

Nutrition for Lactation

Applicable to: Health Professionals

Summary of Key Recommendations

Care providers shall utilize patient- and family-centred care to be responsive to the individual context, self-identified gender, pronouns, and preferred terminology of the families they support. Individuals should be encouraged to use whichever terms for milk and feeding with which they identify.

People who are lactating (this also includes breastfeeding and chestfeeding) are encouraged to:

- Follow a healthy eating pattern such as outlined in Canada's food guide.
- Consume an additional 350–400 calories/day of foods from Canada's food guide.
- Drink to thirst to meet the increased fluid needs. Aim for a fluid intake from all sources of 12 cups (3.1 L) every day.
- Take a daily multivitamin and mineral supplement containing 0.4 mg (400 mcg) folic acid, 400 international units (international units) vitamin D, and vitamin B₁₂.
- Consume at least 150 g (5 oz) fatty fish that are low in mercury each week.
- Avoid alcohol as the safest option.
- Limit caffeine intake to 300 mg/day.
- Only consume herbal products that are considered safe during lactation.
- Consider that no special diet is recommended during lactation to prevent a food allergy or colic in an infant.

Introduction

The purpose of the Nutrition for Lactation Nutrition Guideline is to provide care providers with an overview of the evidence-based nutrition recommendations for individuals who are breastfeeding, chestfeeding, body feeding, or human milk feeding and provide answers to commonly asked questions (See [Key Questions List](#)).

Alberta Health Services is committed to the protection, promotion, and support for breastfeeding¹ within a patient-and family-centred care approach. Breastfeeding is the normal and unequalled method of feeding infants.² Exclusive breastfeeding for the first six months, and continued for up to two years or longer, is recommended for the healthy growth and development of infants and toddlers² and the benefits to the individual who is lactating.³



Nutrition Guideline

Nutrition for Lactation

As a strategy to support and encourage breastfeeding, this guideline provides information on:

- dietary considerations for the individual who is lactating
- common diet-related questions for the parents of the infant

The focus of this information is to:

- support care providers in assisting individuals in achieving a nutritionally adequate diet while lactating to meet the increased nutrient requirements of lactation and to optimize the health benefits for healthy, term infants.

This guideline **does not** cover information specific to:

- preterm infants (which is defined as less than 37 weeks 0 days gestation)⁴
- individuals who are lactating with specific health conditions (e.g. diabetes)

The Nutrition Guideline was developed by the Nutrition Services Public Health Provincial Target Population Reproductive Health Working Group and is based on scientific evidence and best practice. It was reviewed by health professionals across the province. If you have questions about this Nutrition Guideline, please contact publichealth.nutrition@ahs.ca.

This information is intended as a general resource only and is not meant to replace the medical counsel of a primary care provider or individual consultation with a registered dietitian (RD). It is the responsibility of care providers to evaluate the situation of each person in their care and apply the Nutrition Guideline appropriately. Individuals who are at high risk of malnutrition or who have a medical condition that is impacted by nutrition should be referred to an RD.

Referral to a Registered Dietitian

For more information on referral to an RD and RD services available in Alberta Health Services (AHS):

- See also: [Referral to a registered dietitian \(RD\)](#)
- Visit [Referring Patients for Nutrition Services](#)

Note: For purposes of this Nutrition Guideline, the single term patient will be used to refer to clients, patients, and residents.

Inclusive Language¹

Some individuals who lactate may not identify as mothers or women, but as parents, fathers, men, non-binary, or gender diverse.¹ These individuals may not identify with the terms breast, breastmilk, and breastfeeding, and may instead identify with terms such as chest, chestmilk, human milk, chestfeeding, or body feeding.¹ In all circumstances, care providers shall utilize patient-and family-centred care to be responsive to the self-identified gender, pronouns, and terminology of the families they support.¹

Nutrition Guideline

Nutrition for Lactation

The language used within this Nutrition Guideline is based on the Academy of Breastfeeding Medicine Position Statement,⁵ the Academy of Breastfeeding Medicine Protocol #33,⁶ AHS Best Practices,⁷ and aligns with the AHS Breastfeeding Policy¹ and the AHS 20-Hour Breastfeeding Course. A variety of terms are used for accuracy and clarity.

- non-gendered terms (e.g., parent, individual) are used, when possible, to be inclusive.
- gendered terms (e.g., mother, woman) used in the original source being cited, are noted throughout by “^α”, and replaced with inclusive language. This notation acknowledges that the unique nutritional needs of transgender, gender-diverse, and intersex people are not represented in this research.
- breastfeeding, chestfeeding, and human milk feeding are included under the term “breastfeeding”.
- human milk is used when referring to donor milk, human milk oligosaccharides (HMOs), or when discussing human milk nutrient composition. The use of the term breastmilk in the original source being cited is noted throughout by “^β”.

Definitions

Chest: The part of the body located between the neck and abdomen, enclosed by the ribs, sternum, and spine (chest wall).⁸

Breast: The breast is a glandular organ overlaying the chest.⁹ During puberty, the female sex hormones cause the breast tissue to differentiate, leading to the development and growth of glandular tissue, first during puberty and furthered with each menstrual cycle, with complete development of glandular tissue not occurring until pregnancy.¹⁰ Milk is produced from the glandular tissue located in the breast.

Breastfeeding: “The act of feeding and nurturing one’s own children at the breast, and thus to some implies a physical and/or emotional connection between the dyad.”⁵

Chestfeeding: “Is used to refer to transmasculine or gender non-conforming individuals and the act of feeding a baby or child at the chest with or without a supplementing tube.”¹¹

Bodyfeeding: The act of feeding a baby or child directly from the body.

Lactation: The production and secretion of milk from the glandular tissue in the breast – “does not require any physical or emotional connection between the dyad.”⁵

Nutrition Guideline

Nutrition for Lactation

Key Questions List

Key nutrition questions related to lactation and breastfeeding addressed in this Nutrition Guideline are listed below.

Healthy Eating during Lactation and Breastfeeding

- Are energy and nutrient needs greater?
- How much fluid is needed?
- What advice can be given about nutrition supplement drinks?

Foods and Beverages to Limit or Avoid

- What is considered a safe intake of caffeine?
- Is alcohol safe to consume?
- Are fish and shellfish safe to eat?
- What about the use of natural health products, herbal teas, and herbs?
- Are sugar substitutes safe?
- Are probiotics safe?

Situations when Extra Energy and Nutrients may be Needed

- What are the nutrition recommendations for individuals with high energy demands?
- What are the extra considerations for adolescents (age under 18 years)?
- Are there any extra considerations for vegan eating patterns?

Weight Loss during Lactation and Breastfeeding

- What are the energy requirements for lactation and how does this relate to healthy postpartum weight loss?
- What is the effect of postpartum weight loss on milk production?

Diet Quality and Composition of Human Milk

- How is the composition of human milk influenced by the diet quality of the individual who is lactating?
 - Macronutrients
 - Micronutrients
- Does intake of docosahexaenoic acid (DHA) affect the DHA composition of human milk?
- What influences the flavour of human milk?

Food and Beverage Influences on Milk Production

- Do extra fluids increase milk production?
- What are galactagogues and can they be safely recommended to increase milk production?

Nutrition Guideline

Nutrition for Lactation

Food Safety Considerations

- What advice can be given about susceptibility to foodborne illness?
- Can human milk cause foodborne illness in the infant?

Health Considerations for the Parent

- What advice can be given about constipation?
- What advice can be given about iron deficiency anemia?
- What advice can be given about candidiasis/thrush?

Common Questions about Human Milk and Infant Conditions

- What should a parent do if they suspect their infant has food allergy symptoms?
- Are there foods recommended to eat or restrict during lactation to prevent allergies in the infant?
- What advice can be given about infant colic and the diet of the individual who is lactating?
- What advice can be given about infant gas and the foods eaten by the individual who is lactating?

Other Special Considerations

- Are there special considerations when working with individuals with culturally diverse backgrounds (e.g., Indigenous peoples, immigrants, and refugees)?
- What is known about the impact of religious fasting on human milk composition?
- What are other important considerations when working with any individual?

Referral to a Registered Dietitian

- When is a referral to a registered dietitian (RD) recommended?

Resources

- What resources are available for professionals?
- What resources are available for the public?

Answers to Key Questions

Healthy Eating during Lactation and Breastfeeding

Return to [Key Questions List](#)

Are energy and nutrient needs greater?

Yes. Total caloric, protein, and carbohydrate needs, as well as requirements for vitamins and minerals including vitamin A, vitamin C, vitamin E, B vitamins, and zinc, are greater with lactation.^{12–14} To meet the energy requirements of lactation, an additional 350–400 calories/day is recommended during the first year.^{12,15–17}

Iron requirements are lower during lactation due to the absence of menstruation.¹⁸ However, iron needs increase with the resumption of menstruation¹⁸ and some individuals who are lactating may need higher amounts of iron based on individual needs assessment (e.g. anemia).¹⁵

To meet these increased energy and nutrient needs, advise individuals to:

- Follow Canada’s food guide
- Include additional foods from Canada’s food guide to meet increased energy requirements
- Provide practical examples of snacks or additions to meals that are 350–400 calories, such as:
 - ¾ cup (30 g) whole grain cold cereal with 1 cup (250 mL) 1% milk and a medium pear
 - 1 small pita with 1.5 oz (50 g) of cheese, 3 oz (75 g) of chicken
 - 1 small apple, ¼ cup (60 mL) almonds, and ¾ cup (175 mL) yogurt
- Take a daily multivitamin/mineral supplement containing:
 - 400 mcg (0.4 mg) folic acid¹⁹
 - 400 international units of vitamin D
 - Vitamin B₁₂¹⁹

Note: Prenatal multivitamin/mineral supplements are often also marketed as postnatal supplements. Although prenatal/postnatal-specific multivitamin/mineral supplements are not necessary in the postpartum period, finishing a prenatal supplement is acceptable for practical reasons. The higher iron and folic acid content of many prenatal supplements is not necessary after pregnancy for most people. A “regular” daily multivitamin/mineral supplement will contain adequate amounts of folic acid, vitamin D, vitamin B₁₂, and other nutrients to meet the nutritional demands of lactation. The exception may be if additional iron or folic acid or other single nutrient supplements were prescribed during pregnancy. In these situations, it is recommended an individual check with their primary care provider for advice on continuing.

Nutrition Guideline

Nutrition for Lactation

Is more fluid needed?

Yes, more fluid is required to support lactation. An average adequate intake for an individual who is lactating is about 12 cups (3.1 L) fluid/day. This is higher than the 9 cups (2.2 L)/day required for those who are not lactating.²⁰ All beverages such as water, milk, juice, soup, coffee, and tea are considered fluids. It is also recommended that individuals drink to thirst to meet their increased fluid needs and pay attention to early signs of insufficient fluid intake (e.g. dark-coloured urine).²¹ Even though low fluid intake has not been shown to impact milk production, inadequate fluid intake could still cause mild dehydration and associated health consequences (e.g. constipation).²² Additional fluids may be needed in hot weather and during exercise.²⁰

- See also: [Do extra fluids increase milk production?](#)

What advice can be given about nutrition supplement drinks?

Some nutrition supplement drinks are marketed specifically for individuals who are pregnant or lactating.²³ These drinks are not required for a healthy diet and are not intended as a total diet replacement as they are missing essential nutrients such as fibre.²³ A nutrition supplement drink may not provide enough important nutrients like folic acid and vitamin D;²³ therefore, it is not recommended as a multivitamin/mineral supplement replacement for individuals who are lactating. If an individual is using this product, they are advised to follow the directions for use on the label²³ unless otherwise advised by a primary care provider or RD. Drinking more than the recommended amount may put individuals at risk of exceeding upper nutrient limits (e.g., vitamin A) when considering all oral sources of nutrients (food, drinks, and supplements).

Foods and Beverages to Limit or Avoid

[Return to Key Questions List](#)

What is considered a safe intake of caffeine?

