



Infant-Toddler Nutrition Guidelines for Health Professionals

Updated Fall 2023

Job #1946 (FF07327-IND-Rev.-09/23)

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Background

The Northern Health (NH) Infant-Toddler Nutrition Guidelines for Health Professionals is a long-standing resource that is updated regularly. This work is lead, on behalf of the Population Health Nutrition team, by Lise Luppens, MA, RD, Population Health Dietitian, Regional Lead for Nutrition in the Early Years. For a summary of recent updates, see [Updates in 2023](#), in the following pages.

Purpose and scope

This resource is intended to guide the practice of health professionals working with families of healthy term infants and toddlers. It represents a compilation of public health nutrition recommendations, such as those from the federal statement [Nutrition for healthy term infants](#), BC's [Pediatric nutrition guidelines \(birth to six Years\) for health professionals](#) (BCCDC), and other sources.

The unique nutritional needs of premature infants, and infants and toddlers with diagnosed medical conditions, are beyond the scope of this document. Also, given that this is a resource for health professionals, it is not appropriate to photocopy sections of this document for clients.

A note on language

We recognize that there are many types of families and gender identities, and we aim to use language that reflects that. In this document, we have used the term breastfeeding, but recognize that some may prefer to use the word nursing, chestfeeding, or human milk feeding. Explore and use clients' preferred language.

Information regarding the use of human milk substitutes

In line with the Baby-Friendly Initiative (BFI), breastfeeding is the standard and optimal method of infant feeding, and should be protected, promoted, and supported. BFI supports all families. In line with BFI, these guidelines also provide detailed information on the use of human milk substitutes (commercial infant formula) so that NH staff can adequately support families who feed their infants with these products to do so in a safe and responsive manner.

For enquiries, comments, or suggestions, please contact the Population Health Nutrition team at: PopHthNutrition@northernhealth.ca

Acknowledgements

For 2015 – 2023 versions of this document, a variety of health professionals reviewed and contributed to various revisions and sections of these guidelines:

- Destyni Atchison, RD, Jennifer Boon, RN, Marianne Bloudoff, RD, Sarah Brown, RN(C), Laurel Burton, RD, Nancy Stokke, RN, Kristi Estergaard, RD (IH), Beth Evans, RD, Laura Ewart, RN, Madison Friesen, RN, Amelia Gallant, MPH, RD, Lea Geiger, RN, IBCLC (PHSA), Kathryn Germuth, RN, Carmen Gottschling-Aceto, RDH, Jeanne Hagreen, RN, IBCLC, Courtenay Hopson, RD, CNSC, Michael Kerwin, EHO, Jessie King, MA, Rebecca Larson, RD, Genevieve Larivee, RD (HealthLink BC), Teresa MacDonald, RN, Brenda Matsen, RDH, Brittney McCullough, RN IBCLC, Emilia Moulechkova, RD, Randi Parsons, RN, Heather Paterson, RN, Kaethe Patterson, RD, Jane Ritchey, RN, PNC(C), Karen Sadler (BCCHR), Vanessa Salmons, RN, Reanne Sanford, RN(C), Darlene Schmid, MPH, RN, IBCLC, PNC(C), Loraina Stephen, M.Sc., RD, Lisa Sutherland, RM (PSBC), Natasha Thorne, RN, Robyn Turner, RD, Nancy Viney, RN, Stacie Weich, Lindsay Willoner, RN, and Danelle Zwick, RN.

In 2019, various NH staff also contributed to the development of a course, LearningHub #20057: [NHA – POP - Infant-Toddler Nutrition Guidelines for Health Professionals](#), to support orientation to these guidelines:

- Samantha Berg, Petrina Bryant, RN, Laurel Burton, RD, Diana Cutting, RN, Kathryn Germuth, RN, Sarah Gray, RN, Shirley Gray-Kealey, RDH, Kami Griffin, RN, Gail Haeussler, Jeanne Hagreen, RN, IBCLC, Courtenay Hopson, RD, Jay-Anna Major-Brier, RD, Emilia Moulechkova, RD, Brittney McCullough, RN, IBCLC, Randi Parsons, RN, Kaethe Patterson, RD, Celia Romain, RN, Vanessa Salmons, RN, Flo Sheppard, RD, Robyn Turner, RD, and Dana Vigneault, RN

Tips for using this document

New to this document?

- Review the [Executive summary](#). This summary is a compilation of the key practice points from each of the document's chapters.
- For more thorough orientation to these guidelines, complete LearningHub course #20057: [NHA – POP – Infant-toddler nutrition guidelines for health professionals](#)

Access the document electronically

- Access this document online to ensure you are using to the most recent version.
- Use a [digital version](#) to access the many links in the document.
- Consider saving a bookmark to this document.
- This document can be found at Document Source (#1946), on the [Population Health Nutrition](#) MyNH page, and on the [Public health nutrition guides](#) (NH public webpage for health professionals).

Tips for navigating the electronic document

- The main [table of contents](#) and those found at the beginning of each chapter are “clickable”, allowing you to navigate to specific pages in the document.
- In addition to using the tables of contents, consider searching for specific terms using the “search” function – i.e., the following icon in the top of your screen:



- Internal links: Throughout the document, you can click on links that will bring you to specific pages in other chapters or sections. To return to your original page, press both “Alt” and the left arrow on your keyboard.
- External hyperlinks: Throughout the document, you can click on links to other webpages and files to access resources for clients or for health professionals. These should open in a new window, so that you can view these resources while retaining your position within this document.

Updates in 2023

General updates	<ul style="list-style-type: none"> Updated links; minor additions, clarifications, and wording changes
Chapter 1: Breastfeeding and human milk	<ul style="list-style-type: none"> Revisions to The importance of breastfeeding and human milk Addition: Accommodating breastfeeding at work Updates to Substance use and human milk sections Revised CPS: 1-1-2-140: Donor human milk
Chapter 2: Human milk substitutes	<ul style="list-style-type: none"> New evidence about increased risk of cow milk protein allergy with short-term or intermittent use of cow milk formula. See also Allergy prevention Soy follow-up formulas are no longer available. For the few infants who need to continue using soy formula to two years, recommend continued use of a soy infant formula.
Chapter 3: Animal milks and other beverages	<ul style="list-style-type: none"> Updated resource: Refresh your drink: Help kids to choose water (Document Source #10-421-6047)
Chapter 4: Feeding by age	<ul style="list-style-type: none"> No major changes
Chapter 5: Topics of interest	<ul style="list-style-type: none"> Addition: New course: Preventing food allergies in infants: Early introduction to allergenic solids (UBC CPD) New evidence about increased risk of cow milk protein allergy with short-term or intermittent use of cow milk formula. See Allergy prevention New section: Bedsharing and breastfeeding New CPS 1-22-2-040: Early childhood growth monitoring: Birth to 2 years of age
Chapter 6: Key nutrients	<ul style="list-style-type: none"> No major changes

Executive summary

Chapter 1: Breastfeeding and human milk

- Health professionals play an important role in protecting, promoting, and supporting breastfeeding.
- Human milk is the standard and optimal source of nutrition for infants. Breastfeeding is rarely contraindicated.
- If supplementation is medically indicated, or an informed decision has been made to supplement, expressed milk from the infant's parent is the first choice. If that is not an option or is limited, pasteurized donor human milk from a regulated milk bank is the next best choice.
- Recommend exclusive breastfeeding for the first six months of life. Other than human milk, no other food or fluids should be offered unless medically indicated.
- Recommend introduction to nutrient-rich solid foods at about six months of age, with particular attention to iron, with continued breastfeeding for up to two years and beyond, for as long as parent and child wish to continue.
- Recommend that all infants and toddlers who receive any amount of human milk be given a liquid vitamin D supplement of 400 IU (10 mcg) daily.

Chapter 2: Human milk substitutes

- Support families to make fully informed decisions about infant feeding, which involve understanding the benefits and risks of various feeding options.
- Temporary or intermittent supplementation with cow milk-based formula (e.g., bottles of formula in early days postpartum followed by only breastfeeding) should be avoided due to increased risk of cow milk protein allergy.
- For infants who are not exclusively receiving human milk, for whom formula use is anticipated to be ongoing, recommend a commercial infant formula that is cow milk-based.
- Recommend other formulas in specific circumstances, such as for temporary or intermittent supplementation of a breastfed infant, or for infants who cannot take cow milk-based formula due to confirmed medical conditions or for cultural or religious reasons.
- Other beverages are not nutritionally complete and are not appropriate as human milk substitutes.
- Support parents and guardians to ensure that they are safely preparing, storing, and transporting formula. Instruction should be provided, as needed, on an individual basis (i.e., not in a group setting).
- Regardless of feeding method, promote responsive, cue-based feeding.

Chapter 3: Animal milks and other beverages

- Recommend waiting until about six months of age before offering water.
- Animal milk is not required while children continue to receive human milk.
- Recommend delaying the transition from formula to plain pasteurized whole cow milk until 9 to 12 months of age.
- Goat milk is not recommended in the case of cow milk protein allergy.
- Lower-fat milks and fortified soy beverages are not recommended before two years of age.
- Other plant-based beverages are not recommended as alternatives to milk.
- Fruit juice is not required and should be avoided.
- Other sugary, artificially sweetened, or caffeinated beverages should be avoided.
- Recommend that fluids introduced after six months be offered in an open cup.

Chapter 4: Feeding by age

- Recommend offering solid foods starting at about six months of age.
- For first foods, recommend iron-rich foods such as well-cooked meat, poultry, fish, eggs, tofu, legumes, and iron-fortified cereals.
- Recommend that parents and guardians provide a variety of soft textures and finger foods starting at about six months of age.
- Recommend eating together as a family when possible.
- At every age, the child is responsible for deciding how much they want to eat or whether they want to eat at all.
- Breastfeeding and human milk continue to be important and are recommended to two years and beyond, for as long as parent and child wish to continue.

Chapter 5: Topics of interest

Allergy prevention

- Dietary restrictions during pregnancy and lactation are not recommended for the prevention of food allergy in infants.
- Delaying the introduction of common food allergens is not recommended.
- For most infants, common food allergens can be introduced starting at about six months of age.
- For infants at high risk of developing food allergy, consider introducing common food allergens at about six months of age, but not before four months of age, based on signs of developmental readiness.

- Individualized care plans and an interdisciplinary team approach are indicated for children with suspected or confirmed food allergy.

Bedsharing and breastfeeding

- Counsel all families about safer sleep.
- Breastfeeding and human milk are protective against sudden, unexpected infant death during sleep, regardless of sleep arrangement.
- For healthy, term breastfed infants, it is safe to bedshare with the infant if there are no risk factors present.
- Bedsharing promotes breastfeeding initiation, duration, and exclusivity.

Constipation

- Support parents and guardians with information on the wide variation in normal stooling patterns.
- There are several types of constipation; management will vary depending on the type of constipation, mode of feeding, and the child's age.

Crying (colic)

- It is generally not beneficial to alter feeding practices when an infant is experiencing increased crying (colic).
- Support parents and guardians with information on normal periods of increased crying and coping strategies.

Dental health

- Dietary guidance and fluoride use can help to reduce the risk of early childhood caries.

Diarrhea (acute) and dehydration

- Appropriate diagnosis of diarrhea and dehydration is important. Recommend seeking medical attention if a child is thought to be dehydrated.
- Infants with diarrhea, without dehydration, should continue to be fed an age-appropriate diet and should be offered increased fluids from their usual diet.
- Treatment for mild to moderate dehydration includes the use of oral rehydration solutions, fluid maintenance, and appropriate re-feeding.
- Severe dehydration requires intravenous rehydration in a clinical setting.
- When dehydration is corrected, early re-feeding with a normal diet is recommended.

Food insecurity (household)

- Household food insecurity is a significant public health issue in northern BC.

- Household food insecurity is an income-based problem that requires income-based solutions. Screen clients, and link to financial and other supports, as needed.
- Families benefit from compassionate and non-judgmental support to reduce the risk of nutrient deficiencies and to optimize their children’s diets.
- Although breastfeeding and the expression of breast milk have the potential to be food security strategies for infants, low-income parents and guardians may face greater barriers and may be less able to maintain breastfeeding and lactation. Offer parents additional and continued supports to meet their infant feeding goals.
- Support families who use commercial infant formula to choose a formula that is “acceptable, feasible, affordable, sustainable, and safe” in their circumstances.

Growth

- Concerns about growth can translate into unnecessary and harmful changes to feeding practices, such as supplementation, discontinuation of breastfeeding, or coercive or restrictive feeding.
- Health professionals have an important role to play in accurately assessing growth patterns, reassuring families, providing anticipatory guidance, and promoting responsive feeding and healthy feeding relationships.

Reflux

- Reflux is common in infants and does not generally require treatment or changes in feeding.

Vegetarian diets

- Well-planned vegetarian diets are compatible with lactation and can support normal growth and development.
- The more restrictive the diet, the greater the risk of nutrient deficiencies. Vitamin B12 is a nutrient of concern in vegan diets.
- Recommend support from a registered dietitian if there are concerns regarding dietary adequacy.

Chapter 6: Key nutrients

Calcium

- Human milk is the optimal source of nourishment for infants and is the preferred sole nutritional source of calcium for infants during the first six months of age.
- Commercial infant formula contains adequate calcium for infants from birth to 12 months of age.

- After 12 months of age, for toddlers who no longer receive human milk or commercial infant formula, 2 cups (500 mL) of fluid cow milk daily will help meet calcium requirements.

Dietary fats

- Dietary fat restriction is not recommended under two years of age.
- Evidence is inconclusive on the benefits of adding DHA and ARA to commercial infant formula for healthy term infants. However, there are potential benefits and no apparent risks.
- Recommend that people who are pregnant and lactating, older infants, and children regularly consume foods containing essential fatty acids.

Iron

- Recommend exclusive breastfeeding for the first six months of life, with continued breastfeeding for up to two years of age and beyond.
- For infants who are not exclusively receiving human milk, recommend a commercial infant formula. All commercial infant formulas contain iron, although fortification levels vary.
- Recommend offering iron-rich foods two or more times per day starting at about six months of age.
- Recommend delaying the introduction of animal milk until 9 to 12 months and offering no more than 3 cups (750 mL) per day.
- Iron deficiency in infancy and childhood is a significant issue; the promotion of the preceding guidelines supports adequate intake of iron.

Vitamin D

- Recommend that infants and toddlers who receive any amount of human milk be given a daily liquid vitamin D supplement of 400 IU (10 mcg).
- Infants who receive only commercial infant formula, and who were born to gestational parents with adequate vitamin D status, do not generally require a vitamin D supplement.
- As a clinical decision, health professionals may recommend higher intakes of vitamin D to address suspected or known deficiency.
- A daily supplement of 400 IU (10 mcg) is unlikely to result in excessive vitamin D intake.

1. Breastfeeding and human milk

Practice points

- Health professionals play an important role in protecting, promoting, and supporting breastfeeding.
- Human milk is the standard and optimal source of nutrition for infants. Breastfeeding is rarely contraindicated.
- If supplementation is medically indicated, or an informed decision has been made to supplement, expressed milk from the infant’s parent is the first choice. If that is not an option or is limited, pasteurized donor human milk from a regulated milk bank is the next best choice.
- Recommend exclusive breastfeeding for the first six months of life. Other than human milk, no other food or fluids should be offered unless medically indicated.
- Recommend introduction to nutrient-rich solid foods at about six months of age, with particular attention to iron, with continued breastfeeding for up to two years and beyond, for as long as parent and child wish to continue.
- Recommend that all infants and toddlers who receive any amount of human milk be given a liquid vitamin D supplement of 400 IU (10 mcg) daily.

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The importance of breastfeeding and human milk

See [A note on language](#) in Background.

Breastfeeding is the standard and optimal way to feed infants. Feeding at the breast supports skin-to-skin contact, bonding, transfer of microbiota, and regulation of milk supply, reduces physiological stress, and influences children’s craniofacial structure. (1) In addition, human milk:

- composition changes during each feeding episode and as the child matures, and in response to the physical and emotional state of the mother-child dyad (1)
- supplies the correct quantity and quality of nutrients, and is easily digested (2)
- includes numerous bioactive factors, including hormones, white blood cells, antimicrobial peptides, cytokines, chemokines, oligosaccharides, and live microbes (1)
- supports the development of healthy gut microbiome (3)

Messages about importance of breastfeeding often focus on the health protection it offers for both children and lactating parents (compared to the use of human milk substitutes). See next page, [Breastfeeding and health outcomes](#), for more details.

However, parents have advocated that more emphasis should be placed on normalizing breastfeeding and highlighting other reasons parents choose to breastfeed. (4) These reasons may include: (5) (4) (6) (7)

- It is the biological norm
- It is convenient (i.e., portable; no preparation, heating, or cleaning is required)
- It has low costs
- It supports bonding and emotional closeness between parent and child
- It is a pain management strategy for children undergoing painful procedures
- It can be a secure food system for infants, including in disasters, public health emergencies, and other times of crisis
- It is environmentally friendly (e.g., no manufacturing, packaging, or transport; no waste products)

To support informed decision making about infant feeding, health professionals should provide information on the importance of breastfeeding. They should also provide information on the health consequences of *not* breastfeeding, and the risks and costs of using infant formula. See [Making informed decisions about infant feeding](#) in Chapter 2: Human milk substitutes.

Resource for parents and guardians

- [10 Great reasons to breastfeed](#) (Government of Canada)
- [Breastfeeding is important](#) (NH public webpage)

Breastfeeding and health outcomes

Breastfeeding and feeding with human milk offer significant protection against a number of short-term and long-term health concerns for both children and parents. This protection is dose dependent, with greater protection with exclusive or predominant breastfeeding and longer breastfeeding duration. (3) Feeding at the breast, compared to feeding expressed breast milk via an alternate method, may offer greater protection.

Protection for infants	Protection for parents
<p>Breastfeeding supports optimal growth and development, and offers protection against:</p> <ul style="list-style-type: none"> • respiratory tract infections (3) (8) • gastrointestinal infections (8) • necrotizing enterocolitis (3) • acute otitis media (3) (8) • Sudden Infant Death Syndrome (SIDS) (3) (8) • childhood leukemia (3) (8) <p>Breastfeeding is associated with better:</p> <ul style="list-style-type: none"> • cognitive development and intelligence tests (3) • jaw/tooth development (i.e., less malocclusions) (3) <p>Breastfeeding and human milk are associated with a possible reduction in risk of:</p> <ul style="list-style-type: none"> • allergic rhinitis (3) • asthma (3) (8) • atopic dermatitis (8) • type 1 diabetes (3) (8) • type 2 diabetes (3) 	<p>Breastfeeding offers protection against:</p> <ul style="list-style-type: none"> • breast cancer (3) (8) • ovarian cancer (3) (8) • type 2 diabetes (3) • cardiovascular disease (1) <p>Breastfeeding is associated with:</p> <ul style="list-style-type: none"> • delayed menses, (2) which can influence child spacing (3) and iron stores <p>Evidence is unclear or insufficient regarding breastfeeding and:</p> <ul style="list-style-type: none"> • risk of post-partum depression (3) • risk of osteoporosis (3) • postpartum weight retention (3)

Breastfeeding older infants, toddlers, and young children

Health professionals can help to normalize and promote the importance of breastfeeding older infants, toddlers, and young children.

Many of the protective effects of breastfeeding are dose dependent. Outcomes associated with continued breastfeeding past six months of age include:

- Continued provision of immune factors to the child (9)
- For the child, supports optimal growth and development, and offers further protection against:
 - Gastrointestinal and respiratory infections (9)
 - Childhood leukemia (8)
- For the parents, further protection against breast and ovarian cancers (9) (8)
- Enhanced bonding between parent and child (9)

Parents may face criticism and negative attitudes around breastfeeding older infants, toddlers, and young children, and/or around nursing both a newborn and an older child (i.e., “tandem nursing”). As such, some may be reluctant to share that they continue to breastfeed, and they may choose to not breastfeed their children openly, referred to as “closet nursing.” (10)

Parents benefit from continued support to breastfeed their children beyond infancy. (9)

- Health professionals can promote the importance of breastfeeding to two years and beyond, while supporting parents regarding their decisions.
- Continue to support the provision of age-appropriate and nutrient-dense complementary foods (see [Chapter 4: Feeding by age.](#)).
- Recommend a 400 IU liquid vitamin D supplement, until the child is two years old **and** is consuming adequate vitamin D from their diet. (6) See [Vitamin D](#) in Chapter 6: Key nutrients.

Resources for parents and guardians

- “Breastfeeding your toddler” in [Toddler’s first steps](#) (Province of BC)
- [Nursing older babies and toddlers](#) (NH public webpage)
- [Vitamin D for breastfed infants and toddlers in Northern BC](#) (NH Document Source #10-421-6020)

The right to breastfeed

Some parents continue to encounter challenges when feeding their children in public spaces. The Canadian Charter of Rights and Freedoms and BC's Human Rights Code protect the right to breastfeed. As per BC's Ministry of Justice: (11)

- It is illegal to discriminate against individuals because they may become pregnant, are pregnant, or have a baby
- Nursing mothers/parents have the right to breastfeed their children in a public area
- It is discriminatory to ask a mother/parent to cover up or breastfeed somewhere else

Breastfeeding in public spaces

Perinatal Services BC (PSBC) has created a window decal (shown here) for businesses and organizations to show their support for the right to breastfeed. Encourage community members to order decals via [Breastfeeding-friendly spaces](#) (NH public webpage). See additional resources below.

Accommodating breastfeeding at work

Employers have a legal obligation to accommodate the pregnancy-related needs of employees, inclusive of breastfeeding, unless the accommodation will cause undue hardship. (12) Managers can explore with staff what their needs are related to breastfeeding, expressing milk, storing EBM, etc. (13) Expectations should be clear regarding how managers and co-workers will support breastfeeding in the workplace. (1)



Additional resources

- [Human rights in British Columbia: Sex discrimination and sexual harassment](#) (including people who are pregnant and/or breastfeeding)
- Tip sheet: [Make breast/chest feeding your business: Welcome families to breast/chest feed any time, anywhere](#) (NH Document Source #10-030-6105)
- Poster: [We welcome you to breast/chest feed any time, anywhere](#) (NH Document Source #10-030-6106)

Breastfeeding protection, promotion, and support

Breastfeeding recommendations

NH supports the following recommendations by the World Health Organization, Health Canada, the Canadian Pediatric Society, Dietitians of Canada, and the Breastfeeding Committee for Canada (9):

- Within the first hour after birth, hold babies skin-to-skin and support them to start breastfeeding.
- For the first six months of life, give babies only human milk (unless there are medical reasons for supplementation).
- At about six months of age, when babies show that they are ready, introduce appropriate complementary solid foods.
- For two years and beyond, continue to breastfeed for as long as families wish.
- Give a daily liquid vitamin D supplement infants and toddlers who receive human milk. (3) See [Vitamin D](#) in Chapter 6: Key nutrients.

Various barriers exist to breastfeeding exclusively to six months, which may discourage families and health professionals. Since the protection offered by breastfeeding is dose dependent, it is helpful to emphasize that *any* breastfeeding is valuable (i.e., every feed matters; it's not “all or nothing”). (4) See [The importance of breastfeeding and human milk](#), earlier in this chapter.

Resource for parents and guardians

- [Breastfeeding is important](#) (NH public webpage)

Breastfeeding rates in British Columbia

As per the 2017-18 Canadian community health survey: (14)

- 96.4% of BC parents initiated breastfeeding during their hospital stays after birth
- 76% of BC parents breastfed for at least six months (i.e., “any breastfeeding”)
- 48% of BC parents breastfed exclusively for at least six months
- Breastfeeding rates increased with parent age and level of education. Rates were higher for married parents and those who lived in urban (versus rural) areas
- The most common reasons parents shared for stopping breastfeeding before six months were “not enough milk” (43%) and “difficulty with breastfeeding” (21%)

Older data shows that, nationally, only 19% of infants are breastfed beyond one year of age. (9) There is little information available regarding breastfeeding until two years of age and beyond, as per the recommendations above. (10)

The role of health professionals

Health professionals play an important role in protecting, promoting, and supporting breastfeeding. The Baby-Friendly Initiative (BFI) is an evidence-based quality improvement framework that helps to improve rates of breastfeeding initiation, duration, and exclusivity. Rates increase with the number of steps implemented. (10)

NH has adopted BFI to guide care in acute care and community settings, as outlined in [CPS 1-1-3-150: Baby-Friendly Initiative \(BFI\): Protect, promote, and support breastfeeding](#). This CPS:

- Describes the [BFI 10 steps](#), which guide and inform practice to ensure that families receive evidence-based, optimal perinatal care
- Serves as NH's infant feeding policy (i.e., Step 1)
- Is summarized in plain language in the poster [Our baby-friendly pledge to families](#) (NH Document Source #10-030-6115). This is appropriate for sharing with all staff and the public, and for posting in NH facilities.
- Supports all families: those who breastfeed, who provide human milk, and who use human milk substitutes
- Has a related Learning Hub course, #20070: [NHA – Baby-friendly initiative \(BFI\) – Clinical practice standard implementation](#), which should be completed by staff who support families

In community settings, health professionals should:

- Support informed decision-making conversations with clients, ideally starting early in pregnancy. (15) See [Making informed decisions about infant feeding](#), in Chapter 2: Human milk substitutes
- Provide anticipatory guidance about the importance of breastfeeding, what to expect with breastfeeding, and where to get help if challenges arise (6)
- Work with parents to identify and address breastfeeding concerns (6)

Tools for health professionals

Health professionals' roles include normalizing and supporting breastfeeding, removing barriers to success, and providing additional supports when challenges arise. (10) Timely access to support is critical, especially when families face challenges.

The [Breastfeeding and human milk](#) MyNH page for NH staff highlights a variety of resources to support practice, including:

- [Key resources: Breastfeeding and human milk](#)
 - A list of up-to-date resources available for printing at [Document Source](#)
 - Includes client information, promotional materials, and resources for health professionals

- [Perinatal & newborn health hub](#) (PSBC)
- [Breastfeeding healthy term infants](#) (Health promotion guideline, PSBC, NH Document Source #1993) supports evidence-based lactation care. Information includes: (6)
 - BFI and the International code of marketing of breast-milk substitutes
 - Recommendations for prenatal, intrapartum, and postpartum care
 - Guidance for teaching about early infant feeding cues, feeding frequency, and positioning
 - Management of breastfeeding challenges and weaning
- Informed decision making: Having meaningful conversations regarding infant feeding (BFI Strategy Ontario and Best Start). Includes:
 - [Resource for health professionals](#) (NH Document Source #21147)
 - [Six video scenarios](#)
- [Breastfeeding protocols for health care providers](#) (BFI Strategy Ontario, and Toronto Public Health)
 - Includes a variety of protocols, from breastfeeding initiation, the management of breastfeeding concerns, expression, and storage of breast milk, to weaning
 - Several protocols have been updated and are available at NH [Document Source](#) – see “Resources for Health Professionals” on the [Key resources: Breastfeeding and human milk](#)

Resources and supports for parents and families

It takes time, practice, and support for parents to learn to breastfeed and feel confident feeding their baby. It is a learning process for all involved. Some parents encounter challenges or find that breastfeeding is different from what they expected. In a timely manner, help parents to identify breastfeeding concerns and overcome challenges. As needed, link to additional supports.

