthy Eating Guidelines for New Zealand Babies and Toddlers (0–2 years old) is written to help health workers provide consistent, evidence-based advice on feeding babies and toddlers.

These guidelines provide evidence-based, population health advice on meeting key nutrient needs for babies' and toddlers' optimal growth and development and establishing healthy eating patterns. The recommendations in this document relate to healthy full-term babies and toddlers and do not replace advice provided by health practitioners and nutrition specialists, which considers the health and other issues relevant to a particular individual.

The guidelines outline the current Eating Statements for New Zealand babies and toddlers, the rationale and international evidence underpinning each statement and information on how to put each one into practice (including links to useful websites).

The advice in *Sit Less, Move More, Sleep Well: Active play guidelines for under-fives* (Ministry of Health 2017) complements these guidelines as it provides recommendations on sleep and activity opportunities for children under two years of age.

More information for the public on putting the Eating Statements into practice is available in the resources available for downloading or ordering from the Health Education (HealthEd) website at: www.healthed.govt.nz

For an overview of the process used to develop these guidelines see Appendix 1.

1 The 2015/16 survey is the most recent survey to include information on household food insecurity among the child component.

The evidence underpinning the statements

The Eating Statements in these guidelines are based on international evidence reviews that have informed other countries' guidelines, evidence-informed guidelines from the World Health Organization (WHO) e-Library of Evidence for Nutrition Actions (eLENA) and other countries' evidence-based guidelines, as shown in Table A1, Appendix 2. These reviews and reports were selected based on discussions between the Ministry of Health and the Maternal, Infant and Toddler Technical Advisory Group (MAT0-2 TAG). Additional evidence was sought from systematic reviews on particular topics or New Zealand-specific studies, and these have been referenced throughout the guidelines.

For a summary of the evidence base for the Eating Statements for New Zealand babies and toddlers, see Appendix 2, Table A1.

The Eating and Activity Guidelines series

These guidelines are part of the *Eating and Activity Guidelines* series, where the *Eating and Activity Guidelines for New Zealand Adults* is the central document.

These guidelines are for children aged 0–2 years and sit alongside the Eating and Activity Guidelines for New Zealand Adults. The *Eating and Activity Guidelines for New Zealand Adults* (Ministry of Health 2020b) provide the fundamentals of healthy eating that apply to all age groups.

For more information on the guidelines series, go to the Eating and Activity Guidelines webpage on the Ministry of Health's website at: www.health.govt.nz/our-work/eating-and-activity-guidelines

Ngā Tauākī Kainga a ngā pēpi me ngā kōhungahunga nō Aotearoa (0-2 ngā tau te tamarikitanga)
Eating Statements for New Zealand babies and toddlers (0–2 years old)

1

Aim to exclusively breastfeed your baby until they are around six months of age

Continue to breastfeed for up to two years or longer

If your baby is not breastfed, a commercial infant formula is the only suitable alternative to breast milk in the first year of life

2

Around six months of age, when your baby is showing signs of readiness, introduce complementary foods

Offer iron-rich foods, vegetables and fruit as first foods, and continue to offer these foods every day

Once you have started complementary feeding, offer your baby or toddler a variety of nutritious foods every day, including:

3

vegetables and fruit

grain foods (such as iron-fortified infant cereal, oats (porridge), bread, rice, noodles and pasta)

milk* and milk products (such as yoghurt and cheese)

legumes (such as lentils, tofu and beans), nut butters, eggs, fish, seafood and chicken or lean red meat

* Not recommended as a drink for babies under one year of age.

When preparing food for your baby or toddler, do not add salt or sugar. If using commercially prepared foods, choose those that are low in salt (sodium) and with no added sugars

4

Recommended drinks for your baby or toddler are breast milk* and water (once they are eating complementary foods). Cow's milk can be offered as a drink from 12 months of age

5

Do not give your baby or toddler juice, cordial, fruit drink, flavoured milk, soft drinks, tea, coffee or alcohol

* Or, if necessary, a commercial infant formula until 12 months of age.

Let your baby or toddler guide you about how much they eat. Encourage your child to eat, but don't force them

6

Sit with your baby or toddler while they eat or drink, and include them in family mealtimes

From a young age, encourage your child to feed themselves

Kōrero Kainga 1
Eating Statement 1

Aim to exclusively breastfeed your baby until they are around six months of age

Continue to breastfeed for up to two years or longer

If your baby is not breastfed, a commercial infant formula is the only suitable alternative to breast milk in the first year of life

Key points

- Exclusive breastfeeding is recommended for around the first six months of a baby's life to help them achieve optimal growth, development and health.
- Breastfeeding should continue alongside the introduction of complementary foods (at around six months of age). This is key to maintaining adequate nutrition for the baby.
- Every month of breastfeeding is beneficial. Any amount of breastfeeding, including if it is partial, will benefit a baby (Sankar et al 2015).
- Breastfeeding delivers health benefits for the mother too.
- The mother should not consume alcohol when breastfeeding as alcohol will pass through the breast milk to the baby.
- When breastfeeding is not possible, a commercial breast milk substitute (infant formula product) is the only recommended milk source for the baby until 12 months of age.
- Expressed breast milk and infant formula must be prepared and stored carefully to minimise the growth of any bacteria that could harm the baby.
- Women who receive breastfeeding support from their health care providers are more likely to breastfeed for longer and exclusively.

Breastfeeding definitions

'Exclusive breastfeeding' means that from birth the baby receives only breast milk (from the breast or expressed) and prescribed medicines, where necessary.

'Partial breastfeeding' means that the baby receives some breast milk (from the breast or expressed) and some infant formula or other solid food.

Reasons for the recommendations

Breastfeeding duration

The WHO recommends exclusive breastfeeding for the first six months of a baby's life (Kramer and Kakuma 2012; WHO 2003). From around six months until one year of age, breast milk remains the main source of energy and nutrients for the baby.

The WHO also recommends breastfeeding until the child is two years of age or longer as breastfeeding delivers nutritional and health benefits for the child and health benefits for the mother (Chowdhury et al 2015; Sankar et al 2015; Horta and Victora 2013; WHO 2003). It is important to help parents understand that each month of breastfeeding, including partial breastfeeding, will benefit their baby (Sankar et al 2015).

Importance of breastfeeding

Breastfeeding delivers health, nutritional and emotional benefits to babies and young children. Breast milk is unique. The composition of a mother's breast milk changes in response to her baby's feeding habits and, over time, it adjusts to meet her baby's specific growth and development needs (Horta and Victora 2013).

Breast milk is the ideal food for babies because it provides important nutrition as well as antibodies, enzymes, hormones and growth factors, which cannot be replicated in commercially produced infant formula products (Victora et al 2016). The bioactive components naturally present in breast milk play a significant role in promoting a baby's health and development. Breastfeeding helps protect a baby against infection by transferring antibodies from the mother to the baby, thereby giving the baby's immature immune system the benefit of the mother's mature immune system (SACN 2018).

Benefits of breastfeeding

The benefits of breastfeeding for the baby include that it:

- helps build a strong emotional bond between the mother and baby, and this bond supports healthy brain development in the baby and reduces the risk of mental health conditions later in life (Horta and Victora 2013)
- boosts the baby's immune system and helps protect the baby against common childhood illnesses, particularly diarrhoeal infections and pneumonia, and hospitalisation (Sankar et al 2015; SACN 2018)
- protects against sudden unexplained death in infancy (SUDI) (Hauck et al 2011; Sankar et al 2015)
- decreases the chance of health problems later in life, such as type 2 diabetes (Horta and Victora 2013; Horta et al 2015; Koletzko et al 2019)
- may reduce the chance of obesity in childhood, adolescence and early adulthood (Horta et al 2015)
- exposes the baby to flavours originating from the maternal diet through their mother's milk, which helps them accept new foods better once they are eating solid foods (Spahn et al 2019; Stoody et al 2019).

The benefits of breastfeeding for the mother include that it:

- decreases the chance of women developing breast cancer and ovarian cancer compared with women who have never breastfed. Longer duration of breastfeeding is more protective (Chowdhury et al 2015)
- decreases the chance of developing type 2 diabetes (Aune et al 2014).

Number of New Zealand babies that are breastfed

Breastfeeding data is collected by district health boards as part of the Well Child/ Tamariki Ora quality indicators. This includes the number of babies who are exclusively or fully breastfed at two weeks, at the time they were discharged from their Lead Maternity Carer, and at three months. A summary of the indicators is published every six months.

More information and reports are available on the Nationwide Service Framework Library: https://nsfl.health.govt.nz/dhb-planning-package/well-child-tamariki-ora-quality-improvement-framework

Supporting breastfeeding

Health care providers play an important role in influencing and supporting infant feeding decisions at key moments before and after birth and later when challenges arise. Women who receive breastfeeding support from their health care providers are more likely to breastfeed for longer and exclusively (McFadden et al 2017).

Health practitioners can support breastfeeding by:

- providing accurate information on baby feeding options (see *The Code in New Zealand* below)
- providing timely and culturally relevant information (Glover et al 2009)
- encouraging skin-to-skin contact between mother and baby following the birth
- encouraging mothers to breastfeed on demand (see How often should a baby be breastfed?) to meet the baby's nutrient and fluid requirements, and to help establish and maintain a good milk supply
- discouraging the use of a pacifier or bottle until breastfeeding is well established (Offering a baby anything other than the breast in the first month can reduce the baby's intake of breast milk.)
- providing timely referrals to professional breastfeeding support services such as:
  - an International Board Certified Lactation Consultant (IBCLC), via the New Zealand Lactation Consultants Association (NZLCA, www.nzlca.org.nz)
  - a La Leche League NZ breastfeeding group or peer support programme (https://lalecheleague.org.nz)
  - Plunket's Lactation Consultant Service (Plunketline 0800 933 922, available 24 hours a day, seven days a week).

How often should a baby be breastfed?

Babies should be breastfed based on their hunger cues (on demand). It is normal for breastfed babies to feed often – up to every two hours or more, including at night. It is important to feed regularly and often during the early weeks (especially the first two weeks) to establish a good milk supply.

Avoid using pacifiers until breastfeeding has been well established.

A baby's appetite, weight gain and wet nappies indicate how much breast milk the baby has received. If the baby is hungry after feeding from one breast, then the mother should offer the other breast.

If the baby only fed for a short time, the next feed should be started on the last (second) breast that the baby fed from.

The Code in New Zealand

Implementing and Monitoring the International Code of Marketing of Breast-milk Substitutes in New Zealand: The Code in New Zealand (The Code in New Zealand) (Ministry of Health 2007) contributes to creating an environment in which mothers can make the best possible feeding choice for their baby, based on impartial information and free from commercial influences, and to be fully supported in doing so.

The Ministry is responsible for monitoring the implementation of two voluntary and self-regulatory codes of practice: the Ministry's Code of Practice for Health Workers, contained in *The Code in New Zealand* and the Infant Nutrition Council Code of Practice for the Marketing of Infant Formula in New Zealand. The Code of Practice for Health Workers outlines a health worker's responsibilities in relation to providing accurate information on infant feeding.

For more information about *The Code in New Zealand*, see the webpage WHO Code in NZ on the Ministry of Health's website at: www.health.govt.nz/our-work/who-code-nz

For more information about the Code of Practice for Health Workers, go to the Ministry of Health's webpage at: www.health.govt.nz/our-work/who-code-nz/code-practice-health-workers

For more information about Code of Practice for the Marketing of Infant Formula in New Zealand, go to the document on the Infant Nutrition Council's website at: www.infantnutritioncouncil.com/wp-content/uploads/2018/11/INC-Code-of-Practice-151118-5mmbl-crops-A5.pdf

Storing and using expressed breast milk

Breast milk can be expressed by hand or pump to store and be given to a baby later in a bottle, cup or Supplemental Nursing System (SNS). Expressed breast milk needs to be collected and stored carefully to minimise the growth of any bacteria that could harm the baby.

For babies under six months old, all equipment and containers need to be washed and then sterilised. For babies over six months old, it is sufficient to wash equipment in warm, soapy water and then rinse it. Hands should be washed before expressing breast milk to avoid contaminating the breast milk.

Expressed breast milk can be stored in an airtight container or bag with a sealed lid and kept under the storage conditions shown in Table 1. Always store expressed breast milk towards the back of the fridge or freezer, where it is cooler. The container should be labelled with the date collected, and the oldest milk should be used first.

Table 1: Guidelines for storing expressed breast milk

Storage conditions	Storage time	Additional information
Room temperature (< 24 degrees C)	4 hours	Store in a covered container
Refrigerated (< 4 degrees C)	72 hours (three days)	Store at the back of the fridge. Do not store in the door of the fridge
Frozen • Freezer box in fridge • Separate door fridge/freezer • Separate chest freezer (deep freeze)	 • 2 weeks • 3–6 months • 6–12 months	Store at the back of the freezer in the bottom half

To thaw or warm expressed breast milk, put the milk container, bag or bottle in a bowl of hot water until the milk is warm enough. Be careful not to overheat the milk in this process so that the special qualities of the breast milk are not lost. Microwaves are not recommended for warming breast milk because they can easily overheat or heat unevenly and burn the baby's mouth and throat.

Before feeding the baby, the caregiver should always check the breast milk temperature by placing a few drops on the inside of their own wrist. The milk should feel just warm.

Bottle feeding

Bonding with a baby can be achieved no matter what method of feeding is followed (Hairston et al 2019). When bottle feeding a baby, either expressed breast milk or infant formula, hold the baby close, maintain eye contact and talk to the baby while feeding. It is important to change sides during a feed or at every other feed. This makes the experience more similar to breastfeeding and encourages eye and head movement.

A baby may drink more quickly from a bottle than from the breast, and this can lead to overfeeding, where a baby's natural fullness cue (satiety) is overridden or ignored. Practice responsive feeding when bottle feeding.

Tips for responsive bottle feeding

- Hold the baby in a semi-upright position rather than lying their head back.
- Keep the bottle almost horizontal, just slightly tipped, rather than almost vertical, to prevent the milk or formula from flowing too fast.
- Stop and check periodically to see if the baby wants more.
- Do not encourage a baby to finish the bottle if they are showing signs of fullness.
- Give more milk if the baby is still hungry and demands more after finishing the bottle. (See also Eating Statement 6.)

Safety considerations

Never prop up the bottle for a baby to feed independently before the baby is able to hold the bottle for themselves. A baby should never be put to bed with a bottle. If a baby were to fall asleep while latched onto a bottle, they could draw liquid into their lungs, which could cause them to choke. Allowing milk to pool around the gums and teeth while a baby is asleep may lead to tooth decay. If the baby drinks while lying flat, milk can flow into their ear cavities and cause ear infections.

Breastfeeding and alcohol consumption

Breastfeeding women should avoid drinking alcohol as there is no safe amount of alcohol that breastfeeding women can drink. A baby's developing brain is more sensitive to damage from alcohol than an adult's brain is. Alcohol crosses easily into breast milk and passes through the breast milk to the baby (NHMRC 2020).

Alcohol inhibits the role of the hormone oxytocin in breastfeeding women. This can result in a delayed 'let-down' of milk and decreased milk production (Giglia 2010). After entering the breast milk, alcohol may remain there for several hours. It may negatively impact the baby's sleep patterns and behaviour, making them irritable, unsettled or not able to feed (NHMRC 2020).

While not recommended, if a woman chooses to drink alcohol while breastfeeding, she should:

- avoid drinking alcohol during the first month of breastfeeding and at least until breastfeeding is well established
- consider expressing milk before drinking alcohol to ensure alcohol-free breast milk is available for her baby (NHMRC 2020)
- wait for at least two hours after one standard drink before breastfeeding again, though the appropriate length of time will vary for individual women depending on their weight and metabolism (NHMRC 2020) (The longer the time between drinking alcohol and breastfeeding, the less the potential impact is for the baby, NHMRC 2020.)
- make sure the baby always has a sober caregiver looking after them who is alert to their needs
- never share a bed or sofa with her baby (this applies to any caregiver, not just the mother).