It is recommended that individuals who are lactating limit their caffeine intake to 300 mg/day.^{24,25} This daily amount is unlikely to have adverse effects on postnatal development for breastfed infants.²⁶ Caffeine rapidly passes into the milk of the lactating parent after ingestion, with a peak level usually occurring about one hour after ingestion.^{27–30} The elimination half-life (the time required for a quantity to reduce to half its initial value³¹) of caffeine ranges between 3–7 hours and can be influenced by many factors, including sex, age, the use of oral contraceptives, pregnancy, and smoking.²⁶ Fussiness, jitteriness, and poor sleep patterns have been reported in the infants of parents who are breastfeeding and consuming very high caffeine intakes, equivalent to about 10 or more cups of coffee daily.³²

Coffee is a key beverage source of caffeine. The caffeine content of coffee and tea can vary depending on the plant variety and growing conditions, brewing method and time, the proportion of coffee or tea to water, roasting method, particle size ('grind'), and serving size.^{33–35} Caffeinated energy drinks (e.g. drinks and shots) are not recommended.^{36,37} Energy drinks may have herbal ingredients that have not undergone scientific evaluation.³⁸ Supplements and over-the-counter medications (e.g. pain relievers, diuretics, cold remedies, and weight loss aids) can also be a source of caffeine. The medication label will list the caffeine content of the product. Advise consultation with healthcare professionals regarding the safety of specific medications.

Nutrition Guideline

Nutrition for Lactation

Table 1. Beverage and Food Sources of Caffeine

Beverages with between 100–200 mg/1 cup (250 mL) serving	Beverages and foods with Less than 100 mg/1 cup (250 mL) (or standard serving size)
Coffee, brewed Coffee, roasted and ground, filter drip Coffee, roasted and ground, percolated	Baking chocolate (unsweetened) (28 g) Candy chocolate (milk, sweet) (28 g) Chocolate milk Coffee, espresso (30 mL single shot) Coffee, instant Coffee, instant, decaffeinated Coffee, roasted and ground, decaffeinated Cola beverage, regular (355 mL can) Cola beverage, diet (355 mL can) Hot cocoa mix (prepared) Iced tea Tea, regular (average blend, leaf, or bag)

Sources: Health Canada. Canadian Nutrient File, Version 2015³⁹; Health Canada, Caffeine in Foods²⁴

Advise individuals who are lactating:

- to limit caffeine intake to 300 mg/day from all sources
- that common sources of caffeine for most people are:
 - Coffee: about 150 mg caffeine per 250 mL (1 cup)
 - Tea, green, and black: about 30–50 mg caffeine per 250 mL (1 cup)
 - Cola beverages: about 23–40 mg caffeine per 250 mL (1 cup)
 - Chocolate: about 3–50 mg caffeine in one chocolate bar

Is alcohol safe to consume?

The safest option for the individual who is breastfeeding is to not drink alcohol,^{40,41} as the alcohol consumed is transferred into their milk.⁴² Infants have rapidly developing central nervous systems and an underdeveloped ability to metabolize alcohol.⁴³ Risks to an infant after exposure to alcohol through their parent’s milk include disrupted sleep patterns, decreased milk intake (due to reduced parental production), and potential negative effects on brain development.^{42,44–47}

The infant’s level of alcohol exposure through their parent’s milk is influenced by many factors and varies from individual to individual. These factors include:^{40,42,44}

- an individual’s^a ability to metabolize alcohol.
- frequency, volume, and concentration of alcohol consumption.
- infant’s risk level based on their age and ability to metabolize alcohol.

Nutrition Guideline

Nutrition for Lactation

Alcohol Clearance

Alcohol has been detected in human milk^β, approximately 30–60 minutes after ingestion,^{40,45} at a level that parallels the blood plasma level of alcohol in the individual who is lactating.^{42,44,48} Alcohol does not remain in the milk of the individual^α who is lactating; it clears from the milk at the same rate as it clears from the parent's^α blood concentration.^{42,48} The alcohol clearance rate is estimated as approximately 2–3 hours per standard drink, depending on the weight of the individual who is lactating.⁴⁹ One standard drink is defined as 5 oz (142 mL) of wine, 12 oz (341 mL) of beer, or 1.5 oz (43 mL) of liquor.⁵⁰

Drinking water or coffee, resting, or 'pumping and dumping' milk, while drinking alcohol, do not increase clearance rates.⁴² However, individuals who choose to have an alcoholic drink may choose to pump and discard their milk to relieve discomfort.

Risk Reduction Advice

Risk reduction advice can be provided to individuals who are lactating and who occasionally consume alcohol. To reduce the risk to their infant, a patient can be advised to:

- make an alternative feeding plan for their infant
- limit alcohol to 1–2 drinks per occasion⁴⁰
- feed their infant prior to alcohol ingestion^{40,42}
- allow enough time for the alcohol to be eliminated from their body before resuming breastfeeding
- pump and store milk for their infant, before having an alcoholic drink⁴⁰

Care providers concerned about an individual's alcohol intake can refer to local protocols for screening and referral.

Are fish and shellfish safe to eat?

Yes, fish and shellfish are safe to eat, as long as while breastfeeding, individuals follow Health Canada's guidance on limiting high mercury fish. Consumption of fish and shellfish is encouraged as part of a healthy pattern of eating.⁵¹ Typical diets consumed by individuals^α who are lactating pose no health hazard to their infants.⁵² Like during pregnancy, it is recommended that individuals^α who are lactating consume 150 g (5 oz) of low mercury fatty fish per week.^{39,53} Fish and shellfish that contain higher levels of DHA and EPA (important nutrients for neurological and cardiovascular health) and are also low in mercury include anchovy, capelin, hake, herring, Atlantic mackerel, pollock (Boston bluefish), salmon (farmed and wild), smelt, rainbow trout, shrimp, clams, mussels, and oysters.⁵⁴

Fish is the primary source of mercury exposure in humans.⁵⁵ Mercury exposure can adversely affect an infant's growing brain and nervous system,⁵⁶ and is excreted into human milk.^{57,58} High mercury fish include fresh or frozen tuna, shark, swordfish, escolar, marlin, and orange roughy.⁵⁵ Health Canada states that up to 150 g (5 oz)/month of these fish species combined can be eaten during lactation.⁵⁵ Care providers can advise clients to choose light tuna such as skipjack, yellowfin, and tongol when purchasing canned tuna. These choices are relatively lower in mercury versus albacore or white canned tuna, which should be limited to 300 g/week.^{54,55} For people who plan to eat locally caught fish, they can be advised to look up local fish consumption advisories at [Should I Eat This Fish?](#)

Nutrition Guideline

Nutrition for Lactation

What about the use of natural health products, herbal teas, and herbs?

A limited number of studies exist on herb use during lactation and many organizations have mixed reports and safety recommendations, making it confusing for both the patient and care provider.⁵⁹

Organizations that provide recommendations for natural health products include Practice-based Evidence in Nutrition[®],⁶⁰ LactMed[®],⁶¹ Hale's Medications and Mother's Milk[™],⁶² and the Natural Medicines Database[™].⁶³ The recommendations provided here take into account the recommendations from the above organizations as well as other published evidence.

Herbal products (including herbal lactation teas and some dietary substances) are often considered natural but many have pharmacologically-active substances that could have a positive or negative effect on lactation (e.g., milk supply) or the infant.⁶⁴ Risks of using an unlicensed natural health product* include interaction with medications or other natural health products, non-standard dosing, and contamination or incorrect ingredients.⁶⁵

If a patient chooses to use natural health products, herbal teas, or other herbal products, the following advice can be provided:

- Due to insufficient evidence on their safety and efficacy, there are no natural health products, including herbal supplements, which can be widely recommended.
- Talk to a healthcare professional knowledgeable about natural health and herbal products.⁶⁵
- Choose a natural health product with an 8-digit Natural Product Number (NPN) or Homeopathic Medicine Number (DIN-HM) on the label,⁶⁵ which identifies the product as a licensed natural health product in Canada and indicates it is safe and effective when used according to the instructions on the label.⁶⁵ Note: some commercial herbal teas and beverages contain an NPN or DIN-HM.
- Read and follow all instructions on the product label (e.g., steeping time). Ensure there are no warnings for use while lactating.⁶⁵
- Review the ingredient list of commercial herbal teas to ensure the herbs are considered safe during lactation (see [Herbs Generally Considered Safe During Lactation](#)) and consume these in moderation (a total of 2 cups [500 mL]/day[†]).⁶⁰ Many teas with names that indicate a single herb (e.g. "Lemon Zinger")⁶⁶ contain multiple ingredients. Not all herbs in herbal teas marketed to individuals who are lactating have been studied in lactation or are necessarily safe.
- Some herbs and herbal teas that are considered safe during pregnancy may not be safe during lactation, and vice versa.
- Herbs commonly used in food preparation in small amounts are safe.

* Natural health products (NHPs), also referred to as "complementary" or "alternative" medicines, are naturally occurring substances used to restore or maintain good health.⁶⁵ They include vitamins and minerals, herbal remedies, homeopathic medicines, traditional medicines like traditional Chinese and Ayurvedic (East Indian) medicines, probiotics, and other products like amino acids and essential fatty acids.⁶⁵

† Two cups (500 mL) per day was chosen as "in moderation" based on: Health Canada's use of 2–3 cups as "in moderation" for certain herbal teas in pregnancy.²⁵ From this, the lower range of 2 cups (500 mL) was chosen, as 3 cups (750 mL) of herbs in tea form is often presented as the medicinal dose.¹⁵⁸

Nutrition Guideline

Nutrition for Lactation

Herbs Generally Considered Safe during Lactation

Herbs are generally considered safe during lactation when used orally in amounts commonly found in food:*

- Anise seed or fruit⁶⁷⁻⁷⁰
- Blessed thistle herb/herb top⁷⁰⁻⁷²
- Caraway seed^{67,70,73}
- Cinnamon spice/bark⁶⁷⁻⁶⁹
- Fenugreek seed^{145,143,158,159}
- Fennel seed^{67,68,74}
- Fruit pieces (e.g. peaches, cherries)
- Ginger root^{60,67,75}
- Lemon balm herb top/leaf^{67,76}
- Lemon verbena leaf⁷⁰
- Lemon peel⁶⁹
- Milk thistle fruit/seed (silymarin)^{77,78}
- Orange peel^{69,70}
- Peppermint leaf^{67,69,70}
- Red raspberry leaf^{60,79,80} (short-term use—up to two weeks)⁸¹
- Rose hip^{60,82}

Note: This list is not exhaustive.

* The evidence for this recommendation and list of herbs is based on the following:

- the herb is listed as Generally Recognized as Safe (GRAS) for use as a food or food additive in the US⁸³ (note: Canada does not have this designation);
- and/or the herb is included in the Canadian Food and Drug Regulations⁶⁸ as a permitted spice, dressing or seasoning (Division 7) or flavouring preparation (Division 10);
- and/or where there is research, there are no reported severe adverse effects of the herbal tea on breastfeeding individuals or infants in amounts up to 500 mL/day.

It is recommended that individuals avoid the following herbs in all forms (including teas and supplements) during lactation, due to potential adverse effects for the parent or the infant. Potential adverse effects for each herb can be found in the cited references.

- Aloe vera/aloe latex (oral use)⁸⁴⁻⁸⁶
- Blue cohosh⁸⁷⁻⁸⁹
- Borage leaf (*Borago officinalis*)^{90,91}
- Comfrey leaf (*Symphytum officinale*)^{90,92}
- Kombucha tea^{93,94}

Are sugar substitutes safe?

The following sugar substitutes (see [Table 2](#)) permitted for use in Canada⁹⁵ are considered safe for consumption at or below the acceptable daily intake (ADI).⁹⁶ The ADI is set for all Canadians and there are no specific recommendations for lactation.⁹⁶ While the use of sugar substitutes during pregnancy and lactation is considered safe, there is limited research for each of these populations. The use of cyclamates (e.g. Sugar Twin[®];⁹⁷ generic brands) during lactation should be avoided or used with extreme caution.⁹⁸ Cyclamate is not permitted as a food additive in Canada but can be sold as a non-food product and must carry the following cautionary statement: “the sweetener should be used only on the advice of a [primary care provider]”.⁹⁹

Nutrition Guideline

Nutrition for Lactation

Table 2. Sugar Substitutes Considered Safe in Moderate Amounts

Sugar Substitutes	ADI (mg/kg body weight)
Acesulfame potassium ¹⁰⁰	15 ¹⁰¹
Advantame ¹⁰²	5 ⁹⁷
Aspartame ^{100,104}	40 ¹⁰¹
Monk fruit extract (also called <i>luo han guo</i>) ¹⁰⁵	Not specified ¹⁰¹
Neotame ¹⁰⁰	2 ¹⁰¹
Saccharin ^{104,106}	5 ¹⁰¹
Sucralose ¹⁰⁰	8.8 ¹⁰¹
Sugar alcohols* (polyols), hydrogenated starch hydrolysate (mixture of sugar alcohols ¹⁰⁷) and polydextrose ^{100,104}	Not specified; however, intake of greater than 10–20 g/day may cause flatulence, diarrhea, and other gastrointestinal symptoms ^{108,109}
Stevia ¹⁰⁴	4 ¹⁰¹
Thaumatococin ¹⁰⁰	0.9 ¹⁰¹

*Sugar alcohols permitted for use as food additives in Canada include hydrogenated starch hydrolysates, isomalt, lactitol, maltitol, maltitol syrup, mannitol, sorbitol, sorbitol syrup, xylitol, and erythritol.¹¹⁰

Are probiotics safe?