Resource for parents and guardians

- [Breastfeeding and human milk](#) (NH public webpages)
 - Includes specific pages, such as: [Learning to breastfeed](#) and [Help with breastfeeding](#) (which features local and virtual supports)
 - Can be promoted to the public, in waiting rooms and on bulletin boards, with the promotional poster: [Breastfeeding and human milk public webpage poster](#) (Document Source #10-030-6124)

Collection and storage of expressed breast milk (EBM)

Recommend feeding at the breast, ideally when skin-to-skin, as this is associated with better breastfeeding and health outcomes. (1) (16) Breastfeeding should be well established (i.e., after four to six weeks) before EBM is offered by cup or bottle. (17)

For some families, feeding at the breast may not be possible or preferred. “Combination feeding” may describe feeding at the breast and feeding EBM by bottle. “Exclusive pumping” describes providing EBM as the sole source of nutrition to infants.

In both cases, support families with milk expression, storage, and handling, feeding techniques, and cleaning of equipment. (16) Health professionals can find detailed guidance in [Breastfeeding protocol: Expressing, collecting, and storing of human milk](#) (BFI Strategy Ontario and Toronto Public Health; NH Document Source #21142).

Expressing breast milk

It is important that all parents learn how to hand express their milk. (16) Milk can also be expressed with a hand pump or electric pump, and in combination with hand expression. (16) When a pump is used, support parents with proper flange sizing, technique, and cleaning as per manufacturer instructions.

Parents may express their milk for various reasons, such as to:

- Relieve full breasts
- Increase milk supply
- Maintain lactation during periods when feeding at the breast is not possible
- Collect milk for feeding via other feeding methods (e.g., supplemental nursing system (SNS), syringe, cup, or bottle)
- Collect milk for [human milk donation](#)

Some parents may benefit from specialized breastfeeding support, such as those who need to feed by SNS, syringe, or cup; manage engorgement, over-supply, or forceful letdown; or increase supply.


Storing EBM

If not being used immediately, fresh EBM should be transferred to a refrigerator or freezer as soon as possible. Encourage clients to: (16)

- Store EBM in a clean, food safe container
- Store EBM in small portions, to minimize waste
- Label containers for freezing with the date of expression
- Use the oldest frozen EBM first

For home use, see the EBM storage guidelines on the next page. (16) (18)

Note: Recommendations for storage of EBM in acute care settings differ from those for home use. For acute care, see NH [CPS 1-1-3-090: Safe handling, storage, administration, and transport of human milk](#).

Guidelines for breast milk storage for healthy, term infants				
 northern health the northern way of caring	Room temperature (20°C)	Refrigerator (0 - 4°C)	Freezer* (separate door freezer on fridge) (-18°C)	Deep freezer (-20°C)
Freshly expressed milk	Up to 6 hours	Up to 5 days	Up to 6 months	Up to 12 months
Milk thawed in fridge, but not warmed	Up to 4 hours	Up to 24 hours	Do not refreeze	
*If your freezer compartment is located inside your fridge and keeps ice cream hard, it can be used to store freshly expressed breast milk for up to 1 month.				

Client resource (fridge magnet):

[Guidelines for breast milk storage for healthy term infants](#)

(NH Document Source # 10-421-6059).

Thawing and warming EBM

EBM can be thawed in a refrigerator, under warm water (less than 37°C), or with a waterless warmer. (16) With warm water, water should not come into contact with the top of the container and warming should take no longer than 20 minutes. (16) A microwave or stove top should not be used, as this can result in uneven heating, high temperatures, and destruction of milk properties. (19) (16)

Unused warmed EBM, from which children have not started feeding, can be refrigerated up to four hours, or kept at room temperature for one hour, before being discarded. (16)

Feeding with EBM

EBM may be fed at body temperature, room temperature, or at refrigeration temperature, depending on the preference of the child. (16)

For bottle feeding techniques, see [Bottle feeding](#), in Chapter 2: Human milk substitutes.

Cleaning equipment

Support families with information on cleaning pump pieces, containers, and bottles.

Resources for parents and guardians

- [Learning to breastfeed](#) (NH public webpage)
- [Options for infant feeding](#) (NH public webpage)
- [How to express your milk by hand](#) (NH Document Source #10-030-6038)
- [Guidelines for breast milk storage for healthy term infants](#) (fridge magnet; NH Document Source # 10-421-6059)
- “Expressing your milk” and “Cleaning and sterilizing feeding equipment”, [Baby’s best chance](#) (Prov. of BC)

Donor human milk

When milk from an infant’s own parent is not available (or in the rare event when there are [contraindications to breastfeeding](#) (see later in this chapter)), pasteurized donor human milk (PDHM) is the next best choice. As supplies are limited, PDHM is prioritized for the most vulnerable infants, such as those in Neonatal Intensive Care Units (NICUs) (20), often as a “bridge” to exclusive breastfeeding.

Pasteurized donor human milk

BC’s only human milk bank is the [BC Women’s Hospital Provincial Milk Bank](#) in Vancouver. The milk bank screens prospective donors, and collects, pasteurizes, and distributes PDHM. (21)

Advise prospective donors to begin storing milk and to contact the milk bank in Vancouver directly regarding donation requirements and screening. (21)

NH has one donor human milk collection depot, located at the NICU at the University Hospital of Northern British Columbia (UHNBC) in Prince George. (21) UHNBC NICU staff can assist approved donors with questions about transporting milk to the depot (phone: 250-565-2328). This may include shipping it via the NH Connections bus service.

For more information, see NH [CPS 1-1-2-140: Donor human milk](#)

Resource for parents and guardians

- [Donor human milk](#) (NH public webpage)
- [Donating milk](#) (BC Women’s Hospital and Health Centre)

Informal (peer-to-peer) milk sharing (unpasteurized donor human milk)

As the availability of PDHM is limited, some parents and guardians may be interested in feeding their infant with unpasteurized donor human milk (UDHM) obtained from family, friends, or online sources. This is referred to as “informal milk sharing” and may involve peer-to-peer sharing or the purchasing of UDHM between strangers. (20)

Health Canada, the Canadian Pediatric Society, and the Human Milk Banking Association of North America do not endorse the use of UDHM, as there are various associated risks. (20) PSBC has a practice resource for health professionals to support clients with informed discussions, decision making, and harm reduction approaches. See [Informal \(peer-to-peer\) milk sharing: The use of unpasteurized donor human milk: Practice resource for health care providers](#) (PSBC).

Resource for parents and guardians

- [Information for families: Informal \(peer-to-peer\) milk sharing](#) (PSBC)

Diet and nutrition

Diet quality is an important consideration for the parent's own energy and health. Day-to-day dietary intake has little effect on milk production and the level of most nutrients in human milk. (2) Milk production is generally controlled by infant demand, and nutrients in milk are drawn primarily from the parent's nutrient stores and, to a lesser extent, dietary intake. Rapid weight loss, however, can decrease milk supply. (2)

Many cultures promote specific foods for the purposes of enhancing milk supply. The use of such foods may help to give parents confidence and should be respected. (10)

For considerations related to household food insecurity, see [Food insecurity](#) in Chapter 5: Topics of interest.

Recommendations:

- Reassure parents that day-to-day dietary intake has little effect on milk production and the level of most nutrients in human milk. (2) Encourage them to breastfeed even if they do not always eat well.
- Food and nutrition guidelines during lactation are like those for people who could become pregnant. For their own health and energy, encourage nursing parents to:
 - follow a diet based on [Canada's food guide](#), (2) inclusive of relevant cultural and traditional foods,
 - consume at least 150 grams (5 ounces, or two small portions) per week of fatty fish that is low in mercury, (22) such as salmon, herring, and sardines. Canned fish can be a nutritious and economical choice,
 - continue taking a daily multivitamin containing 400 micrograms (0.4 mg) of folic acid, such as a prenatal vitamin, (23)
 - follow their cues of hunger and satiety to determine how much to eat. Compared to pre-pregnancy, they may need a small amount of additional food per day to meet the additional energy needs of lactation, (24) and
 - choose water to satisfy their thirst.
- Encourage parents who eat a vegan diet to consume foods, beverages, fortified foods, or supplements that are reliable sources of vitamin B12, each day. (22) For more information, see [Vegetarian diets](#) in Chapter 5: Topics of interest.
- Dietary restrictions during lactation are not generally recommended to address common health conditions in infants. For more information, see [Allergy prevention](#), [Constipation](#), [Crying \(colic\)](#), and [Reflux](#) in Chapter 5: Topics of interest.

- Sugar substitutes are approved for use during lactation. Advise that consumption should be moderate, and foods and beverages made with these sweeteners should not replace nutritious food or drinks. (25)
- Encourage limiting caffeine intake to 300 mg/day during lactation, which is the equivalent of about 2 cups (500 mL) of coffee per day, or 6 cups (1500 mL) of black or green tea. (22) (26)
 - A nursing parent’s caffeine intake may make an infant restless. (27)
Limited studies have not identified any adverse effects of moderate caffeine consumption on behaviours of newborn infants. (22)
 - Energy drinks are not recommended during pregnancy and lactation. (28)
- Many herbal products are not recommended during lactation due to insufficient reliable information on the safety of their use during lactation. (22)
- The following herbs can be consumed in moderation (in the amount commonly found in food or in 2 - 3 cups (500 – 750 mL) per day of herbal tea): (22)
 - bitter orange/orange peel
 - echinacea
 - peppermint
 - red raspberry leaf
 - rose hip
 - rosemary

Resources for parents and guardians

- [Canada’s food guide](#) (Government of Canada)
- [Facts on caffeine](#) (Dietitians of Canada)
- [Folic acid: Are you getting enough?](#) (Public Health Agency of Canada)
- [Mercury in fish](#) (HealthLink BC)

Substance use and human milk

The following sections explore considerations related to human milk and the use of various substances: alcohol, cannabis, herbal products, medications (prescribed and over the counter), controlled substances, and commercial tobacco and vapour products.

NH CPS [1-16-1-030: Early childhood development and family services: Two months to six years of age](#) includes guidance on supporting families regarding substance use.

Recommendations from this and other sources include:

- Ask about substance use. Use a supportive approach. As an example, see suggested language in the section on [Tobacco and vapour](#), later in this chapter.
- If client shares that they use substances, follow a harm reduction approach to care, and assess for dependence and patterns of use. (29)
 - When engaging with clients who use substances, use a compassionate, trauma-informed lens and person-first language.
 - Harm reduction approaches to care are considered best practice. This includes safety planning around substance use and the use of human milk.
 - A harm reduction approach involves using non-judgmental approaches and strategies aimed at providing and enhancing the knowledge, skills, resources, and supports for individuals, their families, and communities to make informed decisions to be safer and healthier.

Resources for health professionals:

- [Doorways to conversations – Brief intervention on substance use with girls and women](#) (Centre of Excellence for Women’s Health)
- [Drugs and lactation database](#) (LactMed website, US National Institutes of Health)

Resources for parents and guardians:

- [Taking care: A short guide to breastfeeding and substance use](#) (Centre of Excellence for Women’s Health)

Alcohol

[Canada's guidance on alcohol and health: Final report](#) describes the risks and harms associated with alcohol use to support informed decision making about alcohol consumption. A one-page [infographic](#) provides a public summary. See the [Alcohol MyNH](#) page.

The Public Health recommendation when breastfeeding is that no alcohol use is safest. (30) Alcohol will pass into human milk and expose the infant to alcohol. Further, infants are less able to metabolize alcohol. (30)

In the context of breastfeeding and human milk, alcohol can:

- impair the parent's judgment and functioning, (2) and ability to respond to their child's feeding cues
- reduce milk production due to altered milk let-down reflex, and reduce the amount of milk consumed by the child (2) (30)
- contribute to early cessation of breastfeeding (30)
- effect the infant's short-term sleep patterns and have other possible effects on child health and development. (2) (30)

"Pumping and dumping" does *not* speed up the removal of alcohol from human milk, but this practice may support parent comfort and protect milk supply. (27)

For more information, see [Drinking alcohol while breastfeeding: Desk reference for health care providers](#) (Best Start)

Recommendations:

- When breastfeeding, no alcohol use is safest. (30)
- In the case of chronic heavy maternal alcohol use, the risk of alcohol exposure to infants may outweigh the benefits of breastfeeding. Refer to specialized support to help make an informed decision and/or [breastfeeding safety plan](#). (31)

Harm reduction messages when abstinence may not be possible or desired: Try to:

- Avoid alcohol until infants are 3 months old, due to immaturity of the liver (31)
- Limit consumption to one standard alcoholic drink (30)
- Breastfeed or express milk just before drinking alcohol (19) (27)
- Delay breastfeeding or expressing milk for child until alcohol is cleared from their breast milk – two to three hours for each standard drink (19) (30)
- When affected by alcohol, avoid sleeping with children (31)

Resources for parents and guardians

- [Mixing alcohol and breastfeeding](#) (Best Start)

Cannabis

Health professionals can support decision-making about breastfeeding and cannabis use using a harm reduction approach. The guidance below comes from [Breastfeeding and cannabis: A harm reduction resource for health care and social service providers](#) (Centre of Excellence for Women’s Health). (32) See also the [Cannabis](#) MyNH page.

- There is no known amount of cannabis that is safe to use when breastfeeding.
- More research is needed on the benefits and risks of cannabis use during lactation. It may have an impact on infant development. (32)
- Cannabis use can also impact parenting, including a parent’s ability to respond to their child’s feeding needs. (32)
- Regardless of how an individual uses cannabis (e.g., inhale, eat, drinks, use oils), components of cannabis will enter their milk, including THC and CBD. (32)
- THC is stored in body fat and has been found in human milk weeks after cannabis use. “Pumping and dumping” does not remove cannabis from milk. (32)
- When it comes to harm reduction messaging, health professionals have an important role in communicating that cannabis use is not necessarily a barrier to breastfeeding. (32)

Recommendations:

- The safest option is to not use cannabis while breastfeeding. (32)

Harm reduction messages when abstinence may not be possible or desired: Try to: (32)

- Use smaller amounts and/or use less frequently
- Choose a product with a lower amount of THC
- Avoid synthetic cannabis products (E.g., K2, Spice) as these are stronger and more dangerous than natural cannabis products
- Avoid combining cannabis with alcohol, commercial tobacco and vapour, and prescription or non-prescription medications
- Take steps to protect parents and children from second-hand smoke and vapour, such as smoking outside and changing clothing
- Delay breastfeeding to an hour after inhaling cannabis (to avoid the risk of exposure to the highest concentration of THC in breastmilk)
- When affected by cannabis, avoid sleeping with children (33)
- Keep cannabis products in a safe (e.g., locked) space, out of reach of children

Resource for parents and guardians

- [Risks of cannabis on fertility, pregnancy, breastfeeding, and parenting](#) (Best Start)

Controlled substances

Controlled substances refer to any non-prescribed psychoactive substance (previously referred to as unregulated or illicit substances or drugs). These include opioids such as fentanyl and heroin, stimulants such as cocaine and methamphetamine, benzodiazepines, and others. (34)

Controlled substances are highly toxic and can be fatal at any amount. See [Harm Reduction](#) MyNH page.

- It is safest not use controlled substances while breastfeeding. There are few studies examining effect on infants, and there are no known safe amounts. (35)
- Breastfeeding is an essential component of the non-pharmacological treatment of neonatal abstinence syndrome (such as Eat, Sleep, Console model) (36)
- Breastfeeding should be encouraged for mothers/individual who are not actively using controlled substances and are stable on opioid agonist therapy (OAT). (37)
- Substance use, or risk of substance use relapse, are not absolute contraindication to breastfeeding. (35)

Some substances require a careful breastfeeding safety plan, which is a written document that addresses: (36)

- What substances the breastfeeding person may be affected by;
- After using those substances, the length of time they need to either abstain from breastfeeding, or pump and discard (to maintain their milk supply until substances have cleared from their milk);
- What feeding option will be used during this time (e.g., previously expressed breastmilk, pasteurized donor human milk if available, or an appropriate and safely prepared infant formula); and
- If client chooses to, how to stop breastfeeding/wean gradually

Recommendations:

- Ask permission to link individuals, who wish to breastfeed and who are using substances or taking OAT, to their primary care provider and/or other knowledgeable health professionals (e.g., OAT clinics, Perinatal Substance Use nurses). Ideally, discussions should start in the prenatal period, regarding the benefits and risks of breastfeeding, to support individuals to make informed decisions. (37)
- Support clients to have a safety plan and education around naloxone use. If requested, refer to appropriate treatment or safer supply options (29)

Resource for health professionals:

- [Perinatal substance use](#) (BC Women's Hospital and Health Center)
- [RACE line](#) (includes perinatal addictions specialty): 1-877-696-2131

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health professionals, Fall 2023



Herbal products

Many herbs, herbal teas, and herbal products are not recommended during lactation due to insufficient evidence on safety during lactation.

For a list of herbal teas that are safe to consume in moderation during lactation, see [Diet and nutrition](#), earlier in this chapter.

Other useful resources include:

- Health professionals such as lactation consultants, pharmacists, nurse practitioners, and physicians.
- [Drugs and lactation database](#) (LactMed website, US National Institutes of Health)
- Government of Canada' [Natural and non-prescription health products](#) website. Clients can check the label for a NPN/DIN number and look up information for the product.

Recommendations:

- Where relevant, parents should speak with informed health professionals about the use of herbal products during lactation. (27)

Medications (prescription and over the counter)

Most medications are compatible with lactation. (2) However, due to the varied range of prescription and over-the-counter medications, it is impossible to make a definitive global statement about the safety of their use during lactation. (38)

Useful resources for health professionals about the transfer of medications to human milk and their potential effects on milk supply or on infant health include:

- Health professionals such as lactation consultants, pharmacists, and physicians
- [Drugs and lactation database](#) (LactMed website, US National Institutes of Health)
- E-book: [Drugs in pregnancy and lactation: A reference guide to fetal and neonatal risk](#) (Briggs, et al., 2022). Available through the NH library.
- [Drug product database](#) (Government of Canada)

Recommendations:

- Encourage parents to inform their health care team of their lactating status so that informed decisions can be made about medications that, if possible, will preserve the breastfeeding relationship. (38)

Resources for parents and guardians

- [Medicine use while breastfeeding](#) (HealthLink BC)

Tobacco and vapour

In the following section, “tobacco” refers to commercial tobacco (versus [traditional tobacco use](#)). Recognize that there are cultural and ceremonial uses of tobacco, and the benefits of traditional uses can outweigh the potential harms. (29)

Many people quit using tobacco and vapour products during pregnancy, but relapse is common after the birth of their child. There is often shame and guilt associated with tobacco and vapour use – it is important to use a supportive approach and encourage families to continue their tobacco and vapour-free journey. (39)

Despite the health concerns associated with tobacco and vapour use, exclusive breastfeeding is still recommended for parents who consume tobacco, as human milk may protect against some of the negative effects of tobacco. (2)

Tobacco and vapour use:

- is associated with decreased intention to breastfeed, and decreased rates of breastfeeding initiation and duration (22)
- can affect milk production (2) and is associated with increased *perceptions* of low milk supply (however, studies have not consistently reported an effect of smoking during lactation on reduced milk production or infant weight gain) (22)
- results in transfer of nicotine and other harmful chemical through breast milk, and lowers levels of fat and vitamins C and E in breast milk (22) (40)
- is associated with an increased risk of asthma and SIDS, and may negatively impact child growth and, in the short term, sleep patterns (2)
- may expose children to second and third-hand smoke or vapour (41)

Recommendations:

- Inquire about tobacco and vapour use, as per the NH CPS [1-22-8-010: Addressing tobacco using the 3As approach: Brief intervention](#)

1. ASK	<p>Ask about all tobacco use and dependence. If patients deny using tobacco, ask if they use e-cigarettes or vape.</p> <p>Use a supportive approach. Instead of asking, “do you smoke?”, ask clients which of the five following statements best describes their situation: (42)</p> <ul style="list-style-type: none">• I have never used tobacco or have smoked <100 cigarettes in my lifetime.• I stopped using tobacco <i>before</i> I found out I was pregnant; I’m not using now.• I stopped using tobacco <i>after</i> I found out I was pregnant; I’m not using now.• I use tobacco now, but I’ve cut down since I found out I was pregnant.• I use tobacco regularly now - about the same amount as before I found out I was pregnant.
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<p>2. ADVISE</p>	<p>Advise parents and guardians to quit tobacco or vapour use to improve their own health and the health of others, and options available to support that change.</p> <p>If quitting is not possible or desired, harm reduction strategies include:</p> <ul style="list-style-type: none"> • breastfeeding and the provision of human milk (22) • switching to nicotine patches or other nicotine replacement therapies. (22) Note: Only physicians and nurse practitioners can prescribe NRT for pregnant or lactating clients (43) • limiting tobacco and vapour use as much as possible (2) (22) • waiting until after breastfeeding or expressing milk to smoke, vape, or use tobacco, to decrease exposure to the child • reducing the family’s exposure to second and third-hand smoke and/or vapour • avoiding bedsharing with infants, due to increased risk for sudden, unexpected infant death during sleep (44)
<p>3. ACT</p>	<p>Provide information about services to support tobacco cessation, such as:</p> <ul style="list-style-type: none"> • QuitNow offers free information, support, and counseling by trained professionals by phone, text, or email. • BC Smoking cessation program covers the costs of nicotine replacement therapy products. People who are pregnant or lactating are advised to consult with their doctor or pharmacist. • Talk tobacco is a free, confidential program offering culturally appropriate support and information about quitting smoking, vaping and commercial tobacco use to First Nations, Inuit, Metis, and urban Indigenous communities. • FNHA benefits program offers coverage for nicotine replacement therapy • Pregnets (Prevention of gestational and neonatal exposure to tobacco smoke) website offers information for clients and health professionals.

See additional resources on the [Tobacco & vapour reduction](#) MyNH page.

Contraindications to breastfeeding

Breastfeeding is rarely contraindicated. Most medications are compatible with lactation. (2) However, a case-by-case approach is required with the use of medications and other substances.

Parents should be encouraged to breastfeed unless the risks clearly outweigh the benefits. (36) While not using substances is safest for parents and children, substance use, or the risk of substance use relapse, is not an absolute contraindication to breastfeeding. (35) Some substances require breastfeeding safety plans. (35) See the various sections under [Substance use and human milk](#), earlier in this chapter.

Temporary contraindications

These include:

- severe illness that prevents lactating parents from caring for their infants (2) (5)
- untreated, infectious tuberculosis (2) (5)
- herpes lesions on both breasts (2)
- hepatitis C infection, when lactating parents have cracked and bleeding nipples (2) (45)

In the case of *temporary* contraindications, support parents to maintain lactation until they can safely breastfeed or provide their breast milk again. (2) (5) To maintain their milk supply and to prevent engorgement, support parents to manually express or pump their milk as frequently as their children would normally feed. This may be six to eight times per day (no longer than four to six hours apart). (2)

Contraindications to breastfeeding and the use of human milk

These include:

- galactosemia in infants (2)
- certain health concerns in lactating parents:
 - HIV infection – the virus can be transferred via human milk, even with antiretroviral therapy (2)
 - Human T-lymphotropic virus type 1 or 2 infection (5)

When feeding at the breast or the use of milk from an infant's own parent is not possible or is contraindicated, the next best choice is pasteurized human donor milk (PDHM) (see [Donor human milk](#), earlier in this chapter). (20) However, given the limited access to PDHM, in many cases an appropriate and safely prepared human milk substitute (i.e., commercial infant formula) may be the most feasible alternative. (2) See Chapter 2: [Human milk substitutes](#).

2. Human milk substitutes

Practice points

- Support families to make fully informed decisions about infant feeding, which involve understanding the benefits and risks of various feeding options.
- Temporary or intermittent supplementation with cow milk-based formula (e.g., bottles of formula in early days postpartum followed by only breastfeeding) should be avoided due to increased risk of cow milk protein allergy.
- For infants who are not exclusively receiving human milk, for whom formula use is anticipated to be ongoing, recommend a commercial infant formula that is cow milk-based.
- Recommend other formulas in specific circumstances, such as for temporary or intermittent supplementation of a breastfed infant, or for infants who cannot take cow milk-based formula due to confirmed medical conditions or for cultural or religious reasons.
- Other beverages are not nutritionally complete and are not appropriate as human milk substitutes.
- Support parents and guardians to ensure that they are safely preparing, storing, and transporting formula. Instruction should be provided, as needed, on an individual basis (i.e., not in a group setting).
- Regardless of feeding method, promote responsive, cue-based feeding.

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Making informed decisions about infant feeding

Families have the right to make informed decisions about infant feeding, which involve understanding benefits and risks of various feeding options. (46) Starting early in the prenatal period, health professionals can facilitate informed decision-making discussions that include: (6)

- The opportunity for parents to discuss their concerns about infant feeding,
- The importance of breastfeeding for the infant, parent, family, and community (for more information, see [Importance of breastfeeding](#) in Chapter 1: Breastfeeding),
- The health consequences of not breastfeeding for the infant and parent (see [Potential health consequences of not breastfeeding](#), on the next page),
- The impact and costs of Human milk substitutes (see [Potential risks and costs of human milk substitutes](#) on the next page), and
- The difficulty of reversing the decision once breastfeeding is stopped.

If feeding directly at the breast is not possible or preferred, or if a supplement is required, the priority for supplementation is as follows: (6)

- The parent's own expressed milk
- Pasteurized donor human milk (PDHM) from an approved milk bank (see [Donor human milk](#), in Chapter 1: Breastfeeding and human milk).
 - Note: supplies are limited. PDHM is prioritized for vulnerable infants, such as in Neonatal Intensive Care Units
- An appropriate commercial infant formula, prepared safely

The marketing of infant formula disrupts informed decision-making and undermines breastfeeding. (6) (46) Free samples are associated with shorter breastfeeding duration. (47).

- As per the [International code of marketing of breast-milk substitutes](#) families should not receive marketing materials, free samples, coupons, or gift packages that include Human milk substitutes and feeding paraphernalia.

If temporary supplementation is indicated for acceptable medical reasons, the importance of breastfeeding should be weighed against the risks posed by the use of commercial infant formula. (6) See next page.