Feed Safe New Zealand app

The Feed Safe New Zealand app helps a breastfeeding woman make safe decisions by using the woman's height, weight and alcohol intake to estimate when her breast milk should be free of alcohol.

It is based on the official guidelines of Australia's National Health and Medical Research Council (NHMRC). Feed Safe New Zealand was released in New Zealand in collaboration with WellSouth Primary Health Network.

→ **For more information and to download the app, go to the Feed Safe website at: www.feedsafe.net**

For more advice

More information on breastfeeding and supporting breastfeeding is available from:

→ **Breastfeeding NZ, YouTube channel: www.youtube.com/user/breastfeedingnz**

→ **BreastFedNZ App: www.breastfednz.co.nz**

→ **Ministry of Health:**

- **The National Breastfeeding Strategy for New Zealand Aotearoa: www.health.govt.nz/our-work/life-stages/breastfeeding/national-breastfeeding-strategy-new-zealand-aotearoa-rautaki-whakamana-whangote**
- **Breastfeeding: www.health.govt.nz/our-work/life-stages/breastfeeding**

→ **Mama Aroha, breastfeeding cards (training workshops also available) – designed to be used by health professionals while sitting and talking about breastfeeding where the whānau participate in the discussion: www.mamaaroha.co.nz**

Infant formula

When breastfeeding is not possible, a commercial breast milk substitute (infant formula product) is the only recommended milk source until the baby is 12 months of age. As with breastfeeding, complementary foods should be introduced from around six months of age.

The following milks are not recommended for babies under the age of 12 months.

- Cow's milk as a drink
- Plant-based milk alternatives as a drink
- Condensed milk
- Evaporated milk.

If possible, some breastfeeding can continue alongside infant formula use, as any amount of breastfeeding, will benefit a baby (Sankar et al 2015). Once a formula-fed baby is over 12 months old, it is appropriate to transition to whole-fat (dark blue label) pasteurised cow's milk as their main drink.

Infant formula products

In New Zealand, the manufacture of infant formula is governed by Food Standards Australia New Zealand (FSANZ), ensuring that all formulas available for sale meet specified safety, quality and composition standards.

When breast milk is not available, a standard dairy-based infant formula (made from cows', goat's or sheep milk protein) is the next best choice for most babies. Research suggests that no specific infant formula offers significant benefits over any other (Crawley and Westland 2018). Dairy-based infant formulas all contain lactose as the main carbohydrate and therefore are not appropriate for a baby with lactose intolerance or galactosaemia. Infant formula based on goat's and sheep milk contains similar proteins to cow's milk and therefore is not appropriate for a baby that has a cow's milk allergy.

Before buying a commercial infant formula, check the label for the appropriate age group to be fed to and the use-by date. Infant formula that is past its use-by date is not safe to feed a baby.

Infant formula from birth, commonly labelled as stage 1 infant formula, is suitable for a newborn through to 12 months of age – even if labelled '0–6 months'.

Follow-on formula, or stage 2 formula, is suitable for babies aged 6–12 months – not to be given to babies under six months of age.

Soy-based formulas are not recommended for babies under six months of age and should only be used on medical advice or after discussing with a dietitian (SACN 2018). A baby that has been diagnosed with a cow's milk allergy or intolerance should be under the care of a specialist who can prescribe a specialised infant formula. If a cow's milk allergy or intolerance is suspected, the parents/caregivers should see their general practitioner (GP) in the first instance. See Eating Statement 2 for more information about food allergies.

'Gold' infant formulas contain additional optional ingredients (such as probiotics, long-chain polyunsaturated fatty acids (such as DHA), nucleotides and prebiotics). These ingredients are not necessary (Braegger et al 2011) but have been approved as safe by FSANZ.

Homemade infant formula should never be used as it cannot provide the right nutrients for a baby's growth and development. It may also contain unsafe ingredients or could be prepared in a way that allows harmful bacteria to grow.

Preparing infant formula

Infant formula is not sterile and must be prepared and stored carefully to minimise the growth of any bacteria that could harm a baby. To minimise the risk, prepare formula as close as possible to feeding and throw out any formula that the baby has not drunk within two hours of it being made up.

Infant formula must be made up according to the instructions on the pack and using the measuring scoop provided. The scoop has been designed to measure the correct amount of that brand of formula. The scoop size can vary between brands so scoops are not interchangeable.

When making up formula, always pour the correct amount of water into the sterilised bottle before adding the powder. This is to ensure the correct ratio of water to powder. Incorrect formula preparation can make a baby very ill. Do not add anything else to the bottle, for example, cereal or baby rice. This could increase the risk of choking, plus babies are not developmentally ready for other foods until around six months of age.

Steps for preparing infant formula

- Wash and sterilise all feeding equipment until the baby is at least six months old (including any items used with breast milk). A dishwasher can be used to wash feeding equipment, but the equipment will still need to be sterilised. Once the baby is over six months old, thorough washing and rinsing is enough.
- Boil water and allow time for it to cool. Keep this water for no longer than 24 hours.
- Make a fresh bottle of formula just before each feed.
- Wash and dry hands before preparing formula.
- Follow the instructions on the formula pack carefully.
- Measure the exact amount of cooled boiled water into the cleaned and sterilised bottle.
- Add the correct number of scoops of powdered formula as instructed on the product label. Use the measuring scoop provided with the product and make sure the powder is a level scoop that has not been packed down.
- Attach the teat to the bottle, cover with the cap and gently shake or swirl the bottle until the formula is mixed well.
- Use the formula within two hours unless it is being stored in the fridge (for a maximum of 24 hours).
- Throw out any formula that the baby has not drunk after two hours.

Sterilising feeding equipment

Feeding equipment that will be used to prepare formula can be sterilsed in boiling water, in a steam-sterilsiing unit or using cold-water sterilsising tablets or solution.

For more information on sterilizing feeding equipment, see *Feeding Your Baby Infant Formula* available from the Health Education (HealthEd) website at: www.healthed.govt.nz

If formula must be prepared in advance for later use, it can be stored in the fridge (<4 degrees C) for a maximum of 24 hours (Soboleva 2021). If transporting a prepared bottle, keep the bottle cold in a chilly bin or an insulated carrier. Throw out prepared formula that has been out of the fridge for more than two hours. Ideally, when transporting formula, keep the cooled boiled water separate from the powder and mix them up just before use.

Preparing water for infant formula

From the time a baby is born until it is six months old, all water used for making formula should be boiled and cooled to room temperature on the day it is used. Bottled water must also be boiled as it is not sterile.

From the time the baby is six months old, the town supply water from the cold tap can be used to make the formula. Run the tap for 10–15 seconds before collecting the water to flush out the water that has been sitting in the taps for a while and draw fresh water into the system.

Water from a private supply (such as from a well or bore) should be boiled and cooled until the infant is 18 months old. Water from a private supply should be tested for any contaminants that could harm the baby. If testing shows that the water is high in a contaminant, for example nitrates, it is not suitable for making up formula.

Warming infant formula

It is not necessary to warm infant formula. However, some caregivers may choose to do so. The safest way to warm formula is to rest the prepared bottle of formula in a bowl of hot water until the formula is warm enough. Microwaves are not recommended for warming formula because they can easily overheat or heat unevenly and burn the baby's mouth and throat.

Before feeding the baby, the caregiver should always check the infant formula temperature by placing a few drops on the inside of their own wrist. The formula should feel just warm.

Kōrero Kainga 2
Eating Statement 2

Around six months of age, when your baby is showing signs of readiness, introduce complementary foods

Offer iron-rich foods, vegetables and fruit as first foods, and continue to offer these foods every day

Key points

- Around the age of six months, a baby needs complementary foods, in addition to breast milk (or infant formula), to meet their energy and nutrient needs.
- Give iron-rich foods as first foods to prevent iron deficiency.
- Vegetables and fruit, along with iron-rich foods, provide valuable nutrients for growth and development and are an important part of a healthy diet.
- Offer a variety of flavours when introducing complementary foods to babies.
- Start with spoon-fed purées, then progress over the next few weeks to mashed/lumpy foods and soft finger foods.
- When introducing complementary foods to a baby, include common allergy causing foods (in an age-appropriate form) as this may help reduce the chance of the child developing an allergy to that food.

Reasons for the recommendations

The importance of introducing complementary foods at around six months of age and increasing texture

Around the age of six months, a baby's need for energy and nutrients starts to exceed what breast milk can provide, and complementary foods are necessary to meet those needs (Fewtrell et al 2017).

A baby around six months old is developmentally ready for other foods in that their gut has matured and their tongue and mouth have developed sufficiently to allow for greater swallowing movements. Early introduction of complementary foods (usually defined as before a baby is four months old) is associated with an increased risk of the baby becoming overweight or obese (SACN 2018), and at that age, their digestive system and renal function is not mature enough to cope with complementary foods (Butte et al 2004).

What is complementary feeding?

Complementary feeding is the process starting when breast milk (or infant formula) alone is no longer sufficient to meet a baby's nutritional requirements, so other foods and liquids are needed, along with the main milk source.

Complementary foods are sometimes called 'solids' or 'solid foods'.

When a baby starts receiving complementary foods, at around six months old, it is important to move quickly from the purée stage to mashed and other textures so that the baby develops biting and chewing skills. For more information on texture progression of complementary foods, see page 28, 'Increasing food texture and moving toward having the baby eat the family diet'. Introducing complementary foods later than six months will result in the baby not meeting the nutritional requirements for growth and development, may be detrimental to their speech development and can also increase the risk of them developing a food allergy (Joshi et al 2019).

Iron-rich foods, vegetables and fruit as first foods

Iron-rich foods

Iron deficiency can be serious in babies. By six months of age, a baby's iron stores received in utero from their mother are beginning to run low. The iron in breast milk is highly bio-available (easily absorbed) but not sufficient for a growing baby from six months of age, so offering iron-rich foods daily is important (Castenmiller et al 2019). Iron supplementation is not recommended for healthy babies and toddlers of normal birth weight (Domellöf et al 2014).

There are two types of dietary iron: haem (found in meat, poultry and fish) and non-haem (found in iron-fortified infant cereals, tofu, dried beans, lentils, chickpeas, whole grains, leafy green vegetables, nuts and seeds, eggs, and iron medications). Haem iron is more bio-available than non-haem iron. Foods rich in vitamin C (particularly vegetables and fruits) help with absorbing non-haem iron.

Good choices for iron-rich first foods are:

- cooked and puréed or minced meats
- cooked and puréed or minced chicken
- cooked and puréed fish or seafood
- cooked and mashed tofu, beans or lentils (served with vitamin C rich vegetables or fruit)
- iron-fortified baby cereal.

Vegetables and fruits

Vegetables and fruits are an important part of a healthy diet. They provide vitamins, minerals and dietary fibre as well as many other phytonutrients (beneficial chemicals found in plants). Eating vegetables and fruits in early childhood provides valuable nutrients for growth and development, strengthens immunity, aids digestion and decreases the risk of obesity and obesity-related illnesses later in life. For examples of vegetables and fruits to offer as first foods, see Table 2.

Babies and toddlers may need to see, touch and taste unfamiliar foods (particularly bitter vegetables) many times before they are happy to try, and begin to enjoy, eating them. It is important that caregivers continue to offer such foods even if a baby appears not to like them. Repeated exposure will help the child accept these foods (Hendrie et al 2017). Verbal encouragement and eating the same foods in front of the baby or toddler (positive role modelling) can also help them accept new foods (Gerritsen and Wall 2017).

Fresh, seasonal vegetables and fruit add variety and texture to a baby or toddler's diet. The vegetables and fruit should be washed in clean water before serving. Frozen and canned vegetables and fruit are also good options. They can be prepared quickly, are good value for money and are a healthy way to include vegetables and fruit in daily meals.

Canned vegetables or fruit may contain added sodium (salt) and sugar. For babies and toddlers, choose canned vegetables or fruit with no or low sodium (added salt). Choose canned fruit in natural juice rather than syrup and drain the liquid before serving.

Table 2: Examples of complementary foods by texture

Puréed food

- Cooked and puréed meats
- Cooked and puréed chicken
- Cooked and puréed fish or seafood
- Iron-fortified baby cereal
- Cooked and puréed (or well mashed) vegetables without skins, for example, kūmara, pumpkin, potato, cassava, squash, carrots, taro
- Steamed and puréed vegetables, for example, broccoli, cauliflower, spinach, pūhā, watercress, taro leaves, bok choy (pak choi), kai lan (gai lan – Chinese broccoli), choy sum
- Cooked and puréed fruit without skins, pips or seeds, for example, apple, pear.

Note: Use breast milk or infant formula to moisten food and obtain the right consistency.

Soft foods (some of which can be given as finger foods)

- Porridge
- Whole-fat yoghurt
- Very soft pieces of vegetables without skins, for example, slightly overcooked pumpkin, potato, kūmara, carrot, parsnip, zucchini
- Steamed broccoli and cauliflower florets
- Soft pieces of ripe fruit without skins, pips or seeds, for example, banana, avocado, kiwifruit, mango, melon, peaches, pears (very ripe)
- Cooked apple (thin slices).

Mashed/lumpy food

- Cooked and mashed vegetables
- Cooked and mashed tofu, beans, lentils (served with vitamin-C-rich vegetables or fruit)
- Cooked and mashed fish, no bones
- Cooked and mashed eggs (need to be well cooked to ensure they are free from salmonella bacteria, which can cause severe diarrhoea and vomiting)
- Cooked and mashed fruit without skins, pips or seeds, for example, apple, pear
- Mashed ripe fruit, for example, banana, papaya, avocado
- Minced meat
- Breakfast cereals, for example, porridge, wheat biscuits
- Cottage cheese.

Table 2: Examples of complementary foods by texture continued...

Finger foods

- Grapes, cut in quarters
- Berries, cut in half
- Cucumber and tomatoes, sliced or chopped finely
- Pasta or noodles (well cooked)
- Wholegrain toast fingers (topped with a thin spread of smooth peanut butter or hummus)
- Bread
- Polenta, cooked, cooled and cut into sticks
- Grated or thinly sliced full-fat cheese
- Egg omelettes cut into sticks
- Eggs, hard-boiled, cut into wedges
- Tofu (soft)
- Fish, steamed or poached in water, with bones removed, flaked into small pieces
- Crispbreads, rice cakes, corn thins, crackers (that dissolve in the mouth and require minimal chewing).

Chopped

- Cooked then minced, shredded or finely chopped meat, chicken and seafood
- Soft fruit
- Cooked vegetables
- Finely chopped raw salad vegetables, for example, lettuce, cucumber, tomato, grated carrot
- Tender meat (for example, casserole)
- Apple, peeled and grated
- Pear, peeled and grated
- Carrot, peeled and grated.

Increasing food texture and moving toward having the baby eat the family diet

The aim of complementary feeding is to transition a baby from an entirely milk diet to eating the same foods as the rest of the family. The following is a guide to progressing through the different food textures. It is normal for babies to develop at different rates, so be guided by the baby's feeding cues and developmental capabilities.

Starting out

Suitable textures for first foods include smooth purées and soft foods. Purées teach a baby to swallow a thicker texture comfortably (compared with breast milk or infant formula). They also introduce the baby to new flavours. Offer a variety of purées with different tastes, including naturally sweet, savoury and bitter flavours. Babies that start complementary foods before six months of age should start with a liquid purée.

From around six months of age, babies can eat increasingly thick puréed, mashed and soft foods. Soft foods are those that can be easily squashed between your thumb and forefinger or on the roof of your mouth with your tongue.

Seven to nine months

By seven months of age, babies will generally have moved on from puréed foods to having mashed/lumpy foods so that they develop biting and chewing skills. Large pieces of cooked or ripe soft foods (without skins, pips or seeds) that the baby can grasp and bring to their mouth can also be offered.