Studies on the safety of probiotic food or supplement consumption during lactation are lacking.^{111,112} Of the studies available, a variety of probiotic strains and dosages were used.¹¹¹ As probiotics are strain-specific, benefits and safety from one strain cannot be extrapolated to another strain.¹¹³ No documented adverse effects on the parent or infant, when probiotics were consumed by the parent who is lactating, have been documented.^{114–116} Bacteria, such as lactobacilli or bifidobacteria, are a natural part of the intestinal flora¹¹⁷ and various strains of these have been found in human milk.^{β 118} Lactobacilli and bifidobacteria which have historically been used in foods are generally considered safe for consumption for the general public,^{117,119} including individuals who are lactating.

An additional factor to consider is that cow's milk proteins are a common growth substrate for some probiotics and very small quantities of this protein may be present in some probiotic supplements.¹²⁰ This may be a concern if the parents or infant has a cow's milk protein allergy.

Due to limited research on supplement strains and dosages, no public health recommendation can be made for individuals wanting to take a probiotic supplement while lactating.

- For related Nutrition Guidelines see Nutrition Guideline: Healthy Infants and Young Children: [Prebiotics and Probiotics](#).

Nutrition Guideline

Nutrition for Lactation

Situations when Extra Energy or Nutrients may be Needed

Return to [Key Questions List](#)

What are the nutrition recommendations for individuals with high energy demands?

Limited research is available to provide specific nutrition recommendations for individuals who are lactating and who have additional energy demands.¹²¹ Recommendations are general, with a Canadian expert consensus statement recommending “additional calories” for individuals^a who are underweight, feeding multiple infants, or exercising vigorously,¹⁵ in addition to the recommended increase of 350–400 calories/day for those feeding one child.

Individuals who are both lactating and pregnant are expected to have increased energy and nutrient needs beyond those of people who are either lactating or pregnant.¹²¹

Individualized assessment and counselling is recommended for individuals who are breastfeeding and have additional energy and nutrient demands.

- See also: [Referral to a registered dietitian \(RD\)](#).
- For related Nutrition Guidelines see Nutrition Guideline: [Pregnancy](#).

What are the extra considerations for adolescents (age less than 18 years)?

Adolescents may have higher energy and nutrient requirements to support their own growth, in addition to the requirements needed to support lactation. Specific examples of additional nutrient requirements for adolescents include calcium (1300 mg calcium/day for adolescents compared to 1000 mg calcium/day for adult females.^a)¹²² Adolescents can meet their energy and nutrient needs for lactation by following a healthy eating pattern as outlined in Canada’s food guide. Additional food from Canada’s food guide is recommended to meet the higher caloric needs of both adolescence and lactation.

- See also: [Referral to a registered dietitian \(RD\)](#).

Are there extra considerations for vegan eating patterns?

A vegan eating pattern excludes all food of animal origin including meat, fish, poultry, eggs, milk, and milk products.¹²³ Vitamin B₁₂ is a nutrient found in food from animal sources, and therefore, vegan eating patterns may not provide enough vitamin B₁₂.¹²³ Individuals who follow a vegan eating pattern with inadequate vitamin B₁₂ may produce milk deficient in vitamin B₁₂.^{13,124} Vitamin B₁₂ deficiency in human milk^b can be prevented and improved by increasing the vitamin B₁₂ intake of the parent^a who is lactating.¹²⁴ If food or supplements with vitamin B₁₂ are not consumed regularly, it is recommended that a primary care provider is consulted to assess vitamin B₁₂ levels. Severe vitamin B₁₂ deficiency in infants may lead to growth, developmental, and neurological concerns.¹²⁵

Nutrition Guideline

Nutrition for Lactation

Individuals^a following a vegan eating pattern who are not deficient in B₁₂ can obtain adequate amounts (2.8 mcg/day) by consuming at least two daily food sources of vitamin B₁₂ and a multivitamin/mineral supplement.^{13,19,126} It is recommended that vitamin B₁₂-containing foods be eaten at separate times during the day to promote better absorption.¹³ There are many vegan foods fortified with vitamin B₁₂. Examples of these foods include Red Star[®] nutritional yeast, fortified soy beverage, fortified meat substitute, and fortified ready-to-eat breakfast cereals.

A vegan eating pattern supplies little or no EPA or DHA.¹²³ Individuals^a who are lactating and who have no or low intakes of EPA and DHA will produce milk that is also low in these omega-3 fatty acids.¹²³ An EPA/DHA vegan supplement (derived from marine algae) may be required to meet their^a daily needs.¹²⁷

It is recommended that individuals who are lactating and who are following a vegan eating pattern be referred to an RD.

- See also: [Referral to a registered dietitian \(RD\)](#).

Weight Loss during Lactation and Breastfeeding

What are the energy requirements for lactation and how does this relate to healthy postpartum weight loss?

Additional energy demands for individuals who are exclusively breastfeeding are about 640 calories/day over pre-pregnancy energy requirements during the first six months postpartum. As it is assumed that individuals who are lactating draw on fat stores from pregnancy to help support milk production, the usual guidance for additional energy recommendations for lactation is 350–400 calories/day for the first year post-partum.^{12,15–17} This level of additional energy intake is expected to promote gradual postpartum weight loss.¹⁷ Gradual weight loss is generally defined as 0.5–1.0 kg (1.1–2.2 lbs) per month.¹⁷

Note that the number of additional calories needed for an individual who is breastfeeding is also affected by their age, [body mass index \(BMI\)](#), activity level, and extent of breastfeeding (exclusively breastfeeding versus breastfeeding and formula feeding). Not all people who are lactating may need to lose weight. This includes those who are at or below a healthy body weight¹⁷ and who are healthy and comfortable in larger bodies.

For people who exceeded gestational weight gain targets or who had obesity or overweight before pregnancy, a return to pre-pregnancy weight and/or a healthy body weight through a combination of healthy eating and physical activity is recommended.^{15,128,129} Individuals^a with a BMI greater than or equal to 25 can safely lose weight at a rate of 0.5 kg/week (2.0 kg/month or 4.4 lbs/month), if desired by the client, without affecting their milk production.¹³⁰

- See also: [Referral to a registered dietitian \(RD\)](#).

Nutrition Guideline

Nutrition for Lactation

What is the effect of postpartum weight loss on milk production?

There is little evidence suggesting that volume or nutrient composition is negatively affected by gradual weight loss of the parent^a after childbirth.¹²⁹ Research suggests that milk^b output by the parent^a may decrease only when parental caloric intake is less than 1500 calories/day.¹³¹

Diet Quality and Composition of Human Milk

Return to [Key Questions List](#)

How is the composition of human milk influenced by the diet quality of the individual who is lactating?

Limited research exists that directly quantifies the association between the dietary patterns of the individual^a who is lactating and the composition of their milk.¹³² Overall, research suggests that the nutritional quality of human milk is highly preserved¹³³ and day-to-day variations in diet do not affect milk production and composition of nutrients.¹³⁴ The nutrition composition of human milk^b is mainly affected by the nutrient stores of the individual^a who is lactating.¹³⁵

Macronutrients

In terms of macronutrients, the nutritional quality of human milk is highly conserved, particularly for protein, lactose (as the main milk carbohydrate), and total fat.¹³³ A notable exception is that dietary intake does impact the types of fatty acids found in human milk.¹³³ For example, both the amount of trans fatty acids¹³⁶ and certain omega-3 fatty acids (e.g. DHA) in human milk are influenced by the dietary intake of the individual^a who is lactating.¹³⁴ Care providers may advise patients to limit trans fat dietary intake and consume a dietary pattern rich in omega-3 fatty acids.¹³⁶

Micronutrients

Human milk contains numerous vitamins and minerals (micronutrients). The amount of micronutrients present in human milk varies based on diet, nutrient reserves, and genetics.¹⁰ Human milk content of some vitamins and minerals (thiamin, riboflavin, vitamin B₆, vitamin B₁₂, choline, vitamin A, vitamin D, selenium, and iodine) may be low in the milk of individuals^a with these nutrition deficiencies.¹²⁴ However, deficiencies for the majority of these nutrients are rare in North America (although data specifically for individuals who are lactating is not available).^{14,137} Individuals who follow a vegan eating pattern may not get enough vitamin B₁₂ in their diet and may produce milk deficient in B₁₂.^{13,124}

Nutrition Guideline

Nutrition for Lactation

Human milk⁸ is not a significant dietary source of vitamin D for infants.¹²² Typically, very little vitamin D passes into human milk because vitamin D is only present in circulation for short intervals after meals.¹²² An estimate of the amount of vitamin D in mature human milk is 8 international units of vitamin D per 1 cup (250 mL).³⁹ Although a few small studies have demonstrated it is possible to increase the amount of vitamin D in human milk with very large amounts of vitamin D supplementation for the individual who is lactating,¹³⁸ the dosage necessary is well above the tolerable upper intake level (UL) of 4000 international units/day vitamin D and safety implications are unclear.¹²² Current vitamin D supplementation guidance is for the individual who is breastfeeding to take a daily multivitamin/mineral supplement which provides between 5–20 mcg (200–800 international units) of vitamin D and to provide a daily supplement of 10 mcg (400 international units) vitamin D to exclusively and partially breastfed infants.²

- See also: [Referral to a registered dietitian \(RD\)](#).
[Are there any extra considerations for vegan eating patterns?](#)
- For related Nutrition Guidelines see [Nutrition Guideline: Vitamin D](#) for Healthy Infants and Young Children

Does intake of docosahexaenoic acid (DHA) affect the DHA composition of human milk?

Yes, dietary DHA is positively correlated with the amount of DHA that is present in milk.¹³⁹ DHA is a type of omega-3 fatty acid that is known to be critical for brain and retinal development in infancy.¹⁴⁰ Omega-3 fatty acids are long-chain polyunsaturated fatty acids (LCPUFA) that also include alpha-linolenic acid (ALA) and eicosapentaenoic acid (EPA). DHA is primarily found in fish, shellfish, fish oil supplements, and omega-3 enriched eggs.¹⁴¹

A European Union consensus statement recommends 200 mg DHA/day for individuals^a who are pregnant or lactating.¹⁴² A pregnancy and postpartum study conducted with Albertan participants^a (n= 600), found that less than one-third of participants met this recommendation.¹⁴³ This recommended amount can be achieved by eating 1–2 servings of sea fish/week, including oily fish.⁵³ A practical recommendation for individuals who are lactating is to eat 150 g (5 oz) of low mercury fatty fish (e.g., salmon, herring, Atlantic mackerel, and rainbow trout) weekly.

An individual who is lactating can also increase the DHA content in their milk by taking a DHA supplement.¹⁴⁴ People who do not consume fatty fish can discuss supplementation with their care provider.

ALA is found in plant sources such as walnuts, flaxseed, and canola and soybean oils.¹⁴⁵ Humans can convert ALA to DHA, however, the amount of ALA converted is very low.¹⁴⁵ There is insufficient evidence to know if ALA consumption is adequate (in the absence of consuming any DHA-containing foods) to maintain DHA status.¹⁴⁶

Nutrition Guideline

Nutrition for Lactation

What influences the flavour of human milk?