For more information, see the following resources for health professionals:

- [Informed decision making: Having meaningful conversations regarding infant feeding](#) (BFI Strategy Ontario and Best Start, at NH Document Source #21147)
- [Informed decision making](#) - Six video scenarios (BFI Strategy Ontario)

Potential health consequences of not breastfeeding

Not breastfeeding results in loss of parents' protection against breast and ovarian cancers and type 2 diabetes. (3) (8)

While human milk substitutes can be a safe alternative, they do not provide the antibodies, enzymes, hormones, and stem cells found in human milk. (20) Compared to human milk, the use of human milk substitutes has been associated with an increased incidence of the following health outcomes for children: (3) (8) (20)

- acute otitis media
- allergic rhinitis, asthma, atopic dermatitis
- childhood leukemia
- diabetes (type 1 and type 2)
- gastrointestinal infections
- overweight and obesity
- necrotizing enterocolitis
- respiratory tract infections
- sudden infant death syndrome (SIDS)

Potential risks and costs of human milk substitutes

New evidence indicates that, for breastfed infants, temporary or intermittent supplementation with cow's milk-based formula may increase risk for cow milk allergy (CMA). (48)

Proper use of formula is critical. See [Safely preparing, storing, and transporting commercial infant formula](#), later in this chapter, to help manage certain risks:

- Bacterial contamination; powdered infant formula is not a sterile product (2)
- Risk of foodborne illness, related to issues with formula preparation, storage, or cleaning of equipment (2)
- Over- or under-dilution of formula due to errors in reconstituting powdered or concentrated liquid formula (38)
- Safety of water used to reconstitute powdered or concentrated liquid formula (20)

Other risks and costs related to formula use include:

- Significant financial costs to purchase commercial infant formula and related supplies (20)
- Concerns about product availability due to recalls and supply chain issues
- Risk of serious illness related to contaminated, expired, and recalled products (20)
- Risk of choking, aspiration, ear infections, and childhood caries related to feeding with propped bottles. (2) For appropriate bottle-feeding techniques, see [Bottle feeding](#) later in this chapter

- Environmental impacts related to the production, transport, and disposal of formula, containers, and related feeding products (20) (47)
- Concerns about the use of homemade formula, which is likely nutritionally deficient and is not appropriate as a human milk substitute. (2) (49) See [Homemade infant formula \(e.g., evaporated milk formula\)](#), later in this chapter

Potential benefits of human milks substitutes

Human milk substitutes provide an infant feeding option that: (20)

- is considered medically and culturally acceptable
- is readily available
- provides families with a choice

It is an option in cases where:

- human milk is contraindicated* (i.e., for infants diagnosed with galactosemia) (20)
- breastfeeding is contraindicated* (e.g., with parent's use of chemotherapy medications) (5) (20)
- human milk (parent's own milk or pasteurized donor human milk) is not available, or is not available in adequate amounts, and human milk substitutes become a necessity (20)

*See [Contraindications to breastfeeding](#) in Chapter 1: Breastfeeding and human milk

The difficulty in reversing the decision once breastfeeding is stopped

Though relactation is possible, it can be difficult to return to breastfeeding after formula feeding. This is especially true when milk supply has decreased or was not well established. (15)

Supporting families who feed with human milk substitutes

Support families who are, or plan to be, feeding with human milk substitutes, whether as a supplement to human milk or as a sole source of nutrition. (10) See NH CPS [1-1-3-100: Formula feeding healthy term infants](#)

- Provide non-judgemental information and support. (6) Consider that families may feel guilt, shame, or disappointment for not breastfeeding or for supplementing with human milk substitutes. In addition to requiring information and support regarding the use of commercial infant formula, these families may also benefit from emotional support. (10)
- Emphasize the importance for skin-to-skin contact for all infants. (10)
- For those who provide human milk substitutes as a supplement to breastfeeding, steps should be taken to preserve and improve the breastfeeding relationship. (10) (2) (6)
 - Consider a link to a lactation consultant, other health professional, or breastfeeding support person. See [Help with breastfeeding](#) (NH public webpage).
 - Resources for clients include: “Supplementing a Breastfed Baby” (in [Infant formula: What you need to know](#) (NH Document Source #21101).
 - Recommend a vitamin D supplement for the infant. See [Vitamin D](#) in Chapter 6: Key nutrients.
- Recommend appropriate commercial infant formulas; formula must be “acceptable, feasible, affordable, sustainable, and safe” for a family in their circumstances. (6) See the next section, [Selecting commercial infant formula](#).
- Provide information on the safe preparation, storage, and transportation of formula. See [Safely preparing, storing, and transporting commercial infant formula](#) later in this chapter. To align with responsibilities of health professionals as per the [International code of marketing of breast-milk substitutes](#), provide information:
 - On an individual basis (i.e., not in a group setting) (2) (6) (50)
 - that is current, appropriate, and separate from breastfeeding information
 - that is free of promotional material
- Promote responsive, cue-based feeding, including at night. (46) See [Feeding infants with commercial infant formula](#) in this chapter, as well as [Honour hunger and satiety cues](#) in Chapter 4: Feeding by age.

Selecting commercial infant formula

If an infant is not exclusively fed human milk, an appropriate commercial infant formula must be selected that is acceptable, feasible, affordable, sustainable, and safe for a family in their circumstances. (46) When supporting families, it may be helpful to consider the following points:

- All commercial infant formula sold in Canada are fortified with iron, although fortification levels vary. (49) See “Iron” in [Additions to commercial infant formula](#).
- Temporary or intermittent supplementation with cow milk-based formula (e.g., bottles of formula in early days postpartum followed by only breastfeeding) should be avoided due to increased risk of cow milk protein allergy. For more information, see [Allergy prevention](#) in Chapter 5: Topics of interest.
- For infants who are not exclusively receiving human milk, for whom formula use is anticipated to be ongoing, recommend a commercial infant formula that is cow milk-based. For examples of different types of formula, see [Summary sheet - Infant formula for healthy term infants](#) (Alberta Health Services)
- Recommend other formulas in specific circumstances, such as there is a medical indication for temporary or intermittent supplementation of a breastfed infant, or for infants who cannot take cow milk-based formula due to confirmed medical conditions or for cultural or religious reasons. (49) See the table on the next page on indications for use.
- Other beverages, such as cow milk, goat milk, soy beverages, and other plant-based beverages, are not nutritionally complete and are not recommended as Human milk substitutes. (2) See Chapter 3: [Animal milks and other beverages](#).
- In rural and remote communities, commercial infant formula choices may be limited. Health professionals can help to advocate for the availability of appropriate formulas for their clients.

Types of human milk substitutes: Indications for use

Formula type	Indications	Comments
Standard cow milk-based formula	Standard choice for ongoing supplementation* of healthy term infants that are not exclusively receiving human milk (2)	Iron content ranges from 6.5 to 13 mg/L. (51) Infants at higher risk of iron deficiency may need a formula with iron levels at the higher end of this range. (2) (49) See Iron in Chapter 6: Key nutrients.
Lactose-free cow milk-based formula	Limited Temporary use may be justified with specific severe acute medical conditions (49)	This formula is contraindicated with cow milk protein allergy. (2) This formula is also contraindicated with galactosemia and congenital lactase deficiency due to residual lactose content. (2) This formula is ineffective in management of crying (colic). (2) This formula offers no advantage over standard formula, even with acute gastroenteritis, due to the preservation of lactose digestion and absorption. (2)
Partially hydrolyzed, cow milk-based formula	None	There is little evidence to support any benefit of this formula regarding the infant digestive system compared to standard formula. (2) This formula is contraindicated with cow milk protein allergy, as it would be expected to provoke an allergic reaction. (2) (52)
Extensively hydrolyzed casein formula (i.e., Nutramigen, Alimentum, Pregestimil)	Short term or intermittent supplementation of breastfed infant * Physician-confirmed food allergy or malabsorption syndromes (2)	For infants who continue to experience allergic reactions even while on an extensively hydrolyzed formula, amino acid-based formula may be recommended (i.e., Neocate, Puramino). (2)
*Temporary or intermittent supplementation with cow milk-based formula should be avoided due to increased risk of cow milk protein allergy. For information, see Human milk substitutes in “Allergy prevention”, in Chapter 5: Topics of interest.		

Formula type	Indications	Comments
Soy-based formula	<p>Galactosemia (2) (49)</p> <p>Congenital/primary lactase deficiency (49)</p> <p>Cultural or religious reasons (i.e., vegan diet) (2) (49)</p>	<p>This formula is contraindicated for non-IgE mediated cow milk protein allergy due to high rates of coincident soy allergy. (49)</p> <p>May be considered if diagnosis of non-IgE-mediated cow milk protein allergy can be ruled out (i.e., via clinical challenge). (49)</p> <p>There is no conclusive evidence that soy isoflavones adversely affect development. (2)</p> <p>Infants who receive soy-based formula should continue receiving soy-based formula until two years of age. (6) (53)</p>
Follow-up or second step formula	<p>Not suitable for infants 0 – 6 months (51)</p> <p>No indication for use for infants 6-12 months, but are an acceptable choice (54)</p> <p>May be a better option if families offer formula past 12 months (54)</p>	<p>This formula is higher in calcium and phosphorous than infant formula but does not offer nutritional or health advantages over other infant formulas for infants 6-12 months of age. (49)</p> <p>Follow-up formula is not needed for most healthy children. Healthy children do not usually need formula after 12 months. (49)</p> <p>Soy-based follow-up formula is no longer available. Children who have been using soy-based infant formula can continue to use this to two years of age.</p>
Homemade milk “formula” (e.g., evaporated whole milk formula)	Not recommended as human milk substitute	<p>This formula is nutritionally incomplete, (2) and has caused nutrient deficiencies in infants. (49)</p> <p>This also have a high renal solute load, which can increase the risk of dehydration in young infants. (49)</p> <p>This may be considered for emergency, short-term use only. If used, follow appropriate recipes (i.e., from WHO). (2) See Homemade infant formula (e.g., evaporated milk formula), below.</p>

Formula type	Indications	Comments
Other milks and beverages	Not recommended as human milk substitute	These beverages are not nutritionally complete and are inadequate as Human milk substitutes. See Chapter 3: Animal milks and other beverages .

For information on specific brands or types of formula, consult product information on formula company websites or see the following resources for health professionals:

- [Compendium](#) – Infant formula for healthy term infants (Alberta Health Services)
- [Summary sheet](#) - Infant formula for healthy term infants (Alberta Health Services)

Homemade infant formula (e.g., evaporated milk formula)

Evaporated milk formula and other homemade formula have been used by families when there is a lack of access to commercial infant formula, due to financial barriers, supply chain issues, and natural disasters. Their use may also relate to cultural practices and beliefs that commercial infant formula is unacceptable. (55)

Concerns with the use of these formula include nutrient deficiencies and toxicities, food-borne illness, gastrointestinal dysfunction, and high renal solute loads, high osmolality, and dehydration. (49) (55) For example, compared to infants who are breastfed or fed with commercial infant formula, those that receive evaporated milk formula have lower intakes of nutrients such as iron, selenium, and thiamin, and prolonged poorer iron status, including iron-deficiency anemia. (49)

Evaporated milk formula should only be considered for emergency, short-term, “last resort” use and must be prepared with evaporated cow milk following specific directions to decrease some of the risks associated with their use. (2)

- See directions in the [Guidelines for use of breastmilk substitutes in emergency situations](#) (World Health Organization). (56)
- Iron supplements should be provided to infants using such formula, under the guidance of a physician or other primary care provider.
- Families should be supported to access appropriate commercial infant formula, the composition of which is regulated by the Canadian Food and Drug Regulations.

Resources for parents and guardians

- [Safety of homemade infant formula in Canada](#) (Government of Canada)

Additions to commercial infant formula

The Canadian Food and Drug Regulations regulate the composition and labelling of all commercial infant formula sold in Canada. These regulations restrict what additives may be used, some of which are discussed in the table below. (2) Advise clients to use caution regarding formula available from non-Canadian sources (i.e., online).

Addition	Comments
Iron	If an infant is not exclusively receiving human milk, a commercial infant formula is recommended. All commercially available infant formulas contain iron, although fortification levels vary. Formula in Canada contains 6.5 to 13 mg/L of iron. (51) There is no evidence to support the belief that iron-fortified formula causes constipation in infants. (49) For more information, see Iron in Chapter 6: Key nutrients.
Long Chain Polyunsaturated Fatty Acids (LCPUFAs)	LCPUFAs (i.e., docosahexaenoic acid (DHA) and arachidonic acid (ARA)) are permitted as optional ingredients. While they appear to be safe, evidence is inconclusive as to their benefit. Formulas with these ingredients are common. (49) For more information, see Dietary fats in Chapter 6: Key nutrients.
Nucleotides	Some commercial formula contains added nucleotides, based on the levels found in human milk. Evidence is lacking on their benefits to infants. (2)
Probiotics	Live microorganisms, specifically determined to be safe for infant use, may be added to commercial infant formula. (2) This is intended to mimic human milk, as human milk is known to contain various bacterial strains. (57) More evidence is needed to support the use of such formula. (2) Probiotics in powdered formula may be inactivated when formula is reconstituted with hot water (>70°C) (the temperature generally recommended for formula preparation). (49)
Vitamin D	Vitamin D is added to commercial infant formula. Infants fed commercial infant formula only, and who were born to gestational parents with adequate vitamin D stores, do not generally require a vitamin D supplement. (2) (58) For more information, see Vitamin D in Chapter 6: Key nutrients.

Commercial infant formula formats

Commercial infant formula is available in three formats: ready-to-feed, concentrated liquid, and powdered formula. The table below highlights details related to considerations, preparation, and relative cost. For more information, see [Safely preparing, storing, and transporting commercial infant formula](#), later in this chapter.

Format	Considerations	Preparation and cost
Ready-to-feed (liquid)	<p>Sterile (2) (until opened)</p> <p>Safest formula choice for higher-risk infants* who receive formula (2) (i.e., least risk of contamination and no need for reconstitution)</p> <p>Recommended if no safe water source is available (59)</p>	<p>Does not require dilution (49)</p> <p>More costly than concentrated liquid and powdered formats (60)</p> <p>Often sold in cases (as opposed to individual cans), which may present a challenge for transportation and storage</p>
Concentrated liquid	<p>Sterile (2) (until opened)</p> <p>Safer choice than powdered formula</p>	<p>Must be diluted properly to manage risk of over or under dilution</p> <p>Generally less costly than ready-to-feed format, but more costly than powdered format (60)</p> <p>Often sold in cases (as opposed to individual cans), which may present a challenge for transportation and storage</p>
Powdered	<p>Not sterile (2)</p> <p>Has been linked with rare, but very serious, infant illnesses. <i>Cronobacter Sakazakii</i> and <i>Salmonella enterica</i> are the main concerns, especially for higher-risk infants* (2) (60)</p> <p>Can be used if prepared properly (2)</p>	<p>Must be prepared properly to manage microbial risk and risk of over or under dilution</p> <p>Generally less costly than ready-to-feed and concentrated liquid formats (60)</p> <p>Requires minimal storage space. (60)</p>

* Higher-risk infants include preterm, low birthweight, and immunocompromised infants. (2) (59) (61)

BPA in commercial infant formula packaging and plastic baby bottles

In 2009, Health Canada determined that Bisphenol A (BPA) was not detectable in canned powdered formula products available for sale in Canada. Additionally, since that time, manufacturers have phased out the use of BPA-containing packaging for liquid formula. (62)

In Canada, it is illegal to manufacture, import, advertise, or sell polycarbonate baby bottles that contain BPA. BPA can be found in older types of polycarbonate baby bottles. (63) Caution should be exercised when purchasing baby bottles from non-Canadian sources (i.e., online) or when obtaining older bottles (i.e., used, or second-hand).

Resources for parents and guardians

- [Bisphenol A \(BPA\)](#) (Government of Canada)

Safely preparing, storing, and transporting commercial infant formula

Proper preparation and storage of formula reduces the risk of food-borne illness. (2)
Careful preparation prevents mixing errors, such as:

- Over-dilution, which can result in coma, hyponatremia, poor weight gain, or irritability (38)
- Under-dilution, which can result in dehydration, vomiting, diarrhea, or stress on the kidneys (38)

Safe formula preparation practices are not always followed. (49) Provide clients with support to ensure that they are preparing, feeding, handling, and storing formula properly.

- Families who have made an informed choice not to breastfeed or to provide human milk should be **individually** supported. (9) (6)
- Group instruction on the preparation, storage, and feeding of formula is **not** recommended, and contradicts the WHO International Code of Marketing of Breast-Milk Substitutes (50)

Disinfecting equipment

The cleaning and disinfection of all infant feeding equipment helps reduce the risk of foodborne illness. This should be done with each use.

Advise parents and guardians to wash their hands; clean and disinfect kitchen surfaces; wash and disinfect all feeding equipment; and avoid cross-contamination. (2) Equipment should not be washed with other dirty dishes. (49) Home dishwashers may not disinfect, even during the “sanitize” cycle. (49)

No research is available to determine an age at which it is safe to stop disinfecting equipment. (49) Current recommendations in client resources from HealthLink BC and PSBC are to disinfect equipment for the duration of formula use. (64) (59) Previous guidance was to disinfect equipment until infants were *at least* four months old. (65)

Resources for parents and guardians

- Relevant information on cleaning and disinfection is included in the comprehensive booklet, [Infant formula: What you need to know](#) (PSBC, available to order from NH Document Source #21101)
- A one-page resource is also available: [Formula feeding: How to clean and disinfect](#) (HealthLink BC)

Water choices for commercial infant formula preparation

The following tables describe suitable and unsuitable water sources for formula preparation. Water should come from a potable water supply that is not on any kind of water quality advisory. All safe water sources require disinfection. If safe water sources are not available, a [ready-to-feed formula](#) should be considered. (49) (59)

Suitable water	Comments
Cold tap water (2) (Unless not advised as per local public water advisories)	Hot tap water may contain metal contaminants. (2) Tap water should be run until water becomes cold. (49) If charcoal or activated carbon filters are used, these should be changed regularly to prevent increased mineral/chemical build up and pathogen contamination. (49)
Commercially bottled water (2)	Water should not be carbonated or fortified with vitamins or minerals. (49)
Safe well water (2)	Well water should be tested regularly (at least twice per year) for mineral levels and contaminants. (49)

Unsuitable water	Comments
Carbonated water (2)	
Mineral water (2)	Mineral water has been implicated in infant electrolyte disturbances. (49)
High fluoride levels (2)	Fluoride levels must be below 1.5 mg/L. (2)
High manganese levels (64)	Manganese levels must be below 0.12 mg/L. (64) (66) (67) Avoid discoloured water until safety is confirmed. (64)
High nitrate levels (2)	Nitrate levels must be below 45 mg/L (or 10 mg/L of nitrate-nitrogen) (2) to reduce the risk of methemoglobinemia. (49)
High lead and copper levels (49)	High levels can occur when lead or copper leaches from water pipes, urns, kettles, and cookware containing lead. (49)
Softened water (49)	Water that has gone through water softeners has sodium levels that are too high for infants. (49)
Over-boiled water (49)	Boiling water longer than the recommended two minutes can concentrate minerals in the water. (49)

There is no indication for the use of distilled water, (2) and no recommendations are available regarding distilled, deionized, demineralized, purified, or reverse osmosis water. (49)

Disinfecting water

Tap water, well water, and bottled water are not sterile, and should be boiled.

- Recommend that all water be boiled for two minutes.
- Avoid boiling water longer, as it can concentrate minerals in the water. (49)
- Boiled water can be cooled and stored in a disinfected, tightly closed container for 48-72 hours in the refrigerator, or 24 hours at room temperature (i.e., primarily for use with concentrated liquid formula). (49)

There is no research supporting a specific infant age at which it is safe to stop boiling water for formula preparation. (49) Like the disinfection of formula feeding equipment, it is safest to continue this practice for the duration of formula use. (64)

Preparing commercial infant formula

Reconstituted formula is not sterile, and all formula is an excellent medium for bacterial growth. The time between preparation and feeding should be minimized to decrease the risk of infant illness. Ideally, formula is prepared and fed to infants immediately. (49)

The table below outlines considerations for the preparation of various types of formula.

Formula format	Preparation considerations
Ready-to-feed (liquid)	No dilution is required. Follow manufacturer's direction for preparation and storage.
Concentrated liquid	Dilution is required, as per manufacturer's directions. Disinfected water should be added first, then concentrated liquid, to help decrease the risk of over concentrating the formula. (49)
Powdered formula (PIF)	PIF is not sterile . Outbreaks have been caused by the consumption of PIF contaminated with harmful bacteria, such as <i>Cronobacter Sakazakii</i> and <i>Salmonella enterica</i> . Special care is required in the handling of PIF to decrease the risk of infection. (2) Disinfected water should be added first, then the PIF powder (using the scoop provided with the specific product), to help decrease the risk of over concentrating the formula. (49) Differing recommendations are available regarding preparation of PIF for immediate use and for later use (i.e., advanced preparation). <i>See next page.</i>

Formula format	Preparation considerations
PIF for immediate use	<p>WHO recommends that PIF should be prepared with water that has been boiled and then cooled to no less than 70°C, to kill harmful bacteria that may be contaminating the PIF powder. (61) The formula should then be rapidly cooled to a safe feeding temperature. (49)</p> <p>With healthy term infants, it is also considered safe to mix formula powder with previously boiled water that has been cooled to room temperature. (2) This should be consumed within two hours. (2)</p>
Advanced preparation of PIF	<p>For advanced preparation of PIF, recommend mixing powder with very hot water (boiled and cooled to no less than 70°C) to kill harmful bacteria that may exist in the formula powder. (2)</p> <p>Advise to cool prepared formula quickly and to store at refrigeration temperatures (0-4°C) for up to 24 hours. (2) Formula should not be frozen. (27)</p>

Resources for parents and guardians

- Information on formula preparation is included in the booklet [Infant formula: What you need to know](#) (PSBC, and NH Document Source #21101)
 - The following one-page resources are also available:
 - [Formula feeding: How to prepare ready-to-feed formula](#) (HealthLink BC; available as NH Document Source #10-421-6063*)
 - [Formula feeding: How to prepare concentrated liquid formula](#) (HealthLink BC; available as NH Document Source #10-421-6046*)
 - [Formula feeding: How to prepare powdered formula](#) (HealthLink BC; available as NH Document Source #10-421-6031*)
- * NH Document Source versions also include a second page on [How to clean and disinfect](#) related equipment (HealthLink BC).

Automatic infant formula preparation machines

Automatic infant formula preparation machines measure, dispense, and mix powdered infant formula with heated water. Due to various safety concerns, these machines are not recommended. (59) (64)

Advise parents and guardians who are considering using these machines of the risks with their use, such as:

- Inconsistent dispensing of formula powder, resulting in over- or under-dilution of formula. (64) (68) This can have serious implications for infant health.

- Inadequate water temperatures, not reaching the 70°C recommended to kill bacteria that may be present in powdered infant formula. (59) (64) (69) This food safety issue is heightened when formula is prepared in advance of feeding (e.g., preparing a day's worth of bottles), as formula is an excellent medium for microbial growth.
- Microbial growth in water, compartments, or tubing. (70)

Though it does not eliminate the above risks, parents and guardians who use these machines should follow manufacturer directions for daily cleaning. One popular brand recommends cleaning certain components after every four bottles made, as well as monthly descaling to prevent mineral build up. (71)

Given the above risks and the need for frequently cleaning, automatic infant formula preparation machines are likely less safe and convenient than they initially appear.

Warming refrigerated commercial infant formula

A limited amount of research suggests that it may be fine to feed cold formula, as long as it is accepted by the infant, but more research is warranted to explore the acceptability and effects of this practice, especially in younger infants. (49)

The following should be considered to warm formula safely.

- Refrigerated formula can be warmed to room temperature or to body temperature, depending on the preference of the infant. (49)
- Bottles of formula can be warmed under hot water, making sure that the water remains below screw caps/lids to prevent contamination of the formula. (49) A bottle warmer may also be used.
- Formula should not be warmed in the microwave, as it may result in uneven heating and possible scalding. (49)
- Warming should not take longer than 15 minutes, the formula should be fed immediately, and all leftovers should be discarded. Formula should not be warmed more than once. (49) Preparation of smaller volumes of formula may help to decrease the amount of formula discarded.
- Before feeding infants, adults should check the temperature of prepared formula (i.e., with a clean thermometer or by shaking a few drops on the inside of their wrists).

Storing and transporting prepared commercial infant formula

The following table outlines considerations for the safe storage and transportation of formula.

Location	Considerations
General	<p>Store powdered formula and unopened containers of liquid formula in a cool, dry place. (49)</p> <p>Use formula before the expiration date, to help ensure that the formula maintains its “microbiological and physical stability and the nutrient content declared on the label.” (72)</p> <p>Discard if past the expiration date. (49) Do not donate expired formula.</p> <p>Prepared formula, when not stored at refrigerator temperatures, should be consumed within two hours, or discarded. (49)</p>
Refrigerator (Fridge temperatures should be at or below 4°C) (49)	<p>Formula should be stored in the main compartment of the refrigerator (i.e., not in the refrigerator door). (49)</p> <p>Opened ready-to-feed formula, and concentrated liquid formula which is not yet reconstituted, should be well covered, or sealed and refrigerated immediately. This can be kept for 48 hours in the refrigerator (0-4°C). (49)</p> <p>Reconstituted powdered or concentrated liquid formula may be stored in the refrigerator for up to 24 hours. (2) (49)</p>
Freezer	<p>Formula should not be frozen, as it may become grainy and the fat may separate. (49)</p>
Transportation	<p>Prepared formula should be cooled to less than 5°C or removed from the refrigerator immediately before being transported and should be transported in a cooler or bag with ice. (49)</p>

Feeding infants with commercial infant formula

Bottle feeding

Appropriate feeding techniques can decrease some of the risks associated with bottle feeding. Support parents and guardians to:

- create a calm environment (38)
- hold the infant during feeding, maintaining a semi-upright position with the infant's head, back, and shoulders in a straight line. (73) Encourage skin-to-skin contact when feeding with a bottle; even older infants benefit from being held during feedings (2)
- always supervise feedings (2)
- avoid propping of bottles due to dangers of:
 - choking or aspiration of contents into the lungs (2)
 - increased risk of childhood caries, from bottle contents pooling in the mouth if the infant falls asleep (38)
 - increased risk of ear infections, from bottle contents traveling from the back of the mouth up through the Eustachian tube into the middle ear (38)
 - overfeeding, since the infant cannot stop the feeding (2)
- avoid the use of the bottle as a pacifier (2)
- feed infants “on-cue,” responding to their early hunger and satiety cues, including at night. (9) (2) (6) If showing signs of satiety (i.e., turning head away, falling asleep), stop feeding, even if the bottle has not been emptied. (2) For more information, see:
 - [Recommended approaches to feeding](#) in Chapter 4: Feeding by age
 - [Responsive feeding info sheet](#) (Unicef UK – The Baby Friendly Initiative)
- let the infant eat at a pace that is comfortable for them (could be a little or a lot, fast or slow, steady or start-and-stop) (38)
- use bottle contents within two hours from the start of a feeding and discard leftovers, (2) as bacteria can be introduced into the bottle with sucking (49)
- take steps to reduce the risk of “nursing bottle syndrome” and early childhood tooth decay; (2) see [Dental health](#) in Chapter 5: Topics of interest.
- avoid the addition of infant cereal or liquids other than human milk and formula to bottles, due to choking risk and changes in caloric density (2)

Commercial infant formula amounts to prepare

Formula requirements vary depending on the infant's size and metabolism. Formula intake is considered adequate if the infant is growing appropriately as measured by evidenced-based growth standards. (49) See [Growth](#) in Chapter 5: Topics of interest.

The following table outlines typical commercial infant formula amounts to prepare per day. The information is a guide - the actual amount consumed is determined by the infant's appetite. (49) Some infants will need more and others less, (49) and there may be variations from day to day. **Parents and guardians should be counselled to allow the infant's appetite to be the guide for the amount of formula to provide.** (See [Recommended approaches to feeding](#) in Chapter 4: Feeding by age.)