By eight months of age, most babies will also be eating 'finger foods' (that they pick up themselves) and bringing a spoon to their mouth. Minced and finely chopped foods can now be introduced. These can be added to mashed foods to start with if preferred.

Note:

Prolonged use of puréed foods and delaying the introduction of lumpy textures beyond the age of nine months is associated with feeding difficulties in older children and a lower intake of nutritious foods, such as vegetables and fruit (Fewtrell et al 2017).

10–12 months

Continue to offer a range of different tastes and textures, including family foods where appropriate (all foods will still need to be cut into small pieces). By 12 months of age, most children should be eating the same types of foods as the rest of the family, especially nutrient-dense foods that are low in sodium and with no added sugars. Preparing separate meals for toddlers is unnecessary and unhelpful for moving the toddler to a diet that is based on the *Eating and Activity Guidelines for New Zealand Adults* (Ministry of Health 2020b).

Age and developmentally appropriate foods

Babies between the age of 6 and 12 months have immature chewing and swallowing skills, few teeth and small airways, all of which make it easy for them to choke on foods. Caregivers must actively supervise their baby during mealtimes and give age and developmentally appropriate foods. While a baby's oral skills are developing and while they are learning how to deal with food, it is important to provide foods that the baby can easily chew and swallow (for example, modifying foods by cooking, grating, slicing thinly or cutting into very small pieces).

For more information on how to minimise the risk of food-related choking in young children see Eating Statement 3.

What about baby-led weaning?

Baby-led weaning is an approach to introducing complementary foods, whereby:

- baby food, including first foods, are provided as finger foods rather than purée
- babies feed themselves by selecting and picking up their food of choice from what is on offer, instead of being fed by someone else with a spoon.

Currently, the Ministry of Health does not recommend baby-led weaning. More research is required on baby-led weaning to establish if it is a developmentally and nutritionally safe practice.

If a parent chooses to practice baby-led weaning, the following will help ensure they do so safely.

- The baby should be able to sit unassisted, pick up food and bring it to their mouth.
- Foods offered in the first month or two of complementary feeding should be soft and able to be squashed on the roof of the mouth with the tongue.
- Follow the advice to reduce the risk of choking (see Eating Statement 3).
- Offer iron-rich foods daily.

Teething

Most babies get their first teeth between the age of 6 and 10 months. Teeth are at risk of dental decay as soon as they break through the gums. Many babies show no signs of teething, but for some, the gums swell and become sore as teeth break through.

Teething biscuits (often called rusks) contain salt and sometimes sugars, so a teething ring or cold flannel/washcloth is a better option to give to babies who want something to chew on to relieve the discomfort. Do not dip teething rings in sweet substances such as honey or syrup as this may lead to dental cavities.

Necklaces made from amber beads are not recommended as there is no evidence that amber offers effective pain relief, and they pose a serious risk of choking or strangulation.

For more information see 'Looking after developing baby and toddler teeth' under Eating Statement 5).

How to reduce the chance of food allergies

A food allergy is an adverse reaction to a food by the body's immune system. Food allergies affect up to 10 percent of children under the age of five years (Sinclair et al 2013). The most common foods that cause allergic reactions are: eggs, peanuts, cow's milk, tree nuts, soy, sesame seeds, wheat, fish and shellfish.

Research shows that giving the common allergy-causing foods to babies before they are one year old may help reduce the chance of the babies developing an allergy to those foods (Castenmiller et al 2019; Joshi et al 2019).

When introducing complementary foods, include common allergy-causing foods in an age-appropriate form, such as:

- well-cooked egg
- cow's milk (in small amounts, for example, in cooking), cheese or yoghurt
- smooth peanut butter
- finely ground peanuts or tree nuts
- wheat-based foods, such as bread, noodles, pasta
- cooked fish or shellfish, with skin and bones removed
- ground sesame seeds, for example, tahini
- soybeans, edamame (immature, green soybeans), tofu.

Introduce common allergy-causing foods one at a time so to see if the child reacts to it. Once introduced and if there is no allergic reaction, offer these foods regularly (approximately twice a week) as part of a varied diet to maintain the baby's tolerance to them. Trying a food and then not continuing it in the diet may result in susceptible babies developing an allergy to that food.

Continuing breastfeeding when introducing complementary foods has a beneficial effect on the baby's gut microbiome and may help reduce the risk of the baby developing allergies, although the evidence for this is not consistent (Güngör et al 2019).

Common allergy-causing foods should not be excluded during pregnancy or breastfeeding (unless a doctor diagnoses an allergy in the mother).

What about babies with an increased chance of developing an allergy?

Babies that have severe eczema or have a sibling or parent with food allergies have an increased chance of developing a food allergy themselves. The process for introducing foods to these babies should follow the same advice as described above for introducing common allergy-causing foods (Joshi et al 2019). However, caregivers may wish to discuss how best to go about this with their doctor.

Giving a hydrolysed (partially and extensively) infant formula (known as 'HA' or 'Hypoallergenic' formula) to babies is no longer recommended for preventing allergies (Greer et al 2019; Joshi et al 2019). There is also no benefit in switching to soy or goat's milk-based formula, formulas containing long-chain polyunsaturated fatty acids or formulas that contain prebiotics, synbiotics or probiotics compared with standard cow's milk-based infant formula (Joshi et al 2019).

What does an allergic reaction look like?

Allergic reactions usually occur quickly – usually within minutes of ingesting the food concerned (although they can take up to two hours).

Symptoms of a food allergy reaction can range from mild to severe. If a food allergy is suspected, stop giving that food and seek medical advice.

Food allergy can include one or more of the following symptoms

Mild to moderate symptoms

- Swelling of the face, lips or eyes
- Hives or red welts on the skin
- Red, watery eyes
- Itchy mouth or throat
- Vomiting
- Diarrhoea.

Severe symptoms (signs of anaphylaxis)

- Difficult/noisy breathing
- Tongue swelling
- Coughing, wheezing and shortness of breath
- Baby becomes pale and floppy.

Call an ambulance immediately if there are signs of a severe allergic reaction (anaphylaxis).

More information about allergies is available from:

- **the Infant feeding and allergy prevention webpage of the Australasian Society of Clinical Immunology and Allergy (ASCIA) website at: www.allergy.org.au/hp/papers/infant-feeding-allergy-prevention**
- **the How to Introduce Solid Foods to Babies for Allergy Prevention – Frequently Asked Questions (FAQ) webpage of the ASCIA website at: www.allergy.org.au/patients/allergy-prevention/ascia-how-to-introduce-solid-foods-to-babies**

Practical advice on introducing complementary foods

Signs a baby is ready for complementary foods

A baby is ready to start complementary foods if they:

- are around six months old
- can hold up their head and sit with less help
- open their mouth as food approaches
- can keep food in their mouth and then swallow it, instead of pushing the food out
- show signs of biting and chewing.

How to start complementary feeding

Complementary feeding should begin when the baby is most relaxed and happy. The baby can be held or seated in a high chair but must be sitting upright to feed.

Until the baby is eight to nine months of age, the milk feed should be offered before complementary foods. After approximately eight to nine months of age, offer the baby complementary foods first, followed by the milk feed. The amount of complementary foods the baby eats each day should gradually increase: by nine months of age, a baby should be consuming two to three meals a day plus one or two snacks, depending on appetite.

It is important to look for and learn to recognise a baby's cues for hunger and for when they are full and feed in response to those cues. This feeding practice is known as 'responsive feeding' and supports the baby to form healthy eating habits by teaching them how to self-regulate their food intake from an early age (see also Eating Statement 6).

Caregivers should feed the baby slowly and patiently, encouraging the baby to eat but not forcing them, talking to the baby and making eye contact. Use a small teaspoon and hold the spoon towards the baby. Once the baby moves towards the spoon and opens their mouth, place the spoon near the middle of the baby's tongue. The baby should take the food off the spoon without thrusting out their tongue. Look for signs the baby is full, which will include turning away, closing their mouth and shaking their head. For examples of hunger and fullness cues, see Eating Statement 6. Any uneaten food should not be kept and offered at a later stage to the baby as it may have been contaminated by the bacteria in saliva carried from the spoon to the food.

Babies should be introduced to as wide a variety of tastes in their foods as possible during the first few weeks and months after introducing complementary foods as this helps to establish healthy taste preferences. There is no need to introduce new foods one at a time unless the food is a common allergy-causing food.

The baby may make different facial expressions when trying new foods. This does not necessarily mean that they do not like the food but rather that it is a new sensation, and they are just learning about textures and tastes. Caregivers should praise their baby and give lots of smiles and enthusiasm when the baby tries a new food or a food they had previously seemed to dislike. Babies learn to eat by watching others, so include them in family mealtimes when possible and show them that eating is enjoyable and a social occasion (see Eating Statement 6).

For more advice

- **The Healthy Kids website of Te Hiringa Hauora/Health Promotion Agency (Te Hiringa Hauora) (www.healthykids.org.nz) has recipes and examples of first foods.**
- **The Ministry of Health oral health webpage Teeth and teething at: www.health.govt.nz/your-health/pregnancy-and-kids/first-year/6-weeks-6-months/teeth-and-teething**

How many New Zealand babies are introduced to complementary foods around 6 months of age?

The Growing Up in New Zealand (GUiNZ) longitudinal study of child development is run by researchers from The University of Auckland. It has been following the lives of 6,000 New Zealand children and their families since 2009.[2]

57%

of babies were introduced to solid foods at around 6 months of age

(5 months to less than 7 months old)

39%

of babies were introduced to solids early

(before 5 months of age)

4%

of babies were introduced to solids late

(7 to 9 months of age or later (0.1%))

Source: Gontijo De Castro et al (2018)

2 For more details on the GUINZ, see the Growing Up in New Zealand website at: www.growingup.co.nz

Kōrero Kainga 3
Eating Statement 3

Once you have started complementary feeding, offer your baby or toddler a variety of nutritious foods every day, including:

vegetables and fruit

grain foods (such as iron-fortified infant cereal, oats (porridge), bread, rice, noodles and pasta)

milk* and milk products (such as yoghurt and cheese)

legumes (such as lentils, tofu and beans), nut butters, eggs, fish, seafood and chicken, or lean red meat

* Not recommended as a drink for babies under one year of age.

Key points

- Offer babies and toddlers a variety of nutrient-dense foods each day as this is positively associated with diet quality and nutrient adequacy among young children.
- Don't give babies and toddlers dietary supplements unless they are at risk of a deficiency.
- Early and frequent taste exposures, particularly to vegetables and fruits, helps promote acceptance and enjoyment of a range of nutritious foods.
- To reduce a child's risk of choking, offer foods that are appropriate for a child's stage of development and always supervise babies and young children while they are eating.

Reasons for the recommendations

The importance of variety in baby and toddler diets

Healthy eating involves eating a range of foods from the four food groups every day. Different foods provide different types and amounts of nutrients; no single food or food group provides all the nutrients the body needs. By eating a variety of foods each day, babies and toddlers are more likely to get the essential nutrients they need to grow, develop and be healthy (WHO 2009). Tasting a variety of different foods also helps babies and toddlers establish healthy taste preferences (SACN 2018).

The importance of each of the four food groups, and the main nutrients supplied by each group, is described in *Eating and Activity Guidelines for New Zealand Adults* (Ministry of Health 2020b). It is still important to offer vegetables, fruit and iron-rich foods every day as a child grows (see Eating Statement 2).

For information on the recommended number of servings from each of the four food groups, and for serving size examples, see Appendix 3. Serving size advice is only available for children aged one year and older.

Dietary supplements are not recommended for children unless a child is at risk of deficiency and cannot get the nutrient from a food source. It is beneficial to obtain nutrients from foods and support the promotion of healthy eating habits (WHO 2009).

Micronutrients

An adequate intake of micronutrients is important for healthy growth and development, particularly in infancy and early childhood, which is a time of rapid growth. For example, iron has important implications for growth as well as brain development and function (see Eating Statement 2, 'Iron-rich foods, vegetables and fruit as first foods' for more details).

The following micronutrients were identified as ones that New Zealand babies and toddlers may be at higher risk of deficiency.

Vitamin D

Vitamin D helps to build strong bones. Low levels of vitamin D in babies and children can cause rickets. Rickets can result in weak bones, delayed walking, bowed legs and swollen wrists or ankles. If untreated, rickets can lead to failure to grow, deformed or broken bones, pneumonia and seizures.

Sun exposure is the main source of vitamin D. When our skin is exposed to sunlight, the ultraviolet B (UVB) rays from the sun synthesise vitamin D in our bodies. However, babies can't safely get vitamin D in this way. Their skin is very sensitive and should not be exposed to direct sunlight. Once young children are mobile, they should follow the same sun prevention advice as for the general population. Sunburn should always be avoided.

Adequate intakes of vitamin D are difficult to achieve through diet alone, as only a few foods in New Zealand contain or are fortified with vitamin D. The best dietary sources of vitamin D for babies and toddlers are:

- fatty fish, with no added salt, either freshly cooked (with bones and skin removed) or canned (for example, salmon, herring, mackerel, sardines)
- vitamin D-fortified foods (for example, table spread "margarine", some plant-based milk alternatives and yoghurts)
- whole-fat milk (dark blue label) and butter
- egg yolk.

Breast milk is the ideal and recommended food for babies, but it is not a good source of vitamin D as it can contain variable levels of the vitamin. Many babies will get enough vitamin D from incidental sun exposure (for example, a few minutes exposure to the sun when being carried between buildings). However, babies who are breastfed over winter months in New Zealand may be vitamin D deficient by late winter/spring. These babies may benefit from vitamin D supplements.

Doctors can prescribe subsidised vitamin D liquid drops for high-risk babies. Caregivers of babies that are at high risk should talk to their doctor, midwife or nurse about vitamin D supplementation.

Babies receiving more than 500 mL of infant formula a day will receive enough vitamin D as formula is fortified with vitamin D. Toddlers are unlikely to be at risk of vitamin D deficiency because of incidental sun exposure (for example, playing outside or walking between buildings).

For more information on vitamin D, supplements and appropriate sun exposure, see *Companion Statement on Vitamin D and Sun Exposure in Pregnancy and Infancy in New Zealand* (Ministry of Health 2020a).

Who is at risk of vitamin D deficiency?

Babies at higher risk of vitamin D deficiency include:

- breastfed babies with one or more of the following:
  - a naturally dark skin
  - a mother who is deficient in vitamin D or is at a higher risk of becoming deficient
  - a sibling who has had rickets or seizures resulting from low blood-calcium levels
- preterm babies (< 37 weeks gestation) with a body weight less than 2.5 kg
- babies who are solely breastfed over winter months in New Zealand.

Iodine

Iodine is part of thyroid hormones that are needed for growth and development. It is essential for normal brain development. The iodine content of New Zealand soils is low and, as a consequence, locally produced foods are also low in iodine (Skeaff et al 2005). The level of iodine in breast milk reflects the mother's iodine intake. The Ministry of Health recommends breastfeeding women take a 150-microgram daily iodine-only tablet to help meet both their own and their baby's iodine requirements.

Iodine fortification of bread and bread products

Since 2009, most commercially prepared bread in New Zealand has been legally required to have iodine added to it in the form of iodised salt. Organic bread, non-yeast-leavened bread and bread making flour are exempt.

Once complementary feeding has been established, it is important to include good sources of iodine in the baby's or toddler's diet. Good sources of iodine from foods are:

- cooked fish and some shellfish
- most breads (except for organic and unleavened breads)
- milk and milk products
- eggs
- meat and poultry.

Vitamin B12 for babies with a vegan diet

Vitamin B12 is essential for normal blood and nerve function. Vitamin B12 is only found naturally in animal products. Not many foods and plant-based milk alternatives are fortified with vitamin B12 in New Zealand.

If a mother is breastfeeding, it is important that her diet has sufficient vitamin B12 to provide vitamin B12 for the baby (American Dietetic Association 2003), so if her diet does not regularly include foods containing vitamin B12, she should take a vitamin B12 supplement.