Diet (foods consumed) can affect the flavour of human milk. In general, the variety of flavours found in milk is found to be beneficial to an infant's development of food preferences. Evidence to suggest that certain flavours adversely affect the acceptability of human milk to the infant is limited.¹⁴⁷

Flavour exposure starts in utero when an infant swallows amniotic fluid.¹⁴⁸ Flavour exposure continues when components of the diet pass through to human milk.¹⁴⁹ The extent of what is passed to an infant is highly variable between and within each individual.¹⁴⁷ Research shows that early exposure of different flavours to infants through human milk may improve their acceptance of these flavours later on in life when exposed to the same flavour in complementary feeding.¹⁵⁰

Food and Beverage Influences on Milk Production

Return to [Key Questions List](#)

Do extra fluids increase milk production?

Extra fluids likely do not increase the milk production of individuals who are lactating. There is insufficient evidence to support the view that extra fluids increase milk production (beyond what is required to satisfy thirst).²¹ One study observed a wide range (872–3704 mL/day) of total fluid intakes among a small sample of individuals^a who were lactating, with no significant relationship between 24-hour total fluid intake and their milk volume.²²

Does alcohol increase milk production?

No. Alcohol does not increase milk production. Alternatively, drinking the equivalent of 1.5 standard drinks daily has been shown to lead to an overall reduction in milk production, block the release of oxytocin, and interfere with the milk ejection reflex.^{40,47,48}

In some traditions, beer has been recommended for initiation of lactation and enhancement of success of breastfeeding.¹⁵¹ Some evidence suggests that beer consumption can stimulate prolactin secretion which may enhance lactogenesis.^{45,151} However, the analysis of this topic in the Drugs and Lactation Database (LactMed[®]) reports that the polysaccharides in barley¹⁵² and possibly hops¹⁵³ are likely responsible for the increase in prolactin after beer ingestion. Non-alcoholic beer would likely have a similar effect on prolactin secretion.¹⁵¹

Breastfeeding after consumption of a single dose of alcoholic beer (by individuals^a who were lactating) has been found to decrease the amount of milk consumed by infants¹⁵⁴ and can cause infant agitation and poor sleep patterns.⁴⁵ Non-alcoholic beer is unlikely to affect infants in the same way,¹⁵⁵ although non-alcoholic beer can still contain trace amounts of alcohol.

Nutrition Guideline

Nutrition for Lactation

What are galactagogues and can they be safely recommended to increase milk production?

Galactagogues are substances believed to increase milk production.⁶⁴ Many foods and herbs throughout history have been used and recommended to help milk production, including anise, blessed thistle, fennel, fenugreek, milk thistle, and shatavari (*Asparagus racemosus*),^{64,70,156,157} oats, dill, and barley.¹⁵⁸

There is a lack of research on the use of foods as galactagogues. Many herbal teas are marketed as a way to increase the milk production of individuals who are lactating. Although some herbs have shown potential as galactagogues,^{157,159} few randomized clinical trials are available to make conclusions about their effectiveness or safety for this purpose.¹⁵⁹ Due to this lack of evidence on their efficacy and/or safety,^{157,160} no food or herb can be broadly recommended to individuals who are lactating.¹⁵⁶

Galactagogues are not a substitute for evaluation and counselling on modifiable factors that affect milk production (expression frequency and removal effectiveness).¹⁵⁶ If individuals wish to use potential galactagogues during lactation to increase milk production, they can discuss this with their care provider to make an informed decision.

- See also: [What about the use of natural health products, herbal teas, and herbs?](#)
[Does alcohol increase milk production?](#)

Food Safety Considerations

Return to [Key Questions List](#)

What advice can be given about susceptibility to foodborne illness?

Individuals who are lactating are not more susceptible to foodborne illness than the general population.¹⁶¹ As such, food safety guidance aimed at vulnerable populations, such as individuals who are pregnant, does not apply to people who are lactating. For example, uncooked deli meats or semi-soft cheeses do not need to be avoided while lactating but should be avoided during pregnancy.

It is not clear if foodborne pathogens can be transmitted from an individual to an infant through human milk.^{β 162} In the vast majority of cases, the presence of infection from foodborne pathogens is not a contraindication to breastfeeding.^{162–164}

- For more information on how to prevent foodborne illness, see Health Canada's recommendations for [Food Safety](#).

Nutrition Guideline

Nutrition for Lactation

Can human milk cause foodborne illness in the infant?

If handled incorrectly, expressed milk can be a reservoir for microorganism growth^{165,166} and can be a potential source of infection^{166–168} for foodborne illness. It is recommended to follow the guidelines for pumping, storing, thawing, and warming expressed human milk.

Advise families that human milk obtained via the internet or directly from individuals puts an infant at risk for negative outcomes.¹⁶⁹ There are potential risks the milk may be contaminated with bacteria that can cause foodborne illness, viruses such as HIV, or other substances which are health hazards.^{169,170} For these reasons the consumption of unprocessed donor human milk obtained from private sources is not recommended by Health Canada.¹⁷⁰

Pasteurized donor human milk from regulated milk banks is considered safe from these risks because milk banks abide by strict operating procedures and are regulated under the Food and Drugs Act and Regulations.¹⁷⁰

Health Considerations for the Parent

[Return to Key Questions List](#)

What advice can be given about constipation?

Constipation is a common postpartum problem.¹⁷¹ Advise individuals who are lactating to gradually increase fluid and fibre intake to ensure they achieve adequate intake:

- 12 cups (3.1 L) fluid/day²⁰
- 29 g fibre/day¹⁶

If needed, bulk-forming laxatives (psyllium or methylcellulose) are a safe fibre supplement for use by people who are lactating. These fibre supplements are deemed safe for use because they are not absorbed by the gut and, as a result, do not find their way into infant circulation.^{15,172}

To increase fibre intake, advise patients to:

- Eat a variety of vegetables, fruits, whole grains, and legumes (beans, peas, lentils) daily.
- Choose food with more fibre. When comparing food labels (Nutrition Facts table), choose foods with more than 2 g fibre/serving.
- Refer to [Nutrition Education](#) for patient handouts on constipation and fibre.

What advice can be given about iron deficiency anemia?

There is no evidence that postpartum iron deficiency anemia inhibits milk production directly,^{173,174} although observational studies reported a relationship between postpartum iron deficiency anemia and duration of lactation.^{173,174} Henly et al.¹⁷³ found lactation duration was shorter for individuals^a who were anemic when compared to those who were not anemic. Rioux et al.¹⁷⁴ observed anemia was associated with discontinuation of lactation before four months.

It is recommended that parents^a with signs and symptoms of postpartum iron deficiency anemia such as fatigue and exhaustion, postpartum hemorrhage, pale skin, and vegetarian/vegan dietary pattern be referred to their care provider to screen for low ferritin and hemoglobin.¹⁷³

Nutrition Guideline

Nutrition for Lactation

What advice can be given about candidiasis/thrush?

The overgrowth of yeast, a type of fungus, called *Candida albicans* is associated with the development of candidiasis or thrush.¹⁷⁵ Thrush may be a cause of breast and nipple pain in individuals who are lactating.¹⁷⁵ It is a common belief that a diet restricted in simple sugars, dairy products, yeast, fermented foods, fungi, fruit, gluten-containing grains, and starchy vegetables will prevent or possibly treat *Candida albicans* infections. There is limited research on humans examining the effectiveness of these dietary restrictions on the prevention or treatment of candidiasis, therefore, this cannot be recommended.¹⁷⁶

Common Questions about Human Milk and Infant Conditions

Return to [Key Questions List](#)

What should a parent do if they suspect their infant has food allergy symptoms?

If a breastfed^a infant develops symptoms of a food allergy such as bloody stools,¹⁷⁷ it is possible that the child is reacting to a nutrient (commonly a protein)¹⁷⁷ that has gone through the human milk. If this is suspected and the person can identify a food that may have caused the reaction, a trial elimination of that food from the diet of the individual who is lactating could be considered.^{177,178} Eliminated foods found should be re-introduced into the diet if there is no observed benefit.

It is recommended that a primary care provider be consulted to determine the potential cause of the reaction and confirm if the infant has a food allergy. A referral to an RD is recommended for individuals who restrict or eliminate multiple foods from their diet.

- See also: [Referral to a registered dietitian \(RD\)](#)

Are there foods recommended to eat or restrict during lactation to prevent allergies in the infant?

No. A special diet is not recommended during lactation to prevent an allergy in the infant.¹⁷⁹ The available evidence does not support avoidance of common allergenic foods (e.g. peanuts, seafood, cow's milk) while lactating to prevent allergy in the infant.^{2,178,180–184} Unnecessary exclusion of food can put the individual and infant at risk of nutritional inadequacy.

What advice can be given about infant colic and the diet of the individual who is lactating?

Colic during infancy is a set of behaviours, most notably crying, that may occur in healthy infants and usually starts in the early weeks of life.¹⁸⁵ It peaks between 5–8 weeks old and usually resolves between 4–6 months old.¹⁸⁵ Colic is when a healthy infant that is gaining weight well has bouts of irritability, fussiness, or crying. These bouts start and stop without an obvious cause, last a total of three hours or more daily, happen at least three days/week (for at least one week), and there is no failure to thrive.¹⁸⁶

Nutrition Guideline

Nutrition for Lactation

Infants who are receiving either human milk and/or formula can be affected by colic. While the cause of infant colic is unknown, it appears to be related to both the immaturity of the infant's gut and a possible parental diet source (a protein in the diet of the person who is lactating that passes through their milk).¹⁸⁵

Although the impact on colic in most research is found to be ineffective, some studies have found an association between dietary intake of cruciferous vegetables (cauliflower, cabbage, garden cress, bok choy, broccoli, and Brussels sprouts), cow's milk, and onion for individuals who are lactating and colic symptoms in exclusively breastfed^a young infants.^{2,15,185,187,188} Individuals may eliminate any suspected foods one at a time to determine whether one is causing colic symptoms in their breastfed infant. Eliminated foods found to not affect infant colic can be re-introduced into the diet. Following a hypoallergenic diet while lactating to reduce or treat colic is not normally recommended as it has limited evidence of effectiveness.^{15,185,186} A hypoallergenic diet is defined as excluding all foods containing cow's milk, soy, wheat, eggs, peanuts, tree nuts, and fish.¹⁸⁵

Individuals wanting to follow a hypoallergenic diet or a diet that eliminates multiple foods during lactation may be referred to an RD to ensure nutritional adequacy.

A parent who suspects their infant has colic can discuss their concerns with their care provider.

- See also: [Referral to a registered dietitian \(RD\)](#).
[Are there foods recommended to eat or restrict during lactation to prevent allergies in the infant?](#)
- For related Nutrition Guidelines see [Nutrition Guidelines for Healthy Infants and Young Children](#)

What advice can be given about infant gas and the foods eaten by the individual who is lactating?

The evidence suggests inclusion of spicy or gas-producing foods (e.g. cruciferous vegetables) in the diet of the individual^a who is lactating do not usually negatively affect breastfed^a infants.¹⁸⁹ Modifying the foods eaten by the individual who is lactating in an effort to reduce or eliminate infant gas is not normally effective or recommended, although a trial elimination of suspected foods one at a time can be tried. If a food is removed from the diet and the individual observes no improvement in the infant's gas, the food can be reintroduced into the diet to prevent unnecessary food restrictions. Evidence also does not support lactase deficiency as a likely cause of gas; this condition is rare in infants.¹⁸⁶ It is normal for infants to have gas, but if a caregiver believes that an infant is experiencing distress due to being overly gassy, a primary care provider can be consulted.

Other Special Considerations

Return to [Key Questions List](#)

Are there special considerations when working with individuals with culturally diverse backgrounds (e.g., Indigenous peoples, immigrants, and refugees)?

Breastfeeding may be a time for many people that provokes culturally-based responses and reactions from themselves, their families, and others. Care providers are encouraged to approach each patient interaction as unique, avoiding stereotyping possible cultural influences based on past experiences or knowledge of cultural food practices.

Care providers are advised to continually assess and improve their own cultural competence. While no care provider can be an expert in all aspects of diversity, cultural competence involves the continual learning that arises from experiences, encounters, and ongoing reflection.¹⁹⁰

What is known about the impact of religious fasting on human milk composition?