Age	Weight (kg)	Energy needs from formula (kcal)	Energy from complementary food (kcal)	Formula amount (ounces; based on 20kcal/oz.)	Formula amount (mL)	Feeds per day
2 weeks	2.7 – 4.9	315 - 511	n/a	16 - 26	473 - 769	6 – 10
1 month	3.2 – 5.8	360 – 591	n/a	18 – 30	532 - 887	6 - 8
2 months	3.9 – 7.1	422 – 707	n/a	21 – 35	621 - 1035	5 – 7
3 months	4.5 – 8.0	476 – 787	n/a	24 - 39	710 - 1153	5 – 7
4 months	5.0 – 8.7	401 – 730	n/a	20 – 37	591 - 1094	5 – 7
5 months	5.4 – 9.3	437 – 784	n/a	22 – 39	651 - 1153	5 – 7
6 months	5.7 – 9.8	333 – 698	130	17 – 35	503 - 1035	4 – 5
7 months	6.0 – 10.3	326 – 709	130	16 – 35	473 - 1035	4 – 5
8 months	6.3 – 10.7	353 – 744	130	18 – 37	532 - 1094	4 – 5

Age	Weight (kg)	Energy needs from formula (kcal)	Energy from complementary food (kcal)	Formula amount (ounces; based on 20kcal/oz.)	Formula amount (mL)	Feeds per day
9 months	6.5 – 11.0	190 – 591	310	10 - 30	296 - 887	3 – 4
10 months	6.7 – 11.4	208 – 627	310	10 – 31	296 - 917	3 – 4
11 months	6.9 – 11.7	226 – 653	310	11 – 33	325 - 976	3 – 4
12 months	7.0 – 12.0	0 - 410	580	0 - 21	0 - 621	0 - 3

Information obtained from Dietitians of Canada (49)

Duration of formula feeding

9 – 12 months

- Infants fed with Human milk substitutes can transition from commercial infant formula to whole cow milk when they are 9 to 12 months of age *and* are consuming a variety of solid foods, including iron-rich foods such as meat, fish, legumes, eggs, and iron-fortified cereal (see [Chapter 4: Feeding by age](#)). (9)
- If an older infant, who is receiving commercial infant formula, is not regularly consuming a variety of solids, especially iron-rich solids, it may be prudent to wait until closer to 12 months to switch from formula to whole cow milk.

2 years

- Infants that have been fed soy-based formula for medical, cultural, or religious reasons should continue to receive soy-based formula until two years of age. For these children, additional sources of calcium should be offered daily, as soy infant formula contains less calcium than animal milks. (6)
- This recommendation also applies to older infants who are no longer receiving human milk and who will not be introduced to cow milk (i.e., infants and toddlers in families with a vegan diet). (9)
- For more information on soy beverage and other vegetarian beverages, see [Chapter 3: Animal milks and other beverages](#).

Resources for parents and guardians

See previous chapter sections for client information specific to various infant formula topics.

The key resource to provide to families regarding infant formula is:

- [Infant formula: What you need to know](#) (PSBC, available to order from NH Document Source #21101)

This comprehensive resource:

- aligns with the Baby-Friendly Initiative (BFI)
- addresses a wide range of topics related to formula use
- should be reviewed with, and provided to, individual families that have made an informed decision to use human milk substitutes
- is intended to be used in its entirety

As with other resources relating to human milk substitutes, this resource should:

- not be put on display (e.g., in waiting rooms)
- not be used in group settings
- not be added in standard prenatal or post-partum information packages

Other resources include:

- [Nutrition in the first year](#) (NH public webpage): Find additional resources about Human milk substitutes on the “Human milk substitutes” tab.
- [HealthLink BC](#): Parents and guardians can connect with dietitians and nurses by calling 8-1-1 (or 604-215-8110 in some northern communities).

3. Animal milks and other beverages

Practice points

- Recommend waiting until about six months of age before offering water.
- Animal milk is not required while children continue to receive human milk.
- Recommend delaying the transition from formula to plain pasteurized whole cow milk until 9 to 12 months of age.
- Goat milk is not recommended in the case of cow milk protein allergy.
- Lower-fat milks and fortified soy beverages are not recommended before two years of age.
- Other plant-based beverages are not recommended as alternatives to milk.
- Fruit juice is not required and should be avoided.
- Other sugary, artificially sweetened, or caffeinated beverages should be avoided.
- Recommend that fluids introduced after six months be offered in an open cup.

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Nutrition composition of human milk, animal milks, and plant-based beverages (per 250 mL/1 cup)

	Energy (kcal)	Fat (g)	Protein (g)	Carb (g)	Iron (mg)	Calcium (mg)	Vit A (mcg RE)	Vit D (IU)	Vit B12 (mcg)
Human milk, whole, mature	182	11.4	2.7	18	0.1 [†]	83	159	10.4	0.13
Cow milk 3.25% M.F. (whole)	160	8	8	12	0	330	100	90	1
Cow milk 2% M.F.	129	5	9	12	0	330	100	90	1
Cow milk 1 % M.F.	108	2.5	9	12	0	330	100	90	1
Cow milk 0% M.F. (skim)	88	0	9	13	0	330	100	90	1
Goat milk, 3.5% M.F.	140	8	7	11	0	330	0 - 80	0 - 90	-
Soy beverages	80 - 150	3 - 6	6 - 8	4 - 22	0.8 - 3 [†]	66 - 330*	0 - 100*	0 - 90*	0 - 1*
Pea beverages	90 - 140	4.5	8	6 - 17	0	0	0	0	0
Oat beverages	50 - 110	2.5 - 3.5	1 - 4	6 - 25	0 - 0.8 [†]	0 - 330*	0 - 100*	0 - 90*	0 - 1*
Almond beverages	30 - 110	1.5 - 4	1 - 2	1 - 20	0.3 - 1.3 [†]	22 - 450*	0 - 100*	0 - 90*	0 - 1*
Cashew beverages	25 - 60	2 - 4.5	1	1 - 9	0.3 - 0.6	44 - 330*	0 - 100*	0 - 90*	0 - 1*
Rice beverages	120 - 130	2.5 - 3	0.2 - 2	25 - 26	0	0 - 330*	0 - 100*	0 - 90*	0 - 1*
Coconut beverages	45 - 180	4.5 - 5	0 - 1	1 - 32	0.1 - 0.5*	0 - 300*	0 - 100*	0 - 80*	0 - 1*

Data was obtained from the Canadian Nutrient File (74) and product labels in 2020. Some data was converted from % Daily Value format to unit measures using the existing reference values for Daily Values. (75)

* Fortified or enriched products only.

† Notes on iron content: The iron content of human milk is low, but its bioavailability is high at 50-70%. (49) For oat, almond, and soy beverages, chocolate flavoured versions have higher iron content than plain versions, but also significantly higher levels of added sugar.

Ingredients in cow milk and plant-based beverages

This table depicts ingredients of various “original” beverage varieties. Ingredients vary based on whether products are fortified, sweetened, or flavoured, and may change over time. This table reflects that plant-based beverages often have many ingredients. Key nutrients are often added via fortification, as opposed to being naturally present.

Cow milk, 3.25% M.F.	Whole milk, vitamin D3
Cow milk, 0-2% M.F.	Skim or partly skimmed milk, vitamin A palmitate, vitamin D3
Soy beverage	Soy base (filtered water, soybeans), cane sugar, vitamin and mineral blend (calcium carbonate, zinc gluconate, vitamin A palmitate, vitamin D2, riboflavin (B2), vitamin B12), gellan gum, sea salt, natural flavour, carrageenan (Silk Soy Beverage, Original)
Pea Beverage	Pea base (water, pea protein), sugar, sunflower oil, sea salt, dipotassium phosphate, sunflower lecithin, natural flavours, organic guar gum, gellan gum (Ripple Pea Beverage, Original (Unfortified))
Oat	Oat base (filtered water, oat extract), sunflower oil, vitamins and minerals (calcium carbonate, zinc gluconate, vitamin A palmitate, riboflavin (B2), vitamin D2, vitamin B12), sugars (malt extract), dipotassium phosphate, gellan gum, sea salt, sunflower lecithin, locust bean gum, ascorbic acid (Silk Oat Yeah Beverage, The Plain One)
Almond beverage	Water, cane sugar, almonds, calcium carbonate, sea salt, potassium citrate, sunflower lecithin, gellan gum, zinc gluconate, vitamin A palmitate, riboflavin (vitamin B2), vitamin D2, vitamin B1. (Almond Breeze Original)
Cashew	Cashew base (filtered water, cashews), cane sugar, vitamin and mineral blend (calcium carbonate, zinc gluconate, vitamin A palmitate, vitamin D2, riboflavin (B2), vitamin B12), sea salt almond butter, locust bean gum, sunflower lecithin, natural flavour, gellan gum, ascorbic acid (Silk Cashew Beverage, Original)
Rice beverage	Filtered water, brown rice, white rice, canola oil, tricalcium phosphate, sea salt, vitamin A acetate, vitamin B2 (riboflavin), vitamin D2, vitamin B12, zinc gluconate, amylase (enzyme) (Natur-a Rice Beverage, Original)
Coconut beverage	Coconut base (filtered water, coconut cream), cane sugar, vitamin and mineral blend (calcium carbonate, zinc gluconate, riboflavin (B2), vitamin B12, vitamin A palmitate, vitamin D2), sea salt, natural flavour, locust bean gum, sunflower lecithin, gellan gum (Silk Coconut Beverage, Original)

Data from this table was obtained from product labels in Fall 2020.

Animal milk

Cow milk

The following table outlines the recommendations for cow milk use at various ages.

Age	Cow milk choice	Comments
0 – 9 months	None	<ul style="list-style-type: none"> • Support breastfeeding and provision of human milk. • Cow milk is not an appropriate alternative to human milk for young infants. (2) • Cow milk is low in iron and has low iron availability; introduction before 9 months increases risk of iron deficiency and iron deficiency anemia. (2) (6) • Cow milk is low in essential fatty acids and other nutrients, contains proteins that are less digestible, and has a high renal solute load. (2) • Homemade formulas from canned, evaporated milk are not recommended as human milk substitutes as they are nutritionally incomplete. (2) They should only be considered for short-term, emergency use and should be prepared as per WHO directions. (2) See Homemade infant formula (e.g., evaporated milk formula), in Chapter 2: Human milk substitutes.
9 – 12 months	May introduce plain pasteurized, whole milk (3.25% milk fat (M.F.))	<ul style="list-style-type: none"> • Support continued breastfeeding and provision of human milk. Cow milk is not required while children receive human milk. • Infants who are not receiving breast milk can transition from formula to whole cow milk when they are regularly eating a variety of solid foods, with a special emphasis on iron-rich foods, such as meat, eggs, plant-based protein foods, and iron-fortified cereals. (9) (6) • If an older infant who is receiving commercial infant formula is not regularly consuming a variety of solids, especially iron-rich solids, it may be prudent to wait until closer to 12 months to switch from formula to cow milk. • If introducing cow milk, offer it in an open cup. (9) See Use of cups and bottles at the end of this chapter. • See additional recommendations as listed for 12-24 months, below.

Age	Cow milk choice	Comments
12 – 24 months	May use plain pasteurized, whole milk (3.25% M.F.)	<ul style="list-style-type: none"> • Support continued breastfeeding and provision of human milk. Cow milk is not required while children receive human milk. • For children who are no longer receiving human milk, 2 cups (500 mL) of cow milk are recommended per day. Intake should not exceed 3 cups (750 mL) per day, to avoid displacing foods high in nutrients (e.g., iron or fibre). (9) • Recommend offering milk in an open cup. (9) See Use of cups and bottles at the end of this chapter. • If evaporated or powdered milks are used, they should be properly reconstituted. Recommend full-fat products. (9) • There is no convincing evidence to support an association between whole milk intake during complementary feeding and later obesity risk. (76) • Lower fat milks (2% or 1% M.F.) are generally not recommended before two years of age. (9) If they are used, the child should be growing well, eating a wide variety and adequate quantity of nutritious foods, and have other appropriate dietary fat sources. (9) • Skim milk (0% M.F.) is not an appropriate choice for children less than two years of age. (9)
2+ years	May use plain pasteurized whole (3.25% M.F.) or lower-fat milks (2%, 1% or 0% M.F.)	<ul style="list-style-type: none"> • Support continued breastfeeding and provision of human milk. Cow milk is not required while children receive human milk. • For children who are no longer receiving human milk, 2 cups (500 mL) of cow milk are recommended per day. Intake should not exceed 3 cups (750 mL) per day, to avoid displacing foods high in nutrients (e.g., iron or fibre). (9) • At two years, children can switch to the family's choice of cow milk (i.e., whole, 2%, 1%, or skim). (9) • If evaporated or powdered milks are used, they should be properly reconstituted. • Recommend offering milk in an open cup. (9) See Use of cups and bottles at the end of this chapter.

Additional considerations regarding cow milk:

- Unpasteurized milk is not recommended due to risk of foodborne illness from various pathogenic bacteria. (9) The Government of Canada has additional information available about [raw or unpasteurized milks](#).
- The risks of unpasteurized dairy products outweigh perceived benefits. Pasteurization does not significantly affect the nutritional value of milk and only causes a slight decrease in the bactericidal enzymes present. (77)
- Cow milk obtained from non-commercial sources might not be fortified with vitamin D.
- Plain cow milk is recommended over sweetened milk (i.e., chocolate, or other flavoured milk). (9)

Goat milk

- Goat milk is not recommended before 9 – 12 months of age. (78)
- Like cow milk, goat milk is not an appropriate substitute for human milk for young infants. It is low in iron, essential fatty acids, folate, and other nutrients, contains a less-digestible form of protein, and has a high renal solute load. (2) It is also higher in electrolytes than human milk. (78)
- Older infants and young children with cow milk protein allergy are also likely to have an allergic reaction to goat milk (and sheep's milk), due to the similarity in milk proteins. (9) (78)
- In Canada, it is not mandatory to fortify goat milk with vitamin D or other nutrients, although it can be fortified voluntarily, therefore nutrient levels vary from product to product. (74) (79) (80)
- When infants are 9 to 12 months of age and are consuming a variety of iron-rich foods, pasteurized full-fat goat milk, with added folic acid and vitamin D, may be used as an alternative to cow milk. (9) Recommend 2 cups (500 mL) per day. (6)
- Goat milk poses the same risks for iron deficiency as cow milk when consumed in excessive amounts. (9) If offered to children, as with cow milk, recommend limiting intake of goat milk to less than 3 cups (750 mL) per day. (6)
- As with cow milk, if offered, recommend offering goat milk in an open cup. (9) See [Use of cups and bottles](#) at the end of this chapter.

Resource for parents and guardians

- [Should I give my child goat milk?](#) (Dietitians of Canada)

Plant-based beverages

- Plant-based beverages include those made from soy, peas, almonds, oats, rice, coconut, and cashews.
- Plant-based beverages are not recommended in the first two years of life as alternatives to human milk, infant formula, or whole animal milk. (78) (81)
- The use of plant-based beverages in infants has been linked with kwashiorkor (severe protein-energy malnutrition), rickets, and death. (78) (81)
- Canada’s food guide (which is for Canadians two years and older) includes *fortified* soy beverages as the only plant-based beverage that is a [protein food](#). (82) This is an option for a main beverage after two years of age. See “Soy beverage”, below.
- As plant-based beverages can be voluntarily fortified, nutrients in products vary significantly. Various products are unfortified, including some soy beverages and drinks that are marketed as being natural or organic, and are therefore low in many key nutrients. (83)
- Most plant-based beverages are not nutritionally comparable to animal milks (see the [Nutrition composition](#) table at the beginning of this chapter). (9) (78) (82) See [Almond, cashew, coconut, oat, rice, and other plant-based beverages](#), on the next page.
- Sweetened versions are considered to be sugar-sweetened beverages or “sugary drinks”. (84) (85)
- Other concerns include higher than recommended manganese levels in plant-based beverages, and potentially high levels of arsenic in rice beverages. (78)
- A scan of plant-based beverages in northern BC revealed that these beverages often cost twice as much, per cup, as cow milk. (83)
- For more information on key nutrients in vegetarian diets, see [Vegetarian diets](#) in Chapter 5: Topics of interest.

Resource for parents and guardians

- [Dietitians, paediatricians advise parents to exercise caution with plant-based beverages](#) (Canadian Pediatric Society and Dietitians of Canada, news release)

Soy beverage

Recommendations - under two years of age

- Advise that soy beverage (i.e., soy “milk”) is not suitable as a main beverage for children under two years of age. (9)

- If an older infant or toddler is no longer receiving human milk and will not be introduced to animal milk (e.g., for cultural or religious reasons such as a vegan lifestyle), recommend a soy-based commercial formula until two years of age. (9) (54)
- Advise that as an *occasional* complementary food (i.e., in addition to an older infant or toddler’s usual milk source), a full fat, fortified, plain soy beverage may be offered. (9) (78)
- If a family is choosing to provide a soy beverage as a main beverage to their 12–24-month-old child (despite these recommendations), support them to:
 - Choose a full fat (i.e., 4 to 5 g fat per 1 cup), plain, fortified option (9)
 - Offer 2 - 3 cups (500 – 750 mL) per day, in an open cup (see [Use of cups and bottles](#) at the end of this chapter)
 - Offer extra fat sources. See [Dietary fats](#) in Chapter 6: Key nutrients.
 - Seek support from a registered dietitian (See [Nutrition and dietitian services](#) (NH public webpage) or [Dietitian Services at HealthLink BC](#))

Recommendations - over two years of age

- If soy beverage is offered as a main beverage, recommend they:
 - Choose a plain, fortified option
 - Offer 2 - 3 cups (500 - 750 mL) per day of in an open cup

Almond, cashew, coconut, oat, rice, and other plant-based beverages

- The nutrient composition of beverages made from almond, cashew, coconut, oat, and rice are very different from animal milks. (9) See [Nutrition composition](#) table at the beginning of this chapter.
 - While they may be hydrating, they are often low in protein, fat, and energy. (81)
 - Fortified versions may have vitamin D and calcium levels comparable to cow milk, but they are lacking in many other vitamins and minerals. Unfortified versions are also being sold. (84)

Recommendation – over two years of age

- If plant-based beverages other than soy are offered to a young child over two years of age, advise parents and guardians to: (6) (81)
 - Choose a plain, fortified product
 - Support intake of energy and protein from other dietary sources
 - Consider assessment and support from a registered dietitian

Other beverages

Water

- Exclusively breastfed infants do not require additional water, even in hot or dry climates or conditions. (78) (86)
- Infants should not be given water before six months of age, unless medically indicated. (6)
- Sips of plain water may be introduced at about six months of age. It is recommended that this be offered in an open cup between feedings. (9)
- Water should not interfere with the intake of human milk and commercial infant formula in the first year of life. (6)
- After 12 months, to quench thirst, recommend offering plain water frequently (with and between meal and snack times). (9) (6)
- Water should come from a potable water supply that is not on any kind of water quality advisory, such as safe cold tap water and safe well water. Cold tap water is recommended because hot water from the tap can contain higher levels of lead or contaminants. Commercial bottled water (unflavoured and not carbonated) is also likely suitable. (78) (86)
- Mineral water, carbonated water, and flavoured water are not suitable for infants. No clear indications exist for the use of distilled water. (78)
- For information on choosing and disinfecting water for the preparation of infant formula, see [Safely preparing, storing, and transporting commercial infant formula](#) in Chapter 2: Human milk substitutes.

Fruit juice

- Fruit juice is considered to be a [sugary drink](#) as per Canada's food guide. (87)
- Fruit juice is generally not nutritionally necessary for infants and children. There are various concerns related to the excessive intake of fruit juice, including:
 - displacement of human milk intake (9)
 - displacement of nutrient intake from solid food and whole milk (9)
 - dental decay (9)
 - gastrointestinal symptoms (e.g., diarrhea, flatulence) (9) (78)
- There are also concerns around the possibility that infants and toddlers may develop a preference for sweet drinks. (38)
- 100% fruit juices contain 116 to 160 calories and 22 to 38 g (~5.5 to 9.5 tsp) of sugar per 1 cup (250 mL). (74)

- “Baby juices” or “toddler juices” are marketed for use with infants and toddlers. They have a similar nutrient profile as other juice but may be more expensive. As with other juice, they are not required and should be avoided. (38) (88)
- Although the dilution of juice is a common practice, there is no clear evidence to support this practice. (76)

Recommendations (for children six months and older):

- Offer water frequently (after 12 months of age). (9)
- Emphasize fruits and vegetables. (78)
- Avoid fruit juice. (6)
- If offering fruit juice, recommend to: (9)
 - choose 100% pure fruit or vegetable juice (check the ingredient list) (9) (6)
 - choose pasteurized juice, as unpasteurized juice may be contaminated with pathogenic microbes which could lead to serious illness in vulnerable individuals. (78) The Government of Canada has additional information about [unpasteurized juices and cider](#)
 - limit intake to ½ cup (125 mL) per day (6)
 - offer it as part of a meal or snack (6) (78)
 - serve it in an open cup (i.e., as opposed to in a bottle or sippy cup) (6) (78)
 - avoid putting a child to bed with a bottle or sippy cup of juice (78)

Resources for parents and guardians:

- [Refresh your drink: Help kids to choose water](#) (Document Source #10-421-6047)

Other sugary drinks

- Sugary drinks can include iced tea, fruit juice, soft drinks, sports drinks, energy drinks, fruit-flavoured drinks, sweetened plant-based beverages, flavoured waters, sweetened milk (e.g., chocolate milk), and others. (87)
- Not all “juices” are 100% juice. There are various fruit beverages that contain juice in small amounts. These have added sugar. (38)
- Sugary drinks can contain 23-42 g (6-10.5 tsp) of sugar per 1 cup (250 mL). (74)
- As with fruit juice, the intake of these beverages may increase the risk of early childhood caries. (9)
- Sugary drinks are not recommended for young children because of their high sugar content and potential lack of other nutrients. (9)

Artificially sweetened beverages

- Artificially sweetened beverages may include diet drinks, fruit flavoured drinks, and energy drinks.
- These products may interfere with a young child's intake of nutritious foods needed to support their growth and development. (9)
- Beverages sweetened with artificial sweeteners are not recommended for young children. (9)

Caffeinated beverages

- Caffeinated beverages include coffee, tea, iced coffee, iced tea, hot chocolate, energy drinks, and some pops and sports drinks. (9) (89)
- Caffeine is a stimulant drug, (9) associated with nervousness, irritability, headaches, and insomnia. (90)
- Beverages containing caffeine are not recommended for young children. (9)

Herbal teas

- Due to their small size and rapid growth, infants are more vulnerable to the pharmacological effects of some of the flavouring and chemical substances in herbal teas. (38)
- Teas may also contain sugar and alcohol. (2)
- Herbals teas are not recommended for infants, as there is currently insufficient evidence of the safety of herbal teas in infancy. (2)

Follow-up or second step formula

- For children who do not receive human milk, follow-up or second-step formula are acceptable choices for children over six months of age but may not be superior to regular infant formula for infants six to 12 months of age. (9) (54)
- Healthy children do not usually need formula after 12 months. (49)
- Soy-based formula is recommended for children up to 24 months of age, who are not receiving human milk and who will not be consuming animal milk, such children in families who follow a vegan diet. (6) (54) See [Duration of formula feeding](#) in Chapter 2: Human milk substitutes.

Toddler drinks and toddler milks

- After 9 to 12 months, most infants that have been receiving commercial infant formula and who are regularly consuming a variety of iron-rich foods can transition directly to whole (3.25% M.F) cow milk. (9)

- Toddler drinks, toddler milks, toddler formula, and growing-up milks are nutritional supplement drinks marketed as alternatives or complements to cow milk for children 12 months of age and older (e.g., 12 to 36 months). (9)
- These beverages are generally not required for young children, (91) and are more costly than cow milk.
- There are concerns that the marketing of such commercial foods for young children may undermine progress in optimal feeding. (91) For example, providing such beverages to “picky eaters” may interfere with family meals, the division of responsibility in feeding, and a young child’s learning to (eventually) enjoy a range of family foods. (92)
- There are also concerns about the marketing practices of these products. Although they may not be explicitly promoted as human milk substitutes, they may resemble the packaging, branding, and labelling of commercial infant formula, which may result in confusion as to the purpose of the products. (91) (93) These products are not appropriate for infants. (93)
- If parents and guardians are using or are inquiring about these products, it may warrant an exploration of any concerns they might have regarding feeding or their child’s growth. For example, see Common concern from parents and guardians #6, [“My 12-month-old doesn’t eat anything unless I force-feed him. How much should he be eating?”](#) in Chapter 4: Feeding by age.

Use of cups and bottles

Bottles

- For infants who have been fed by bottle, encourage families to begin the transition from bottles to open cups by about 12 months, and to complete this by 18 months. (9) (6)

Open cups

- As fluids are introduced after six months (i.e., other than human milk and commercial infant formula), they can be offered in an open cup. (9)
- Cup drinking has been shown to be a safe and easily learned skill in infancy. (9) Initially, infants will need an adult to help by holding the cup, and infants will use a sucking action to drink. (9)
- The use of open cups can help to: (9)
 - develop mature drinking skills
 - prevent prolonged bottle feeding
 - reduce risks associated with long term bottle feeding, including displacement of nutrient rich solid foods and risk of dental decay

Sippy cups

- Sippy cups with no-spill valves are not necessary, nor are they recommended.
- Infants need to suck to get liquids out of these cups and therefore these cups do not support the development of mature drinking skills. (9)

Resource for parents and guardians

- [Hello cup...Bye-bye bottle](#) (NH Document Source #10-402-6027)

4. Feeding by age

Practice points

- Recommend offering solid foods starting at about six months of age.
- For first foods, recommend iron-rich foods such as well-cooked meat, poultry, fish, eggs, tofu, legumes, and iron-fortified cereals.
- Recommend that parents and guardians provide a variety of soft textures and finger foods starting at about six months of age.
- Recommend eating together as a family when possible.
- At every age, the child is responsible for deciding how much they want to eat or whether they want to eat at all.
- Breastfeeding and human milk continue to be important and are recommended to two years and beyond, for as long as parent and child wish to continue.

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Introduce solid foods at about six months

Exclusive breastfeeding and the provision of human milk are recommended to about six months of age. (9) Most infants are physiologically and developmentally ready for solid foods at this time, and will show signs of readiness through the ability to: (6)

- maintain better head control
- sit up and lean forward
- demonstrate that they are full (e.g., turning head away)
- pick up food and try to put it in their mouth

At about six months, it is also normal for infants to: (6)

- have some tongue protrusion and/or early gag reflex when beginning to eat solid foods – this will decrease with experience
- require several exposures to new foods before accepting them

Recommend the introduction of solids foods at about six months, when the child is developmentally ready.

- From about six months, human milk alone can no longer meet all of an infant's nutritional requirements. Complementary foods that are energy dense and nutrient-rich help meet changing nutrition requirements. (9)
- Initially, infants may not consume a significant amount of solid food. (9) Human milk continues to be the main source of nutrition as complementary foods are introduced. (9)
- Breastfeeding and human milk continue to be important and are recommended to two years and beyond, alongside nutrient-rich solid foods; (9) “the start of solids is not the end of breastfeeding”.
- Solid foods can be offered before or after breastfeeding or bottle feeding, depending on what works best for the family. (6)
- Delaying the introduction of solid foods beyond six months increases the risk of iron deficiency (9) and food allergy (see [Allergy prevention](#) in Chapter 5: Topics of interest).