Good sources of vitamin B12 are:

- beef, liver, pork, lamb and chicken
- fish and shellfish, such as trout, salmon, tuna and clams
- milk, yoghurt and cheese
- vitamin B12 fortified soy milk
- eggs
- yeast spreads, if fortified (for example, Marmite).

Mothers of babies and toddlers who follow a vegan diet ideally should breastfeed for as long as possible. Two years or more is desirable.

Parents and caregivers should consult a doctor about vitamin B12 supplementation if:

- the baby is breastfed and a recent test shows their mother has inadequate levels of vitamin B12 or
- the toddler has a vegan diet and is no longer breastfed or receiving infant formula.

The importance of repeated exposure to different foods

It is important to keep offering (but not forcing) foods, especially vegetables and fruits, when a child initially seems not to like that food so that the food becomes familiar to them, and they can get used to a range of flavours. Presenting the food in different ways (different cooking methods or textures) and offering it alongside foods that the child enjoys are strategies to increase the child's acceptance of the food.

Repeated exposure is one of the most powerful ways to help babies and young children like a food (Hendrie et al 2017; SACN 2018). After seeing, touching and tasting a food multiple times, a child can become familiar with the food's texture and taste. There is good evidence that the same vegetable(s) or fruit(s) offered once a day for 8–10 or more days is likely to increase acceptability of the food in babies and toddlers (Spill et al 2019).

The difference between gagging and choking

Gagging on foods is normal in young infants. Gagging is a reflex that pushes objects from the back of the throat to the front of the mouth. Gagging helps stop objects from blocking the airway and is usually noisy (the child will often vocalise, spit or vomit). Gagging on food is the infant's way of getting rid of a piece of food and is important developmentally in that it helps them learn to manage food within their mouths. Sometimes gagging will also occur if a child is full.

Choking is **not** normal during meals and may potentially be life threatening. Choking occurs when food gets stuck in the airway. A child who is choking will struggle to breathe and usually will be unable to make any noise with their voice. If a child looks like they are choking, help them straight away.

How to reduce the risk of choking

Babies and young children have an increased risk of choking on food because:

- the small diameter of their air and food passages can be easily blocked by small objects
- they lack experience with moving food around in their mouths
- their biting and chewing skills are not fully developed
- they have a less effective cough mechanism to dislodge foreign bodies
- they lack the second molars that enable them to successfully grind food before swallowing it until they are over 30 months old.

Reduce the risk of a baby or toddler choking on food by providing a safe physical environment when eating, educating parents and caregivers on the appropriate way to respond if a child is choking and providing appropriate foods. Parents and caregivers should balance safety concerns about the risk of choking with the child's need to develop their ability to chew and move food around in their mouths. The variety of foods and textures offered to the baby should be increased over time (see Eating Statement 2).

To minimise the chance of food-related choking:

- make sure babies and toddlers sit down while they eat
- supervise babies and toddlers while they are eating or drinking
- offer food that matches the baby's or toddler's chewing and grinding abilities
- alter the texture of foods that pose a choking risk by grating, cooking, finely chopping or mashing the food (for example, hard foods such as raw apple and carrot)
- remove the high-risk parts of the food, for example, peel the skin or remove strong fibres, pips and seeds from fruit and vegetables
- avoid giving high-risk, small, hard foods, such as whole nuts and large seeds, until children are at least five years old.

Be aware of foods that are more likely to cause choking, such as:

- small hard foods that are difficult for children to bite or chew (for example, whole nuts or pieces of nuts, large seeds, watermelon seeds, popcorn husks, pieces of apple, raw carrot)
- small round foods that can get stuck in children's throats (for example, grapes, berries, raisins, sultanas, peas, watermelon seeds, lollies)
- foods with skins or leaves that are difficult to chew (for example, sausages, chicken, lettuce, nectarines)
- compressible food that can squash into the shape of a child's throat and get stuck there (for example, hot dogs, sausages, pieces of cooked meat, popcorn)
- thick pastes that can get stuck in children's throats (for example, chocolate spreads, peanut butter)
- fibrous or stringy foods that are difficult for children to chew (for example, celery, rhubarb, pineapple)
- food with bones (for example, fish or chicken nibbles) because small bones present a choking risk.

Parents and caregivers need to learn choking first aid and cardiopulmonary resuscitation (CPR). See 'For more advice' below.

Children will often try stuffing their mouths full of food when they are around two to three years of age. This can increase the chance of choking. During this stage, try:

- offering smaller pieces of food
- limiting how much food the child can access at a time (less food on their plate)
- checking that the child doesn't have food in their cheeks when they go to leave the table.

By around three years of age, children can safely manage to eat most foods. However, care is still required with foods considered to be a high choking risk, and children should not be offered whole nuts or large seeds until they are five years old. Children should continue to be encouraged to sit while eating.

Food safety considerations for babies and toddlers

Some foods are at high risk of contamination by bacteria, yeast, mould, fungi, viruses or other microbes/toxins that may cause food poisoning.

The Ministry for Primary Industries provides general advice on how to prepare, cook and store food to ensure food safety on its Preparing and storing food safely at home webpage at: www.mpi.govt.nz/food-safety-home/preparing-and-storing-food-safely-at-home/

There are some higher risk foods for babies and toddlers.

To reduce the chance of food poisoning, do not feed babies (under 1 year):

- honey

To reduce the chance of food poisoning, do not feed babies or toddlers:

- raw, or unpasteurised, milk and products made from unpasteurised milk (for example, some cheeses, yoghurts)
- raw seed-sprouts, including alfalfa and mung beans
- raw fish or shellfish (for example, kina).

Imported frozen berries have been linked in New Zealand and internationally to hepatitis A. If using imported frozen berries (for example, in a smoothie), bring them to the boil or cook them at 85 degrees Celsius for at least 1 minute before feeding them to a baby or toddler.

Young children can get sick from swallowing apricot kernels or just a few apple or pear seeds. These all contain a naturally occurring chemical amygdalin that makes hydrogen cyanide, which changes into cyanide when eaten. In rare cases, this can be fatal.

Shellfish and fish should only be collected from areas where water is not contaminated. The Ministry for Primary Industries issues public warnings if areas become contaminated with biotoxins.

Some foods can take up higher levels of contaminants during cultivation and manufacture. Contaminant levels are rarely a concern when babies and toddlers eat these foods in moderation, but the risk can be elevated if a single food makes up a large part of a baby's or toddler's diet. Ensure toddlers are offered a variety of nutritious food from the four main food groups each day to limit any risks that they will eat too much of any one food.

For more advice

- The Well Child / Tamariki Ora *My Health Book* parent information, health and immunisation record book provided free to every family after the birth of each child has more information on choking first aid and CPR.
- The Food-related choking in young children webpage on the Ministry of Health's website at: www.health.govt.nz/your-health/healthy-living/food-activity-and-sleep/healthy-eating/food-related-choking-young-children
- For more information on how to avoid food-borne illness, see the Food safety at home webpage on the Ministry for Primary Industries website at: www.mpi.govt.nz/food-safety/food-safety-for-consumers/
- The *Companion Statement on Vitamin D and Sun Exposure in Pregnancy and Infancy in New Zealand* available from the Ministry of Health's website at: www.health.govt.nz/publication/companion-statement-vitamin-d-and-sun-exposure-pregnancy-and-infancy-new-zealand

How many New Zealand babies and toddlers eat a nutritious and varied diet?

The Growing Up in New Zealand (GUiNZ) longitudinal study of child development is run by researchers from The University of Auckland. It has been following the lives of 6,000 New Zealand children and their families since 2009.[3] In the Growing Up in New Zealand study:

53%

of babies at 9 months of age were eating food from each of the four food groups at least once a day

The food group with the least adherence to the guideline was meat and alternatives, with two in five babies not usually having this food group daily.

33%

of babies at 9 months of age met the vegetable intake recommendation to eat vegetables twice or more daily*

A further 55% ate vegetables once a day and 12% ate vegetables less than daily or never.

37%

of babies met the fruit intake recommendation to eat fruit twice or more daily*

A further 48% ate fruit once a day and 15% did not eat fruit daily.

79%

of babies at 9 months of age ate iron-rich foods daily

Defined as meat, fish, shellfish, fortified baby rice or cereal.

* The recommended intakes for vegetables and fruit for babies were derived by the researchers for the purpose of this study.

Source: Gontijo De Castro et al (2018)

3 For more details on the GUINZ, see the Growing Up in New Zealand website at: www.growingup.co.nz

Kōrero Kainga 4
Eating Statement 4

When preparing food for your baby or toddler, do not add salt or sugar. If using commercially prepared foods, choose those that are low in salt (sodium) and with no added sugars

Key points

- Adding salt, soy sauce, sugar and other sweeteners to babies' and toddlers' food masks the natural flavour of foods, provides no nutritional benefit and may accustom the child to their taste. This can make it difficult to get your child to eat a healthy and varied diet.
- Provide babies with mostly whole and less processed foods as much as possible, for example, vegetables, fruit, whole grains, unsweetened milk products, legumes, eggs, fish, seafood, chicken or lean red meat.
- Commercial baby foods are a convenient alternative to home-made baby food, but an over-reliance on these products may reduce the variety of flavours and textures in a baby's diet (WHO Regional Office for Europe 2019).
- Having a diet that is low in salt (sodium) and low in added sugar is a key part of a healthy eating pattern over the life course and is linked to a lower risk of excess body weight and related non-communicable diseases.

Reasons for the recommendations

Why low sodium and no added sugar is important for babies and toddlers

Young children need to experience the natural flavours of foods so that they do not develop taste preferences for salty and sugary foods (Michaelsen et al 2003). This is best achieved by not adding salt, soy sauce, sugar or other sweeteners to flavour babies' and toddlers' food.

Complementary foods should contain no or very small amounts of salt (sodium) as babies are less efficient than adults at excreting excess sodium. Babies require only very small amounts of sodium (NHMRC 2006), and the amount required can be met through natural food sources (for example, breast milk, meat, fish, eggs) and processed foods such as bread, crispbreads, yoghurt and cheese.

Most dietary sodium comes from salt (sodium chloride) in processed foods while about 10–20 percent comes from salt added during and after cooking (Brown et al 2009). Salt should not be added during cooking or before serving food that is intended for young children.

Adding sugar increases the energy (kilojoules) content of food and drinks but adds no other useful nutrients. Consuming too much sugar is linked with excess body weight and tooth decay (WHO 2015).

Eating a diet that is low in both salt (sodium) and sugar over the life course is linked with a lower risk of developing non-communicable diseases such as heart disease and diabetes (WHO 2013, 2015).

How to look for salt (sodium) and sugars on food labels

Most packaged foods are required to include a nutrition information panel (NIP) on their labelling. The NIP displays the amount of nutrients a food contains. It allows consumers to compare different foods' nutrient content, serving size and number of serves per package.

Commercial baby food

When buying baby food, check that it is right for the baby's age/stage. Always follow the storage and serving instructions on the jar, pouch or can.

If using a pouch, empty the contents into a bowl (or straight on to a spoon) and spoon-feed the child: infants should not suck directly from the pouch because this does not allow them to see, smell or touch the food.

Commercial baby foods are a convenient alternative to home-made baby food, but an over-reliance on these products may reduce the variety of flavours and textures in a child's diet (WHO Regional Office for Europe 2019).

The ingredient list on food packaging is also helpful. The ingredients are listed in order of quantity present in the food, with the ingredients present in the greatest quantities listed first.

Low in salt (sodium)

Commercially produced baby foods contain restricted levels of sodium to ensure they are appropriate for babies. For toddler and family foods, such as breads and crackers, choose products with the lowest levels of sodium (≤ 400 mg/100 g).

Sugars

Babies and toddlers do not need sugar in their diet.

Food manufacturers use different forms of sugar to sweeten foods. Sugars found on an ingredient list include:

- agave nectar
- brown sugar
- cane sugar
- coconut sugar
- corn syrup
- dextrose
- fructose
- fruit juice concentrate
- glucose
- high-fructose corn syrup
- honey
- invert sugar (also known as invert syrup)
- maltodextrin
- maltose
- malt syrup
- maple syrup
- molasses
- raw sugar
- syrup.

Definition of free sugars

The WHO Nutrition Guidance Expert Advisory Group (NUGAG) Subgroup on Diet and Health defines free sugars as ‘all monosaccharides and disaccharides added to foods by the manufacturer, cook or consumer, plus sugars naturally present in honey, syrup and fruit juices and fruit juice concentrates’ (WHO 2015).

Food ideas for babies and toddlers

Some healthy snacks are:

- carrot, apple or celery – skins removed and finely grated or cooked until soft
- cucumber or watermelon (with large seeds removed)
- low-salt crackers spread thinly with smooth, unsweetened, unsalted peanut butter
- pasteurised cheese (sliced or grated)
- dumplings or steamed buns with minced meat and vegetable filling
- toast with hummus
- banana (raw ripe or cooked green)
- avocado
- scrambled or hard-boiled egg (mashed)
- tinned plain tuna or salmon
- full-fat yoghurt with no added sugar.

The following foods are not good for babies and toddlers as they have poor nutritional value, are high in added sugar and/or salt or are deep-fried.

- Processed meats (for example, sausages, bacon, ham, salami, beef jerky, corned beef) and meat alternatives (for example, plant-based sausages and plant-based burger patties)
- Potato and corn-based snack foods, for example, chips/crisps, corn chips
- Biscuits
- Crackers that are high in fat and salt
- Breakfast cereals that are high in salt and added sugars
- Sauces (for example, tomato and soy)
- Confectionery (for example, lollies and chocolate)
- Cakes, doughnuts and slices
- Ice cream
- Fast foods, including hot chips (fries).

When unhealthy foods (food that are high in salt, fat or sugar) replace nutrient-dense foods in a baby's or toddler's diet, it can lead to long-term health consequences, such as obesity, tooth decay and nutrient deficiencies.

For more advice

The Healthy Kids website of Te Hiringa Hauora/Health Promotion Agency (Te Hiringa Hauora) (www.healthykids.org.nz) has recipes and tips for feeding babies and toddlers.

More information about food labels is available from the Food safety at home webpage on the Ministry for Primary Industries website at: www.mpi.govt.nz/food-safety/food-safety-for-consumers/

How many New Zealand babies have a diet that is low in salt and sugar?

The Growing Up in New Zealand (GUiNZ) longitudinal study of child development is run by researchers from The University of Auckland. It has been following the lives of 6,000 New Zealand children and their families since 2009.[4] In the GUiNZ study:

16%

of babies had salt added to their food or milk

Only a small proportion of babies were given food that had salt or sugar added during meal preparation, but many babies may have been getting too much salt and sugar in pre-prepared foods and drinks.

14%

of babies had sugar added to their food or milk

8% of babies had both sugar and salt added to their food and/or milk.

53%

of babies had tried sweets, chocolate, hot chips or potato crisps by nine months of age

41%

of babies had tried hot chips by 9 months of age

And 14% were eating hot chips at least once a week. Around 7% of babies were eating chocolate, lollies, or potato crisps at least once a week at 9 months of age.

Source: Gontijo De Castro et al (2018)

4 For more details on the GUINZ, see the Growing Up in New Zealand website at: www.growingup.co.nz

Kōrero Kainga 5
Eating Statement 5

Recommended drinks for your baby or toddler are breast milk* and water (once they are eating complementary foods). Cow's milk can be offered as a drink from 12 months of age

Do not give your baby or toddler juice, cordial, fruit drink, flavoured milk, soft drinks, tea, coffee or alcohol

* Or, if necessary, a commercial infant formula until 12 months of age.