Fasting is observed in many religions and is defined as partial or total abstinence from all foods or prohibited foods, during a specific time period.¹⁹¹ Very little scientific research has examined the impact of religious fasting on lactation. There are reported decreases in human milk^β micronutrient^{192,193} and macronutrient¹⁹³ composition, as well as overall nutrient intake by the individual who is lactating while fasting during Ramadan.¹⁹² However, research suggests there is no detrimental effect of this type of fasting on infant growth parameters.^{192,194}

It is recommended individuals who are lactating excuse themselves from fasting.^{192,195} Those who choose to participate in religious fasting are advised to make every effort to consume adequate food and fluids during non-fasting hours.

What are other important considerations when working with any individual?

Household Food Insecurity

Household food insecurity (HFI) is defined as “an inadequate or insecure access to food because of financial constraints”;¹⁹⁶ it impacts physical, mental, and social well-being. Care providers will encounter patients living in food-insecure households, due to the high prevalence of HFI among those accessing healthcare.¹⁹⁷

HFI is best addressed through income-based interventions.^{196,198,199} Those experiencing HFI have food preparation, budgeting, and cooking skills similar to the general population.²⁰⁰ Interventions focused on food skills do not protect people from, nor improve HFI.²⁰⁰ Emergency food programs (e.g. food banks) may provide temporary relief.²⁰¹ However, these programs do not solve HFI and are inappropriate and/or inaccessible for many patients.²⁰¹

Nutrition Guideline

Nutrition for Lactation

Care providers can offer better support if they are aware of when patients are worried about having enough money for food and are experiencing other challenges because of financial strain.^{202,203} Care providers are encouraged to work with patients to develop interventions that are sensitive to financial strain.

Key steps for care providers include:

- Learn about financial strain, how to screen patients for poverty, and the link between poverty and poorer health through the Identifying Financial Strain and Addressing Financial Barriers to Health Care modules – available on My Learning Link (MLL) for AHS staff and Covenant Learning Connection (CLiC) for Covenant Health staff.
- Review the [Nutrition Guideline: Household Food Insecurity](#) for additional information on how to support patients experiencing HFI.
- Assist patients in accessing available income supports. 211 Alberta (ab.211.ca) is a provincial directory that can be used to identify financial benefits, programs, and services.

Additional income support may exist for individuals during the early postpartum period:

- People who receive Assured Income for the Severely Handicapped (AISH) or Income Support (Alberta Works) may be eligible for funding to help cover the cost of a healthy diet during lactation (breastfeeding)
- The Alberta Canada Prenatal Nutrition Program (CPNP) may provide vitamins, food, food coupons, and/or nutrition counselling.
- Postnatal multivitamin/mineral supplements may be available through the Non-Insured Health Benefits (NIHB) for First Nations and Inuit and for people receiving Income Support (Alberta Works).

Please see the [Point of Care Reference: Funding Options for Special Diets and Nutrition Products](#) for details on all programs, eligibility and required steps to access coverage.

Referral to a Registered Dietitian

Return to [Key Questions List](#)

When is a referral to a registered dietitian (RD) recommended?

A nutrition assessment by an RD will help determine if an individual has adequate calorie and nutrient intake. In addition to calorie and macronutrient intake, specific micronutrients to be assessed in lactation include calcium, vitamin D, omega-3 fatty acids, folic acid, and iron.

Referrals for individual nutrition assessment and counselling by an RD are especially important for individuals who are lactating and who:

- are adolescents (under 15 years old or less than three years since the onset of menses).
- are producing milk for twins, triplets, or higher-order multiples.
- consuming a low-calorie diet (less than 1500 calories/day)
- have a low weight – defined as less than 90% of desirable body weight or BMI less than 18.5.
- have a nutrition-related health condition they are managing in conjunction with lactation, such as diabetes, hypertension, or other medical conditions with an impact on nutrition (e.g., inflammatory bowel disease, bariatric surgery, or celiac disease).

Nutrition Guideline

Nutrition for Lactation

Other reasons that could indicate an RD referral:

- Higher requirements for specific nutrients (e.g. lactating and pregnant, exercising vigorously)
- Risk for poor nutrient intakes due to other factors including alcohol and substance use, poverty, and low socioeconomic status.
- Food restrictions, food allergies, or food intolerances that cause severe food restrictions or avoidance.
- Other restricted patterns of eating such as following a restricted vegetarian or vegan pattern of eating.

Referral processes will vary based on zone and site policy. Referral information and referral forms can be found at albertareferraldirectory.ca. Primary Care Networks and Family Care Clinics may also have registered dietitians who can provide support for nutrition concerns.

Resources

Return to [Key Questions List](#)

What resources are available for professionals?

Nutrition Guidelines and Supporting Resources

Nutrition Guidelines for care providers on a variety of healthy eating and active living topics including general nutrition and nutrient information can be found on the [Nutrition Guidelines page](#).

The 20-Hour Breastfeeding Course

An accredited continuing medical education learning program on breastfeeding. Registration is free. All care providers are welcome to register. Follow the links on the [AHS Breastfeeding Initiative–Breastfeeding Course](#) webpage for more information.

Nutrition eLearning

A series of nutrition eLearning Modules on topics related to the nutrition and feeding of infants and young children can be found on [Nutrition eLearning Information for Health Professionals](#).

Courses for AHS professionals

AHS self-learning modules on My Learning Link (access through AHS) platform, include:

- Breastfeeding Foundations*
- Breastfeeding Challenges and Supplementation*
- Public Health Nutrition Module: Nutrition for Lactation

*The above modules will be replaced by the AHS 20-Hour Breastfeeding course, once all course modules are available.

Drugs and Lactation Databases

[LactMed®](#) and Medications and Mothers' Milk Online® (access through AHS) are databases with information on the levels of drugs and herbs in human milk and infant blood, and possible risks to the infant and parent who is lactating^a. LactMed® is regularly updated.

Nutrition Guideline

Nutrition for Lactation

Community Programs for At-Risk Individuals

The [Canada Prenatal Nutrition Program \(CPNP\)](#) is a community-based program that provides support to improve the health and well-being of people who are pregnant, new parents, and babies facing challenging life circumstances.

What resources are available for the public?

Pregnancy and Birth

General information on breastfeeding and nutrition for parents and infants is found in [Healthy Parents, Healthy Children](#).

Health Canada has information on pregnancy, breastfeeding, and healthy eating. The resource: [Your Guide to a Healthy Pregnancy](#) has information on breastfeeding.

General healthy eating information can be found on [Canada's food guide](#) page.

Nutrition Handouts

For nutrition resources visit: [Nutrition Education](#).

Nutrition Guideline

Nutrition for Lactation

References

1. Alberta Health Services. Breastfeeding Policy. 2022.
2. Health Canada, Canadian Pediatric Society Nutrition Committee, Dietitians of Canada, Breastfeeding Committee for Canada. Nutrition for healthy term infants: recommendations from birth to six months [Internet]. Vol. 2017. 2015. Available from: <https://www.canada.ca/en/health-canada/services/food-nutrition/healthy-eating/infant-feeding/nutrition-healthy-term-infants-recommendations-birth-six-months.html>
3. Victora CG, Bahl R, Barros AJD, V A França GVA, Horton S, Krasevec J, et al. Breastfeeding in the 21st century: epidemiology, mechanisms, and lifelong effect. *Lancet*. 2016;387(10017):475–90.
4. World Health Organization. Preterm birth [Internet]. 2017. Available from: <http://www.who.int/mediacentre/factsheets/fs363/en/>
5. Bartick M, Stehel EK, Calhoun SL, Feldman-Winter L, Zimmerman D, Noble L, et al. Academy of Breastfeeding Medicine Position Statement and Guideline: Infant Feeding and Lactation-Related Language and Gender. *Breastfeed Med*. 2021 Aug 1;16(8):587–90.
6. Ferri RL, Braitsch Rosen-Carole C, Jackson J, Carreno-Rijo E, Greenberg KB. ABM Protocol ABM Clinical Protocol #33: Lactation Care for Lesbian, Gay, Bisexual, Transgender, Queer, Questioning, Plus Patients. *Breastfeed Med*. 2020;15(5):284–93.
7. Alberta Health Services, Human Resources. Guide to creating safer and more welcoming places for sexual & gender minority (LGBTQ2S+) people [Internet]. 2018 [cited 2022 Sep 23]. Available from: [https://insite.albertahealthservices.ca/Main/assets/tms/dvi/tms-dvi-diversity-inclusion-gender-sexual-diversity-guide.pdf#search=guide to creating safer and more welcoming places for sexual %26 gender minority %28LGBTQ2S%2B%29 people](https://insite.albertahealthservices.ca/Main/assets/tms/dvi/tms-dvi-diversity-inclusion-gender-sexual-diversity-guide.pdf#search=guide%20to%20creating%20safer%20and%20more%20welcoming%20places%20for%20sexual%20and%20gender%20minority%20people)
8. National Cancer Institute. Definition of chest wall [Internet]. [cited 2022 Aug 4]. Available from: <https://www.cancer.gov/publications/dictionaries/cancer-terms/def/chest-wall>
9. National Cancer Institute. Definition of breast [Internet]. [cited 2022 Aug 4]. Available from: <https://www.cancer.gov/publications/dictionaries/cancer-terms/def/breast>
10. Wambach K, Spencer B. Breastfeeding and human lactation. 2021. 1727 p.
11. MacDonald T, Noel-Weiss J, West D, Walks M, Biener ML, Kibbe A, et al. Transmasculine individuals' experiences with lactation, chestfeeding, and gender identity: A qualitative study. *BMC Pregnancy Childbirth*. 2016 May 16;16(1):1–17.
12. Health Canada. Prenatal Nutrition Guidelines for Health Professionals - Background on Canada's Food Guide [Internet]. 2009 [cited 2020 Nov 30]. Available from: <https://www.canada.ca/en/health-canada/services/publications/food-nutrition/prenatal-nutrition-guidelines-health-professionals-background-canada-food-guide-2009.html>
13. Institute of Medicine. Dietary reference intakes for thiamin, riboflavin, niacin, vitamin B6, folate, vitamin B12, pantothenic acid, biotin, and choline. Washington, DC: National Academies Press; 1998.
14. Institute of Medicine. Dietary Reference Intakes for vitamin C, vitamin E, selenium and carotenoids. Washington: The National Academies Press; 2000.
15. O'Connor DL, Blake J, Bell R, Bowen A, Callum J, Fenton S, et al. Canadian Consensus on Female Nutrition: Adolescence, Reproduction, Menopause, and Beyond. *J Obstet Gynaecol Canada JOGC = J d'obstetrique Gynecol du Canada JOGC*. 2016;38(6):508-554.e18.
16. Institute of Medicine. Dietary reference intakes for energy, carbohydrate, fiber, fat, fatty acids, cholesterol, protein, and amino acids. Washington, DC: National Academies Press; 2005.
17. Institute of Medicine. Nutrition During Lactation [Internet]. National Academies Press. Washington (DC): National Academies Press (US); 1991. Available from: <http://www.ncbi.nlm.nih.gov/books/NBK235593/>
18. Institute of Medicine. Dietary reference intakes for vitamin A, vitamin K, arsenic, boron, chromium, copper, iodine, iron, manganese, molybdenum, nickel, silicon, vanadium, and zinc. 2002.
19. Health Canada. Prenatal Nutrition Guidelines for Health Professionals - Folate Contributes to a Healthy Pregnancy [Internet]. 2009 [cited 2022 Jun 16]. Available from: <https://www.canada.ca/en/health->