Resource for parents and guardians

- [Before you feed your baby solid foods](#) (NH Document Source #10-421-6060)

Food choices

	6 to 12 Months	12 Months +
Breastfeeding, human milk, and human milk substitutes	<p>Recommend and normalize continued breastfeeding and provision of human milk, with vitamin D supplementation. (9) At any given feeding, it does not matter whether complementary foods are offered before or after human milk. (9) Parents and guardians can decide what works best for their situation.</p> <p>For infants who do not receive human milk, recommend continued use of a commercial infant formula until they are 9 to 12 months old <i>and</i> are consuming iron-rich foods daily. (9)</p>	
Solid foods	<p>Recommend first foods that are iron-rich, (2) such as:</p> <ul style="list-style-type: none"> • well-cooked meat, poultry, fish, and shellfish (heme-iron sources*) (9) • eggs, tofu, beans, lentils, nut butters, seeds (9) • iron-fortified cereals (9) <p>*Heme-iron is better absorbed than non-heme iron. (9)</p> <p>When iron-rich foods are regularly offered two or more times per day, other foods can be added to the diet, in no particular order: (9)</p> <ul style="list-style-type: none"> • vegetables and fruit • full-fat cheese and yogurt • other grain products 	<p>By 12 months, young children can be offered a wide variety of family foods. (78)</p> <p>Recommend offering iron-rich foods at each meal and offering a variety of foods from Canada’s food guide, including protein foods, grains, vegetables, and fruit. (9)</p> <p>Nutritious, higher-fat foods are an important source of energy for young children. Dietary fat restriction is not recommended for children less than two years. (9) See Dietary fats in Chapter 6: Key nutrients.</p> <p>Recommend offering fish but limiting fish that is higher in mercury. (6)</p>
	<p>Recommend offering small amounts of nutritious foods from family meals, modified to a texture and size appropriate for the child’s abilities. (9)</p> <p>Foods should be energy and nutrient dense, with little or no added sugar or salt - this allows children to experience the natural flavours of foods. (9)</p> <p>Commercial infant foods are not required. (9) If offered, consider that a child may be able to manage a more advanced texture than what is implied on a product label.</p> <p>Common food allergens can be offered amongst the first foods. For infants at increased risk of food allergy, see Allergy prevention in Chapter 5: Topics of interest.</p>	

Beverages	See Chapter 3: Animal milks and other beverages .	
Delay these items	<p>Animal milks – delay to 9 – 12 months to help prevent iron deficiency. (9)</p> <p>Honey (all forms and products containing) – delay to 12 months to help prevent infant botulism. (9) See infant botulism (Government of Canada).</p> <p>Sugar substitutes – not recommended for children under two years</p> <p>Foods with higher risk for choking – delay until four years. (9) See Food textures later in this chapter</p>	
Food safety	<p>Food safety principles should be applied to the preparation and storage of foods for infants and young children. (9) See Food safety information for children ages 5 and under (Government of Canada)</p> <p>Recommend avoiding the following foods for young children due to a higher risk of foodborne illness: (6) (78)</p> <ul style="list-style-type: none"> • raw/unpasteurized animal milks and milk products • raw/undercooked cooked eggs and products containing them • raw/undercooked meat, poultry, fish, and seafood • raw/lightly cooked sprouts (e.g., alfalfa sprouts, bean sprouts) • unpasteurized fruit juice and cider <p>Exceptions to the above recommendation may include raw and/or frozen cultural foods prepared safely according to traditional practices. (9)</p> <p>Homemade “baby food” can be safely stored in the fridge for one to two days, or in a freezer for use within three months. (94) Advise to avoid preparing large amounts of texturally modified foods, as infants can quickly advance to more challenging textures and should be included family meals.</p>	
High mercury fish	<p>Higher mercury fish include fresh or frozen tuna* (from countries other than Canada), shark, marlin, swordfish, escolar, and orange roughy. (95)</p> <p>*Fresh, frozen, or canned albacore tuna from BC or Canada has no serving limits. On commercial product labels, look for “Product of Canada”. (95)</p> <p>See Mercury in fish (HealthLink BC)</p>	
	<p>For 6 to 12 months, limit: (95)</p> <ul style="list-style-type: none"> • higher mercury fish to 40 g (~¼ cup) per month • canned albacore (white) tuna* to 40 g (~¼ cup) per week 	<p>For 12 months and older, limit: (95)</p> <ul style="list-style-type: none"> • higher mercury fish to 75 grams (~½ cup) per month • canned albacore (white) tuna* to 75 g (~½ cup) per week

Resources for parents and guardians

- [Feeding babies age 6 – 12 months](#) (NH Document Source #10-421-6061)
- [Iron-rich foods for baby](#) (includes sample meal plans) (NH Document Source #10-421-6023)
- [Baby's first foods](#) (HealthLink BC)
- [Recipes for your baby: 6 - 9 months old](#) (HealthLink BC)
- [Recipes for your baby: 9 – 12 months old](#) (HealthLink BC)
- [Meal and snack ideas for your 1- to 3-year-old child](#) (HealthLink BC)
- “Introducing Solid Foods” in [Toddler's first steps](#) (Province of BC)

Food textures

Advise parents and guardians that soft foods and finger foods can be offered whether or not teeth have appeared. (9)

Recommend advancing the textures of foods. This supports feeding skills, acceptance of a variety of textures and family foods. (6) Avoid foods that present increased risk for choking (see next page). (6)

While convenient, commercial infant foods offer limited food textures. Pureed food in squeezable pouches, and “mesh feeders”, may not support the progression of eating skills or the inclusion of the child in family meals, and may present microbial food safety concerns. (92) (96)

6 to 9 Months	9 to 12 Months	12 Months +
<p>Recommend providing a variety of soft textures and finger foods starting at about six months. (9)</p> <p>Textures for a six-month old can be lumpy, tender-cooked, and minced, pureed, mashed, or ground. (9)</p> <p>Foods can be cooked until tender and/or mashed with a fork or minced with a knife. (2) No special equipment is required.</p> <p>Finger foods can include: (9)</p> <ul style="list-style-type: none"> • minced, ground, or mashed cooked meat, deboned fish, and poultry • grated cheese • pieces of soft or cooked vegetables and fruit • bread crusts or toasts 	<p>Delaying the introduction of lumpy textures beyond nine months is associated with feeding difficulties in older children and a lower intake of nutritious foods such as vegetables and fruit. (9)</p> <p>Between eight and 12 months, older infants can move foods to the teeth with lateral movements of the tongue, enabling biting and chewing of chopped foods and a greater variety of finger foods. (9)</p>	<p>By 12 months, recommend a variety of finger foods, and modified textures such a ground, mashed, or chopped foods, with a tender consistency. (9) (6)</p> <p>By 12 to 18 months, young children will acquire full chewing movements. (9)</p> <p>Continue to avoid or modify foods that present a higher risk for choking until 4 years of age. (6)</p>

Choking risk

Gagging is a reflex that helps prevent choking. (9) Anticipatory guidance distinguishing gagging from choking may help to decrease anxiety around feeding and can support parents and guardians to offer their infant progressively more challenging textures.

Recommend avoiding foods that are choking hazards for children under four years of age. (9) The table below lists foods that present a choking risk, as well as steps that can be taken to reduce risk.

Foods at risk of causing choking include:	The risk of choking can be reduced by:
<ul style="list-style-type: none"> • hard, small, and round solids (9) • smooth and sticky solids (9) • meat and other protein foods: <ul style="list-style-type: none"> ○ hot dogs/wieners and sausages ○ fish with bones (9) ○ sunflower/pumpkin seeds (9) ○ peanuts or nuts (9) ○ nut or seed butter spread thickly or served on a spoon (9) (97) • vegetables and fruit: <ul style="list-style-type: none"> ○ raw vegetables ○ raisins and other dried fruit (6) (97) ○ grapes (6) ○ olives with pits (6) ○ whole small tomatoes (6) • other: (6) <ul style="list-style-type: none"> ○ hard candy or cough drops ○ gum ○ popcorn ○ marshmallows 	<ul style="list-style-type: none"> • supervising children while they are eating (6) • being aware of their chewing and swallowing abilities (6) • avoiding foods with the potential to cause choking (9) • obtaining training in first aid to effectively respond to a choking incident (9) <p>Foods can be modified to reduce risk: (6) (97)</p> <ul style="list-style-type: none"> • grate or finely chop raw vegetables and hard fruits, such as carrots and apples • remove pits and skins from fruits • slice grapes, small tomatoes, and larger berries lengthwise into quarters • finely chop fibrous or stringy foods such as oranges, celery, and pineapple • spread nut or seed butters thinly on crackers or toast • finely chop nuts and seeds • cut meat into small cubes • remove bones from chicken and fish • slice hot dogs/wieners and sausages lengthwise into quarters

Resources for parents and guardians

- [Prevent choking in babies and young children: For child care providers](#) (HealthLink BC)
- “Reduce choking hazards” in [Toddler’s first steps](#) (Province of BC)

Amounts and frequency

Support parents and guardians to decide what foods to *offer* and to work towards a regular meal and snack schedule. (9)

At every age, the child is responsible for deciding how much to eat or whether to eat. (9)
Intake will vary, day-to-day; children compensate for eating less at some times by eating more at other times. (6)

Encourage parents and guardians to be responsive to their child's hunger and satiety cues, and to avoid coercive or restrictive feeding practices. (9) (6)

6 to 9 Months	9 to 12 Months	12 Months +
From six to eight months, complementary foods typically contribute about one fifth of infants' calories. (9)	From nine to 11 months, complementary foods typically contribute just under half of older infant's calories. (9)	From 12 to 24 months, two thirds of young children's calories typically come from complementary foods. (9)
Recommend <i>offering</i> iron-rich foods at least twice per day. (9)	Recommend <i>offering</i> iron-rich foods at least twice per day. (9)	Recommend <i>offering</i> iron-rich foods with each meal. (9)
Recommend working towards <i>offering</i> complementary foods three to five times per day. (9)	Recommend <i>offering</i> complementary foods four to five times per day, (9) such as three meals and one to two sit down snacks. (6)	Recommend working towards a regular routine of three meals and two or three snacks per day, offered every two and half to three hours. (9)
Recommend starting by <i>offering</i> small amounts of solids foods (could be just a teaspoon to start) and slowly increasing based on infants' interest. (6) At first infants may only eat a few spoonfuls per day. (9)	Recommend continuing to <i>offer</i> small amounts of food to start and offering more based on child's interest. (9) (6)	Amounts to <i>offer</i> could be about $\frac{1}{4}$ to $\frac{1}{2}$ of the size of adult portions. Examples include: <ul style="list-style-type: none"> • 2 to 3 Tbsp meat or mashed beans, $\frac{1}{2}$ egg • $\frac{1}{2}$ cup milk, 2 Tbsp shredded cheese • 2 to 3 Tbsp cooked vegetables or soft fruit • 2 to 3 Tbsp cooked grains, $\frac{1}{2}$ piece of toast or muffin, $\frac{1}{4}$ pita A child may eat less or more, depending on their appetite.

Recommended approaches to feeding

Recommend a division of responsibility in feeding

NH's [Position on healthy eating](#) supports responsive feeding and the promotion of a division of responsibility in feeding (i.e., [Ellyn Satter's division of responsibility in feeding](#)). (98) This approach helps to prevent and address many common feeding challenges. (73) Adults support children to learn and grow with eating when they apply this approach, (99) described below.

Age of child	Adults' roles with feeding	Children's role with eating
0 to 6 months	Adults decide whether to breastfeed and/or offer human milk and/or an appropriate human milk substitute. (9)	Infants demonstrate through hunger and satiety cues <i>when, where, how much, and whether</i> they will feed. (9) Suggestions for frequency of feedings and amounts to provide are <i>guides</i> only; support parents and guardians to respond to their infant's feeding cues.
6 to 12 months	In addition to feeding at the breast, human milk, and/or commercial infant formula (or, after 9-12 months, whole cow milk), adults offer developmentally appropriate solid foods. (9) Adults work towards deciding <i>when</i> and <i>where</i> infants are fed, (99) by starting to establish a meal and snack pattern. (100)	Older infants continue to breastfeed on cue. (9) Children are always responsible for <i>how much</i> they will eat, and <i>whether</i> they will eat at a particular meal or snack. (9)
12 months+	Adults maintain a regular meal and snack pattern, choose food and beverages, and manage the mealtime environment. (9)	Children are always responsible for <i>how much</i> they will eat, and <i>whether</i> they will eat at a particular meal or snack. (9)

Resources for parents and guardians

- [Helping your 1- to 3-year-old child eat well](#) (HealthLink BC)
- [Raise a healthy child who is a joy to feed](#) (Ellyn Satter Institute)

Recommend family meals and sit-down snacks

Eating together with children is important for a variety of reasons:

- Supports learning about family and cultural food traditions (101)
- Role models eating skills and habits; children learn through imitation (9)
- Exposes children to the tastes, colours, and textures of family foods
- Supports food acceptance; young children are more likely to enjoy a variety of foods when they are offered the same foods as the rest of the family (9)
- Ensures that infants and young children are safe and supervised (9)

Tips for family meals

Eating together may be a new practice for some families. Helpful tips include:

- Aim for regular meal and snack times. Start with foods you already eat. (102)
- Gather the family (whoever is available at those times, even if it is just one adult and one child) to eat together. (102)
- Establish an eating environment that is safe and comfortable (e.g., eating in a moving vehicle may be hazardous). (9)
- Ensure children are sitting up (i.e., not lying down, walking, or distracted). (9)
- Minimize distractions (e.g., toys, books, screens). (6)
- Eat with children as often as possible (i.e., don't just feed them). (6)
- Follow a division of responsibility in feeding appropriate for the child's age (see [Recommend a division of responsibility in feeding](#), on the previous page). (6)
- Supervise children while they are eating. (9)
- Keep meal and snack times pleasant. Avoid criticizing or arguing. (102) Limit comments about what or how much children are eating. Avoid pressure. (6)
- Once in the habit of eating together at regular meal and snack times, work towards offering the same foods to the whole family. (102) Modify child's food textures as needed. (6)
- Breastfeeding can continue as determined by the parent and child. Otherwise, for children over 1 year of age, when the meal or snack is over, offer only water until the next planned meal or snack. This allows children to have an appetite for the next meal or snack. (100)

Resources for parents and guardians

- [The benefits of eating together for children and families](#) (HealthLink BC)
- [Family meals and snacks](#) (Ellyn Satter Institute)

Honour hunger and satiety cues

To support self-regulation of energy intake, encourage parents and guardians to trust children's ability to eat as much as they need at each feeding, meal, or snack. (9)

Advise that:

- Waking to feed at night is normal during the first year of life or longer. (6)
- Intake will vary. Children will eat less on some days and more on other days. (9)

Encourage parents and guardians to:

- Identify and respond to early cues of hunger and satiety, such as: (6)
 - Hunger cues: rooting, opening mouth, licking lips, sucking, acting fussy, crying (note: crying is a late hunger sign, but not all crying means hunger)
 - Satiety cues: turning away, closing mouth, pushing away breast or food.
- Offer small portions initially and offer more based on the child's cues (9)
- Avoid coercive or restrictive feeding practices (6)
 - Pressuring children to eat, such as with excessive encouragement, praise, or rewards, may lead to negative eating attitudes and habits. (9)
 - Withholding food, restricting portions, or limiting energy-dense foods due to concerns about intake or growth may adversely affect the child's self-regulation and increase their intake of foods when they are available. (9)
- Use neutral language when speaking about food (i.e., avoid terms like "healthy" or "unhealthy"; "good" or "bad"; "growing foods" or "treats") (6)

Promote self-feeding

Self-feeding is an important developmental and experimental process. (9) Advise parents and guardians that:

- They can support self-feeding by offering finger foods amongst the first complementary foods at about six months. (9) This is a critical period for oral and motor development, when older infants are ready to reach out for and "munch" on food. (9)
- This approach may not result in much food intake at first and will be messy. (9)
- If parents and guardians express interest in a [Baby-led weaning](#) approach (which emphasizes self-feeding), they should prioritize [iron-rich foods](#) and energy-dense foods, and take steps to reduce [choking risk](#). (78)
- In addition to supporting infants to feed themselves with finger foods, they can also offer foods via spoon. (103)

Common concerns from parents and guardians

The following scenarios provide guidance to help support parents and guardians with common feeding concerns. Should a health professional have concerns that feeding practices that are coercive, restrictive, or nutritionally inadequate, a more thorough assessment is warranted. In these situations, consider a connection with a local [NH dietitian](#) or with [Dietitian Services](#) at HealthLinkBC (dial 811, or 604-215-8110 in some northern communities).

1) “Formula no longer seems to satisfy my four-month-old baby for very long. Will my baby sleep longer if I add infant cereal to their bottle?”

Waking to feed at night is normal during the first year of life or longer. (6)

Adding infant cereal to commercial infant formula has not been shown to influence sleep duration and is not recommended. (104) (105)

Infants’ eating patterns will change over time. Support parents and guardians to follow infants’ feeding cues to determine how often and how much to feed their infant, which may involve feeding more often, or with a greater volume, than usual.

2) “I am allergic to eggs. My baby is six months old and I am concerned about him developing food allergy. Should I wait until a year or two to offer eggs?”

Infants with a first-degree relative with a history of food allergy are at increased risk of developing food allergy. (52) However, the introduction of common food allergens should not be delayed, as this can *increase* the risk of food allergy developing. (6) (52)

Current guidelines recommend that common food allergens should be offered at about six months, when infants show [signs of readiness](#) for solid foods. (9) (6) (52) These foods should be offered one-at-a-time to help clarify tolerance to individual foods. (9) (52) Other foods do not need to be introduced one-at-a-time. Once a common food allergen has been introduced and is tolerated, it is beneficial to offer the food two or three times per week, to help maintain tolerance. (6) See [Allergy prevention](#) in Chapter 5: Topics of interest.

3) “My eight-month-old baby refuses to eat anything. She only wants the breast.”

At this age, human milk will still be the main source of energy and nutrients for infants, but nutritional requirements also begin to change. (9)

Infants develop interest in eating solid foods at different times. Parents and guardians can offer solid foods but should not pressure their children to eat. (6)

Exposure to solid foods can be supported through the following approaches:

- Include her in family meal and snack times at the table. Eat with her. (6) See [Tips for family meals](#), earlier in this chapter.

- Offer her the same foods the family is eating, modified to an appropriate size and texture. She is more likely to try food that she sees her adults enjoying. (97)
- Offer iron-rich foods at least twice daily (e.g., meat, poultry, fish, shellfish, eggs, beans, lentils, chickpeas, nut butters, seeds, iron-fortified cereal). The iron from meat, fish, and poultry (i.e., heme-iron) is better absorbed than iron from other sources. (9)
- Some infants prefer to feed themselves. It's low and messy, but valuable. Let her try to feed herself, as well as offering her foods by spoon. (9) (103)
- Give her lots of opportunity to get familiar with foods by letting her see, smell, touch, and taste them many times. It can take many exposures before a child accepts a new food. (6)
- Avoid pressure. Offer, but don't force. (6) See the [Recommend a division of responsibility in feeding](#), earlier in this chapter.

If there is a concern about iron-deficiency, refer the family to their primary care provider to explore the possibility of an iron supplement. Iron supplements should be used under the direction of a physician or other primary care provider. (106)

4) “I am hesitant to feed many foods to my older baby because I am afraid he will choke.”

Concerns about gagging or choking may cause parents and guardians to delay offering their child a variety of foods and textures, which is associated with feeding challenges in young children and decreased intakes of certain nutritious foods. (9)

Caregivers may need reassurance that gagging is a normal and healthy part of the process of learning to eat solid foods and more advanced textures. (97) Infants and toddlers have a sensitive gag reflex, which helps to prevent choking. (9) (97)

Encourage parents to stay calm and reassuring when gagging occurs, as to not startle their child or make them afraid of trying new foods. (97)

Gagging must be distinguished from choking, where a food or an object blocks the child's airway and prevents them from breathing. (107) Children should be supervised during meals and snacks, and certain food shapes and textures should be avoided before four years of age. (9)

See [Food textures](#) earlier in this chapter.

5) “We all follow a low-fat diet in my family. Shouldn't I give my baby a head start with some skim milk at 12 months?”

Dietary fat restrictions are not recommended for children younger than two years, as this may compromise their intake of energy and essential fatty acids. (9) Adequate

intake of dietary fat is required for proper growth and development, (9) including brain development. See [Dietary fats](#) in Chapter 6: Key nutrients.

Skim milk is not recommended for children younger than two years. Skim milk is low in calories and provides no essential fatty acids. For children that are no longer receiving human milk, whole (3.25% M.F.) milk is recommended from 9 to 12 months until at least two years of age, at which time they can be offered the family's preferred choice of milk. (9) See [Cow milk](#) in Chapter 3: Animal milks and other beverages.

6) “My 12-month-old doesn’t eat anything unless I force-feed him. How much should he be eating?”

Current guidelines for feeding young children do not prescribe specific quantities of food that should be consumed during a meal or day, reflecting that the amount that an individual child eats varies based on many factors. (9) Parents and guardians may need reassurance that children will eat less on some days and will compensate by eating more on other days. (9) Growth monitoring can help to determine if the child is growing at an appropriate rate (see [Growth](#) in Chapter 5: Topics of interest).

Tips for parents and guardians:

- Maintain a division of responsibility in feeding. See [Recommend a division of responsibility in feeding](#) earlier in this chapter. Pressure or restrictive feeding practices can interfere with his ability to respond to his hunger and fullness cues and can affect his relationship with food. (6)
- At every age, he can determine how much to eat or whether he wants to eat at a particular meal or snack time. (9)
- Adults can take responsibility for deciding what foods to *offer* and can work towards a regular and age-appropriate meal and snack routine. (9)
- Aim for a regular routine of three meals and two or three planned, sit-down snacks per day. (9) Food “handouts” or beverages (other than water) between times can make it harder for him to eat well at meals and snacks and slow his progress in learning to enjoy a variety of family foods. (6)
- Work towards serving the same foods to the whole family, modifying his food textures if needed. Eat together. (9)
- Serve small portions to start and provide more if he shows interest. (9)

Resource for parents and guardians:

- [The child who eats “too little”](#) (Ellyn Satter Institute)

7) “My nine-month-old is very fat. I am concerned that she eats everything in sight. If I didn’t stop her, she would eat everything. How can I control her?”

Restrained feeding does not reassure a child that they will get enough to eat, can increase their preoccupation with food, and can interfere with their ability to respond to their body’s hunger and fullness cues. It can also lead to feeding struggles. (108)

As per the [Division of responsibility in feeding](#), at every age, the child is responsible for deciding how much they want to eat, or whether they want to eat at all at a particular meal or snack time. (9) Encourage parents and guardians to apply the same feeding approaches as described in the scenario above (#6).

Resources for parents and guardians:

- [The child who eats “too much”](#) (Ellyn Satter Institute)
- Satter, Ellyn. *Your Child's Weight: Helping Without Harming*. Madison, WI: Kelcy Press, 2005. ISBN 0-9671189-1-3.

8) “My child doesn’t like vegetables.”

Children often need repeated neutral exposures to a food before they will accept it – this is normal. Some sources suggest it may take 10, 15, or 20 (or more) exposures before they learn to like a new food, but most parents and guardians “give up” after only offering it three times. (9) (109) With plenty of opportunities to learn, children will eventually learn to like a variety of family foods. Children will learn at their own pace. (110)

Tips for parents and guardians in helping their child to get comfortable with vegetables:

- Follow a division of responsibility in feeding. (9) See [Recommend a division of responsibility in feeding](#) earlier in this chapter.
- Continue offering vegetables, in different forms, as part of meals and snacks. (9) Do not limit the menu to foods kids will readily accept, as this will not help them learn to like new foods. (101)
- Adults are role models. Eat together and enjoy vegetables yourself. Kids are more likely to try food that they see you enjoying. (97)
- Remove all forms of pressure. Pressure includes forcing, bribing, rewarding, or praising. Pressure can cause kids to eat less. (101)
- “Hiding” vegetables in foods (i.e., in sauces, purees, or juice) does not help kids learn to like those foods and may affect their trust. (111)
- Give kids lots of chances to learn - they need to see, smell, touch, taste, and experiment with food, at their own pace. Try growing vegetables, pointing them out in the store or market, or having kids “help” to prepare them. (97)

Resources for parents and guardians

- [Vegetables: A kid-friendly approach](#) (NH Document Source #10-421-6072)
- [Picky eater? Kids are “eaters in training”](#) (NH Document Source #10-421-6038)
- [Talking to kids about food](#) (NH Document Source #10-421-6053)
- [Coaching kids to become good eaters](#) (NH Document Source #10-421-6048)
- [The child who doesn’t eat fruits and vegetables](#) (Ellyn Satter Institute)

9) “My toddler won’t drink milk.”

Children need time to learn to accept new foods. Strategies for helping a child learn to like milk are like those described above in the scenario about vegetables (#8).

In the interim, for the toddler who no longer receives human milk, it is important to consider sources of vitamin D, calcium, protein, and fat in the child’s diet:

- Plant-based beverages, such as soy, almond, or coconut “milks”, are not recommended before two years of age (see [Chapter 3: Animal milks and other beverages](#)). (6)
- For children (over 9-12 months of age) who do not drink 2 cups of cow milk daily, a 400 IU vitamin D supplement is recommended. (9)
- Fat can be obtained from a variety of foods (e.g., avocado, nut butters, fatty fish, cheese, fats, and oils), as can calcium (e.g., cheese, yogurt) and protein.
- An assessment with a registered dietitian can help to ensure that the child’s diet contains an adequate amount of these key nutrients. See [Nutrition and dietitian services](#) (NH public webpage) or [Dietitian Services at HealthLink BC](#)

10) “My toddler doesn’t eat much food, so I give her a toddler supplement drink to make sure that she is getting her nutritional needs met.”

Toddler formula, toddler milks, growing up milks, and toddler supplement drinks are marketed as alternatives or complements to cow milk for children 12 months of age and older. (9) Generally, these beverages are not necessary for young children. (91)

There are concerns that the marketing of such commercial foods may undermine the progress in optimal feeding. (91) For example, providing such beverages to “picky eaters” may interfere with family meals, the division of responsibility in feeding, and a young child’s learning to (eventually) accept a range of family foods. (92)

If parents and guardians are using or are inquiring about these products, it may warrant an exploration of any concerns they might have regarding feeding or their child’s growth.

See also [scenario #6](#), above, for guidance on supporting the parent or guardian of the child who appears to eat too little.

Additional resources

Resources for parents and guardians

Please see previous chapter sections for client information specific to various aspects of infant and toddler feeding. Below are additional client resources.