Key points

- Breast milk or a breast milk substitute (infant formula), are the only recommended milk drinks for babies under one year of age.
- From six months of age, the baby can be given drinks in an open cup (without a spout), encouraging the baby to hold the cup with two hands and bring it up to their mouth themselves.
- From one year of age, breast milk, whole-fat pasteurised cow's milk (around 350 mL per day) and water are the recommended drinks.
- Soy milk fortified with calcium and vitamin B12 is recommended for toddlers who need an alternative to cow's milk.
- Other drinks are not recommended for babies and toddlers.

Reasons for the recommendations

Appropriate drinks for babies and toddlers

Babies that are exclusively breastfed can meet their fluid requirements with breast milk and do not need additional drinks (WHO 2009). Formula-fed babies under six months of age may need to have their fluid content supplemented with boiled, cooled water in hot weather. Other drinks, including cow's milk, should not be given to babies under one year of age. They do not provide enough energy and are not nutritionally equivalent to breast milk or infant formula.

See Eating Statement 1 for more information about breast milk and breast milk substitutes (infant formula) for children aged under one year old.

After one year of age, breast milk or whole-fat pasteurised cow's milk (dark blue label) provides important extra nutrients to help with growth and development, and plain water is important for hydration. There is no need to give other drinks to toddlers (Hojsak et al 2018; Lott et al 2019).

Frequent consumption of foods and drinks high in added sugars is associated with dental decay (NHMRC 2012b) and increased risk of overweight and obesity (WHO 2015). There is no known safe level of intake of caffeine or low- and no-calorie sweeteners (diet or sugar-free drinks) for young children, and so these are not recommended for children under the age of five years old (Lott et al 2019).

Drinking from an open cup

Use of an open cup has been shown to be a safe and easily learned skill in infancy (American Dental Association 2004). Use of bottles among babies has been associated with excess consumption of calories and may contribute to obesity in childhood (Gooze et al 2011). The transition from bottle to open cup should take place by 12 months of age at the latest (Institute of Medicine 2011).

After six months of age, drinks can be offered in an open cup (without a spout). Babies may need support at first to help them control a cup. Encourage the baby to hold the cup with two hands and bring it up to their mouth themselves. If a training cup is used, one without a valve under the spout is the best option: a valve stops the baby from learning to sip and instead encourages an immature sucking pattern.

When to offer water

From the time a baby starts complementary foods (around six months of age) plain water should be offered to drink with every meal and snack.

Babies who are not breastfed should be offered water to drink if the weather is hot and their nappies are not very wet. For babies under six months of age, always boil water and cool before offering to the baby. Bottled water is not sterile and, like tap water, needs to be boiled then allowed to cool.

Water from a private supply (such as from a well or bore) should be boiled and cooled until the baby is 18 months old. Water from a private supply should be tested for any contaminants that could harm the baby.

Parents and caregivers should check that their home's drinking water supply is clean and safe from contaminants that could make children sick. The Ministry of Health publishes an annual report on drinking-water quality, which describes drinking-water quality for all registered networked drinking-water supplies that serve populations of more than 100 people.

There is also advice for households that are not on a town water supply on the Household water supplies webpage of the Ministry of Health website at: www.health.govt.nz/your-health/healthy-living/drinking-water/household-water-supplies

What about raw milk?

Raw (unpasteurised) milk from any animal may be contaminated with illness-causing bacteria, including shiga toxin-producing *E. coli* (STEC), *Listeria monocytogenes* and *Campylobacter*. These bacteria most commonly cause severe diarrhoea and vomiting, but occasionally they have serious complications that include paralysis, meningitis and serious kidney problems in children.

Babies and toddlers are the most likely age group to get sick from drinking raw milk, and so it is important that raw milk is not given to babies and toddlers.

Cow's milk as a drink

Cow's milk is an important food for toddlers because it provides key nutrients, such as energy, protein, calcium, riboflavin and vitamin B12. However, there is concern that drinking too much milk can have negative health effects (NHMRC 2012c). A young child may fill up on milk and have less motivation or interest in eating a varied diet. Cow's milk is also low in iron, high in protein and can displace iron-rich foods. For these reasons, cow's milk as a drink is not recommended before a child is 12 months of age. Goat's milk poses the same risks as cow's milk for iron deficiency and excess protein when consumed in large amounts.

For non-breastfed toddlers over 12 months of age, offer around 350 mL of plain, whole-fat (dark blue label) cow's milk a day in a cup (not a bottle). Breastfed toddlers may need less cow's milk depending on how often they are breastfeeding. Reduced-fat milks should not be given to toddlers under two years old because of the low energy content of these milks at a time when children have high energy requirements.

Plant-based milk alternatives

Plant-based milk alternatives (soy, almond, oat, rice, coconut, hemp) have a different nutritional profile to cow's milk. Some contain significantly less protein and energy compared with cow's milk. Babies under 12 months old should not be given plant-based milk alternatives because such milks do not contain enough nutrients for a baby's growth and development.

From one year of age, toddlers can be offered unflavoured soy milk as a drink (soy milk is higher in protein and fat than other plant-based milk alternatives). Choose a soy milk fortified with calcium (with at least 100 mg of added calcium per 100 mL) and vitamin B12 if the toddler has a vegan diet and is not taking a B12 supplement. Home-made soy milks will not contain added calcium and are not recommended.

Toddler milks

Toddler milks, also known as young child formula or growing up milk, are milk based drinks (made from cows', goat's or sheep milk) drinks with added vitamins and minerals, designed for consumption by one- to three-year-olds. These are marketed as stage 3 and stage 4 formulas.

Toddler milks are not recommended by the WHO (WHO and UNICEF 2018) because:

- they can continue a child's preference for milk and limit variety in the diet
- achieving optimal nutritional intake from a healthy varied diet is preferable to obtaining nutrients mainly from milk (in order to establish healthy eating behaviours in toddlers)
- they are expensive.

If a toddler is eating a variety of foods, including iron-rich foods, then the extra nutrients in toddler milks generally provide no benefit. However, some research suggests toddler milks may assist with improving iron, iodine and vitamin D status in New Zealand children (Cairncross et al 2017; Houghton et al 2011; Lovell et al 2019; Szymlek-Gay et al 2019; Szymlek-Gay et al 2009).

Practical advice

Looking after developing baby and toddler teeth

Oral health is important for overall child health and wellbeing. Dental decay may affect nutrition, growth and weight gain as toothache and infections can change eating and sleeping habits, dietary intake and metabolic processes (SACN 2018).

Dental caries are largely preventable but are common in young children (Ministry of Health 2010). Identifying early childhood caries can help prevent or stop the progression of this disease. Parents or caregivers should lift their child's lip once a month to check for signs of tooth decay. Health practitioners should also regularly check children's teeth for decay.

Sugary drinks such as cordials, fruit drinks and juices, flavoured milks and soft drinks should not be offered to babies and young children as they can damage the child's developing teeth.

Start brushing a baby's teeth as soon as the first tooth comes through the gums (usually around six months). Buy a soft, small-headed brush and use a small smear of regular strength fluoride toothpaste (minimum 1,000 ppm). Brush the baby's teeth twice a day – in the morning after breakfast and at night before bed. Fluoride in water can reduce the likelihood of experiencing dental decay and minimise its severity (Iheozor-Ejiofor et al 2015). Fluoride and regular brushing keep teeth healthy.

Signs of tooth decay in infants and toddlers

Whitish marks on the tooth surface close to the gum line are early signs of tooth decay. At this early stage, the decay process can be stopped and/or reversed with fluoride treatment. Seek dental care for advice and treatment.

If it is left untreated, it can quickly progress to become a hole that will need dental treatment. The more advanced stage of decay appears as a yellow-brown or black appearance on teeth.

For more advice

Children who are residents and citizens of New Zealand are entitled to and encouraged to access free basic oral health services from birth. Call 0800 TALK TEETH (0800 825 583) to enrol your baby or toddler.

Ministry of Health advice for:

- **WellChild Service Providers on oral health at: www.health.govt.nz/publication/healthy-smile-healthy-child**
- **households that are not on a town water supply: www.healthed.govt.nz/resource/household-water-supplies**

For information on raw milk, see the webpage Is it safe to drink raw milk and eat raw milk products? On the Ministry for Primary Industries website at: www.mpi.govt.nz/food-safety/food-safety-for-consumers/is-it-safe-to-eat/raw-milk

What do New Zealand babies and toddlers drink?

The Growing Up in New Zealand (GUiNZ) longitudinal study of child development is run by researchers from The University of Auckland. It has been following the lives of 6,000 New Zealand children and their families since 2009.[5]

In the GUiNZ study, most babies only drank breast milk, infant formula and water.

39%

of babies aged nine months old had tried fruit juices, soft drinks, coffee, tea or herbal drinks

23%

of babies drank a fruit juice at least weekly at 9 months, which is the most common inappropriate drink consumed (including watered-down juice)

6% of babies had tried a soft drink by 9 months of age.

Source: Gontijo De Castro et al (2018)

5 For more details on the GUINZ, see the Growing Up in New Zealand website at: www.growingup.co.nz


EAST COAST
NYC
MCMXCVII

Kōrero Kainga 6
Eating Statement 6

Let your baby or toddler guide you about how much they eat. Encourage your child to eat, but don't force them

Sit with your baby or toddler while they eat or drink, and include them in family mealtimes

From a young age, encourage your child to feed themselves

Key points

- Feeding in response to a baby's or toddler's hunger or fullness cues (responsive feeding), helps protect the baby's or toddler's natural ability to self-regulate their food intake according to appetite.
- Relaxed, enjoyable mealtimes, without distractions such as television and other screens, provide a positive eating experience.
- Family mealtimes help a child learn to eat as young children will copy what parents, siblings, whānau and peers do. It also provides opportunities for social interaction.
- It is the parent's role to decide what food is offered to a baby or toddler. This includes limiting access to energy-dense, nutrient-poor foods that displace healthy foods.

Reasons for the recommendations

Responsive feeding helps babies and toddlers learn how to eat and enjoy eating. It supports them to pay attention to their body's signals and may also protect them from gaining too much weight (DiSantis et al 2011; Institute of Medicine 2011). Experts consider responsive feeding to be one of the most important practices for encouraging healthy eating behaviours and appetite regulation in early life (Cameron et al 2012; Gerritsen and Wall 2017).

Non-responsive feeding practices can be characterised by an imbalance, because of either excessive caregiver control (for example, restrictive feeding practices) or excessive child control (for example, indulgent feeding practices – parents permit their child freedom to eat when they wish and to choose foods they prefer). Both types of non-responsive feeding are associated with the development of poor self-regulation skills, such as a tendency to eat in the absence of hunger, and a higher risk of obesity (Hurley et al 2011). Pressuring children to eat in early childhood is associated with children being overweight and also underweight at five years of age (Haszard et al 2019). It is thought this happens because a baby is unable to develop self-control and respond to innate satiety cues and therefore becomes conditioned to eat in the absence of hunger (Gerritsen and Wall 2017).

A lack of confidence in reading a baby's hunger and satiety cues alongside a desire to establish a routine as soon as possible can prevent parents from feeding responsively (Research New Zealand Ltd 2014), as can a parent's concern about their baby or toddler being over- or underweight (Gerritsen and Wall 2017). Chronic stress in either the baby or the mother also makes it more likely that parents will use food to soothe the child or follow restrictive and controlling feeding practices (Bergmeier et al 2014).

What is responsive feeding?

Responsive feeding is when a parent or caregiver feeds their child in response to the child's hunger and fullness cues. It involves paying close attention to the baby or toddler and only feeding when they are hungry and stopping as soon as they indicate they are full.

Responsive feeding is important during all stages of feeding a baby or toddler: when breastfeeding, bottle-feeding, spoon-feeding and self-feeding.

Responsive feeding means **only** offering food because a child is hungry and not for other reasons, such as comfort, entertainment, reward or to control behaviour.

Enthusiastic role modelling by adults helps with food acceptance

Babies and toddlers need to learn to like healthy food. Familiarity and feeling sure that a food is safe are key. Children will copy what parents, siblings, whānau and peers do, so it helps when adults model preferred eating behaviours and talk about food in a positive way around children.

Mealtimes are culturally and socially important for helping children learn how to eat and how to think about food, and mealtimes are occasions for building strong relationships between family members. Aim to make mealtimes fun and low stress.

Families should eat together as often as possible. A ‘family mealtime’ does not have to mean that every family or whānau member is sitting at the table, taking part in a formal meal. It can be any meal anywhere, if:

- there is an adult present who is eating with the child
- the adult is taking the time to connect with the child and is not simply focused on getting the child to eat
- everyone can choose how much they will eat, ideally serving themselves or being assisted to serve themselves if they are a baby or toddler.

How to recognise when a baby or toddler is hungry or full

Babies and toddlers are good at knowing when they have had enough to eat. It is important that a caregiver notices when their baby or toddler is making hunger signs and offer food as soon as possible, then stop feeding when the baby makes any of the signs of being full.

Hunger signs

Opening mouth and (when a baby) turning head from side to side (the 'seeking' or 'rooting' reflex)

Fussing and leaning toward the breast or food

Increasing physical movements that become agitated/excited

Crying in a distressed, intense way (note that once the baby becomes agitated you will need to soothe them before starting to feed)

Asking for or pointing at foods

Signs of fullness

Slowing or stopping sucking

Releasing the nipple or teat

Pushing or arching away, pushing food or plate away

Turning head away or shaking head to communicate ‘no more’

Falling asleep (up to three months old)

Sealing lips together (four to seven months old)

Spitting out food

Using words like ‘All done’ or ‘Get down’

Becoming distracted and more interested in what is going on around them

The pitfalls of eating in front of screens

Watching the television, tablet or phone while eating makes it difficult for babies and toddlers to recognise their fullness cues and can lead to overeating (Gerritsen and Wall 2017; Marsh et al 2013). Caregivers may also find it difficult to feed their child responsively when they are distracted by events occurring on a screen.

It can be tempting to distract 'fussy eaters' in order to get them to eat, but it is important that all children focus on eating during mealtimes.

How to respond to a fussy eater

Fussy eating is common in toddlers. This is a natural part of child development.

If a toddler is picky about the foods they will eat, it may help to:

- ensure they are hungry when they sit down to a meal (offer the last snack at least 90 minutes before a meal)
- provide small portions with a variety of offerings
- provide plenty of opportunities to try foods, offering the same food ten or more times
- avoid pressure and stress at mealtimes
- have adults role model eating the food and talk positively about the food
- praise the child when they try a new food or eat something that they have said they dislike
- reward with stickers or reward charts – but never reward with food
- resist the temptation to replace the offered food with a favourite food
- end the meal within a reasonable time (for example, 30 minutes) and clear away the plate without comment.

Feeding a baby or toddler when they are unwell

When babies and toddlers are unwell, they still need to drink and eat. Depending on the degree of illness, they may not want to eat as much or at all. It is important they remain hydrated and keep taking in fluids.

Regularly offer:

- breast milk, if the baby or toddler is breastfeeding
- plain water
- small portions of food that are easy to chew and swallow.

Wash your hands after caring for a sick child, especially before you prepare and serve food. You don't want to pass on an infection to others.

The Well Child / Tamariki Ora *My Health Book* parent information, health and immunisation record book provided free to every family after the birth of each child has more information on danger signs of illness in young children and when to see a doctor.