Nutrition Guideline

Nutrition for Lactation

- canada/services/food-nutrition/reports-publications/nutrition-healthy-eating/prenatal-nutrition-guidelines-health-professionals-folate-contributes-healthy-pregnancy-2009.html
20. Institute of Medicine. Dietary reference intakes for water, potassium, sodium, chloride, and sulfate. National Academies Press. 2005;
 21. Ndikom CM, Fawole B, Ilesanmi RE. Extra fluids for breastfeeding mothers for increasing milk production. *Cochrane Database Syst Rev.* 2014;(6).
 22. McKenzie A, Perrier E, Guelinckx I, Kavouras S, Aerni G, Lee E, et al. Relationships between hydration biomarkers and total fluid intake in pregnant and lactating women. *Eur J Nutr.* 2017 Sep;56(6):2161–70.
 23. Similac. Similac® mom [Internet]. 2015. Available from: <https://similac.ca/en>
 24. Health Canada. Caffeine in foods [Internet]. 2012 [cited 2022 Jun 16]. Available from: <https://www.canada.ca/en/health-canada/services/food-nutrition/food-safety/food-additives/caffeine-foods/foods.html>
 25. Government of Canada. Healthy pregnancy. Caffeine and pregnancy [Internet]. 2014. Available from: <https://www.canada.ca/en/public-health/services/pregnancy/caffeine.html>
 26. Nawrot P, Jordan S, Eastwood J, Rotstein J, Hugenholtz A, Feeley M. Effects of caffeine on human health. *Food Addit Contam.* 2003;20(1):1–30.
 27. Findlay JW, DeAngelis RL, Kearney MF, Welch RM, Findlay JM. Analgesic drugs in breast milk and plasma. *Clin Pharmacol Ther.* 1981;29(5):625–33.
 28. Berlin C M J, Denson HM, Daniel CH, Ward RM. Disposition of dietary caffeine in milk, saliva, and plasma of lactating women. *Pediatrics.* 1984 Jan;73(1):59.
 29. Stavchansky S, Combs A, Sagraves R, Delgado M, Joshi A. Pharmacokinetics of caffeine in breast milk and plasma after single oral administration of caffeine to lactating mothers. *Biopharm Drug Dispos.* 1988;9(3):285–99.
 30. Tyralla EE, Dodson WE. Caffeine secretion into breast milk. *Arch Dis Child.* 1979;54(10):787–9.
 31. Wikipedia. Half-life [Internet]. 2017. Available from: <https://en.wikipedia.org/wiki/Half-life>
 32. National Institutes of Health, US National Library of Medicine. Caffeine [Internet]. *Drugs and Lactation Database.* Bethesda, MD: National Library of Medicine (US); 2022 [cited 2022 Aug 5]. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK501467/>
 33. McCusker RR, Goldberger BA, Cone EJ. Caffeine Content of Specialty Coffees. *J Anal Toxicol.* 2003 Oct;27(7):520–2.
 34. Heckman MA, Weil J, Gonzalez de Mejia E. Caffeine (1, 3, 7-trimethylxanthine) in foods: a comprehensive review on consumption, functionality, safety, and regulatory matters. *J Food Sci [Internet].* 2010 Apr;75(3):R77–87. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/20492310>
 35. Ludwig IA, Mena P, Calani L, Cid C, Del Rio D, Lean MEJ, et al. Variations in caffeine and chlorogenic acid contents of coffees: what are we drinking? *Food Funct.* 2014;5(8):1718–26.
 36. Government of Canada, Health Canada, Health Products and Food Branch. Category specific guidance for temporary marketing authorization - caffeinated energy drinks [Internet]. 2013. Available from: <https://www.canada.ca/en/health-canada/services/food-nutrition/legislation-guidelines/guidance-documents/category-specific-guidance-temporary-marketing-authorization-caffeinated-energy-drinks.html>
 37. Rotstein J, Barber J, Strowbridge C, Hayward S, Huang R, Godefroy SB. Energy drinks: an assessment of the potential health risks in the Canadian context. *Int Food Risk Anal J.* 2013;3(5):1–29.
 38. Thornton J. Energy drinks: Implications for the breastfeeding mother. *MCN, Am J Matern child Nurs.* 2016;41(3):1–6.
 39. Health Canada. Canadian nutrient file [Internet]. 2015 [cited 2022 Jun 16]. Available from: <https://food-nutrition.canada.ca/cnf-fce/index-eng.jsp>
 40. Giglia RC. Alcohol and lactation: An updated systematic review. *Nutr Diet.* 2010;67(4):237–43.
 41. World Health Organization. Acceptable medical reasons for use of breast-milk substitutes [Internet]. Geneva:

Nutrition Guideline

Nutrition for Lactation

- WHO Press. World Health Organization; 2009. Available from: https://www.who.int/publications/i/item/WHO_FCH_CAH_09.01
42. Fríguls B, Joya X, García-Algar O, Pallás CR, Vall O, Pichini S. A comprehensive review of assay methods to determine drugs in breast milk and the safety of breastfeeding when taking drugs. *Anal Bioanal Chem.* 2010;397(3):1157–79.
 43. Government of Canada. Chapter 6: Breastfeeding [Internet]. [cited 2022 Aug 4]. Available from: <https://www.canada.ca/en/public-health/services/publications/healthy-living/maternity-newborn-care-guidelines-chapter-6.html#a5>
 44. D’Apolito K. Breastfeeding and substance abuse. *Clin Obstet Gynecol.* 2013;56(1):202–11.
 45. National Institutes of Health, US National Library of Medicine. Alcohol [Internet]. Drugs and Lactation Database. Bethesda, MD: National Library of Medicine (US); [cited 2022 Aug 5]. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK501469/>
 46. Rowe H, Baker T, Hale TW. Maternal medication, drug use, and breastfeeding. *Pediatr Clin North Am.* 2013;60(1):275–94.
 47. Bowen A, Tumback L. Alcohol and breastfeeding: dispelling the myths and promoting the evidence. *Nurs Womens Health.* 2010;14(6):454–61.
 48. Haastrup MB, Pottegård A, Damkier P. Alcohol and breastfeeding. *Basic Clin Pharmacol Toxicol.* 2014;114(2):168–73.
 49. Koren G. Drinking alcohol while breastfeeding: Will it harm my baby? *Can Fam Physician.* 2002 Jan;48:39–41.
 50. Butt P, Beirness D, Gliksman L, Paradis C, Stockwell T. Alcohol and health in Canada: a summary of evidence and guidelines for low-risk drinking [Internet]. Ottawa, ON: Canadian Centre on Substance Abuse; 2011. 66 pages. Available from: <http://deslibris.ca/ID/233659>
 51. Government of Canada, Health Canada. Nutrition considerations during pregnancy and to support breastfeeding [Internet]. Canada’s food guide. [cited 2022 Aug 5]. Available from: <https://food-guide.canada.ca/en/applying-guidelines/nutrition-considerations-during-pregnancy-support-breastfeeding/#breastfeeding>
 52. Dorea JG. Mercury and lead during breast-feeding. *Br J Nutr.* 2004;92(1):21–40.
 53. Koletzko B, Cetin I, Thomas Brenna J. Dietary fat intakes for pregnant and lactating women. *Br J Nutr.* 2007;98(5):873–7.
 54. Health Canada. Mercury in fish consumption advice: making informed choices about fish. [Internet]. 2017 [cited 2022 Jun 16]. Available from: <https://www.canada.ca/en/health-canada/services/food-nutrition/food-safety/chemical-contaminants/environmental-contaminants/mercury/mercury-fish.html>
 55. Health Canada. Mercury in fish - questions and answers [Internet]. 2011. Available from: <https://www.canada.ca/en/health-canada/services/food-nutrition/food-safety/chemical-contaminants/environmental-contaminants/mercury/mercury-fish-questions-answers.html>
 56. World Health Organization. Mercury and health [Internet]. World Health Organization; 2016. Available from: <http://www.who.int/mediacentre/factsheets/fs361/en/>
 57. Grandjean P, Jørgensen PJ, Weihe P. Human milk as a source of methylmercury exposure in infants. *Environ Health Perspect.* 1994;102(1):74–7.
 58. Björnberg KA, Vahter M, Berglund B, Niklasson B, Blennow M, Sandborgh-Englund G. Transport of methylmercury and inorganic mercury to the fetus and breast-fed infant. *Environ Health Perspect.* 2005;113(10):1381–5.
 59. Budzynska K, Gardner ZE, Low Dog T, Gardiner P. Complementary, holistic, and integrative medicine: advice for clinicians on herbs and breastfeeding. *Pediatr Rev.* 2013;34(8):343.
 60. Dietitians of Canada. What herbal beverages/supplements are safe to take during pregnancy and lactation? In: *Practice-based Evidence in Nutrition [PEN]*. [Internet]. 2012. Available from: www.pennutrition.com Access only by subscription.

Nutrition Guideline

Nutrition for Lactation

61. National Institutes of Health, US National Library of Medicine. LactMed: Drugs and lactation database [Internet]. Bethesda, MD: National Library of Medicine (US); 2022. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK501922/>
62. Hale T, Rowe H. Medications and mothers' milk online [Internet]. Vol. 2017. Springer Publishing Company; 2017. Available from: <https://www.halesmeds.com/>
63. Therapeutic Research Center. Natural medicines [Internet]. 2017. Available from: <https://naturalmedicines.therapeuticresearch.com>
64. Budzynska K, Gardner ZE, Dugoua J-J, Low Dog T, Gardiner P. Systematic review of breastfeeding and herbs. *Breastfeed Med*. 2012;7(6):489–503.
65. Health Canada. About natural health products [Internet]. 2016. Available from: <https://www.canada.ca/en/health-canada/services/drugs-health-products/natural-non-prescription/regulation/about-products.html>
66. Celestial Seasonings. Lemon zinger herbal tea (product information) [Internet]. 2016. Available from: <http://celestialseasonings.ca/en/>
67. US Government Publishing Office. Part 182. Substances generally recognized as safe [Internet]. 2016. Available from: <https://www.ecfr.gov/cgi-bin/text-id?SID=4979eec059872026397c6a4261c77c14&mc=true&node=pt21.3.182&rgn=div5>
68. Government of Canada. Food and Drug Regulations [Internet]. 2016. Available from: http://laws-lois.justice.gc.ca/PDF/C.R.C.,_c._870.pdf
69. Government of Canada. Food and Drug Regulations. Division 10. Flavouring preparations [Internet]. 2016. Available from: http://laws-lois.justice.gc.ca/PDF/C.R.C.,_c._870.pdf
70. Dietitians of Canada. Do herbs/herbal teas have an effect on breastmilk production? [Internet]. 2012. Available from: www.pennutrition.com Access only by subscription.
71. Conover E, Buehler BA. Use of herbal agents by breastfeeding women may affect infants. *Pediatr Ann*. 2004;33(4):235–40.
72. Hale T, Rowe H. Blessed thistle [Internet]. Medications and mothers' milk online. New York, NY: Springer Publishing Company; 2016. Available from: <https://www.halesmeds.com/>
73. National Institutes of Health, US National Library of Medicine. Caraway [Internet]. Drugs and Lactation Database. Bethesda, MD: National Library of Medicine (US); 2022. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK501791/>
74. National Institutes of Health, US National Library of Medicine. Fennel [Internet]. Drugs and Lactation Database. 2022. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK501793/>
75. National Institutes of Health, US National Library of Medicine. Ginger [Internet]. Drugs and Lactation Database. Bethesda, MD: National Library of Medicine (US); 2022. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK501786/>
76. National Institutes of Health, US National Library of Medicine. Lemon balm [Internet]. Drugs and Lactation Database. Bethesda, MD: National Library of Medicine (US); 2022. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK501841/>
77. Hale T, Rowe H. Milk thistle [Internet]. Medications and mothers' milk online. New York, NY: Springer Publishing Company; 2017. Available from: <https://www.halesmeds.com/>
78. National Institutes of Health, US National Library of Medicine. Milk thistle [Internet]. Drugs and Lactation Database. Bethesda, MD: National Library of Medicine (US); 2022. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK501771/>
79. Health Canada. Organic raspberry leaf (tea). Traditional Medicinals, Inc [Internet]. 2016. Available from: <https://health-products.canada.ca/lnhpd-bdpsnh/info.do?licence=80012819>
80. National Institutes of Health, US National Library of Medicine. Raspberry [Internet]. Drugs and Lactation Database. Bethesda, MD: National Library of Medicine (US); 2022. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK501785/>