- [Nutrition in the first year](#) (NH public webpage)
- [Nutrition for toddlers and preschoolers](#) (NH public webpage)
- [Healthy eating - Infants and children](#) (HealthLink BC)
- Videos: “Raising our healthy kids” (Alberta Health Services):
 - [Infant nutrition](#)
 - [Preschool nutrition](#)
- [Let’s talk! Meal-time conversation cards for toddlers and preschoolers](#) (Island Health) (NH Document Source #1926)
- [Nutrition and dietitian services](#) (NH public webpage)
- [Dietitian Services](#) at HealthLink BC (NH Document Source #1997)

Resources to Support Practice

- [Summary of recommendations for fluids and foods](#) from Pediatric Nutrition Guidelines (Birth to Six Years) for Health Professionals (BCCDC)
 - Summarizes guidelines for fluids and food
 - Organized by age: 0 – 6 months, 6 – 9 months, 9 - 12 months, 1-2 years, and 2 – 6 years
- [Display: Feeding babies age 6 – 12 months](#) (NH Document Source #10-421-6069)
 - Collection of posters for a tri-fold display board or bullet board display, ideal for waiting rooms or health fairs
 - Includes suggested display set-up information, key messages, and a list of recommended client handouts to accompany the display

5. Topics of interest

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Allergy prevention

Practice points

- Dietary restrictions during pregnancy and lactation are not recommended for the prevention of food allergy in infants.
- Delaying the introduction of common food allergens is not recommended.
- For most infants, common food allergens can be introduced starting at about six months of age.
- For infants at high risk of developing food allergy, consider introducing common food allergens at about six months of age, but not before four months of age, based on signs of developmental readiness.
- Individualized care plans and an interdisciplinary team approach are indicated for children with suspected or confirmed food allergy.

This section provides guidance about feeding as it relates to the prevention of IgE-mediated food allergy in infants. For a more detailed review of current recommendations, NH staff can also access an online module from UBC CPD: [NHA - CL - Preventing food allergies in infants: Early introduction to allergenic solids](#)

Information on the management of suspected or confirmed food allergy is outside of the scope of this resource, although some considerations are included later in this section. See [Individualized care plans for children with suspected or confirmed food allergy](#).

What is food allergy?

- Food allergy can be described as “when the immune system mistakes a specific protein (an allergen) in a food as harmful.” **(112)**
- The majority of food allergy is associated with “common food allergens”: **(112)**
 - Milk (and milk products)
 - Egg
 - Peanut
 - Tree nuts (e.g., almonds, cashews, walnuts)
 - Soy
 - Seafood (fish, shellfish, and crustaceans)
 - Wheat
 - Sesame
- When a person has food allergy, they will have an allergic reaction each time they eat the food to which they are allergic. **(112)**

Symptoms of food allergy

- Symptoms of food allergy can range from mild to severe. (112)
- Reactions often appear within minutes of exposure to a food allergen, and for infants and toddlers can include: (112)
 - hives, swelling, redness, rash
 - stuffy or runny nose with itchy watery eyes
 - vomiting
 - cough
- Although less common, vomiting and/or diarrhea can occur hours later. (112)
- Severe symptoms that require immediate medical attention include: (112)
 - swelling of the mouth, tongue, or throat
 - hives that are spreading
 - difficulty breathing, repetitive coughing, or wheezing
 - difficulty swallowing or hoarse voice or cry
 - pale or blue colour of the face or lips
 - faintness, weakness, or loss of consciousness

Risk of food allergy

- A Canadian Pediatric Society practice point defines infants at high risk of developing food allergy are those who: (48)
 - have a personal history of atopy (e.g., eczema)
 - have a first-degree relative (i.e., biological parent or sibling) with atopy (e.g., eczema, food allergy, allergic rhinitis, or asthma)
- Infants who have *severe* eczema or egg allergy (an estimated 1-2% of infants) are at higher risk than others for developing peanut allergy. (113) (114) However, all infants with eczema are at high risk of developing food allergy.
- Food allergy does not usually cause eczema. Rather, having eczema increases the risk of developing food allergy. (115)
- The Dual Allergen Exposure Hypothesis explains the association between eczema and development of food allergy. Sensitization to a food can occur via the skin, particularly with eczema. In contrast, initial exposures via the digestive tract appear to promote tolerance to a food. (116)
- For these reasons, good management of eczema and the [timely introduction of common food allergens](#) are important in reducing risk of food allergy. (112)

Guidance for infants at high risk of food allergy

- Much of the research and guidance related to reducing the risk of food allergy in infants focuses on infants who are at high risk of developing food allergy. This is the focus on the recommended client resource [Reducing risk of food allergy in your baby](#) (HealthLink BC).
- The following topics in this chapter section apply to infants at high risk of developing food allergy: diet during pregnancy and lactation, breastfeeding and human milk, the use of human milk substitutes, and the introduction of complementary foods.
- There is less research or guidance related to infants who not at high risk of developing food allergy.
- A family with an infant who is not at high risk may also choose to follow the guidance for children at high risk of developing food allergy.

Diet during pregnancy

- Dietary restrictions during pregnancy are not recommended for the prevention of allergic conditions among infants and carry the risk of malnutrition for people who are pregnant. (48)
- There is currently insufficient evidence to support supplementation of fish oil and/or DHA during pregnancy for the purpose of preventing food allergy in young children. (117) (118) (119) As for other adults, Health Canada recommends that people who are pregnant aim eat at least 150 grams (5 ounces, or two small portions) per week of fatty fish that is low in mercury (120).

Diet during lactation

- Dietary restrictions during lactation are not recommended for the *prevention* of food allergy in infants. (2) (112) (52)
- There is currently insufficient evidence to support supplementation with fish oil and/or DHA during lactation for the purpose of preventing food allergy in young children. (117) Health Canada recommends that adults eat at least 150 grams (5 ounces, or two small portions) per week of fatty fish that is low in mercury. (121)
- Food allergens can pass from a person's diet into their milk, and some children may react to allergens in human milk. (52)
 - A nursing parent may have to remove a confirmed allergen from their diet. (52) They should be encouraged to continue breastfeeding.

- They should be offered support from a dietitian to ensure that the allergen is removed from their diet and to ensure that their diet remains nutritionally adequate and is not unnecessarily restricted. (52)
- Cow milk allergy is infrequently associated with increased crying (colic). (2) For breastfed infants with increased crying (colic), where the relatively rare concern of an allergy to cow milk is suspected, nursing parents can consider a short trial of a cow milk-free diet. (2) (122)
 - This trial should be done with assistance from a dietitian, to ensure that sources of cow milk protein are eliminated and are adequately substituted. (2)
 - This trial should be discontinued after one to two weeks if there is no observed benefit. (2) (122)
 - Care should be taken to ensure that breastfeeding is not prematurely discontinued. (122)

Breastfeeding and human milk

- Evidence that breastfeeding is protective against allergy development is not strong; some studies have found a protective effect, while others have found no association. (48)
- Breastfeeding, exclusively for the first six months and to two years or beyond with appropriate complementary feeding, is recommended for nutrition, immunologic protection, growth, and development. (52)

Human milk substitutes (Commercial infant formula)

- For ongoing use, the use of soy-based formula, partially hydrolyzed formula, or extensively hydrolyzed formula (compared to the use of a standard cow milk-based formula) do not protect against the development of food allergy. (123) (124)
- **New** evidence indicates that, for breastfed infants, temporary or intermittent supplementation with cow's milk-based formula may increase risk for cow milk allergy (CMA). Health professionals should make families aware of this risk so that they can make informed decisions. (48)
 - Support exclusive breastfeeding and use of human milk, when possible. (125) (126)
 - If short-term formula supplementation is medically indicated (e.g. for top-ups in the newborn period), an extensively hydrolyzed formula may be considered - while this does not prevent CMA, it does not appear to

increase risk either. (125) (126) However, this formula is more costly and supply may be limited.

- If cow milk-based formula has been introduced, or a family wishes to use formula for ongoing regular supplementation (i.e., “mixed feeding”), support continued breastfeeding alongside regular use of cow milk-based formula. As little as 10 mL per day can help maintain tolerance. (48) (125) (126)
- For examples of different types of formula, see [Summary sheet - Infant formula for healthy term infants](#) (Alberta Health Services)
- For more information on the indications for use of various types of formulas, including for infants with physician confirmed food allergy, see [Types of human milk substitutes: Indications for use](#) in Chapter 2: Human milk substitutes.

Introduction of complementary foods – Timing

- Common food allergens are cow milk (and milk products), egg, peanut, tree nuts, soy, seafood (fish, shellfish, and molluscs), wheat, and sesame. (6)
- Delaying the introduction of common food allergens is not recommended to prevent food allergy, especially for infants at high risk of allergy. (2) (6)
Unnecessary delays in the introduction of common food allergens may:
 - increase infants’ risk of developing food allergy (6) (52) (113)
 - interfere with the promotion of healthy eating behaviours (52)
 - limit the range of iron-rich foods made available to infants, as many common food allergens are also sources of iron (e.g., fish, shellfish, peanut, tree nuts, whole egg, and fortified cereals containing wheat) (52)
- For most infants, based on signs of developmental readiness, common food allergens can be introduced starting at about six months.
- For infants at high risk, this timely introduction can decrease the risk of food allergy developing. Foods should not be introduced before four months of age. (112) (6) (48)
- The evidence to support timely introduction is strongest for egg and peanut. (112) (48) Families can also prioritize those allergens that are regularly eaten at home. (6)

Introduction of complementary foods – Approaches

The recommendations below apply to infants at increased risk for food allergy but could also be of interest to families who are otherwise concerned about the risk of food allergy.

- Advise to introduce common food allergens one-at-a-time, to gauge reaction. Symptoms of food allergy usually appear quickly, up to two hours after eating a food. New foods can be offered at each meal or 3-4 hours apart. (6) Avoid unnecessary delays between each new food. (52) (48)
- Clarify that foods that are not common food allergens do not need to be introduced one-at-a-time.
- Advise to offer food in textures that are safe for infants. See [Food textures](#) in Chapter 4: Feeding by age, and suggestion in [Reducing risk of food allergy in your baby](#) (HealthLink BC). (112)
- Advise to offer a small taste of the food, such as 1/8-1/4 teaspoon, and to wait about 15-20 minutes before offering more. (6) (112)
- If an allergic reaction to a food is suspected, advise parents and guardians to stop giving that specific food and to seek medical clarity (i.e., a diagnosis). Encourage the continued introduction of other new foods. (52)
- If an infant tolerates a food, recommend that parents and guardians continue to offer it regularly, at least two to three times per week, to maintain tolerance. (6) (48)

There is little evidence available to support other recommendations around how to introduce common food allergens. (52)

- There is no evidence that the *order* in which solid foods are introduced affects the risk of developing food allergy, including for infants at high risk. (9)
- There is no “right” time of day to introduce common food allergens. Support families to make a plan that is convenient and comfortable for them. (52)
- It is **not** recommended to introduce a common food allergen on the skin or on the lips prior to offering the food for eating. The presence or absence of a reaction on the skin cannot be interpreted in relation to food allergy.
 - Exposure via the digestive tract is thought to promote tolerance to a food, whereas exposure via skin, particularly broken skin (i.e., eczema), increases risk of developing food allergy. (115)

Individualized care plans for children with suspected or confirmed food allergy

- The preceding guidelines, regarding diet during pregnancy and lactation, and the introduction of solids to infants, focus on the *prevention* of food allergy in infants at high risk of developing food allergy.
- If an adverse reaction to a food is observed, advise parents to promptly consult with their primary care provider to determine next steps. (48)

- Encourage the continued introduction of other new foods, including other common food allergens, to prevent unnecessary delays in the introduction of common food allergens. (52)
- Parents and guardians may also be interested in using the [Allergy check](#) app from BC Children’s Hospital to understand whether symptoms may be caused by a food allergy. This does not replace the advice of health professionals. (127)
- Individualized care plans are required for infants with suspected or confirmed allergic conditions. Optimal care is child-centered and facilitated through an interdisciplinary team approach. (52)
- Refer to doctor, paediatrician, or paediatric allergist to: (52)
 - confirm food allergy
 - assess need for an emergency treatment plan
 - follow child for evidence of remission of food allergy, so that food can be reintroduced in their diet when appropriate to do so
- Consider a connection with a local [NH dietitian](#), or to [Dietitian Services at HealthLink BC](#) by calling 811 (or 604-215-8110 in some northern communities). They can support parents to avoid suspected or confirmed allergens, while ensuring that the diet remains adequate, and promote confidence in feeding. (52)
- A goal is to not unnecessarily restrict the child’s diet, so they can still eat a wide variety of foods and partake in family meals. (52)

Resources for parents and guardians

- [Nutrition and dietitian services](#) (NH public webpage)
- [Dietitian Services at HealthLink BC](#)
- [Reducing risk of food allergy in your baby](#) (HealthLink BC)
- [Eczema and food allergy in babies and young children](#) (HealthLink BC)
- [Allergy check](#) app (BC Children’s Hospital)
- [Food Allergy Canada](#)

Bedsharing and breastfeeding

Practice points

- Counsel all families about safer sleep.
- Breastfeeding and human milk are protective against sudden, unexpected infant death during sleep, regardless of sleep arrangement.
- For healthy, term breastfed infants, it is safe to bedshare with the infant if there are no risk factors present.
- Bedsharing promotes breastfeeding initiation, duration, and exclusivity.

This section provides guidance about bedsharing as it relates to breastfeeding. This guidance should be used in conjunction with current recommendations about safer infant sleep. See [Safer infant sleep practice resource for health-care providers](#) (PSBC), which includes an infant sleep discussion guide, as well as one-page decision aid tool.

“Bedsharing” is defined as “parents/caregivers sleeping on the same surface as their infants. This could include a mattress or an adult bed. Bedsharing in the context of safer sleep is distinct from sofa and/or recliner sharing. Sleeping with an infant on a couch or recliner is not a safe sleep arrangement”. (33) Bedsharing is distinct from “room sharing”. “Co-sleeping” is a commonly used term, but it does not have a standard definition.

- Breastfeeding and human milk are protective against sudden, unexpected infant death during sleep, regardless of sleep arrangement. (33)
- Bedsharing is likely to happen, whether intended or not. Parents express various reasons for sleeping with their infants: (128)
 - Cultural and religious beliefs, parenting philosophies
 - Links between lactation and nighttime breastfeeding
 - Biological drives for close contact
 - Ease of nighttime care, monitoring, and comforting of infants; increased sleep for parents
 - Protection of the infant from threats, such as earthquakes
- Night wakings are a normal component of infant sleep and a response to their need to feed frequently. (33)
 - For infants, feeding method does not affect their total sleep duration. (33)
 - Breastfeeding parents who bedshare with their babies often wake to feed. They are awake for shorter periods and fall back to sleep more rapidly and achieve greater sleep duration than non-bedsharing mothers. (128)

- Bedsharing promotes breastfeeding initiation, duration, and exclusivity. (128)
There is a strong relationship between breastfeeding duration and bedsharing. (33)
- Bedsharing with breastfeeding is considered the human evolutionary norm, as per anthropological research. (128)
 - “Breastsleeping” is defined as “a biologically based model of sustained contact between the mother and [child], starting immediately after birth, in which sleeping and breastfeeding are inextricably combined, assuming no hazardous risk factors.” (128)
- Bed sharing is not a safer sleep practice for some infants, such as those that are premature, low birth weight, or substance exposed. (33)
- Risk factors that increase bedsharing risk for healthy term infants, include: (33)
 - Parent/caregiver than never initiated breastfeeding
 - Parent/caregiver impaired by alcohol or other substances that affect awareness and arousal
 - Antenatal exposure to commercial tobacco smoke or sleeping with a caregiver who smokes commercial tobacco
 - Infant sleeping in the prone or side-lying position

Recommendations:

- Counsel all families about safer sleep. Engage parents and guardians in a balanced conversation about the risks and benefits of different infant sleep practices, while acknowledging their social and cultural context.
- Normalize frequent waking for feeding. This may help to prepare families with realistic expectations.
- Advise that, for healthy, term breastfed infants, it is safe to bedshare with the infant if there are no risk factors present. Provide information on how to do this safely.
- If risk factors are present, suggest other sleep surface options and discuss how to reduce their risk.

Resources for health professionals:

- [Safer infant sleep practice resource for health care providers](#) (PSBC)
- [Honouring our babies: Safer sleep toolkit](#) (PSBC)
- [Breastfeeding and bedsharing protocol](#) (Academy of Breastfeeding Medicine)

Resources for parents and guardians:

- [Safer sleep for my baby](#) (PSBC, MOH)
- [Bedsharing and breastfeeding](#) (Academy of Breastfeeding Medicine)

Constipation

Practice points

- Support parents and guardians with information on the wide variation in normal stooling patterns.
- There are several types of constipation; management will vary depending on the type of constipation, mode of feeding, and the child's age.

This section provides guidance about infant and toddler feeding as it relates to the prevention and management of constipation. The medical management of chronic or organic constipation is outside the scope of this resource.

Constipation involves stools that are dry, hard, and difficult or painful to pass. (129)
Infrequent stools that are soft and easy to pass are not a sign of constipation. (130)
Constipation that does not resolve quickly will likely require medical management to prevent or manage related problems (129).

Normal stooling patterns

Parents and guardians often express concern about the frequency of their child's bowel movements. While infrequent stools alone do not define constipation, information on the wide variation in normal stooling patterns can be helpful. (2)

- Almost all infants will grunt and turn red when passing stool. (27)
- After the first four to six weeks, breastfed infants may stool daily or as infrequently as once per week or longer. (2) (27) (129)
 - This wide range of normal frequency is often misinterpreted. (2)
 - Constipation in breastfed infants is extremely rare. (2) (27)
- After the first few weeks, infants who receive commercial infant formula may have a bowel movement every one to two days. (131)
 - There is less variability in stooling frequency than with infants who receive human milk. (129)
- Stool frequency decreases with age, as the gut matures and better conserves water. (132)
 - For infants 6 to 12 months old, mean stools are 5 to 28 per week.
 - For toddlers one to three years old, mean stools are 4 to 21 per week.

Types of constipation

Acute constipation:

- Is a short-term (less than two weeks) condition that is self-limited
- May occur with dietary changes (e.g., starting solids, weaning from human milk), changes in routine (e.g., starting daycare), or during or after illness with fever and vomiting (133)
- Can usually be successfully treated with adequate fluid intake and, for older infants and children, a diet containing adequate fibre (134)

Chronic constipation - organic:

- Is caused by an underlying medical condition, with anatomic, endocrine, metabolic, or neurogenic causes, such as hypothyroidism, Hirschsprung disease, or anorectal malformations. (134)
- Is rare (134) and may be suspected with onset of symptoms in infants less than one month old (135)

Chronic constipation - functional:

- Is of longer duration (one or two months), with no underlying medical/organic cause (134) (135)
- When untreated, can lead to abdominal pain, appetite suppression, fecal incontinence, lowered self-esteem, social isolation, and family disruption (129)
- When child voluntarily retains stool, for fear of painful bowel movements, can result in stools that are even more painful to pass, resulting in further stool retention (134)
- Usually requires several months of treatment and co-operation between parents and guardians, caregivers, the child, and the primary care provider (130)
- Treatment goals include soft, painless stools, and the prevention of reaccumulation of feces, and may involve a combination of education, behavioural modification, medication, and dietary modification. (129)

Dietary interventions

- Attention to diet can help prevent and treat [acute constipation](#), and may help prevent the development of chronic functional constipation. (134)
- With [chronic functional constipation](#), dietary interventions alone are not recommended as the first-line treatment. Alongside medical and behavioural therapy, dietary interventions (e.g., increased fibre intake) can be encouraged *following* disimpaction. (136)
- Adequate fluid intake is recommended in all cases. (136)
- If cow milk allergy is suspected in children experiencing constipation, support families to seek a diagnosis, and consider a four-week trial of a diet free from cow milk protein. (136) See [Allergy prevention](#), earlier in this chapter.

Dietary interventions for infants receiving human milk (birth to six months)

- Provide support to manage any challenges with breastfeeding. (136)
- As always, recommend offering the breast and/or human milk in a manner that is responsive to infants' feeding cues. (133) See [Honour hunger and satiety cues](#) in Chapter 4: Feeding by age.
- Prune juice, corn syrup, brown sugar water, or other home remedies are not recommended for young infants. (2)

Dietary interventions for infants receiving infant formula (birth to six months)

- Iron-fortified formula does not cause constipation in infants. (137) All commercially available formulas in Canada contain iron. (2)
- There is not enough evidence to recommend switching from standard infant formula to formula with different characteristics (e.g., with prebiotics). (136)
- Care should be taken to ensure that formula is prepared properly (i.e., that powdered and concentrated formula are adequately diluted as per manufacturer's directions). (133)
- As always, recommend offering human milk substitutes in a manner that is responsive to infants' feeding cues. See [Honour hunger and satiety cues](#) in Chapter 4: Feeding by age.
- Prune juice, corn syrup, brown sugar water, or other home remedies are not recommended for young infants. (2)

Dietary interventions for older infants and young children (6 months and older)

- Recommend continued breastfeeding and provision of human milk. For infants fed with formula, recommend transitioning from infant formula to cow milk when infants are nine to 12 months old *and* are consuming iron-rich foods daily. (6) See [Cow milk](#) in Chapter 3: Animal milks and other beverages.
- Other beverages:
 - From 6-12 months, small amounts of water can be offered in an open cup. (6) After 12 months, recommend offering water frequently, (9) such as by making water available with and between meals and snacks.
 - Excessive milk intake can displace intake of dietary fibre and other nutrients. (9) From 9-12 months onwards, recommend limiting animal milk intake to 3 cups (750 mL) per day. (9) (6)
 - While fruit juice is not recommended for infants and young children, if parents and guardians wish to offer juice, such as unsweetened apple, pear, or prune juice, advise them to limit this to ½ cup (125 mL) per day. (6) For detailed recommendations regarding the use of juice, see [Fruit juice](#) in Chapter 3: Animal milks and other beverages.
- Solid foods:
 - Recommend offering an age-appropriate, balanced diet with sufficient fibre. (9) (129) (136) Foods sources of fibre include soft beans, peas, and lentils; whole grain breads, crackers, and cereals; and vegetables and fruit.
 - If parents and guardians wish to offer additional fibre-rich foods, advise that this should occur only after disimpaction has occurred (if needed). Advise to increase fibre gradually. Sufficient fluids are also required. Monitor gastrointestinal side-effects and growth. (136)
 - Fibre supplements are not generally recommended for infants and toddlers. (133) (138) Bran is not recommended for children less than two years of age. (136) Recommend providing adequate fibre through foods.
 - There is a lack of evidence to inform guidelines regarding the use of prunes for the treatment of constipation in children. (136) If prunes are offered, advise starting with a small amount (i.e., 1 Tbsp or 15 mL) and increasing slowly. (133)

Resources for parents and guardians

- [Constipation, age 11 and younger](#) (HealthLink BC)
- [Healthy bowel habits for children](#) (Canadian Pediatric Society)

Crying (colic)

Practice points

- It is generally not beneficial to alter feeding practices when an infant is experiencing increased crying (colic).
- Support parents and guardians with information on normal periods of increased crying and coping strategies.

This section provides guidance about feeding as it relates to infants who experience increased crying (colic). Infant crying is stressful for parents and guardians and may result in various interventions in attempts to manage it. Many of these interventions are not evidence-based. It is generally not beneficial to alter feeding practices, interrupt breastfeeding, restrict diets of nursing parents, or supplement with formula. (2)

High criers

“Higher crier” is a term that is used to describe an infant with higher levels of intensity and length of crying, in the absence of other health concerns (e.g., failure to thrive). This describes an infant who cries five or more hours per day during their peak crying period, which is at the higher end of the spectrum of normal crying behaviour. (139)

The term “high crier” is now more commonly used than “colic”, as there is concern that “colic” suggests that there is something wrong with an infant, the parents or guardians, or the care that is being provided.

The period of PURPLE crying

Increased crying starts at about 2 weeks of age, peaks at 2 to 3 months, and eases off by 5 months. While the causes are unknown, this period of increased infant crying is developmentally normal and is known as the [Period of PURPLE Crying](#)[®]. (139)

Crying is the most common trigger for traumatic head injury – child maltreatment, caused by shaking and physical abuse of infants. [Prevent Shaken Baby Syndrome](#) BC, in partnership with health authorities, provides education to parents and guardians of newborns about normal infant crying, ways to respond, and how to cope with the frustrations that come with increased crying. (139)

Breastfeeding and human milk

Crying is similar in infants receiving human milk and those receiving commercial infant formula. Parents who are breastfeeding and providing expressed breast milk should be supported to continue to do so. (140)

Cow milk allergy is infrequently associated with increased crying. (2) Where there is concern about the relatively rare possibility of cow milk allergy, nursing parents may consider a short trial of a cow milk-free diet. (2) (122)

- This trial should be done with assistance from a dietitian, to ensure that all sources of cow milk protein are eliminated from the diet and are adequately substituted. (2)
- This trial should be discontinued after one to two weeks if there is no observed benefit. (2) (122)
- Care should be taken to ensure that breastfeeding is not prematurely discontinued. (122)

Human milk substitutes (commercial infant formula)

In most cases, avoid nutritional interventions in infants who are fed with formula. (140)

- Lactose-free formula and soy-based formula are ineffective in the management of increased crying. (2) (122) (140)
- All commercial infant formulas are fortified with iron. Formula with higher iron levels (e.g., 1.2 mg iron/100 mL) are well tolerated. (49)

For infants who are fed with formula, where there is concern about the relatively rare possibility of cow milk allergy, a two-week trial of an *extensively* hydrolyzed formula can be considered. (122) (140) See [Types of human milk substitutes: Indications for use](#) in Chapter 2: Human milk substitutes.

Other interventions

If parents and caregivers are considering other interventions, encourage them to discuss this with their care providers. There is insufficient evidence to recommend gripe water, herbal teas, lactase, and probiotics. (140) Additional considerations include:

- Gripe water - If used, advise that it should not contain alcohol or sugar. (140)
- Herbal teas – There are concerns of potential harmful side-effects, lack of standardization of strength and dosage, and potential displacement of human milk and commercial infant formula intake. (140)

Resources for parents and guardians

- [The period of PURPLE crying](#) (NH public webpage)

Dental health

Practice points

- Dietary guidance and fluoride use can help to reduce the risk of early childhood caries.

This section provides feeding guidance as it relates to the prevention of early childhood caries. Other aspects of dental health are outside the scope of this resource. For families that need additional support, see the [Dental health program](#) (NH public webpage).

Early childhood caries (ECC) is a common, but mostly preventable, disease in children that can lead to serious infections, eating difficulties, and other dental, health, and social problems. (9)

Dietary risk factors for ECC include:

- Prolonged bottle feeding with formula, milk, or sugary drinks (especially at sleep times) (6)
- Excessive juice/sugary drink consumption (6)
- Frequent sipping of liquids other than water (6)
- Frequent snacking (especially sticky or sugary foods, including dried fruit and fruit bars) (6)
- Saliva sharing behaviours between adults and children, or between children, such as sharing spoons, cleaning soothers in mouths, (141) or pre-chewing food. There is a significant correlation between maternal salivary levels of *S. mutans* bacteria and ECC in their children. (141)

Recommendations:

- Emphasize oral hygiene for all infants and children as part of daily care. (9) See [Dental care for your infant and toddler](#) (HealthLink BC)
- If using bottles, recommend that parents and guardians:
 - Remove the bottle when the infant is finished feeding
 - Hold baby while feeding. Avoid propping bottles due to risks related to choking, dental health (2), and ear infections
 - Find other ways to soothe baby. Avoid using the bottle as a pacifier (2)
 - Start the transition from bottle feeding to an open cup by 12 months, and aim to complete by 18 months (2) Avoid long-term use of bottles.
 - If continuing to use bottles after 12 months, avoid putting children to bed with a bottle with liquid other than water (2)

See [Bottle feeding](#) in Chapter 2: Human milk substitutes.

