

Nutrition Guideline

Healthy Infants and Young Children

Milk

For Professional Reference Only

Applicable to: Nurses, Physicians and Other Health Professionals

Recommendations

- Breastmilk is the optimal milk for infants and is recommended for up to 2 years and beyond.
- Pasteurized 3.25% (homogenized) milk may be introduced to healthy term infants at 9 – 12 months of age and continued throughout the second year of life.
- Whole, 3.25% or greater, pasteurized goat's milk fortified with vitamin D may be used as an alternative to cow's milk after 9 – 12 months of age.
- Children 1 year of age and older should be offered 2 cups (500 mL) of milk each day.
- Children 2 years of age and older can be offered lower fat milk (skim, 1% or 2%).
- Soy, rice, almond and other plant-based beverages are not suitable alternatives to milk for children under 2 years of age.
- For children 2 years of age and older not consuming milk, *Eating Well with Canada's Food Guide* recommends a fortified soy beverage. If parents choose another plant-based beverage as a milk alternative for their child, they should look for a product that:
 - provides at least 6 g of protein per 250 mL (1 cup);
 - provides at least 30% Daily Value of calcium and vitamin D per 250 mL (1 cup); and
 - contains less than 10 g of sugar per 250 mL (1 cup).
- A child under 2 years of age who is not drinking breastmilk, 3.25% milk, or commercial infant formula may benefit from a referral to a dietitian.
- Toddler formulas which are marketed as an alternative or complement to breastmilk or fluid milk are not necessary for young children.

Health Benefits

This guideline will provide information on and considerations for the use of fluid milks for infants and young children. This information will assist health professionals when educating parents on appropriate milk choices for infants and young children to help support healthy growth and development. Fluid milks contain nutrients such as protein, calcium, vitamin D, phosphorus, potassium, magnesium and vitamins A, B₁₂ and riboflavin which support growth and development including building strong bones and teeth.¹

Definitions

Young infant: Birth to 6 months

Older infant: 6 – 12 months

Young child: 12 – 24 months

Infant formula: food intended for young infants until the introduction of appropriate complementary feeding.

Follow-up formula: formula marketed for infants 6 months and older when appropriate complementary feeding is introduced.

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Milk: the fluid secreted by female mammals to feed their young. For this guideline human breastmilk and fortified cow or goat milk are referred to as “milk”.

Plant-based beverage: a beverage made from legumes, nuts, cereal grains or potatoes.² Common examples are soy, almond, and rice beverages.

Toddler formula (Growing up milk, milk beverage, milk drink): a supplement marketed as an alternative or complement to breastmilk and cow’s milk for young children.

Key Questions

At what age can cow’s milk be introduced?

At 9 – 12 months of age, healthy term infants can be offered pasteurized, 3.25% (homogenized) milk.³ This can also be in the form of reconstituted powder 3.25% milk or evaporated canned 3.25% milk.² Preterm infants should not receive 3.25% milk until they are 12 months corrected age.^{4,5,6} To reduce the risk of iron-deficiency, it is important for older infants to consume iron-rich foods at most meals before 3.25% milk is offered.⁷ It is best to offer milk at meals and snacks in an open cup. Sipping on milk between meals may cause early childhood caries.^{8,9}

Cow’s milk to drink is not appropriate for infants younger than 9 months of age as it:

- is low in iron^{3,10}
- may displace iron-rich foods³
- can inhibit iron absorption³
- is low in essential fatty acids¹⁰
- contains a less digestible form of protein¹⁰
- is associated with occult blood loss in stool in infants under 6 months of age^{11,12,13,14}

After 6 months of age, milk can be used in baking or cooking, and milk products such as cheese and yogurt can be introduced along with a variety of iron-rich foods.³

For infants younger than 9 months of age not receiving breastmilk, commercial infant formula will meet the nutritional needs of infants and is the only recommended alternative to breastmilk.³

For more information on infant formula or vitamin D, refer to the Nutrition Guidelines: [Infant Formulas](#) or [Vitamin D](#)

If an older infant or child is breastfed, can you offer additional milk to drink?