Nutrition Guideline

Nutrition for Lactation

81. Nice FJ, Nice MH. The galactagogue recipe book. Plano: Hale Publishing, L.P; 2014.
82. Lawrence R, Lawrence RM. Approach to breast-feeding. In: Duggan C, Watkins JB, Walker WA, editors. Nutrition in pediatrics Basic science Clinical applications. 4th ed. Hamilton, Ontario: BC Decker Inc; 2008.
83. US Government Publishing Office. Part 182. Substances generally recognized as safe [Internet]. 2006 [cited 2016 Dec 19]. Available from: <https://www.ecfr.gov/current/title-21/chapter-I/subchapter-B/part-182>
84. National Institutes of Health, US National Library of Medicine. Aloe [Internet]. Drugs and Lactation Database. Bethesda, MD: National Library of Medicine (US); 2022. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK501829/>
85. Hale T, Rowe H. Aloe vera [Internet]. Medications and mothers' milk online. New York, NY: Springer Publishing Company; 2017. Available from: <https://www.halesmeds.com/>
86. Therapeutic Research Center. Aloe [Internet]. 2016. Available from: <https://naturalmedicines.therapeuticresearch.com>
87. National Institutes of Health, US National Library of Medicine. Blue cohosh [Internet]. Drugs and Lactation Database. Bethesda, MD: National Library of Medicine (US); 2022. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK501780/>
88. Hale T, Rowe H. Blue cohosh [Internet]. Medications and mothers' milk online. New York, NY: Springer Publishing Company; 2017. Available from: <https://www.halesmeds.com/>
89. Therapeutic Research Center. Blue cohosh. 2015; Available from: <https://naturalmedicines.therapeuticresearch.com>
90. Panter KE, James LF. Natural plant toxicants in milk: a review. J Anim Sci. 1990;68(3):892–904.
91. Hale T, Rowe H. Borage [Internet]. Medications and mothers' milk online. New York, NY: Springer Publishing Company; 2017. Available from: <https://www.halesmeds.com/>
92. Hale T, Rowe H. Comfrey [Internet]. Medications and mothers' milk online. New York, NY: Springer Publishing Company; 2017. Available from: <https://www.halesmeds.com/>
93. Therapeutic Research Center. Kombucha tea [Internet]. 2017. Available from: <https://naturalmedicines.therapeuticresearch.com>
94. Hale T, Rowe H. Kombucha tea [Internet]. Vol. 2018, Medications and mothers' milk online. New York, NY: Springer Publishing Company; 2018. Available from: <https://www.halesmeds.com/>
95. Health Canada. List of permitted sweeteners (lists of permitted food additives) [Internet]. 2017 [cited 2022 Jun 16]. Available from: <https://www.canada.ca/en/health-canada/services/food-nutrition/food-safety/food-additives/lists-permitted/9-sweeteners.html>
96. Dietitians of Canada. Sweeteners - Evidence Summary [Internet]. 2013. Available from: www.pennutrition.com Access only by subscription.
97. Sugar Twin. Sugar Twin® sachets [Internet]. 2017. Available from: <https://sugartwin.ca/>
98. myHealth Alberta. Comparing sugar substitutes - topic overview [Internet]. 2017. Available from: <https://myhealth.alberta.ca/Health/pages/conditions.aspx?hwid=abj7112>
99. Government of Canada, Canadian Food Inspection Agency. Sweeteners [Internet]. 2013. Available from: <http://www.inspection.gc.ca/food/labelling/food-labelling-for-industry/sweeteners/eng/1387749708758/1387750396304?chap=3#s7c3>
100. Health Canada. The Safety of Sugar Substitutes [Internet]. 2008 [cited 2022 Jun 16]. Available from: <https://www.canada.ca/en/health-canada/services/healthy-living/your-health/food-nutrition/safety-sugar-substitutes.html>
101. Canadian Diabetes Association Clinical Practice Guidelines Expert Committee. Clinical practice guidelines: Nutrition therapy. Can J Diabetes. 2013;37:S45–55.
102. Health Canada. Notice of modification to the list of permitted sweeteners to enable the use of advantame as a sweetener in certain unstandardized foods including certain beverages □ reference number: NOM/ADM-0092 [Internet]. 2017. Available from: <https://www.canada.ca/en/health-canada/services/food-nutrition/public-involvement-partnerships/notice-modification-list-permitted-sweeteners-enable-use-advantame-a-sweetener->

Nutrition Guideline

Nutrition for Lactation

- certain-unstandardized-foods-including-certain-beverages-reference.html
103. WHO Expert Committee on Food Additives. Advantame [Internet]. 2015. Available from: <http://apps.who.int/food-additives-contaminants-jecfa-database/chemical.aspx?chemID=6181>
 104. Health Canada. Sugar substitutes [Internet]. 2010. Available from: <https://www.canada.ca/en/health-canada/services/food-nutrition/food-safety/food-additives/sugar-substitutes.html>
 105. Health Canada. Consultation document on Health Canada's proposal to enable the use of a new food additive, monk fruit extract (luo han guo extract), as a sweetener in table-top sweeteners [Internet]. 2013. Available from: <https://www.canada.ca/en/health-canada/services/food-nutrition/public-involvement-partnerships/notice-proposal-enable-use-new-food-additive-monk-fruit-extract-extract-sweetener-table-top-sweeteners/consultation.html>
 106. Health Canada. Questions and answers: saccharin [Internet]. 2007. Available from: <https://www.canada.ca/en/health-canada/services/food-nutrition/food-safety/food-additives/sugar-substitutes/questions-answers-saccharin-artificial-sweeteners.html>
 107. Modderman JP. Safety assessment of hydrogenated starch hydrolysates. *Regul Toxicol Pharmacol*. 1993;18(1):80–114.
 108. Wolever T, Piekarz A, Hollands M, Cde R, Younker K, Cde MR. Sugar Alcohols and Diabetes: A Review. Vol. 26, *Canadian Journal of Diabetes*. 2002.
 109. Grembecka M. Sugar alcohols—their role in the modern world of sweeteners: a review. *Eur Food Res Technol*. 2015 Jul;241(1):1–14.
 110. Health Canada. Sugar Alcohols (Polyols) and Polydextrose Used as Sweeteners in Foods - Food Safety - Health Canada - Canada.ca [Internet]. 2015 [cited 2020 Nov 6]. Available from: <https://www.canada.ca/en/health-canada/services/food-nutrition/food-safety/food-additives/sugar-substitutes/sugar-alcohols-polyols-polydextrose-used-sweeteners-foods-food-safety.html>
 111. Cuello-Garcia C, Brożek L. J, Fiocchi A, Pawankar R, Yepes-Nuñez JJ, Terracciano L, et al. Probiotics for the prevention of allergy: A systematic review and meta-analysis of randomized controlled trials. *J Allergy Clin Immunol*. 2015;136(4):952–61.
 112. Elias J, Bozzo P, Einarson A. Are probiotics safe for use during pregnancy and lactation? *Can Fam physician Médecin Fam Can*. 2011;57(3):299–301.
 113. Dietitians of Canada. Gastrointestinal system - probiotics. Background [Internet]. 2010. Available from: www.pennutrition.com Access only by subscription.
 114. Abrahamsson TR, Sinkiewicz G, Jakobsson T, Fredrikson M, Björkstén B. Probiotic lactobacilli in breast milk and infant stool in relation to oral intake during the first year of life. *J Pediatr Gastroenterol Nutr*. 2009;49(3):349–54.
 115. Ortiz-Andrellucchi A, Sánchez-Villegas A, Rodríguez-Gallego C, Lemes A, Molero T, Soria A, et al. Immunomodulatory effects of the intake of fermented milk with *Lactobacillus casei* DN114001 in lactating mothers and their children. *Br J Nutr*. 2008;100(4):834–45.
 116. Baldassarre ME, Di Mauro A, Mastromarino P, Fanelli M, Martinelli D, Urbano F, et al. Administration of a multi-strain probiotic product to women in the perinatal period differentially affects the breast milk cytokine profile and may have beneficial effects on neonatal gastrointestinal functional symptoms. A randomized clinical trial. *Nutrients*. 2016;8(11):677.
 117. Health Canada. Questions and answers on probiotics [Internet]. 2009 [cited 2022 Jun 16]. Available from: <https://www.canada.ca/en/health-canada/services/food-nutrition/food-labelling/health-claims/questions-answers-probiotics.html>
 118. Soto A, Martín V, Jiménez E, Mader I, Rodríguez JM, Fernández L. Lactobacilli and bifidobacteria in human breast milk: influence of antibiotherapy and other host and clinical factors. *J Pediatr Gastroenterol Nutr*. 2014;59(1):78–88.
 119. Joint FAO/WHO Working Group. Guidelines for the evaluation of probiotics in food [Internet]. London, ON; 2002. p. 1–11. Available from: https://4cau4jsaler1zgkq3wnmje1-wpengine.netdna-ssl.com/wp-content/uploads/2019/04/probiotic_guidelines.pdf

Nutrition Guideline

Nutrition for Lactation

120. Dietitians of Canada. What are the risks associated with probiotic intake in infants? [Internet]. 2010. Available from: www.pennutrition.com Access only by subscription.
121. Dietitians of Canada. What are the nutritional needs of a mother who is pregnant and breastfeeding an older child? [Internet]. 2012. Available from: www.pennutrition.com Access only by subscription.
122. Institute of Medicine. Dietary reference intakes for calcium and vitamin D. Washington, DC: National Academies Press; 2011.
123. Amit M. Vegetarian diets in children and adolescents. *Paediatr Child Health*. 2010;15(5):303–14.
124. Allen LH. B vitamins in breast milk: relative importance of maternal status and intake, and effects on infant status and function. *Adv Nutr*. 2012;3(3):362–9.
125. Dror DK, Allen LH. Effect of vitamin B12 deficiency on neurodevelopment in infants: current knowledge and possible mechanisms. *Nutr Rev*. 2008;66(5).
126. Dietitians of Canada. Do infants born to vegetarian women (lacto-ovo, lacto, vegan), and who breastfeed their infant, require a vitamin B12 supplement? [Internet]. 2012. Available from: www.pennutrition.com Access only by subscription only.
127. Arterburn LM, Oken HA, Bailey Hall E, Hamersley J, Kuratko CN, Hoffman JP. Algal-oil capsules and cooked salmon: nutritionally equivalent sources of docosahexaenoic acid. *J Am Diet Assoc*. 2008;108(7):1204–9.
128. Lim S, O'Reilly S, Behrens H, Skinner T, Ellis I, Dunbar JA. Effective strategies for weight loss in post-partum women: a systematic review and meta-analysis. *Obes Rev*. 2015 Nov;16(11):972–87.
129. Amorim Adegboye AR, Linne YM. Diet or exercise, or both, for weight reduction in women after childbirth. *Cochrane Database Syst Rev*. 2013;(7):CD005627.
130. Lovelady CA, Garner KE, Moreno KL, Williams JP. The Effect of Weight Loss in Overweight, Lactating Women on the Growth of Their Infants. *N Engl J Med*. 2000;342(7):449–53.
131. Strode MA, Dewey KG, Lönnerdal BO. Effects of Short-Term Caloric Restriction on Lactational Performance of Well-Nourished Women. *Acta Paediatr*. 1986 Mar;75(2):222–9.
132. Bravi F, Wiens F, Decarli A, Dal Pont A, Agostoni C, Ferraroni M. Impact of maternal nutrition on breast-milk composition: a systematic review. *Am J Clin Nutr*. 2016 Sep;104(3):646–62.
133. Ballard O, Morrow AL. Human milk composition: nutrients and bioactive factors. *Pediatr Clin North Am*. 2013;60(1):49–74.
134. Riordan J, Wambach K. Breastfeeding and human lactation. Sudbury, Mass.: Jones and Bartlett Publishers; 2010.
135. Wambach K, Riordan J. Breastfeeding and human lactation. 5th ed. Burlington, MA: Jones and Bartlett Learning; 2014.
136. Dietitians of Canada. Women's health - lactation evidence summary [Internet]. 2017. Available from: www.pennutrition.com Access only by subscription.
137. Shakur YA, Tarasuk V, Corey P, O'Connor DL. A comparison of micronutrient inadequacy and risk of high micronutrient intakes among vitamin and mineral supplement users and nonusers in Canada. *J Nutr*. 2012;142(3):534–40.
138. Hollis BW, Wagner CL, Howard CR, Ebeling M, Shary JR, Smith PG, et al. Maternal Versus Infant Vitamin D Supplementation During Lactation: A Randomized Controlled Trial. *Pediatrics*. 2015;136(4):625–34.
139. Innis SM. Maternal nutrition, genetics, and human milk lipids. *Curr Nutr Rep*. 2013;2(3):151–8.
140. Innis SM. Impact of maternal diet on human milk composition and neurological development of infants. *Am J Clin Nutr*. 2014;99(3):734S–741S.
141. Dietitians of Canada. What are the omega-3 fatty acid needs for breastfeeding women? [Internet]. 2012. Available from: www.pennutrition.com Access only by subscription.
142. Koletzko B, Lien E, Agostoni C, Böhles H, Campoy C, Cetin I, et al. The roles of long-chain polyunsaturated fatty acids in pregnancy, lactation and infancy: review of current knowledge and consensus recommendations. *J Perinat Med*. 2008;36(1):5–14.