- Recommend the introduction of an open cup with the help of an adult, starting at around six months for sips of water. (2)
 - The use of an open cup can help to prevent prolonged bottle feeding and reduce exposure of teeth to sugar-containing beverages. (2)
 - As infants will need time and practice to learn to drink effectively from a cup, expressed breast milk or commercial infant formula can continue to be offered in a bottle. (2)
 - As other drinks are introduced, these should be offered in an open cup. (2)

See [Use of cups and bottles](#) in Chapter 3: Animal milks and other beverages

- Recommend limiting fruit juice; it is a “sugary drink” as per Canada’s food guide. (9) (87) If parents and guardians choose to offer fruit juice (after six months of age), recommend that they try to:
 - Serve it in an open cup (i.e., not in a bottle or sippy cup) (9) (76)
 - Offer it as part of a sit-down meal or snack (76)
 - Limit to 125 mL (½ cup) per day (9) (6)

See [Fruit juice](#) in Chapter 3: Animal milks and other beverages.

- Recommend limiting or avoiding other sugary drinks, acidic drinks, and sticky foods. (9) (141) If such foods and beverages are offered, recommend limiting them to meal and snack times. Offer drinks in an open cup.
- Recommend working towards establishing a regular meal and snack pattern. By 12 months, this could be three meals and two or three snacks daily, with water and/or breastfeeding in between times. (9) (6)

Resources for parents and guardians

- [Hello cup...bye-bye bottle](#) (NH Document Source #10-402-6027)
- “Dental Care” in [Baby’s best chance](#) (Province of BC)
- “Looking After Your Toddler’s Teeth” in [Toddler’s first steps](#), Province of BC)
- [Dental care for your infant and toddler](#) (HealthLink BC)
- [Dental health program](#) (NH public webpage)

Diarrhea (acute) and dehydration

Practice points

- Appropriate diagnosis of diarrhea and dehydration is important. Recommend seeking medical attention if a child is thought to be dehydrated.
- Infants with diarrhea, without dehydration, should continue to be fed an age-appropriate diet and should be offered increased fluids from their usual diet.
- Treatment for mild to moderate dehydration includes the use of oral rehydration solutions, fluid maintenance, and appropriate re-feeding.
- Severe dehydration requires intravenous rehydration in a clinical setting.
- When dehydration is corrected, early re-feeding with a normal diet is recommended.

This section provides guidance related to feeding infants and young children who experience diarrhea and dehydration. The medical management of these conditions is outside the scope of this resource.

Diarrhea is generally defined as a change in consistency of the stools to loose, liquid, or watery stools, and/or an increase in the frequency of stools. (2) (142) Acute diarrhea is often caused by an infection, such as rotavirus. (2)

The main clinical concern with acute diarrhea is the risk of dehydration, especially in infants and young children, as they can become dehydrated very quickly. (2) (143) Rehydration is the key treatment and should be started as soon as possible. Management will depend on the degree of dehydration. (142)

As soon as dehydration is corrected, early re-feeding with a normal diet is recommended. This helps repair the digestive tract, decreases nutrient losses, and hastens recovery. (38) (142)

Mild or minimal dehydration

- Symptoms include an increase in thirst and a slight decrease in urine output. (143)
- Diet should not be restricted; infants and young children should continue to be fed age-appropriate diets, without interruption. (142)
- Breastfed infants should be offered the breast more often than usual. (38) (143)
- Infants receiving expressed breast milk and/or commercial infant formula should be offered an increased number of feedings daily. (38) (143)

- Older infants and young children should be encouraged to drink often; (143) their regular fluids or oral rehydration solutions can be offered to replace fluid losses and cover maintenance needs. (142) Fluids high in sugars (e.g., fruit juices, ginger ale, and other soft drinks) should be avoided. (142)

Moderate dehydration

- Symptoms may include dry mouth and eyes, significantly increased thirst, little urine output in last six to eight hours, and sunken fontanel. (143)
- Medical attention is recommended, (143) and rehydration should start as soon as possible with an oral rehydration solution (ORS), which are available in ready to serve formats from pharmacies. (2) (142)
- The following are *not* appropriate substitutes for ORS: water, tea, juice, soft drinks, sports drinks, broths, and homemade remedies. (142)

Severe dehydration

- Symptoms may include very dry eyes and mouth, little to no urine output in last 12 hours, and a child that is weak, dizzy, very sleepy, and/or hard to wake up. (143)
- Intravenous rehydration in a clinical setting is recommended. (2) (142)

Additional considerations for the nutritional management of diarrhea and dehydration are included below.

Infants receiving human milk

- Human milk reduces the risk of gastrointestinal infections in infants and has been shown to reduce the severity of diarrhea from rotavirus. (2)
- Breastfed infants should continue to breastfeed or receive human milk during the management of acute diarrhea. (142) They should be offered a greater number of feeds than usual, (143) and should continue to feed on cue. (38)

Infants receiving human milk substitutes (commercial infant formula)

- Once rehydrated, infants should return to their usual formula feeds. Formula should be reconstituted as per manufacturers' directions (i.e., it should not be over diluted). (144)
- Adequate lactose digestion and absorption are preserved in acute gastroenteritis so that low lactose and lactose-free formula have no clinical advantages over lactose-containing formula. (142)

- Lactose-free or low lactose formula are not indicated when: (142)
 - Dehydration is not present, or has been treated
 - Mild to moderate dehydration exists
- Lactose-free or low lactose formula may be justified in the following cases: (142)
 - Severe dehydration
 - Severe enteropathy
 - Severe malnutrition
 - When lactose-containing formula worsens the condition, such as with confirmed lactase deficiency

Older infants and young children

- Once rehydrated, young children should be offered their usual diets. (142)
- Research continues to explore the best foods for re-feeding. Recommend offering a variety of age-appropriate, nutrient-dense foods from pre-illness diets. (142)
- The “BRAT diet” (bananas, rice, applesauce, tea/toast), clear fluids, other restrictive diets, or “gut rest” are not recommended and can result in severe malnutrition. (142)
- Foods and fluids high in sugar might worsen diarrhea. Advised avoiding juices, sports drinks, soft drinks, flavoured gelatins, and sugary desserts. (142)

Resources for parents and guardians

- [Diarrhea, age 11 and younger](#) (HealthLink BC)
- [Dehydration and diarrhea in children: Prevention and treatment](#) (Canadian Pediatric Society)

Food insecurity (household)

Practice points

- Household food insecurity is a significant public health issue in northern BC.
- Household food insecurity is an income-based problem that requires income-based solutions. Screen clients, and link to financial and other supports, as needed.
- Families benefit from compassionate and non-judgmental support to reduce the risk of nutrient deficiencies and to optimize their children’s diets.
- Although breastfeeding and the expression of breast milk have the potential to be food security strategies for infants, low-income parents and guardians may face greater barriers and may be less able to maintain breastfeeding and lactation. Offer parents additional and continued supports to meet their infant feeding goals.
- Support families who use commercial infant formula to choose a formula that is “acceptable, feasible, affordable, sustainable, and safe” in their circumstances.

This section describes household food insecurity and implications for practice as they relate to supporting families and feeding infants and young children.

Household food insecurity (HFI) is defined as “when a household worries about or lacks the financial means to buy healthy, safe, and personally acceptable food.” (145) This definition highlights that the root cause of household food insecurity is **not** a lack of food skills, budgeting skills, or nutrition knowledge, (146) nor is it the cost or availability of food. Rather, household food insecurity is based on the lack of sufficient income to purchase food. It is an income-based problem that requires income-based solutions.

Rates of household food insecurity

HFI in the NH region is described in an infographic: [NH BC – Household food insecurity in 2011-2012](#) (BC Centre for Disease Control). Based on 2011-12 BC data, HFI rates were as follows:

- 17% of all northern BC households (compared to 12% of BC households) (145)
- 25% of northern BC households with children (compared to 15% of BC households with children) (145)
- 34% of BC households with female lone parents/guardians (145)
- 29% of BC Indigenous households off reserve, (145) 41% of households on reserve, and 45% of households on reserve with children (147)

- 79% of northern BC households who rely on social assistance as the main source of income (compared to 76% of BC households who rely on social assistance as the main source of income) (145)

The above statistics emphasize that households who rely on social assistance are particularly at risk. It is also important to note that 65% of food insecure households in BC are working households, with income from salaries or wages. (145)

While the above is the most recent BC health authority level data, a national 2022 report suggests that the number of BC households experiencing HFI have increased from 12% to 15%. (148)

Indigenous communities are often excluded from national datasets, yet they are often disproportionately impacted by HFI. Further, in addition to income, many Indigenous peoples living in their home communities face unique barriers to food security, including concerns regarding access to, and control over, land and foods that are culturally appropriate. (149)

Food costs

Food prices are rising. As well, in Northern BC, the true cost of eating includes more than food prices, as there are other expenses associated with accessing food (e.g., travel to food stores). In 2022, the cost of living, which includes purchasing basic healthy foods, was out of reach for many families in the NH region. (150) For families lowest on the income spectrum, healthy eating is not affordable. For BC food costing reports, see: [Reports & resources](#) – Food Security (BCCDC).

Experiences and impacts of household food insecurity

Members of food insecure households:

- Worry about not having enough food and may reduce the quality or quantity of food they consume. (151) (145)
- May have challenges with inadequate kitchen equipment (e.g., fridge, pots) or transportation to grocery stores, especially in remote communities (152)

Parents and guardians who are food insecure: (151) (145) (147) (152)

- May go without food to prioritize feeding their children
- Experience stress, frustration, guilt, and shame related to feeding their families
- Experience stigma with using community resources
- Are at risk for various chronic diseases, depression, and social isolation.

Food insecure children experience poorer general health, academic outcomes, and social skills than their peers. They are also at risk for a variety of chronic illnesses. (145) Iron deficiency anemia is a particular concern. See [Iron](#) in Chapter 6: Key nutrients.

Implications for practice: Breastfeeding and human milk

Breastfeeding and the expression of breast milk can be viewed as a food security strategy for infants; a parent's milk is generally safe and is available regardless of income. Breastfeeding has few costs and generally requires no special equipment.

However, in Canada, food insecure parents may face greater barriers to breastfeeding; research demonstrates that lower incomes and HFI are associated with lower rates of breastfeeding initiation, exclusivity, and duration. (152) (153) (154) While many nursing parents worry about having "enough milk", food insecure parents may also worry about the quality of their milk. (151)

Recommendations:

- Starting in the prenatal period, offer low-income parents additional supports regarding breastfeeding. (151) (22) (152) For more information, see [Chapter 1: Breastfeeding and human milk](#).
- Reassure parents that their milk will be of excellent quality, even if they do not always eat well. If appropriate, consider sharing that:
 - The day-to-day diets of nursing parents has little or no effect on their milk production and the quantity of most nutrients in their milk. (2) Some nutrient levels are affected by diet, such as vitamin B12. (22) Continued use of a prenatal multivitamin supplement is recommended during lactation. (155)
 - Human milk also contains other important components not found in infant formula (e.g., antibodies, enzymes, hormones, and stem cells). (20)
 - A modest energy deficit (i.e., a deficit of 500 calories per day) does not adversely affect milk production or nutrient composition. (22) (156)
 - Rapid weight loss and/or protein-energy malnutrition can reduce milk production, (2) but does not significantly affect nutrient composition. (156)
 - Parents' diets are important for their own health. (2) Link to a dietitian, if needed. See [Diet and nutrition](#) in Chapter 1: Breastfeeding and human milk.
- For those who are considering expressing their milk, advise that:
- Hand expression incurs no costs, and any clean container can be used to collect breast milk. (27) See [How to express your milk by hand](#) (NH Document Source #10-030-6038)
- In some communities, breast pumps may be available for rent or for loan from health units/centres, pharmacies, or community programs. Eligible BC First Nations clients can obtain manual or electric breast pumps through the FNHA [benefits program](#).

Implications for practice: Human milk substitutes (commercial infant formula)

Access to commercial infant formula can be a significant problem for low-income families. (151) (152) Families may prioritize the purchasing of formula over other foods, which may compromise the diets of other household members. Other strategies to offset costs include over-diluting formula, and earlier than recommended introduction of water, juice, or cow milk. (151)

Formula is not always accessible through food charity, and families accessing such programs may have to switch types of formula depending on what is available. (151)

Parents and guardians who have access to formula sometimes continue to provide this to their children beyond one year of age, as they view it to be a reliable source of nutrients. (151)

Recommendations:

- Support families who do not exclusively breastfeed or provide their infants with human milk to choose commercial infant formula that is “acceptable, feasible, affordable, sustainable, and safe” in their circumstances. (157) See [Selecting commercial infant formula](#) in Chapter 2: Human milk substitutes.
- Reassure families that commercial infant formula will be nutritionally adequate for healthy, term infants, regardless of brand or price. The composition of commercial infant formula is regulated in Canada by the Food and Drug Regulations. (2)
- Support families to ensure that they are preparing and handling infant formula safely. (2) Powdered formula is less expensive than liquid alternatives but presents additional risks because it is not sterile. See [Safely preparing, storing, and transporting commercial infant formula](#) in Chapter 2: Human milk substitutes.
- Support families who are considering trialling more expensive formulas. Feeding changes are unnecessary for most common health conditions in infancy. (2) See [Allergy prevention](#), [Crying \(colic\)](#), or [Reflux](#), earlier in this chapter.
- Advise that infants who are fed with formula who are at higher risk of iron deficiency may need formula with iron levels at the higher end of the fortification range. (2) See [Iron](#) in Chapter 6: Key nutrients.
- Advise that homemade formula is not recommended. If families provide their infants with such formula, take steps to help reduce associated risks. (2) See [Homemade infant formula \(e.g., evaporated milk formula\)](#), in Chapter 2: Human milk substitutes.

Implications for practice: Complementary foods

All families benefit from compassionate and non-judgmental support. To “meet clients where they are at”, respect the foods they can provide; the priority is for these families to have enough to eat. Feeding recommendations may need to be modified for a family depending on their situation. Consider that:

- To offset the costs of commercial infant formula, families who feed their infants with formula sometimes choose to start solid foods and cow milk earlier than recommended. (152) Support families to decrease the risk of iron deficiency anemia, which is a concern for children living in food insecure households. (145) See [Iron](#) in Chapter 6: Key nutrients.
- While commercial infant foods can be costly, provide limited textures, and are not generally required, these foods can be convenient, have a long shelf-life, and may be available to families through food assistance programs. (151) Iron-fortified cereals also provide a reliable source of iron.
- While fruit juice should be limited, a small amount of fruit juice may help families meet nutrient requirements related to fruit consumption. (158) See [Fruit juice](#) in Chapter 3: Animal milks and other beverages.

Recommendations:

- If dietary modifications are indicated, make suggestions for adding to the diet, as opposed to restricting or taking away. As needed, consider a referral to dietitian. See [Nutrition and dietitian services](#) (NH public webpage) or [Dietitian Services at HealthLink BC](#)
- Advise that there is no need for special equipment or blenders to prepare texturally modified family foods for infants and toddlers. A fork is sufficient for mashing foods, where needed. (97) See [Food textures](#) in Chapter 4: Feeding by age.
- Encourage eating together, where possible; this is valuable regardless of what foods are served. (159) See [Recommend family meals and sit-down snacks](#) in Chapter 4: Feeding by age.

Screening and supporting clients who experience food insecurity

All healthcare providers play an important role in supporting clients who experience HFI.

Recommendations:

- Screen for household food insecurity
 - Consider asking, “Within the past 12 months, did you and other household members worry that food would run out before your got money to buy more?”
 - Document in the patient record and revisit at subsequent visits.
- Provide compassionate, non-judgemental, and culturally safe care, acknowledging that food insecurity presents challenges for feeding family members and meeting health care needs.
- Assist clients in accessing support (financial, food, other):
 - HFI is an income-based issue that requires income-based solutions. As a first step, connect clients to financial supports. For example, see ["Financial help for pregnancy"](#) (Vancouver Coastal Health)
 - Emergency food access may be required. Consider linkages to community programs that facilitate access to food and/or supplements, such as food banks, soup kitchens, friendship centres, and parenting programs.
 - Consider linkages with other health professionals and programs:
 - Liaise with allied health professionals to best support clients.
 - Consider linking Indigenous clients with their bands, communities, and/or friendship houses for supports, if they are not already linked.
 - The [First Nations Health Authority benefits program](#) provides coverage of specific products for eligible clients, including for breast pumps, prenatal multivitamins, and vitamin D supplements. A prescription may be required.

Additional resources for health professionals:

- [Household food insecurity: Guidelines for health professionals](#) (booklet) (NH Document Source #10-421-6073)
- [Household food insecurity: Guidelines for health professionals](#) (one-pager) (NH Document Source #10-421-6073B)
- [Learning Hub course #22497: NHA – PPH - Household food insecurity](#)
- [Poverty: A clinical tool for primary care providers](#) (BC Centre for Effective Practice)
- [CLEAR toolkit](#): health professionals addressing social causes of poor health (McGill Department of Family Medicine)

Growth

Practice points

- Concerns about growth can translate into unnecessary and harmful changes to feeding practices, such as supplementation, discontinuation of breastfeeding, or coercive or restrictive feeding.
- Health professionals have an important role to play in accurately assessing growth patterns, reassuring families, providing anticipatory guidance, and promoting responsive feeding and healthy feeding relationships.

The following section describes key aspects of childhood growth monitoring and highlights some considerations related to feeding infants and toddlers. A full orientation to growth monitoring is beyond the scope of this resource. For training and orientation, see:

- NH CPS 1-22-2-040: [Early childhood growth monitoring: Birth to 2 years of age](#)
- LH course #29502: [NHA – CL – Growth chart training](#). No fee; refers to Alberta Health Services resources.
- Resources on the [Perinatal and early childhood health](#) MyNH page

Key points about growth monitoring:

- Physical growth is one sign of health. However, it should be considered along with other factors that influence a child's overall health.
- Growth assessment is a screening tool. It is not diagnostic and should always be used in conjunction with other information.
- A child's growth pattern over time, based on a series of measurements, is more important than a single measurement. One-time measures only reflect a child's size at that time and do not provide enough information to assess growth.
 - For example, if measurements were last taken at an 18-month visit, given the time gap, any that are taken at a kindergarten health event serve as one-time measurements.
- Many parents/guardians are concerned about their children's growth. As well, growth charts tend to be poorly understood. This can translate into unnecessary and harmful changes to feeding practices, such as inappropriate supplementation, discontinuation of breastfeeding/chestfeeding, or non-responsive feeding (i.e. coercive or restrictive feeding).
- Health professionals have an important role to play in accurately assessing growth, reassuring families, providing [anticipatory guidance](#), and promoting responsive feeding and healthy feeding relationships.

Considerations related to feeding:

- Prior to suggesting investigations or changes to the diet, consider various factors that could be affecting growth (e.g. gestational age and size at birth; parental height; acute or chronic illness; recent stress or changes in child’s life; feeding relationship, nutrition, and [food security](#); physical activity and sleep).
- Anticipate differences in growth related to mode of feeding. After the first few months of life, infants who are not breastfed may show an upward shift in growth.
- Avoid the use of stigmatizing language (e.g., “underweight”, “skinny”, “picky”, “normal weight”, “overweight”, “obese”, “chubby”).
- To help prevent undue attention to child growth and unnecessary or harmful interventions, avoid language about growth patterns that may alarm parents and guardians.
- Regardless of a child’s growth pattern, health professionals should support a healthy feeding relationship, based on a [division of responsibility in feeding](#). This provides structure around feeding, allows the child to respond appropriately to their cues of appetite and satiety, and supports the child to growth in a way that is right for them.
 - See recommendations in [Common concerns from parents and guardian](#), which includes a few scenarios that relate to child’s size and food intake.

Resource for parents and guardians

- [Is my child growing well?](#) (Dietitians of Canada, available to order from NH Document Source “WHO Q&A”)

Reflux

Practice point

- Reflux is common in infants and does not generally require treatment or changes in feeding.

The following section focuses feeding guidance related to gastroesophageal reflux, which is common in healthy term infants. (6) Guidance regarding the management of gastroesophageal reflux disease (GERD), which is much less common (affecting about 1 in 300 infants), is outside the scope of this resource. (160) If there are concerns that an infant may be suffering from GERD, they should be referred to a physician or other primary care provider experienced in its diagnosis and management. (2)

Reflux can occur several times a day in healthy infants. (2) Regurgitation (“spitting up”) occurs daily in: (160)

- 50% of infants from birth to three months of age
- 67% of infants by four months of age
- 5% of infants by 10 to 12 months of age

Most infants with reflux have no complications and require no treatment; they can be managed conservatively with parental education and reassurance regarding the natural course of reflux in infants. (2) (160)

Breastfeeding and human milk

- Limited data suggests that breastfed infants do not differ in the frequency of reflux compared to infants receiving commercial infant formula. (161) Breastfed infants may have shorter duration of reflux episodes. (161) Symptoms of reflux in infants are rarely severe enough to warrant discontinuation of breastfeeding. (161) Breastfeeding and the provision of human milk should continue to be supported.
- If an allergy to cow milk is suspected, nursing parents can consider a short trial of a cow milk-free diet. Care should be taken to ensure that breastfeeding is not prematurely discontinued.
- This trial should be done with assistance from a registered dietitian, to ensure that all sources of cow milk protein are eliminated from the diet and are adequately substituted. This trial should be discontinued after one to two weeks if there is no observed benefit.
- See [Nutrition and dietitian services](#) (NH public webpage) or [Dietitian Services at HealthLink BC](#)

Human milk substitutes (Commercial infant formula)

- Evidence indicates that, for most infants, symptoms of reflux do not decrease with changes to feeding volumes or frequency, nor when there are changes from one cow milk-based formula to another or to soy-based formula. (161)
- Decreasing the volume or frequency of feedings: (161)
 - Is not generally recommended to treat reflux
 - Could compromise an infant's energy intake
 - May be beneficial if an infant is overfed, or fed large volumes of formula at infrequent intervals
- Thickened formula:
 - Results in a decrease in *visible* reflux, but do not decrease the *frequency* of reflux episodes (161)
 - Is associated with side-effects, such as increased coughing and diarrhea (161)
 - May result in a significant increase in the energy density of the feeds when thickeners are added to formula; this is not a concern with commercial anti-regurgitant formula (162)
 - Promotes weight gain in infants with recurrent vomiting and poor weight gain (161)
 - Requires further research to assess possible nutritional risks of long-term use (161)
- In infants who present with vomiting, reflux may be associated with cow milk protein allergy. In these cases, with infants who receive formula, a two-to-four-week trial of an extensively hydrolyzed formula may be beneficial. (161)

Vegetarian diets

Practice points

- Well-planned vegetarian diets are compatible with lactation and can support normal growth and development.
- The more restrictive the diet, the greater the risk of nutrient deficiencies. Vitamin B12 is a nutrient of concern in vegan diets.
- Recommend support from a registered dietitian if there are concerns regarding dietary adequacy.

The following section provides key dietary considerations to support clients who follow vegetarian diets during lactation and the early years. Some clients may benefit from detailed assessment and support from a dietitian or primary care provider.

Types of vegetarian diets

There are various types of vegetarian diets, including:

- **lacto-ovo-pesco:** includes dairy products, eggs, and fish; excludes meat and poultry (163)
- **lacto-ovo:** includes dairy products and eggs; excludes meat, poultry, and fish (163)
- **lacto:** includes dairy products; excludes meat, poultry, eggs, and fish (163)
- **ovo:** includes eggs; excludes other animal-based foods
- **vegan:** excludes all foods of animal origin, (163) including gelatin and honey.

Nutritional adequacy of vegetarian diets

- Well-planned vegetarian diets can be nutritionally adequate and have been shown to support normal growth and development of infants. With adequate diets, children fed vegan and vegetarian diets grow similarly to children fed more varied diets. (164)
- Nutritional considerations will vary by the type of vegetarian diet, and may include calcium, zinc, iron, vitamin D, and vitamin B12. The more restrictive the diet, the greater the risk of inadequate intake. (9) For example, inadequate vitamin B12 intake is a risk with vegan diets and can cause serious health consequences, especially for infants and young children. (24)
- Parents and guardians of children following a restrictive vegetarian diet or vegan diet may benefit from a consultation with a dietitian. (9) See [Nutrition and dietitian services](#) (NH public webpage) or [Dietitian Services at HealthLink BC](#)

Vegetarian diets and human milk

- Breast milk of parents who follow a vegetarian/vegan diet is similar in composition to that of those with varied diets and is nutritionally adequate. (38)
- During lactation, for all clients, recommend continued use of a multivitamin containing 0.4 mg of folic acid (e.g., a prenatal vitamin). (23)
- Intake of vitamin B12 influences the secretion of this nutrient in human milk. (164)
 - Parents following a vegetarian/vegan diet are encouraged to consume foods, beverages, fortified foods, and/or supplements that are reliable sources of vitamin B12 each day to prevent vitamin B12 deficiency in their infants.
 - With the introduction of complementary foods, an infant's intake of human milk begins to decrease. They will need to receive adequate vitamin B12 from foods, fortified foods and/or beverages, or supplements.
- Recommend a 400 IU liquid vitamin D supplement for all infants and toddlers who receive any amount of human milk, until they are two years old *and* are obtaining adequate vitamin D from their diets. (9) (2) See [Vitamin D](#) in Chapter 6: Key nutrients.

Vegetarian diets and human milk substitutes (Commercial infant formula)

- When families follow a diet that includes dairy, a cow milk-based formula is recommended for infants who are not exclusively receiving human milk and for whom continued formula use is anticipated. (9) This formula is recommended to 9-12 months.
- When families follow a vegan diet, a soy-based formula is recommended for children who are not exclusively receiving human milk. This formula is recommended to two years. (9) (164)
 - This is the only appropriate human milk substitute for children in families with a vegan diet, even though the form of vitamin D that is added to commercial infant formula is usually of animal origin (i.e., sheep's wool lanolin). (51) (165)
 - Soy-based commercial infant formula is considered safe. (166)
- Plant-based beverages (other than commercial soy-based formula), such as soy, almond, and rice beverages, are not recommended in the first two years of life as alternatives to human milk, commercial infant formula, and whole animal milk. (9) (78) See [Plant-based beverages](#) in Chapter 3: Animals milks and other beverages.

Key nutrients for vegetarian diets

The following table outlines possible key nutrients to consider with vegetarian diets and identifies some food sources of these nutrients. This is a guide only. A thorough assessment by a dietitian and tailored guidance may help to support nutritional adequacy.

Nutrient	Dietary sources	Comments
Energy (Calories)	Offer a variety of foods, and high fat foods such as: <ul style="list-style-type: none"> • Eggs, fish, shellfish • Yogurt, cheese • Whole (3.25% M.F.) cow milk (after 9 to 12 months) • Avocado • Nut and seed butters 	Inadequate energy intake may be a concern if the diet contains too much fibre or includes beverages such as soy, rice, and other beverages, which are inappropriate substitutes to human milk, commercial formula, and cow milk. (2) (38)
Protein	<ul style="list-style-type: none"> • Eggs, fish, shellfish • Yogurt, cheese • Cow milk (after 9 to 12 months) • Fortified soy beverages (after two years) • Beans, chickpeas, lentils, tofu • Meat analogues (“veggie meats”) • Nut and seed butters (modified to address choking hazard for young children) 	
Omega-3 fatty acids	<ul style="list-style-type: none"> • Omega-3 eggs, fatty fish • Tofu, soybeans • Canola, soybean, and flaxseed oils • Hempseed and flaxseed • Walnuts (modified to address choking hazard for young children) 	While some vegetarian diets may provide little EPA and DHA, more research is needed before recommendations can be made regarding supplements. (164) See Omega-3 fats (Dietitians of Canada) See Dietary fats in Chapter 6: Key nutrients.