Ngā honoga whaihua **Useful links**

BreastFedNZ

For access to the free breastfeeding app, which provides simple information and stories to help with breastfeeding:
www.breastfednz.co.nz

Breastfeeding New Zealand videos

For video advice and support through the breastfeeding journey:
www.youtube.com/user/breastfeedingnz

Breastfeeding and work

Breastfeeding and Working: a pamphlet prepared by the Ministry of Health and Te Hiringa Hauora that explains the benefits of and how to manage breastfeeding at work:
www.healthed.govt.nz/resource/breastfeeding-and-working

The webpage Breastfeeding at work on the Employment New Zealand website at:
www.employment.govt.nz/hours-and-wages/breaks/breastfeeding-at-work

Easy Choice Family Kai

Seasonal meal planner and recipe book from the Love Food, Hate Waste website at:
https://lovefoodhatewaste.co.nz/easy-choice-meal-planner

Healthy Babies Healthy Futures

A public health programme in the Auckland and Waitemata regions:
https://healthybabies.org.nz

Healthy Kids

Fun, free and low-cost food ideas, tools and recipes:
www.healthykids.org.nz

Healthy Nibbles

Ideas from the Canterbury District Health Board for food and snacks for children:
www.cph.co.nz/your-health/healthy-nibbles

Te Hiringa Hauora Infant Feeding Resources

Information about what, when and how to introduce solid foods at around six months of age:
www.nutritionandactivity.govt.nz/nutrition/infant-feeding-resources

Healthy Start Professional Development

An initiative funded by the Ministry of Health for the health and wellbeing sector to learn how nutrition and physical activity during early life can have lifelong and intergenerational impacts:
www.healthystartworkforce.auckland.ac.nz/en.html

Plunket

Feeding tips from birth to two years:
www.plunket.org.nz/caring-for-your-child/feeding/

Papakupu **Glossary**

Baby, in this report, relates to a child under the age of 12 months.

Breastfeeding is the process of feeding children with milk from the breast. In this report, it includes feeding breast milk that has been expressed and given to the baby in a bottle.

Choking is the obstruction (blockage) of the airway. A child who is choking will struggle to breathe and usually be unable to make any noise with their voice. Choking is dangerous, and caregivers need to react quickly to dislodge food stuck in a baby or toddler's airway.

Commercial infant formula (see Infant formula).

Complementary food is sometimes called 'solids' and is food other than breast milk or infant formula that is introduced when the child is around six months of age.

Dietitians are experts on human nutrition, and, in New Zealand, must have completed a postgraduate degree in dietetics and are registered with the Dietitians Board.

Exclusive breastfeeding means that the baby receives only breast milk: no other liquids or solids are given – not even water (with the exception of medicines as needed).

Family mealtime is a social and cultural occasion where at least one adult eats, and interacts, with a child or children who is also present at the meal.

Fluoride is a naturally occurring element added to drinking water in most areas of New Zealand to prevent tooth decay.

Follow-on formula are commercially produced milks that are suitable for babies from six months of age as the principal liquid part of the diet and that comply with the regulations for follow-on formula.

Food allergy is an adverse reaction to a food by the body's immune system.

Food environment is the food available, marketed and easily accessed in an area. This includes the food and drinks in shops, cafes and restaurants and shown on signs, advertisements and in media.

Food insecurity is a limited or uncertain availability of nutritionally adequate and safe foods or limited ability to acquire personally acceptable foods that meet cultural needs in a socially acceptable way.

Galactosaemia is a genetic condition in which the body is unable to metabolise the sugar galactose. Galactose is part of lactose, which is the main sugar found in milk.

Infant formula is a commercially produced milk that can meet all of a baby's nutritional needs during the first four to six months of life, and can constitute the main milk source alongside complementary foods for the second six months and that complies with the regulations for infant formula.

Intense sweeteners (also known as artificial sweeteners) are a type of food additive that provides little or no energy (kilojoules). Intense sweeteners permitted for use in New Zealand include: aspartame, sucralose and stevia.

Iron is an essential mineral. Deficiency of iron is a major cause of anaemia.

Lactose intolerance is the inability to metabolise lactose due to the absence of the enzyme lactase in the intestinal system or due to a low availability of lactase.

Legumes are the edible seed from the Leguminosae family (Fabaceae). Examples are dried beans, chickpeas, soybeans and lentils.

Nutrients are substances that give the body the nourishment it needs to live and grow.

Plant-based milk alternatives are commercially produced non-dairy beverages made of water and plant material (for example, soy, almond, coconut).

Proteins are organic compounds that consist of large molecules of one or more long chains of amino acids. Proteins are part of all living organisms and provide the structural components of body tissue, such as muscle and hair, and functional components, such as enzymes.

Purée is a thick, smooth sauce made by crushing food, usually vegetables or fruit.

Repeated exposure means offering again on many different occasions a food that a child initially appears to dislike to increase the likelihood that the child will try, and start to enjoy, eating that food.

Responsive feeding is allowing the child to decide when and how much they will eat or drink. The parent or caregiver decides what the child will be offered to eat and gives age-appropriate portion sizes. Responsiveness means looking for a child's hunger and fullness cues.

Role modelling is behaving in a way that you would like the children watching you to behave, realising that they will copy your actions.

Satiety (fullness) is feeling full or satisfied that you have eaten enough.

Saturated fat is a fat or fatty acid that has no double bonds between the carbon atoms of the fatty acid chain. It is found in the fat of animal products, such as milk, cream, butter, cheese and meat, as well as in coconut and palm oil (used in manufactured foods such as pies, biscuits, cakes and pastries).

Sodium (Na) is an essential element that exists in many minerals, including salt. The body needs a small amount of sodium to help the brain send signals to the muscles and other areas of the body. Sodium is an electrolyte that helps the body maintain fluid and blood volume.

Solid foods (also called complementary foods) are the foods given to babies from around six months of age in addition to breast milk or infant formula.

Snack is a small portion of food and/or drink given between main mealtimes.

Supplementary nursing system (SNS) is a pouch that is filled with supplemental nutrition for a baby. The SNS can be placed on the mother's chest or on a pole. The very thin, flexible tubes are fixed alongside the mother's nipples and release additional milk and supplements as the baby breastfeeds.

Toddler, in this report, refers to a child from the age 12 months to 24 months.

Toddler milk is a milk-based drink with added minerals and vitamins to supplement a normal diet and address situations where intakes of energy and nutrients may not be adequate to meet an individual's requirements.

Whānau is the Māori word for family.

Ngā tohutoro **References**

American Dental Association. 2004. From baby bottle to cup: Choose training cups carefully, use them temporarily. *The Journal of the American Dental Association* 135(3): 387.

American Dietetic Association. 2003. Position of the American Dietetic Association and Dietitians of Canada: Vegetarian diets. *Journal of the American Dietetic Association* 103(6): 748-65. DOI: https://doi.org/10.1053/jada.2003.50142 (accessed 27 July 2021).

Aune D, Norat T, Romundstad P, et al. 2014. Breastfeeding and the maternal risk of type 2 diabetes: A systematic review and dose-response meta-analysis of cohort studies. *Nutrition, Metabolism and Cardiovascular Diseases* 24(2): 107–15. DOI: https://doi.org/10.1016/j.numecd.2013.10.028 (accessed 19 July 2021).

Bergmeier H, Skouteris H, Horwood S, et al. 2014. Associations between child temperament, maternal feeding practices and child body mass index during the preschool years: A systematic review of the literature. *Obesity Reviews* 15(1): 9–18. DOI: https://doi.org/10.1111/obr.12066 (accessed 19 July 2021).

Braegger C, Chmielewska A, Decsi T, et al. 2011. Supplementation of infant formula with probiotics and/or prebiotics: A systematic review and comment by the ESPGHAN committee on nutrition. *Journal of Pediatric Gastroenterology and Nutrition* 52(2): 238–50. DOI: https://doi.org/10.1097/MPG.0b013e3181fb9e80 (accessed 19 July 2021).

Brown IJ, Tzoulaki I, Candeias V, et al. 2009. Salt intakes around the world: implications for public health. *International Journal of Epidemiology* 38: 791–813.

Butte N, Cobb K, Dwyer J, et al. 2004. The start healthy feeding guidelines for infants and toddlers. *Journal of the American Dietetic Association* 104(3): 442–54. DOI: https://doi.org/10.1016/j.jada.2004.01.027 (accessed 19 July 2021).

Cairncross CT, Stonehouse W, Conlon CA, et al. 2017. Predictors of vitamin D status in New Zealand preschool children. *Maternal and Child Nutrition.* 13(3): 1–12. DOI: https://doi.org/10.1111/mcn.12340 (accessed 19 July 2021).

Cameron LS, Heath MA, Taylor RW. 2012. How feasible is baby-led weaning as an approach to infant feeding? A review of the evidence. *Nutrients.* 4(11): 1,575–609.

Castenmiller J, de Henauw S, Hirsch-Ernst K, et al. 2019. Appropriate age range for introduction of complementary feeding into an infant's diet. *European Food Safety Authority Journal*. 17(9): 5780. DOI: https://doi.org/10.2903/j.efsa.2019.5780 (accessed 19 July 2021).

Chowdhury R, Sinha B, Sankar MJ, et al. 2015. Breastfeeding and maternal health outcomes: A systematic review and meta-analysis. *Acta Paediatrica, International Journal of Paediatrics*, 104, 96–113. DOI: https://doi.org/10.1111/apa.13102 (accessed 19 July 2021).

Crawley H, Westland S. 2018. *Infant Milks in the UK: A practical guide for health professionals*. London: First Steps Nutrition Trust.

DiSantis KI, Hodges EA, Johnson SL, et al. 2011. The role of responsive feeding in overweight during infancy and toddlerhood: A systematic review. *International Journal of Obesity* 35(4): 480–92.

Domellöf M, Braegger C, Campoy C, et al. 2014. Iron requirements of infants and toddlers. *Journal of Pediatric Gastroenterology and Nutrition* 58(1): 119–29. DOI: https://doi.org/10.1097/MPG.0000000000000206 (accessed 19 July 2021).

DPMC. 2019. *Child and Youth Wellbeing Strategy*. Wellington: Department of the Prime Minister and Cabinet (DPMC). URL: https://childyouthwellbeing.govt.nz/resources/child-and-youth-wellbeing-strategy (accessed 19 July 2021).

Emmett PM, Jones LR, Northstone K. 2015. Dietary patterns in the Avon Longitudinal Study of Parents and Children. *Nutrition Reviews* 73(Suppl 3): 207–30. DOI: https://doi.org/10.1093/nutrit/nuv055 (accessed 19 July 2021).

Fewtrell M, Bronsky J, Campoy C. et al. 2017. Complementary feeding: A position paper by the European Society for Paediatric Gastroenterology, Hepatology, and Nutrition (ESPGHAN) committee on nutrition. *Journal of Pediatric Gastroenterology and Nutrition* 64(1): 119–32. DOI: https://doi.org/10.1097/MPG.0000000000001454 (accessed 19 July 2021).

Gerritsen S, D'Souza A, Goodsell-Matthews T, et al. 2020. *Food Hardship and Early Childhood Nutrition: Findings from Growing Up in New Zealand with a focus on food hardships for tamariki Māori and Pacific children.* Wellington: Ministry of Social Development.

Gerritsen S, Wall C. 2017. *How We Eat: Reviews of the evidence on food and eating behaviours related to diet and body size*. Wellington: Ministry of Health.

Giglia R. 2010. Alcohol and lactation: an updated systematic review. *Nutrition & Dietetics* 67: 237–43.

Glover M, Waldon J, Manaena-Biddle H, et al. 2009. Barriers to best outcomes in breastfeeding for Māori: mothers' perceptions, whānau perceptions, and services. *Journal of Human Lactation* 25(3): 307–16.

Gontijo De Castro T, Gerritsen S, Wall C, et al. 2018. *Infant Feeding in New Zealand: Adherence to Food and Nutrition Guidelines among the Growing Up in New Zealand cohort: Research report*. Wellington: Ministry of Social Development.

Gooze RA, Anderson SE, Whitaker RC. 2011. Prolonged bottle use and obesity at 5.5 years of age in US children. *Journal of Pediatrics* 159(3): 431–36. DOI: https://doi.org/10.1016/j.jpeds.2011.02.037 (accessed 19 July 2021).

Greer FR, Sicherer SH, Wesley Burks A, et al. 2019. The effects of early nutritional interventions on the development of atopic disease in infants and children: The role of maternal dietary restriction, breastfeeding, hydrolyzed formulas, and timing of introduction of allergenic complementary foods. *Pediatrics* 143(4). DOI: https://doi.org/10.1542/peds.2019-0281 (accessed 19 July 2021).

Güngör D, Nadaud P, LaPergola CC, et al. 2019. Infant milk-feeding practices and food allergies, allergic rhinitis, atopic dermatitis, and asthma throughout the life span: A systematic review. *The American Journal of Clinical Nutrition* 109(7): 772S–99S. DOI: https://doi.org/10.1093/ajcn/nqy283 (accessed 19 July 2021).

Hairston IS, Handelzalts JE, Lehman-Inbar T, et al. 2019. Mother-infant bonding is not associated with feeding type: A community study sample. *BMC Pregnancy and Childbirth* 19(1): 1–12. DOI: https://doi.org/10.1186/s12884-019-2264-0 (accessed 19 July 2021).

Haszard JJ, Russell CG, Byrne RA, et al. 2019. Early maternal feeding practices: Associations with overweight later in childhood. *Appetite* 132: 91–96. DOI: https://doi.org/10.1016/j.appet.2018.10.008 (accessed 19 July 2021).

Hauck FR, Thompson JMD, Tanabe KO, et al. 2011. Breastfeeding and reduced risk of sudden infant death syndrome: a meta-analysis. *Pediatrics* 128(1): 103–10. DOI: https://doi.org/10.1542/peds.2010-3000 (accessed 19 July 2021).

Health Canada, Canadian Paediatric Society, Dietitians of Canada, Breastfeeding Committee for Canada. 2014a. Nutrition for Healthy Term Infants: Recommendations from birth to six months. URL: www.canada.ca/en/health-canada/services/canada-food-guide/resources/infant-feeding/nutrition-healthy-term-infants-recommendations-birth-six-months.html (accessed 19 July 2021).

Health Canada, Canadian Paediatric Society, Dietitians of Canada, Breastfeeding Committee for Canada. 2014b. Nutrition for Healthy Term Infants: Recommendations from six to 24 months. URL: www.canada.ca/en/health-canada/services/canada-food-guide/resources/infant-feeding/nutrition-healthy-term-infants-recommendations-birth-six-months/6-24-months.html (accessed 19 July 2021).

Hendrie GA, Lease HJ, Bowen J, et al. 2017. Strategies to increase children's vegetable intake in home and community settings: a systematic review of literature. *Maternal and Child Nutrition* 13(1): 1–22. DOI: https://doi.org/10.1111/mcn.12276 (accessed 19 July 2021).

Hojsak I, Bronsky J, Campoy C, et al. 2018. Young child formula: A position paper by the ESPGHAN committee on nutrition. *Journal of Pediatric Gastroenterology and Nutrition* 66(1): 177–85. DOI: https://doi.org/10.1097/MPG.0000000000001821 (accessed 19 July 2021).

Horta BL, Loret De Mola C, Victora CG. 2015. Long-term consequences of breastfeeding on cholesterol, obesity, systolic blood pressure and type 2 diabetes: A systematic review and meta-analysis. *Acta Paediatrica, International Journal of Paediatrics* 104: 30–37. DOI: https://doi.org/10.1111/apa.13133 (accessed 19 July 2021).

Horta, BL, Victora CG. 2013. *Long-term Effects of Breastfeeding: A systematic review*. Geneva: World Health Organization. URL: https://apps.who.int/iris/handle/10665/79198 (accessed 19 July 2021).

Houghton LA, Gray AR, Szymlek-Gay, et al. 2011. Vitamin D-fortified milk achieves the targeted serum 25-hydroxyvitamin D concentration without affecting that of parathyroid hormone in New Zealand toddlers. *Journal of Nutrition* 141: 1840–46.

Hurley KM, Cross MB, Hughes SO. 2011. A systematic review of responsive feeding and child obesity in high income countries. *The Journal of Nutrition* 141(3): 495–501.

Iheozor-Ejiofor Z, Worthington HV, Walsh T, et al. 2015. Water fluoridation for the prevention of dental caries. *Cochrane Database of Systematic Reviews* (6): CD010856. DOI:10.1002/14651858.CD010856.pub2 (accessed 19 July 2021).

Institute of Medicine. 2011. *Early Childhood Obesity Prevention Policies*. Washington DC: The National Academies Press. DOI: https://doi.org/10.17226/13124 (accessed 19 July 2021).