Nutrition Guideline

Nutrition for Lactation

143. Jia X, Pakseresht M, Wattar N, Wildgrube J, Sontag S, Andrews M, et al. Women who take n-3 long-chain polyunsaturated fatty acid supplements during pregnancy and lactation meet the recommended intake. *Appl Physiol Nutr Metab*. 2015;40(5):474–81.
144. Sherry CL, Oliver JS, Marriage BJ. Docosahexaenoic acid supplementation in lactating women increases breast milk and plasma docosahexaenoic acid concentrations and alters infant omega 6:3 fatty acid ratio. *Prostaglandins Leukot Essent Fat Acids*. 2015;95:63–9.
145. Burdge GC, Calder PC. Conversion of α -linolenic acid to longer-chain polyunsaturated fatty acids in human adults. *Reprod Nutr Dev*. 2005;45(5):581–97.
146. Dietitians of Canada. Are the Adequate Intakes (AIs) for alpha linolenic acid (ALA) adequate for vegetarian (lacto-ovo, lacto, and vegan) women who are pregnant and breastfeeding? [Internet]. 2012. Available from: www.pennutrition.com Access only by subscription.
147. Hausner H, Bredie WLP, Mølgaard C, Petersen MA, Møller P. Differential transfer of dietary flavour compounds into human breast milk. *Physiol Behav*. 2008;95(1):118–24.
148. Mennella JA. Mother's Milk: A Medium for Early Flavor Experiences. *J Hum Lact*. 1995 Mar;11(1):39–45.
149. Mennella JA, Johnson A, Beauchamp GK. Garlic ingestion by pregnant women alters the odor of amniotic fluid. *Chem Senses*. 1995;20(2):207–9.
150. Cooke L, Fildes A. The impact of flavour exposure in utero and during milk feeding on food acceptance at weaning and beyond. *Appetite*. 2011;57(3):808–11.
151. Koletzko B, Lehner F. Beer and breastfeeding. In: *Short and Long Term Effects of Breast Feeding on Child Health*. Boston: Kluwer Academic Publishers; 2000. p. 23–8.
152. National Institutes of Health, US National Library of Medicine. Barley [Internet]. *Drugs and Lactation Database*. 2021 [cited 2022 Aug 5]. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK501827/>
153. National Institute of Health, US National Library of Medicine. Hops [Internet]. *Drugs and Lactation Database*. 2021 [cited 2022 Aug 5]. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK501833/>
154. Mennella JA, Beauchamp GK. Beer, breast feeding, and folklore. *Dev Psychobiol*. 1993;26(8):459–66.
155. Schneider C, Thierauf A, Kempf J, Auwärter V. Ethanol concentration in breastmilk after the consumption of non-alcoholic beer. *Breastfeed Med*. 2013;8(3):291–3.
156. Academy of Breastfeeding Medicine Protocol Committee. ABM clinical protocol #9: Use of galactagogues in initiating or augmenting the rate of maternal milk secretion (first revision January 2011). *Breastfeed Med*. 2011;6(1):41–9.
157. Forinash AB, Yancey AM, Barnes KN, Myles TD. The use of galactagogues in the breastfeeding mother. *Ann Pharmacother*. 2012;46(10):1392–404.
158. Nice FJ. Selection and use of galactagogues. *ICAN Infant, Child, Adolesc Nutr*. 2015;7(4):192–4.
159. Zapantis A, Steinberg JG, Schilit L. Use of herbals as galactagogues. *J Pharm Pract*. 2012;25(2):222–31.
160. Amer MR, Cipriano GC, Venci J V, Gandhi M. Safety of popular herbal supplements in lactating women. *J Hum Lact*. 2015;31(3):348–53.
161. Government of Canada. Food safety for vulnerable populations [Internet]. 2015. Available from: <https://www.canada.ca/en/health-canada/services/food-safety-vulnerable-populations/food-safety-vulnerable-populations.html>
162. Dietitians of Canada. Are foodborne pathogens transmitted through breastmilk? [Internet]. 2011. Available from: www.pennutrition.com Access only by subscription.
163. Lanari M, Sogno Valin P, Natale F, Capretti MG, Serra L. Human milk, a concrete risk for infection? *J Matern neonatal Med*. 2012;25 Suppl 4:75–7.
164. Jones CA. Maternal transmission of infectious pathogens in breast milk. *J Paediatr Child Health*. 2001;37(6):576–82.
165. Cossey V, Jeurissen A, Thelissen M-J, Vanhole C, Schuermans A. Expressed breast milk on a neonatal unit: A hazard analysis and critical control points approach. *Am J Infect Control*. 2011;39(10):832–8.

Nutrition Guideline

Nutrition for Lactation

166. Decousser J-W, Ramarao N, Duport C, Dorval M, Bourgeois-Nicolaos N, Guinebretière M-H, et al. *Bacillus cereus* and severe intestinal infections in preterm neonates: Putative role of pooled breast milk. *Am J Infect Control*. 2013;41(10):918–21.
167. Godambe S, Shah PS, Shah V. Breast milk as a source of late onset neonatal sepsis. *Pediatr Infect Dis J*. 2005;24(4):381–2.
168. Widger J, O'Connell NH, Stack T. Breast milk causing neonatal sepsis and death. *Clin Microbiol Infect*. 2010;16(12):1796–8.
169. Keim SA, Hogan JS, McNamara KA, Gudimetla V, Dillon CE, Kwiek JJ, et al. Microbial contamination of human milk purchased via the Internet. *Pediatrics*. 2013;132(5):1227.
170. Health Canada. Safety of donor human milk in Canada [Internet]. 2014. Available from: <https://www.canada.ca/en/health-canada/services/food-nutrition/healthy-eating/infant-feeding/safety-donor-human-milk-canada.html>
171. National Institute for Health and Clinical Excellence. Routine postnatal care of women and their babies [Internet]. 2021. Available from: <https://www.nice.org.uk/guidance/ng194/resources/postnatal-care-pdf-66142082148037>
172. National Institutes of Health, US National Library of Medicine. Psyllium [Internet]. Bethesda, MD: National Library of Medicine (US); 2022. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK501346/>
173. Henly SJ, Anderson CM, Avery MD, Hills-Bonuyk S, Potter S, Duckett LJ. Anemia and insufficient milk in first-time mothers. *Birth*. 1995;22(2):87–92.
174. Rioux FM, Savoie N, Allard J. Is there a link between postpartum anemia and discontinuation of breastfeeding? *Can J Diet Pract Res*. 2006;67(2):72–6.
175. Matsubara VH, H N Bandara HM, Mayer MPA, Samaranyake LP, Paulo S. Probiotics as antifungals in mucosal candidiasis. *Clin Infect Dis*. 2016;62(9):1143–53.
176. Dietitians of Canada. Do dietary restrictions affect the growth of *Candida albicans*? [Internet]. 2015. Available from: www.pennutrition.com Access only by subscription.
177. Academy of Breastfeeding Medicine Protocol Committee. ABM clinical protocol #24: allergic proctocolitis in the exclusively breastfed infant. *Breastfeed Med*. 2011;6(6):435–40.
178. Greer FR, Sicherer SH, Burks AW. Effects of early nutritional interventions on the development of atopic disease in infants and children: the role of maternal dietary restriction, breastfeeding, timing of introduction of complementary foods, and hydrolyzed formulas. *Pediatrics*. 2008;121(1):183–91.
179. de Silva D, Geromi M, Halcken S, Host A, Panesar SS, Muraro A, et al. Primary prevention of food allergy in children and adults: systematic review. *Allergy - Eur J Allergy Clin Immunol*. 2014 May;69(5):581–9.
180. Høst A, Halcken S, Muraro A, Dreborg S, Niggemann B, Aalberse R, et al. Dietary prevention of allergic diseases in infants and small children. *Pediatr Allergy Immunol*. 2008;19(1):1–4.
181. Muche-Borowski C, Kopp M, Reese I, Sitter H, Werfel T, Schäfer T. Allergy prevention. *J Ger Soc Dermatology*. 2010;8(9):718–24.
182. Kramer MS, Kakuma R. Maternal dietary antigen avoidance during pregnancy or lactation, or both, for preventing or treating atopic disease in the child. *Cochrane database Syst Rev*. 2006;(3):CD000133.
183. Du Toit G, Lack G. Can food allergy be prevented? The current evidence. *Pediatr Clin North Am*. 2011;58(2):481–509.
184. Pali-Schöll I, Renz H, Jensen-Jarolim E. Update on allergies in pregnancy, lactation, and early childhood. *J Allergy Clin Immunol*. 2009;123(5):1012–21.
185. Iacovou M, Ralston RA, Muir J, Walker KZ, Truby H. Dietary management of infantile colic: A systematic review. *Matern Child Health J*. 2012;16(6):1319–31.
186. Critch J. Infantile colic: is there a role for dietary interventions? *Paediatr Child Health*. 2011;16(1):47–9.
187. Dietitians of Canada. Does a breastfeeding mother's diet contribute to infant colic? [Internet]. 2012. Available from: www.pennutrition.com Access only by subscription.

Nutrition Guideline

Nutrition for Lactation

188. Harb T, Matsuyama M, David M, Hill RJ. Infant colic-what works: a systematic review of interventions for breast-fed infants. *J Pediatr Gastroenterol Nutr.* 2016;62(5):668–86.
189. Lawrence RA, Lawrence RM. *Breastfeeding: a guide for the medical profession.* 7th ed. Maryland Heights: Elsevier Inc; 2011.
190. Betancourt JR, Green AR, Carrillo JE. *Cultural Competence in Health Care: Emerging Frameworks and Practical Approaches.* Policy File [Internet]. 2002 Oct 1; Available from: <https://www.commonwealthfund.org/publications/fund-reports/2002/oct/cultural-competence-health-care-emerging-frameworks-and>
191. Trepanowski JF, Bloomer RJ. The impact of religious fasting on human health. *Nutr J.* 2010;9(1):57.
192. Rakicioglu N, Samur G, Topcu A, Topcu AA. The effect of Ramadan on maternal nutrition and composition of breast milk. *Pediatr Int.* 2006;48(3):278–83.
193. Salah ET, Malik NME, Hassan MS, Mohammed IA, Mohamed M, Mohamed MO, et al. How does the fasting of Ramadan affect breast milk constituents? *Sudan J Med Sci.* 2016;11(1):17–21.
194. Haratipour H, Sohrabi MB, Ghasemi E, Karimi A, Zolfaghari P, Yahyaei E. Impact of maternal fasting during Ramadan on growth parameters of exclusively breastfed infants in Shahroud, 2012. *J Fasting Heal.* 2013;1(2):66–9.
195. Zimmerman DR, Goldstein L, Lahat E, Braunstein R, Stahi D, Bar-Haim A, et al. Effect of a 24+ hour fast on breast milk composition. *J Hum Lact.* 2009;25(2):194–8.
196. Tarasuk V, Mitchell A. Household food insecurity in Canada, 2017-18 [Internet]. Toronto: Research to identify policy options to reduce food insecurity (PROOF); 2020. Available from: <https://proof.utoronto.ca/>
197. Men F, Gundersen C, Urquia ML, Tarasuk V. Food insecurity is associated with higher health care use and costs among canadian adults. *Health Aff.* 2020;39(8):1377–85.
198. Alberta Health Services. Household food insecurity evidence review: Lived experience and strategy effectiveness. Calgary; 2020.
199. Ontario Dietitians in Public Health. Position statement and recommendations on responses to food insecurity [Internet]. 2020. Available from: odph.ca.
200. Huisken A, Orr SK, Tarasuk V. Adults' food skills and use of gardens are not associated with household food insecurity in Canada. *Can J Public Heal.* 2016;107(6):e526–32.
201. Loopstra R, Tarasuk V. The relationship between food banks and household food insecurity among low-income Toronto Families. *Can Public Policy.* 2012;38(4):497–514.
202. Andermann A. Taking action on the social determinants of health in clinical practice: A framework for health professionals. *Cmaj.* 2016;188(17–18):E474–83.
203. Sivakumar G, Chau B. Poverty: A clinical instrument for family physicians. *Univ West Ont Med J.* 2017 Dec 3;86(2):62–4.