Nutrient	Dietary sources	Comments
Iron	<ul style="list-style-type: none"> • Eggs, fish • Iron-fortified cereals • Fortified soy beverages (after two years) • Beans, chickpeas, lentils, tofu • Blackstrap molasses 	<p>Vitamin C rich foods eaten at the same time as iron-containing foods can increase iron absorption. Many fruits and vegetables are sources of vitamin C. (106)</p> <p>See Iron in foods (HealthLink BC)</p> <p>See Iron in Chapter 6: Key nutrients</p>
Calcium	<ul style="list-style-type: none"> • Cheese, yogurt • Cow milk (after 9 to 12 months) • Tofu made with calcium • Fortified soy beverages (after two years) • Almond and sesame butter (modified to address choking hazard for young children) • Blackstrap molasses • Oranges 	<p>Check labels of fortified products for calcium content. (167)</p> <p>See Calcium and your health (HealthLink BC)</p> <p>See Calcium in Chapter 6: Key nutrients</p>
Zinc	<ul style="list-style-type: none"> • Eggs, oysters, crab, lobster • Milk, yogurt, cheese • Cow milk (after 9 to 12 months) • Beans, chickpeas, lentils • Tofu • Whole grains, fortified cereals • Nut and seed butters (modified to address choking hazard for young children) 	<p>For more information, see Zinc (National Institutes of Health). (168)</p>

Nutrient	Dietary sources	Comments
Vitamin B12	<ul style="list-style-type: none"> • Eggs, fish, clams • Yogurt, cheese • Cow milk (after 9 to 12 months) • Fortified meat analogues (“veggie meats”) • Fortified soy beverages (after two years) • Fortified cereals • Fortified nutritional yeast 	<p>This is a nutrient of concern for vegan diets. (164) The use of fortified food or beverages, or supplements, is likely required.</p> <p>Seaweeds and fermented plant foods are generally not good sources of vitamin B12. (167)</p> <p>For more information, see Vitamin B12 (National Institutes of Health). (169)</p>
Vitamin D	<ul style="list-style-type: none"> • Eggs, fatty fish • Margarine • Cow milk (after 9 to 12 months) • Fortified soy beverages (after two years) 	<p>There are few foods that naturally contain vitamin D. Fortified foods or supplements may be required.</p> <p>See Vitamin D and your health (HealthLink BC)</p> <p>See Vitamin D in Chapter 6: Key nutrients.</p>

Resources for parents and guardians

- [Nutrition and dietitian services](#) (NH public webpage)
- [Dietitian Services at HealthLink BC](#) (NH Document Source #1997)
- [Healthy eating guidelines for your vegetarian baby: 6-12 months](#) (HealthLink BC)
- [Healthy eating guidelines for your vegetarian toddler: 1-3 years](#) (HealthLink BC)
- “Vegetarian and Vegan Toddlers” in [Toddler’s first steps](#) (Province of BC)

6. Key nutrients

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Calcium

Practice points

- Human milk is the optimal source of nourishment for infants and is the preferred sole nutritional source of calcium for infants during the first six months of age.
- Commercial infant formula contains adequate calcium for infants from birth to 12 months of age.
- After 12 months of age, for toddlers who no longer receive human milk or commercial infant formula, 2 cups (500 mL) of fluid cow milk daily will help meet calcium requirements.

Calcium

- Calcium is important for bone health and numerous metabolic functions. (170)
- Calcium is the most abundant mineral in the body, with over 99% of the body's calcium stored in the bones and teeth, where it supports their structure. (171)
- Bone undergoes continuous remodeling, with constant resorption and deposition of calcium into new bone. In infants and children, bone formation exceeds resorption. (170)

Calcium requirements

The following table outlines the recommended dietary allowances (RDA) or adequate intake (AI) levels* of calcium per day for various age groups. (171) The tolerable upper intake levels (UL) are also included.

Age group	Recommended Dietary Allowance (RDA) or Adequate Intake* (AI) per day	Tolerable Upper Intake Level (UL) per day
Infants 0-6 months	200 mg*	1000 mg
Infants 7-12 months	260 mg*	1500 mg
Children 1-3 years	700 mg	2500 mg

There are no additional benefits to consuming calcium above the RDA, and intakes should stay below the UL to avoid possible adverse effects, such as kidney stones. (171)

Meeting calcium requirements

Age	Recommendations	Comments
0 to 6 months	Recommend exclusive breastfeeding, and provision of human milk, with appropriate vitamin D supplementation. (2)	Calcium levels in human milk, which are generally not influenced by maternal diet, meet the requirements of infants. (172)
	If an infant is not exclusively receiving human milk, recommend a commercial infant formula until 9-12 months. (2)	Commercial infant formula provides adequate calcium to 12 months. Specialized formula, such as hydrolysate, lactose-free, and soy formula, contain a higher calcium level to compensate for decreased calcium bioavailability. (38)
6 to 12 months	Recommend continued breastfeeding and provision of human milk, with appropriate vitamin D supplementation. Offer a variety of foods (may include yogurt, cheese). (9)	Delay cow milk until infants are 9 to 12 months <u>and</u> are consuming a variety of iron-rich foods. (9)
	If using formula, recommend formula until 9-12 months. (9)	
12 to 24 months	Recommend continued breastfeeding and provision of human milk, with appropriate vitamin D supplementation. For children no longer receiving human milk, recommend 2 cups (500 mL) (max 3 cups (750 mL)) of whole cow milk daily, along with a variety of family foods. (9)	Plant-based beverages are not recommended at this age. They may be fortified with calcium but may be deficient in energy and other nutrients. (78) See Chapter 3: Animal milks and other beverages , and Vegetarian diets in Chapter 5: Topics of interest.
	For the few children who continue to use commercial formula after 12 months, recommend a follow-up formula to help meet increased calcium needs. (54) Recommend 2 cups (500 mL) daily.	

Resource for parents and guardians

- [Calcium and your health](#) (HealthLink BC)

Dietary fats

Practice points

- Dietary fat restriction is not recommended under two years of age.
- Evidence is inconclusive on the benefits of adding DHA and ARA to commercial infant formula for healthy term infants. However, there are potential benefits and no apparent risks.
- Recommend that people who are pregnant and lactating, older infants, and children regularly consume foods containing essential fatty acids.

Dietary fat

- The first years of life are a time when energy needs are particularly high. Fat restriction may compromise intake of energy and essential fats, and can adversely affect growth and development, (9) including brain development.
- Between 12 months and 24 months, children who are no longer receiving human milk should be offered whole (3.25% M.F.) cow milk. Lower fat milks are generally not recommended. Skim milk and plant-based beverages (e.g., soy “milk”) are not recommended as a main beverage before two years of age. (9) (See [Chapter 3: Animal milks and other beverages.](#))

Essential fatty acids

- Essential fatty acids include the omega-6 fatty acid linoleic acid (LA) and the omega-3 fatty acid alpha-linolenic acid (ALA), which are precursors for the long chain polyunsaturated fatty acids arachidonic acid (ARA), docosahexaenoic acid (DHA), and eicosapentaenoic acid (EPA). (2)
- Essential fatty acids are important for normal growth and development and have a role in the development of the nervous and visual systems. (27)
- Essential fatty acids cannot be made in the body; dietary sources are required.
- There are dietary reference intakes for LA and ALA, but optimal levels of EPA and DHA have not been established for infants and young children. (9) (173)

Essential fatty acids in human milk

- Human milk contains more than 100 fatty acids, as well as the lipases to convert the fatty acids to useable forms (which formula lack). (38) Many essential fatty acids, including EPA and DHA, are found in varying levels in human milk. (2) (49) Breastfeeding and provision of expressed breast milk should be supported where possible.

- There is inconsistent evidence for a benefit of supplementation with EPA and/or DHA during lactation on neurodevelopment, visual function, or allergy prevention in children. (174) (117)
- As with other adults, sources of essential fatty acids are recommended in the diets of people who are pregnant and lactating. Recommend at least 150 grams (5 ounces) per week of, preferably fatty, fish (e.g., about two small portions) for all adults. (121)

Essential fatty acids in commercial infant formula

- Commercial infant formula is required to contain both linoleic acid and alpha-linolenic acid. There are questions about infants' ability to convert these precursors to ARA and DHA. (2)
- It is not mandatory in Canada for manufacturers to add ARA and DHA to formula. (2) DHA and ARA are permitted as optional ingredients and formula with these ingredients are commonly available. In these cases, the DHA and ARA are sourced from algal and fungal oils. (2)
- Evidence is inconclusive on the benefits of adding DHA and ARA to formula for healthy term infants. (49) (175) Expert opinion acknowledges potential benefits on visual and neurodevelopmental outcomes, and the lack of adverse effects noted to date. (49) (175) Concerns may include potential increased costs and limited product availability. (175)

Dietary sources of essential fatty acids

- Essential fatty acids are found in fish, walnuts, soybeans, tofu, ground flax seed, omega-3 enriched eggs, and canola, flaxseed, and soybean oil. (27)
- Sources of EPA and DHA include fatty fish such as anchovies, mackerel, herring, salmon, sardines, cod, halibut, tuna, and trout. (176)
- For people who are pregnant and lactating, as with other adults, recommend at least 150 grams (5 ounces) per week of, preferably fatty, fish (e.g., two small portions). (121)
- Recommend offering fatty fish when solids are introduced at about six months, and work towards *offering* two portions per week by 24 months of age. (9)
- Recommend limiting or avoiding fish high that is high in mercury. (9)

Resources for parents and guardians

- [Omega-3 fats](#) (Dietitians of Canada)
- [Mercury in fish](#) (HealthLink BC)

Iron

Practice points

- Recommend exclusive breastfeeding for the first six months of life, with continued breastfeeding for up to two years of age and beyond.
- For infants who are not exclusively receiving human milk, recommend a commercial infant formula. All commercial infant formulas contain iron, although fortification levels vary.
- Recommend offering iron-rich foods two or more times per day starting at about six months of age.
- Recommend delaying the introduction of animal milk until 9 to 12 months and offering no more than 3 cups (750 mL) per day.
- Iron deficiency in infancy and childhood is a significant issue; the promotion of the preceding guidelines supports adequate intake of iron.

Iron

- Iron is a mineral that is critical to growth and development, including brain development. (2) It is an essential element of hemoglobin and myoglobin, and is involved in normal cellular function, as well as hormone and connective tissue synthesis. (177)
- In the diet, iron exists in two forms:
 - **Heme iron** is present in meat, fish, and poultry, and is well absorbed.
 - **Non-heme iron** is found in eggs and in plant foods, such as beans, chickpeas, lentils, tofu, nuts, and seeds, and is not as well absorbed as heme iron. (106)

Iron requirements

The following table outlines the recommended dietary allowances or adequate intake levels* of iron per day for various age groups. (173) The tolerable upper intake levels are also included.

Age group	Recommended Dietary Allowance (RDA) or Adequate Intake* (AI) per day	Tolerable Upper Intake Level (UL) per day
0 to 6 months	0.27 mg*	40 mg
7 to 12 months	11 mg	40 mg
1 to 3 years	7 mg	40 mg

Iron deficiency

- Young children are a high-risk group for iron-deficiency, due to depletion of iron stores at about six months, and increased growth and iron needs. (9) (178) (179)
- Iron deficiencies in infancy and early childhood may have serious and irreversible effects, such as motor and cognitive deficits. (2) (178) (179)
- The prevalence of iron deficiency in young Canadian children is unknown, although is influenced by the determinants of health, such as income. Older reports of iron deficiency anemia in privileged infants and toddlers were 4.3%, whereas rates in marginalized communities may be up to 10 times higher. (178)
- Risk factors for iron deficiency before two years of age include:
 - Low socioeconomic status, poverty, food insecurity (178)
 - Infants born to gestational parents with anemia or perinatal bleeding (2) (179)
 - Preterm birth or birth weight less than 2500 g (178) (179)
 - Early umbilical cord clamping (178)
 - Use of homemade infant formula (2) (180)
 - Exclusive breastfeeding past six months (178)
 - Early introduction to animal milk (i.e., before 9-12 months of age) (9) (2) (179)
 - High intake of animal milk (>750 mL per day) (9) (178) (179)
 - Prolonged bottle use (past 12-15 months) (178) (179)
 - Low intake of iron-rich foods (2) (178)
- Symptoms may not appear until a deficiency is severe and include:
 - Poor feeding/appetite, pica/pacophagia (9) (179)
 - Irritability, depression (9) (179)
 - Tiredness/lethargy, inattention, restless legs (179)
 - Failure to thrive; growth retardation (179)
 - Attention-deficit/hyperactivity disorder (179)
 - Iron-deficiency anemia (9)
 - Cardiomegaly; tachypnea (179)
 - Developmental delay; unexplained cognitive and intellectual impairment (179)
- Neither universal screening nor routine iron supplementation are required for healthy term infants without risk factors for iron deficiency anemia. (178)
- Screening is advised for infants and children at risk of deficiency. (9) (2) (180)
- Iron supplements should be used under the direction of a physician. (106)

Meeting iron requirements

Age	Recommendation	Comments
0 to 6 months	Recommend exclusive breastfeeding and provision of human milk. (2) (180)	<p>Most healthy term infants have sufficient iron stores to meet their needs through the first six months. (2)</p> <p>The iron content of human milk is low, about 0.3 mg/L, but its bioavailability is high at 50 to 70% (compared to about 10% bioavailability in commercial infant formula). (49)</p> <p>Maternal iron deficiency has little effect on the iron content of human milk. (181)</p>
	For infants that are not exclusively consuming human milk, recommend a commercial infant formula. (2) (180)	<p>Commercial infant formula is fortified with iron and contain from 6.5 to 13 mg/L of iron. (51)</p> <p>Infants who are fed with formula who are at risk of iron deficiency may need formula with iron levels at the higher end of this range. (2) This formula is well tolerated. (49)</p>
6 months	<p>Recommend introducing iron-rich solid foods at about six months to help meet iron requirements. (180)</p> <p>At this age, human milk will still be the main source of nutrition. (2)</p>	<p>At about six months of age, iron stores are depleted and, in addition to human milk, food sources of iron are required to meet increased needs. (2)</p>
6 to 9 months	<p>Recommend offering iron-rich foods two or more times per day. (9)</p> <p>Recommend continued breastfeeding and provision of human milk.</p> <p>For infants fed with formula, recommended continued infant formula use until 9 – 12 months. (9)</p>	<p>See Dietary sources of iron for more information on iron-rich foods.</p>

Age	Recommendation	Comments
9 to 12 months	<p>Recommend offering iron-rich foods two or more times per day. (9)</p> <p>Recommend continued breastfeeding and provision of human milk.</p>	<p>See Dietary sources of iron (next page) for more information on iron-rich foods.</p>
	<p>Recommend delaying the introduction of cow milk until infants are 9 to 12 months of age <i>and</i> are consuming a variety of iron-rich foods. (9) (180)</p> <p>If a formula-fed infant is not regularly consuming iron-rich foods, it may be prudent to continue infant formula use, and delay the transition to cow milk, until closer to 12 months. (9)</p>	<p>Cow milk is low in iron, can displace intake of human milk and iron-rich foods, and can inhibit iron absorption.</p> <p>Once the older infant is eating a variety of iron-rich foods, the introduction of cow milk is not associated with iron deficiency. (9)</p>
12 months and older	<p>Recommend offering iron-rich foods with each meal. (9)</p> <p>Recommend continued breastfeeding and provision of human milk.</p>	<p>See Dietary sources of iron (next page) for more information on iron-rich foods.</p>
	<p>For children that are no longer receiving human milk, recommend offering about 2 cups (500 mL) of whole cow milk daily. Intake should not exceed 3 cups (750 mL) per day. (9)</p> <p>Recommend the use of an open cup. (9)</p>	<p>Cow milk intake can displace the intake of nutrients from other foods, and excessive cow milk intake is the most common risk factor for severe anemia in young children. (9)</p>

Dietary sources of iron

Heme iron sources (Higher bioavailability)	Non-heme iron sources (Lower bioavailability)
<ul style="list-style-type: none"> • Meat, (2) such as beef, moose, deer, caribou, elk, pork, lamb, veal • Poultry, (2) such as chicken, turkey, wild birds • Fish*, such as tuna, herring, trout, mackerel, and salmon (182) • Shellfish, such as oysters, mussels, clams, shrimp (182) <p>*Recommend limiting or avoiding fish high in mercury. (9)</p>	<ul style="list-style-type: none"> • Iron-fortified grains (e.g., cereals) (9) • Eggs (9) • Legumes (beans, lentils, chickpeas) (9) • Tofu (9) • Peanut, tree nut, and seed butters (6) <p>The absorption of non-heme iron is enhanced when combined with sources of vitamin C (found in many fruits and vegetables) and/or with heme-iron sources. (183)</p>

For more information on the introduction of solids, see [Chapter 4: Feeding by age](#).

For more information on the diagnosis and management of iron deficiency, see BC Guideline: [Iron deficiency – Diagnosis and management](#).

Resources for parents and guardians

- [Iron-rich foods for baby](#) (includes sample meal plans) (NH Document Source #10-421-6023)
- [Iron and your health](#) (HealthLink BC)
- [Iron in foods](#) (HealthLink BC)
- [Mercury in fish](#) (HealthLink BC)

Vitamin D

Practice points

- Recommend that infants and toddlers who receive any amount of human milk be given a daily liquid vitamin D supplement of 400 IU (10 mcg).
- Infants who receive only commercial infant formula, and who were born to gestational parents with adequate vitamin D status, do not generally require a vitamin D supplement.
- As a clinical decision, health professionals may recommend higher intakes of vitamin D to address suspected or known deficiency.
- A daily supplement of 400 IU (10 mcg) is unlikely to result in excessive vitamin D intake.

Vitamin D

- Vitamin D is a fat-soluble vitamin and pro-hormone essential for building and maintaining strong bones and teeth. (9) It has numerous other roles in the body, such as in cell growth, neuromuscular function, and immune function. (184)
- Vitamin D can be obtained from three sources: foods, supplements, and endogenous synthesis (i.e., by exposing bare skin to the sun). (58)

Vitamin D requirements

The following table outlines the recommended dietary allowances (RDA), or adequate intake levels (AI), and upper intake levels (UL) of vitamin D for various age groups. These recommendations are based on minimal sun exposure. (173)

Age group	Recommended dietary allowance (RDA) or Adequate intake* (AI) per day	Tolerable upper intake level (UL) per day
Infants 0 to 6 months	400 IU (10 mcg) *	1000 IU (25 mcg)
Infants 7 to 12 months	400 IU (10 mcg) *	1500 IU (38 mcg)
Children 1 to 3 years	600 IU (15 mcg)	2500 IU (63 mcg)

Excessive intake is not a concern with a 400 International Units (IU) (10 mcg) vitamin D supplement. Even with multiple sources of vitamin D (i.e., a 400 IU (10 mcg) supplement taken in combination with commercial infant formula, cow milk, and/or other dietary sources) older infants and children are unlikely to exceed the ULs. (2)

Vitamin D deficiency

Cases of vitamin D deficiency still occur in Canada and can lead to rickets. (2) Risk of vitamin D deficiency is higher in infants who are:

- Born premature (185)
- Born to birthing parents with low vitamin D stores; risk factors include: (58)
 - Latitude (i.e., northern regions) and season (i.e., winter)
 - Darker skin tone, and covering skin with clothing when outdoors
 - Not supplementing with vitamin D
- Receiving human milk but who are not supplemented with vitamin D or who are only occasionally supplemented with vitamin D (9)

Rationale to supplement children receiving human milk

- Sunlight is the primary source of vitamin D for humans, but sun safety practices prevent adequate vitamin D production. (2) At all Canadian latitudes, there is also insufficient ultraviolet radiation from the sun to support adequate vitamin D production in the skin for a large portion of the year (i.e., October to March). (97)
- Human milk is the optimal food to support growth and development in infants. However, human milk is generally not a significant source of vitamin D. (38)
- Daily supplementation of vitamin D to breastfed infants has been recommended in Canada since 1967 and has been shown to be an effective preventive measure against rickets. (2)
- As per 2017-2018 Canadian Community Health Survey, 90.5% of breastfed infants in BC were given vitamin D supplements. (14)
- The recommendation to supplement all infants who receiving human milk, including those who receive a combination of human milk and formula, is a conservative approach to achieving adequate vitamin D intakes, and offers a consistent public health message. (9)

Maternal vitamin D supplementation

- Research has shown that the effects of maternal vitamin D supplementation on the vitamin D content of human milk are dose dependent:
- Maternal intake of a daily multivitamin, which typically provides between 200 and 800 IU (5 and 20 mcg) of vitamin D, is not likely to raise breast milk vitamin D levels enough to meet infants' needs. (2)
- Maternal vitamin D supplementation of 2400 IU (60 mcg) per day, without direct infant supplementation, results in deficient serum levels in infants. (186)
- Maternal supplementation of high doses of vitamin D (i.e., 6400 IU (160 mcg) per day) has been shown to raise serum levels of breastfed infants to similar levels as with direct infant supplementation of 400 IU (10 mcg) per day. Some

researchers have proposed this as an alternate strategy to direct infant supplementation. (186) However:

- More research has been recommended. (2) (58)
- 6400 IU (160 mcg) per day is above the recommended tolerable upper intake level (UL) for adults, which is set at 4000 IU (100 mcg), above which there may be concerns of possible adverse effects. (171)
- Data is lacking as to whether families can more easily adhere to daily maternal supplementation versus infant supplementation. (187)
- With the introduction of complementary foods, human milk (and the vitamin D made available through this source) starts to decrease.

BC guidance regarding vitamin D supplementation

The following table summarizes BC vitamin D supplementation guidance.

Age and feeding method	Supplement?	BC Guidance
Receiving any amount of human milk 0 to 24 months	Yes	<p>“Recommend a daily 400 IU (10 mcg) liquid vitamin D supplement for all infants or children younger than 2 years who are breastfed or fed some human milk until diet includes \geq400 IU per day of vitamin D from dietary sources.” (6) (58)</p> <p>“Health professionals may recommend higher doses of vitamin D for individual infants to address known or suspected insufficiency/ deficiency as a clinical decision.” (58)</p>
Not receiving human milk. Receiving commercial infant formula 0 to 12 months	Generally not required (6)	<p>“Healthy, term infants fed commercial infant formula only, and who were born to mothers with adequate vitamin D status during pregnancy, do not need a liquid vitamin D supplement.... if the mother’s vitamin D status during pregnancy was suspected to be insufficient/deficient, consider a daily liquid vitamin D supplement of 400 IU (10 μg) until the infant is consuming 800 - 1000 mL of commercial infant formula daily.” (58)</p>
Not receiving human milk 12 to 24 months	Need is determined by dietary assessment	<p>“Recommend a daily 400 IU (10 mcg) liquid vitamin D supplement if intake of cow milk (or fortified goat milk) and other vitamin D rich foods is not sufficient.” (6)</p>

Age and feeding method	Supplement?	BC Guidance
2 to 6 years	Need is determined by dietary assessment	Recommend a daily vitamin D supplement of 400 IU (10mcg) if intake of vitamin D rich foods is not sufficient to meet vitamin D needs (600 IU or 15 mcg). (6)

Vitamin D supplementation recommendations

Dosage

- Recommend a daily 400 IU (10 mcg) supplement for children under two years of age who receive any amount of human milk. (9)
- A supplement may also be indicated for children who do not meet recommended dietary intakes for vitamin D. (6)
- Health professionals may recommend higher total intakes of vitamin D for children with known or suspected insufficiency/deficiency (see [Vitamin D deficiency](#) earlier in this section), which may include supplementing infants consuming only commercial infant formula. (58) Encourage parents and guardians to follow the advice of their healthcare provider.

Format

- For infants and toddlers, recommend vitamin D:
 - in liquid form (2) (6)
 - as a sole nutrient (i.e., not with other nutrients, such as in a multivitamin) (2)
 - as vitamin D3, due to superior absorption, unless a plant-based source (i.e., vitamin D2) is desired. (2) (187)
- Encourage parents and guardians to obtain a pediatric product that provides 400 IU (10 mcg) per dose (i.e., not higher adult doses such as 1000 IU (25 mcg)). (2)
- There are various product formats (i.e., 400 IU (10 mcg) per drop, per 0.25 mL, or per 1 mL). (58). Advise to follow product instructions for proper dosing.
- Many products are available, and costs and ingredients vary. Parents and guardians who are concerned about ingredients may prefer one drop formulations, where vitamin D is in oil (with vitamin E to protect the oil).

Access

- Vitamin D supplements are available in pharmacies and in grocery stores. (2)
- Offer support to groups who are at risk of not providing supplements. (2)

- Pregnancy outreach programs and parenting support programs may support access to vitamin D supplements. (58)
- Eligible clients FNHA [benefits program](#) can obtain coverage for vitamin D supplements with a prescription. (188)

Dietary sources of vitamin D

- Few foods are natural sources of vitamin D (i.e., fatty fish, egg). (189)
- A few foods are routinely fortified with vitamin D, such as cow milk (store-bought) and margarine. (189)
- Yogurt, cheese, and milk obtained from non-commercial sources, and plant-based beverages, are not consistently fortified with vitamin D. (82) (58)
- Health Canada is implementing a strategy to expand vitamin D fortification, including a doubling of mandatory fortification levels of margarine, cow milk, and goat milk, and optional fortification of plant-based beverages and yogurt. (190) Manufacturers have until the end of 2025 to implement these changes.
- The table below depicts vitamin D content of common foods. (58) (191) Note: Some brands of fortified products may already contain higher levels of vitamin D.

Food	Serving size	Amount of Vitamin D
Cow milk and goat milk	250 mL (1 cup)	100 IU (2.5 mcg)
Fortified plant-based	250 mL (1 cup)	100 IU (2.5 mcg)
Salmon	75 g (2.5 oz)	218 – 571 IU (5.5 – 12.3 mcg)
Rainbow trout	75 g (2.5 oz)	192 – 208 IU (5.1 – 5.2 mcg)
Sardines	75 g (2.5 oz)	70 – 145 IU (1.8 – 3.6 mcg)
Mackerel	75 g (2.5 oz)	78 – 343 IU (2 – 8.6 mcg)
Tuna	75 g (2.5 oz)	36 – 219 IU (0.9 – 5.5 mcg)
Herring	75 g (2.5 oz)	65 – 161 IU (1.6 – 4 mcg)
Egg (yolk)	1 egg	32 IU (0.8 mcg)
Margarine	5 mL (1 tsp)	25 IU (0.6 mcg)
Fortified orange juice	125 mL (1/2 cup)	50 IU (1.2 mcg)

Resources for parents and guardians

- [Vitamin D for breastfed infants and toddlers in Northern BC](#) (NH Document Source #10-421-6020)
- [Vitamin D for children in Northern BC](#) (NH Document Source #10-421-6028)
- [Vitamin D and your health](#) (HealthLink BC)

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