Joshi PA, Smith J, Vale S, et al. 2019. The Australasian Society of Clinical Immunology and Allergy infant feeding for allergy prevention guidelines. *Medical Journal of Australia* 210(2): 89–93. DOI: https://doi.org/10.5694/mja2.12102 (accessed 19 July 2021).

Koletzko B, Godfrey KM, Poston L, et al. 2019. Nutrition during pregnancy, lactation and early childhood and its implications for maternal and long-term child health: The Early Nutrition Project recommendations. *Annals of Nutrition and Metabolism* 74(2): 93–106. DOI: https://doi.org/10.1159/000496471 (accessed 19 July 2021).

Kramer MS, Kakuma R. 2012. Optimal duration of exclusive breastfeeding. *Cochrane Database of Systematic Reviews* (8): CD003517. DOI: 10.1002/14651858.CD003517.pub2 (accessed 19 July 2021).

Lioret S, Betoko A, Forhan A, et al. 2015. Dietary patterns track from infancy to preschool age: Cross-sectional and longitudinal perspectives. *The Journal of Nutrition* 145(4): 775–82. DOI: https://doi.org/10.3945/jn.114.201988 (accessed 19 July 2021).

Lipsky LM, Haynie DL, Liu D, et al. 2015. Trajectories of eating behaviors in a nationally representative cohort of U.S. adolescents during the transition to young adulthood. *International Journal of Behavioral Nutrition and Physical Activity* 12(138): 1–11. DOI: https://doi.org/10.1186/s12966-015-0298-x (accessed 19 July 2021).

Lott M, Callahan E, Welker DE, et al. 2019. *Healthy Beverage Consumption in Early Childhood: Recommendations from key national health and nutrition organizations*. Technical Scientific Report. Minneapolis: Healthy Eating Research. URL: https://healthyeatingresearch.org/wp-content/uploads/2019/09/HER-HealthyBeverageTechnicalReport.pdf (accessed 19 July 2021).

Lovell AL, Milne T, Jiang Y, et al. 2019. Evaluation of the effect of a growing up milk lite vs. Cow's milk on diet quality and dietary intakes in early childhood: The Growing up Milk Lite (GUMLi) randomised controlled trial. *Nutrients* 11(1): 1–12. DOI: https://doi.org/10.3390/nu11010203 (accessed 19 July 2021).

Mann J, Truswell S. 2017. *Essentials of Human Nutrition, 5th edition*. Oxford: Oxford University Press.

Marsh S, Ni Mhurchu C, Maddison R. 2013. The non-advertising effects of screen-based sedentary activities on acute eating behaviours in children, adolescents, and young adults: a systematic review. *Appetite* 71: 259–273.

McFadden A, Gavine A, Renfrew MJ, et al. 2017. Support for healthy breastfeeding mothers with healthy term babies. *Cochrane Database of Systematic Reviews* (2). DOI: https://doi.org//10.1002/14651858.CD001141.pub5 (accessed 6 September 2020).

Michaelsen KF, Weaver L, Branca F, et al. 2003. *Feeding and Nutrition of Infants and Young Children: Guidelines for the WHO European Region*. Geneva: World Health Organization.

Ministry of Health. 2006 (revised 2008). *Food and Nutrition Guidelines for Healthy Pregnant and Breastfeeding Women: A background paper*. Wellington: Ministry of Health.

Ministry of Health. 2007. *Implementing and Monitoring the International Code of Marketing of Breast-milk Substitutes in New Zealand: The Code in New Zealand.* Wellington: Ministry of Health.

Ministry of Health 2008. *Food and Nutrition Guidelines for Healthy Infants and Toddlers (Aged 0–2): A background paper – Partially revised December 2012*. Wellington: Ministry of Health.

Ministry of Health. 2010. *Our Oral Health: Key findings of the 2009 New Zealand Oral Health Survey.* Wellington: Ministry of Health.

Ministry of Health. 2015. *Eating and Activity Guidelines for New Zealand Adults.* Wellington: Ministry of Health.

Ministry of Health. 2017. *Sit Less, Move More, Sleep Well: Active play guidelines for under-fives*. Wellington: Ministry of Health.

Ministry of Health. 2019a. *Household Food Insecurity Among Children: New Zealand Health Survey*. Wellington: Ministry of Health.

Ministry of Health. 2019b. Well Child / Tamariki Ora Quality Improvement Framework. Nationwide Service Framework Library. URL: https://nsfl.health.govt.nz/dhb-planning-package/well-child-tamariki-ora-quality-improvement-framework (accessed 16 December 2019).

Ministry of Health. 2020a. *Eating and Activity Guidelines for New Zealand Adults: Updated 2020*. Wellington: Ministry of Health.

Ministry of Health. 2020b. *Companion Statement on Vitamin D and Sun Exposure in Pregnancy and Infancy in New Zealand: A supplement to the consensus statement on vitamin D and sun exposure in New Zealand*. Wellington: Ministry of Health.

Morton SM, Atatoa Carr PE, Grant CC, et al. 2013. Cohort profile: growing up in New Zealand. *International Journal of Epidemiology* 42(1): 65-75. DOI: https://doi.org/10.1093/ije/dyr206 (accessed 27 July 2021).

Ndbog F O R Sundhedspersonale. 2019. *Ernæring Til Spædbørn og Småbørn: En håndbog for sundhedspersonale*. Denmark: Sundhedsstyrelsen. URL: www.sst.dk/da/nyheder/2015/~/media/2986643F11A44FA18595511799032F85.ashx (accessed 19 July 2021).

NHMRC. 2006. *Nutrient Reference Values for Australia and New Zealand including Recommended Dietary Intakes*. Canberra: National Health and Medical Research Council (NHMRC); Wellington: Ministry of Health.

NHMRC. 2012a. *Eat for Health: Infant Feeding Guidelines: Information for health workers.* Canberra: National Health and Medical Research Council (NHMRC).

NHMRC. 2012b. *Literature Review: Infant Feeding Guidelines.* Canberra: National Health and Medical Research Council (NHMRC).

NHMRC. 2013. *Australian Dietary Guidelines*. Canberra: National Health and Medical Research Council. URL: www.eatforhealth.gov.au/sites/default/files/files/the_ guidelines/n55_australian_dietary_guidelines.pdf

NHMRC. 2020. *Australian Guidelines to Reduce Health Risks from Drinking Alcohol.* Canberra: National Health and Medical Research Council (NHMRC).

Nordic Co-operation. 2014. *Nordic Nutrition Recommendations 2012: Integrating nutrition and physical activity.* Copenhagen: Nordic Council of Ministers. URL: http://norden.diva-portal.org/smash/get/diva2:704251/FULLTEXT01.pdf (accessed 23 July 2021).

Obbagy JE, English LK, Wong YP, et al. 2019. Complementary feeding and food allergy, atopic dermatitis/eczema, asthma, and allergic rhinitis: a systematic review. *The American Journal of Clinical Nutrition* 109(7): 890S-934S. DOI: https://doi.org/10.1093/ajcn/nqy220 (accessed 19 July 2021).

Research New Zealand Limited. 2014. Responding to Infants' Hunger and Satiety Cues. Wellington: Health Promotion Agency.

SACN. 2018. *Feeding in the First Year of Life*. United Kingdom: Scientific Advisory Committee on Nutrition (SACN). URL: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/725530/SACN_report_on_Feeding_in_the_First_Year_of_Life.pdf (accessed 19 July 2021).

Sankar MJ, Sinha B, Chowdhury R, et al. 2015. Optimal breastfeeding practices and infant and child mortality: A systematic review and meta-analysis. *Acta Paediatrica, International Journal of Paediatrics* 104: 3–13. DOI: https://doi.org/10.1111/apa.13147 (accessed 19 July 2021).

Sinclear J, Brothers S, Jackson P, et al. 2013. IgE-mediated food allergy: diagnosis and management in New Zealand children. *The New Zealand Medical Journal,* 126(1,380): 57–67. PMID: 24126750.

Skeaff SA, Ferguson EL, McKenzie JE, et al. 2005. Are breast-fed infants and toddlers in New Zealand at risk of iodine deficiency? *Nutrition* 21(3): 325–331. DOI: https://doi.org/10.1016/j.nut.2004.07.004 (accessed 19 July 2021).

Spahn JM, Callahan EH, Spill MK, et al. 2019. Influence of maternal diet on flavor transfer to amniotic fluid and breast milk and children's responses: a systematic review. *The American Journal of Clinical Nutrition* 109(7): 1003S–26S. DOI: https://doi.org/10.1093/ajcn/nqy240 (accessed 19 July 2021).

Spill MK, Johns K, Callahan EH. et al. 2019. Repeated exposure to food and food acceptability in infants and toddlers: a systematic review. *The American Journal of Clinical Nutrition* 109(7): 978S-89S. DOI: https://doi.org/10.1093/ajcn/nqy308 (accessed 19 July 2021).

Soboleva T. 2021. *Microbiological Safety of Reconstituted Infant Formula: Effect of water quality and storage temperature on risk.* New Zealand Food Safety Technical Paper No: 2021/06. Wellington: Ministry for Primary Industries. URL: www.mpi.govt.nz/science/food-safety-and-suitability-research/food-science-research/production-processing-and-handling-research (accessed 19 July 2021).

Stoody EE, Spahn JM, Casavale KO. 2019. The Pregnancy and Birth to 24 Months Project: a series of systematic reviews on diet and health. *The American Journal of Clinical Nutrition* 109(7): 6,85S-97S. DOI: https://doi.org/10.1093/ajcn/nqy372 (accessed 19 July 2021).

Szymlek-Gay EA, Ferguson EL, Heath A-LM. et al. 2009. Food-based strategies improve iron status in toddlers: A randomized controlled trial. *American Journal of Clinical Nutrition* 90(6): 1,541–51. DOI: https://doi.org/10.3945/ajcn.2009.27588 (accessed 19 July 2021).

Szymlek-Gay EA, Gray AR, Heath A-LM, et al. 2019. Iodine-fortified toddler milk improves dietary iodine intakes and iodine status in toddlers: a randomised controlled trial. *European Journal of Nutrition* 59: 909–19. DOI: https://doi.org/10.1007/s00394-019-01950-5 (accessed 19 July 2021).

Victora CG, Bahl R, Barros AJD, et al. 2016. Breastfeeding in the 21st century: Epidemiology, mechanisms, and lifelong effect. *The Lancet*, 387(10017), 475–490. DOI: https://doi.org/10.1016/S0140-6736(15)01024-7 (accessed 19 July 2021).

Wall CR, Thompson JMD, Robinson E, et al. 2013. Dietary patterns of children at 3.5 and 7 years of age: a New Zealand birth cohort study. *Acta Paediatrica* 102(2): 137-42. DOI: https://doi.org/10.1111/apa.12065 (accessed 28 July 2021).

WHO. 2003. *Global Strategy for Infant and Young Child Feeding*. Geneva: World Health Organization (WHO).

WHO. 2009. *Infant and Young Child Feeding: Model chapter for textbooks for medical students and health professionals*. Geneva: World Health Organization (WHO).

WHO. 2013. *Global Action Plan for the Prevention and Control of Noncommunicable Diseases 2013–2020*. Geneva: World Health Organization (WHO).

WHO. 2015. *Guideline: Sugars Intake for Adults and Children.* Geneva: World Health Organization (WHO).

WHO Regional Office for Europe. 2019. *Commercial Foods for Infants and Young Children in the WHO European Region*. 119. Copenhagen: World Health Organization (WHO) Regional Office for Europe.

WHO, UNICEF. 2018. *Clarification on the Classification of Follow-up Formulas for Children 6–36 Months as Breastmilk Substitutes: Information note.* Geneva: World Health Organization (WHO). URL: https://apps.who.int/nutrition/publications/infantfeeding/information-note-followup-formula-bms/en/index.html (accessed 19 July 2021).

Ngā āpitihanga
Appendices

Āpitihanga 1
Appendix 1:
How we developed these Guidelines

The process for developing the guidelines

In 2019, the Ministry of Health contracted The University of Auckland to review and update the maternal, infant and toddler dietary guidelines, published in two separate documents by the Ministry of Health: *Food and Nutrition Guidelines for Healthy Pregnant and Breastfeeding Women: A background paper* (Ministry of Health 2006) and *Food and Nutrition Guidelines for Healthy Infants and Toddlers (Aged 0–2): A background paper* (Ministry of Health 2008).

The process for the review (see Figure A1) broadly follows that used to develop the Ministry of Health's 2015 *Eating and Activity Guidelines for New Zealand Adults*. Statements based on high-quality international reviews (Table A1 in Appendix 2) were developed with input from the Maternal, Infant and Toddler Technical Advisory Group (MAT0–2 TAG). The MAT0–2 TAG consisted of experts in infant feeding, child nutrition and maternal and child health and included Māori and Pacific peoples representation. The draft Eating Statements were tested with practitioners and the general public (described in detail below).

Sarah Gerritsen and Sally Mackay from The University of Auckland prepared the initial draft of the guidelines for the Ministry of Health. The initial draft was then reviewed by the Ministry of Health, MAT0–2 TAG, other experts and a select group of health practitioners. Information regarding food safety was provided by the Ministry of Primary Industries to include in the guidelines.

Further development of the document by Anna Jackson from the Nutrition and Physical Activity Team at the Ministry of Health produced *Healthy Eating Guidelines for New Zealand Babies and Toddlers (0–2 years old),* which was published in September 2021.

Review of relevant New Zealand and international guidelines

An umbrella review of relevant international guidelines and review documents (Table A1 in Appendix 2) plus New Zealand guideline documents (in Figure A1) was undertaken in early 2019 to assess the evidence base and develop preliminary draft Eating Statements. These statements were further developed by the MAT0–2 TAG at a workshop in May 2019. Additional systematic reviews were consulted when required to add more information.

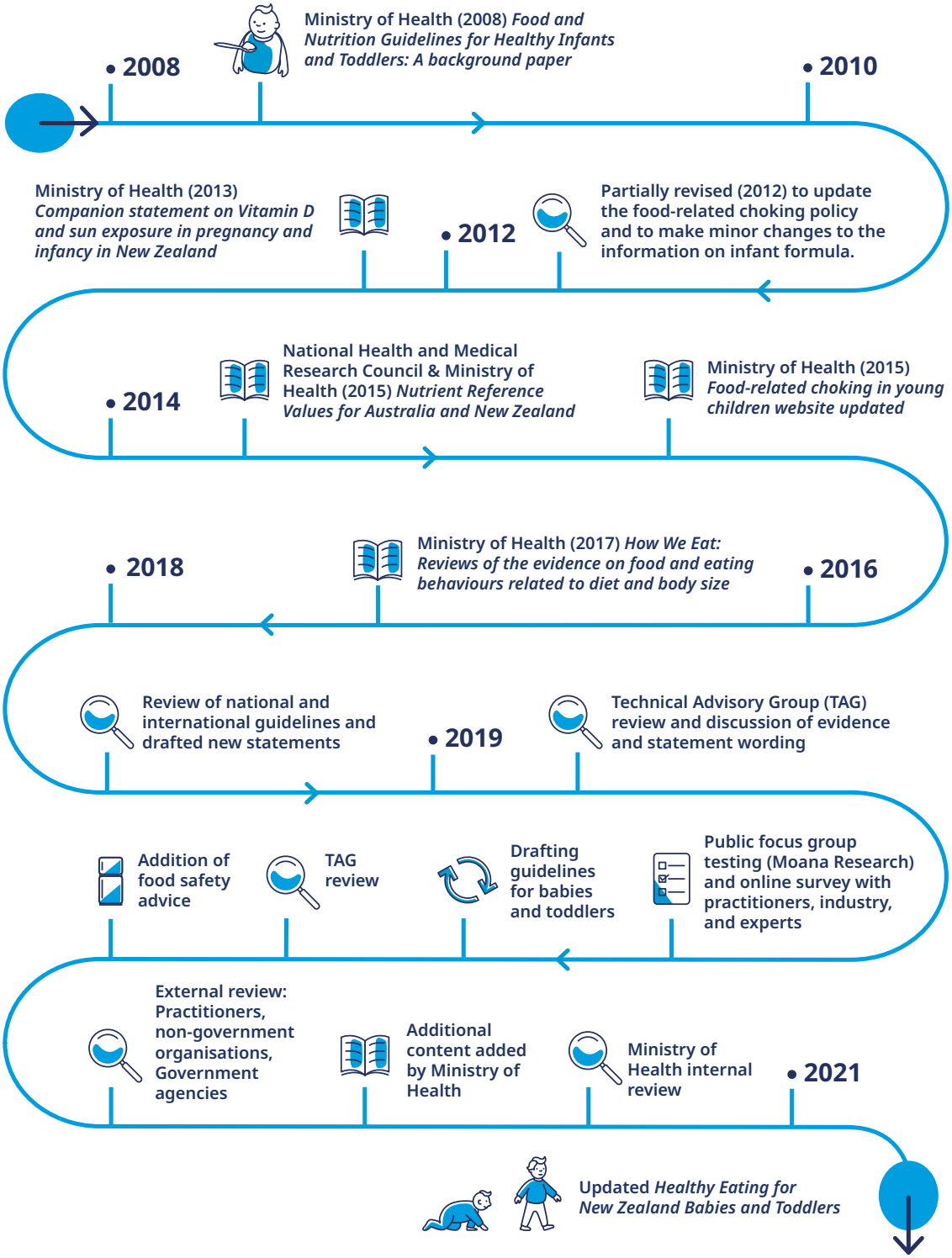
Testing the Eating Statements with the general public and practitioners

Five focus groups, conducted by the consultancy agency Moana Research, were held in June and July 2019 with 53 mothers (including pregnant women), fathers, grandparents, caregivers and early childhood teachers to test the understandability and acceptability of the draft Eating Statements. Thematic analysis of focus group transcripts resulted in recommendations to inform the final Eating Statements and future public resources.

An online stakeholder consultation was held in July 2019. Emails were sent to individual health practitioners and organisations working in the area of maternal, infant and/or toddler health and nutrition inviting them to complete an online survey regarding the wording of the Eating Statements. A summary of the background evidence was provided for each statement.

Submissions from 40 organisations and 32 individuals were received, covering a wide range of expertise.

Figure A1: Process of reviewing and updating the nutrition guidelines for babies and toddlers



Āpitihanga 2
Appendix 2: Evidence for the Eating Statements

The Eating Statements are based on international evidence reviews that have informed other countries' guidelines (generally, reviews of systematic reviews), the WHO's e-Library of Evidence for Nutrition Actions (eLENA), and other countries' evidence-based guidelines as shown in Table A1. These reviews and reports were selected based on discussions between the Ministry of Health and the MAT0–2 TAG. Additional evidence was sought from systematic reviews on particular topics or New Zealand-specific studies, and these have been referenced throughout the guidelines.

There is sparse national data collected on baby and toddler feeding practices in New Zealand. These guidelines include data from the Well Child / Tamariki Ora quality indicators and GUiNZ study about how many New Zealanders follow the Eating Statements in a box at the end of each chapter.

The Well Child / Tamariki Ora quality indicators provide breastfeeding statistics nationally and by district health board (DHB) region. This dataset also includes the number of children who are caries free at five years old, which is a helpful indicator of overall nutrition and wellbeing (Ministry of Health 2019b).

The longitudinal cohort, GUiNZ, has been following nearly 7,000 children born in Auckland, Counties Manukau and Waikato DHB regions in 2009/10. The ethnicity and sociodemographic characteristics of the children and families in the cohort are broadly generalisable to children being born in New Zealand today (Morton 2013).

Table A1: Summary of the main international evidence reviews and reports that underpin the Eating Statements for babies and toddlers (0–2 years old)

Eating statement	Sources of evidence
 **Statement 1 (Breastfeeding)**	• World Health Organization Long-term Effects of Breastfeeding: A systematic review (Horta and Victora 2013) https://apps.who.int/iris/handle/10665/79198 • World Health Organization e-Library of Evidence for Nutrition Actions (eLENA) – Exclusive breastfeeding for optimum growth, development and health of infants – Continued breastfeeding for healthy growth and development of children – Regulation of marketing breast-milk substitutes – Exclusive breastfeeding to reduce the risk of childhood overweight and obesity • The Pregnancy and Birth to 24 Months Project: a series of systematic reviews on diet and health (Stoody et al 2019) https://academic.oup.com/ajcn/article/109/Supplement_1/685S/5456707 • The Scientific Advisory Committee on Nutrition (SACN) report on feeding in the first year of life (SACN 2018) https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/725530/SACN_report_on_Feeding_in_the_First_Year_of_Life.pdf • Nutrition for Healthy Term Infants: Recommendations from birth to six months (Health Canada et al 2014a) www.canada.ca/en/health-canada/services/canada-food-guide/resources/infant-feeding/nutrition-healthy-term-infants-recommendations-birth-six-months.html • Nordic Nutrition Recommendations 2012, Chapter 4: Breastfeeding (Nordic Co-operation 2014) http://norden.diva-portal.org/smash/get/diva2:704251/FULLTEXT01.pdf • Literature Review: Infant Feeding Guidelines and Infant Feeding Guidelines: Information for health workers (NHMRC 2012b, 2012a) www.eatforhealth.gov.au/guidelines www.eatforhealth.gov.au/guidelines/guideline-development

Eating statement	Sources of evidence
 **Statement 2 (Introducing complementary feeding)**	• World Health Organization e-Library of Evidence for Nutrition Actions (eLENA): www.who.int/elena – Appropriate complementary feeding • European Food Safety Authority Panel on Nutrition, Novel Foods and Food Allergens (NDA) Scientific Opinion on the appropriate age range for introduction of complementary feeding into an infant's diet (Castenmiller et al 2019) https://doi.org/10.2903/j.efsa.2019.5780 • The Australasian Society of Clinical Immunology and Allergy infant feeding for allergy prevention guidelines (Joshi et al 2019) https://doi.org/10.5694/mja2.12102 • Complementary Feeding: A position paper by the European Society for Paediatric Gastroenterology, Hepatology, and Nutrition (ESPGHAN) committee on nutrition (Fewtrell et al., 2017) *focussing on healthy term infants in Europe. After reviewing current knowledge and practices, we have formulated these recommendations: Timing: Exclusive or full breast-feeding should be promoted for at least 4 months (17 weeks, beginning of the 5th month of life* https://journals.lww.com/jpgn/Fulltext/2017/01000/Complementary_Feeding__A_Position_Paper_by_the.21.aspx • The pregnancy and Birth to 24 Months Project: a series of systematic reviews on diet and health (Stoody et al 2019) https://academic.oup.com/ajcn/article/109/Supplement_1/685S/5456707 • The Scientific Advisory Committee on Nutrition (SACN) report on feeding in the first year of life (SACN 2018) https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/725530/SACN_report_on_Feeding_in_the_First_Year_of_Life.pdf • Nutrition for Healthy Term Infants: Recommendations from six to 24 months (Health Canada et al 2014b) www.canada.ca/en/health-canada/services/canada-food-guide/resources/infant-feeding/nutrition-healthy-term-infants-recommendations-birth-six-months/6-24-months.html • Ernæring Til Spædbørn og Småbørn (Danish dietary guidelines for infants and toddlers) (Ndbog F O R Sundhedspersonale 2019) www.sst.dk/da/nyheder/2015/~/media/2986643F11A44FA18595511799032F85.ashx • Literature Review: Infant Feeding Guidelines and Infant Feeding Guidelines: Information for health workers (NHMRC 2012b, 2012a) www.eatforhealth.gov.au/guidelines www.eatforhealth.gov.au/guidelines/guideline-development

Eating statement	Sources of evidence
 **Statement 3 (Encouraging a variety of foods)**	• World Health Organization e-Library of Evidence for Nutrition Actions (eLENA): www.who.int/elena – Increasing fruit and vegetable consumption to reduce the risk of noncommunicable diseases • Nutrition for Healthy Term Infants: Recommendations from six to 24 months (Health Canada et al 2014b) www.canada.ca/en/health-canada/services/canada-food-guide/resources/infant-feeding/nutrition-healthy-term-infants-recommendations-birth-six-months/6-24-months.html • Ernæring Til Spædbørn og Småbørn (Danish dietary guidelines for infants and toddlers) (Ndbog F O R Sundhedspersonale 2019) www.sst.dk/da/nyheder/2015/~/media/2986643F11A44FA18595511799032F85.ashx • The pregnancy and Birth to 24 Months Project: a series of systematic reviews on diet and health (Stoody et al 2019) https://academic.oup.com/ajcn/article/109/Supplement_1/685S/5456707 • The Scientific Advisory Committee on Nutrition (SACN) report on feeding in the first year of life (SACN 2018) https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/725530/SACN_report_on_Feeding_in_the_First_Year_of_Life.pdf • Complementary feeding and food allergy, atopic dermatitis/eczema, asthma, and allergic rhinitis: a systematic review (Obbagy et al 2019) https://doi.org/10.1093/ajcn/nqy220
 **Statement 4 (Providing low salt and no added sugars foods)**	• World Health Organization e-Library of Evidence for Nutrition Actions (eLENA): www.who.int/elena – Reducing sodium intake to control blood pressure in children – Reducing free sugars intake in children to reduce the risk of noncommunicable diseases • Ernæring Til Spædbørn og Småbørn (Danish dietary guidelines for infants and toddlers) (Ndbog F O R Sundhedspersonale 2019) www.sst.dk/da/nyheder/2015/~/media/2986643F11A44FA18595511799032F85.ashx • Nutrition for Healthy Term Infants: Recommendations from six to 24 months (Health Canada et al 2014b) www.canada.ca/en/health-canada/services/canada-food-guide/resources/infant-feeding/nutrition-healthy-term-infants-recommendations-birth-six-months/6-24-months.html

Eating statement	Sources of evidence
 **Statement 5 (Recommended drinks)**	• World Health Organization e-Library of Evidence for Nutrition Actions (eLENA): www.who.int/elena – Reducing free sugars intake in children to reduce the risk of noncommunicable diseases – Reducing consumption of sugar-sweetened beverages to reduce the risk of childhood overweight and obesity – Reducing sodium intake to control blood pressure in children • Nutrition for Healthy Term Infants: Recommendations from six to 24 months (Health Canada et al 2014b) www.canada.ca/en/health-canada/services/canada-food-guide/resources/infant-feeding/nutrition-healthy-term-infants-recommendations-birth-six-months/6-24-months.html • Literature Review: Infant Feeding Guidelines and Infant Feeding Guidelines: Information for health workers (NHMRC 2012b, 2012a) www.eatforhealth.gov.au/guidelines www.eatforhealth.gov.au/guidelines/guideline-development
 **Statement 6 (Eating behaviours)**	• World Health Organization e-Library of Evidence for Nutrition Actions (eLENA): www.who.int/elena – Limiting portion sizes to reduce the risk of childhood overweight and obesity • The pregnancy and Birth to 24 Months Project: a series of systematic reviews on diet and health (Stoody et al 2019) https://academic.oup.com/ajcn/article/109/Supplement_1/685S/5456707 • Influence of maternal diet on flavor transfer to amniotic fluid and breast milk and children's responses: a systemic review (Spahn et al 2019) https://doi.org/10.1093/ajcn/nqy240 • Repeated exposure to food and food acceptability in infants and toddlers: a systemic review (Spill et al 2019) https://doi.org/10.1093/ajcn/nqy308 • The Scientific Advisory Committee on Nutrition (SACN) report on feeding in the first year of life (SACN 2018) https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/725530/SACN_report_on_Feeding_in_the_First_Year_of_Life.pdf • Nutrition for Healthy Term Infants: Recommendations from six to 24 months (Health Canada et al 2014b) www.canada.ca/en/health-canada/services/canada-food-guide/resources/infant-feeding/nutrition-healthy-term-infants-recommendations-birth-six-months/6-24-months.html • How We Eat: Reviews of the evidence on food and eating behaviours related to diet and body size (Gerritsen and Wall 2017) www.health.govt.nz/publication/how-we-eat-reviews-evidence-food-and-eating-behaviours-related-diet-and-body-size

Note: Additional systematic reviews of research on specific topics were also consulted and these pieces of research are referenced throughout the guidelines.

Āpitihanga 3
Appendix 3:
Serving size advice for toddlers (1–2 years old)

Recommended number of servings per day from each of the food groups for toddlers*

	Vegetables	Fruit	Grain foods	Legumes, nuts, seeds, fish and other seafood, eggs, poultry or red meat with fat removed	Milk and milk products
TODDLERS 1-2 YEARS	2–3	◖	●●●●	●	1–1.5

● one serving ◖ half serving

* An allowance for unsaturated spreads or oils or nut/seed paste of 1 serving (7–10g) per day is included. Whole nuts and seeds are not recommended for children of this age because of the potential choking risk

Source: NHMRC (2013)

Serving size examples

Vegetables

A standard serving of vegetables is about 75 g (100–350 kJ), which is about the same as:

- ½ cup cooked vegetables (eg, pūhā, watercress, silverbeet, kamokamo (squash), carrot, broccoli, bok choy, cabbage or taro leaves)
- ½ cup canned vegetables (eg, beetroot, tomato, sweet corn)
- 1 cup green leafy or raw salad vegetables
- ½ medium potato or similar sized piece of kūmara, taewa (Māori potato), yam (Pacific or NZ), taro, cassava, or green banana (technically a fruit)
- 1 medium tomato.

Grain foods, mostly wholegrain and those naturally high in fibre

A standard serving (500 kJ) is about the same as:

- 1 slice (40 g) wholegrain bread
- ½ medium (40 g) wholegrain 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
- ¼ cup (30 g) muesli
- 2 breakfast wheat biscuits
- 2/3 cup cereal flakes (wholegrain where possible)
- 3 (35 g) crispbreads or crackers (wholegrain where possible).

Fruit

A standard serving of fruit is about 150 g (350 kJ), which is about the same as:

- 1 medium apple, banana, orange or pear
- 2 small apricots, kiwifruit or plums
- 1 cup diced or canned fruit (drained and with no added sugar), eg, pineapple, papaya
- 1 cup frozen fruit, eg, mango, berries.

Milk and milk products, mostly low and reduced fat

A standard serving (500–600 kJ) is about the same as:

- 1 cup (250 ml) low or reduced fat fresh, UHT long life, reconstituted powdered milk or buttermilk
- 2 slices (40 g) or a 4 x 3 x 2 cm piece of cheese such as Edam
- ¾ cup (200 g) low- or reduced-fat yoghurt
- 1 cup (250 ml) calcium-fortified plant-based milk alternatives (eg, soy, rice, almond, oat milk) (with at least 100 g of added calcium per 100 ml).

Legumes, nuts, seeds, fish and other seafood, eggs, poultry and/or red meat with fat removed

A standard serving (500–600 kJ) is about the same as:

- 1 cup (150 g) cooked or canned beans, lentils chickpeas, or split peas (preferably with no added salt)
- 170 g tofu
- 30 g nuts, seeds, peanut or almond butter or tahini or other nut or seed paste (no added salt)
- 100 g cooked fish fillet (about 115 g raw) or one small can of fish
- 2 large (2 x 60 g = 120 g) eggs
- 80 g cooked lean chicken (100 g raw)
- 65 g cooked lean meat such as beef, lamb, pork, veal (90–100 g raw) – no more than 500 g cooked (700–750 g) red meat each week.

Source: The Ministry has adopted the Australian serving size advice, as contained in the Australian Dietary Guidelines (NHMRC 2013). For further information, go to the Australian Dietary Guidelines website: www.eatforhealth.gov.au

New Zealand Government