Breastfeeding can be continued for up to 2 years of age and beyond, as long as the mother and child want to continue.¹⁵ Older breastfed infants and children not consuming foods or drinks from the Milk and Alternatives food group (e.g. yogurt and cheese) may not be getting enough calcium and vitamin D. Nutrient adequacy will be dependent on frequency and volume of breastmilk consumed. Individual guidance from a dietitian may be warranted.

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If a parent chooses to offer 3.25% milk to a breastfed child, then it is best to offer it at meals and snacks and in an open cup. For children 1 year and older, the total amount from both milk and breastmilk should be no more than 2 cups (500 mL) to prevent iron deficiency anemia.⁷ Children who are overly reliant on milk or breastmilk may consume insufficient amounts of complementary foods which can increase the risk of nutrient deficiencies, such as iron.^{16,17}

Health professionals can support breastfeeding of the older infant and young child by continuing to promote this practice as the normal way of feeding.³

What are the considerations around the consumption of goat's milk?

Pasteurized, whole goat's milk (3.25% or greater) fortified with vitamin D can be offered as an alternative to cow's milk once an infant is 9-12 months of age and eating iron rich foods at most meals.³ Similar to cow's milk, lower fat goat's milk are not appropriate before 2 years of age. Goat's milk poses the same risks for the development of iron deficiency as cow's milk when consumed in excessive amounts.^{3,18} Just like cow's milk, goat's milk is not appropriate for infants younger than 9 months as it:

- is low in iron
- is low in essential fatty acids and other essential nutrients
- contain a less-digestible form of protein³

Goat's milk is not a recommended alternative to cow's milk for cow's milk allergy or for lactose intolerance. Cow's and goat's milk are very similar in composition in terms of their protein, fat and carbohydrate content.¹⁹ Due to the similarity in proteins, older infants and young children who have a food allergy to cow's milk protein are also likely to have an allergic reaction to goat's milk.³

Although both goat's milk and cow's milk contain comparable amounts of lactose, goat's milk contains slightly lower levels.¹⁹ Goat's milk contains smaller fat droplets which may ease digestibility, but this has not been proven.²⁰

Goat's milk is significantly lower in folic acid unless it is fortified. However, at 9 – 12 months of age, older infants will receive folate through complementary foods such as vegetables (especially dark green vegetables), fruits, beans, poultry and meat, eggs, seafood, and grains.²¹

Health Canada recommends choosing a goat's milk fortified with vitamin D, however, fortification with vitamin D is not mandatory in Canada.³ Currently, there are no goat's milk products fortified with vitamin D available for purchase in Alberta, therefore, parents who offer non-fortified whole goat's milk should be advised that their child may not meet their daily vitamin D requirements. Parents may wish to ask their local store to use a supplier that offers fortified goat's milk. Parents offering non-fortified goat's milk should consult with their child's doctor or Registered Dietitian to see if additional vitamin D supplementation is required. The nutrient content for both milks are otherwise similar; see Table 1 below.

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Table 1. Comparison of Cow's and Goat's Milk Nutrient Content per 1 cup (250 mL)

Nutrient	Cow's milk	Goat's milk	
	3.25% (Homogenized)	Fortified (Whole)	Unfortified (Whole)
Energy (calories)	157	178	178
Protein (g)	8	9	9
Carbohydrate (g)	12	11	11
Fat (g)	8	11	11
Calcium (mg)	291	345	345
Iron (mg)	0.1	0.1	0.1
Vitamin A (RAE-mcg)	119	147	147
Vitamin D (IU)	103	100	0.3
Folic Acid (DFE – ug)	13	37	2

Data source: Canadian Nutrient File¹⁹

<https://food-nutrition.canada.ca/cnf-fce/index-eng.jsp>

RAE: Retinol Activity Equivalents

DFE: Dietary Folate Equivalents

How much milk should children drink?

It is recommended that children 1 year of age and older drink 2 cups (500 mL) of milk each day.³ Cow's milk provides a child with calcium, vitamin D, protein and other important vitamins and minerals. The recommendation of 2 cups (500 mL) per day provides approximately 200 IU of vitamin D and 600 mg of calcium per day.¹ Consumption of more than 2 cups (500 mL) a day has been identified as a risk factor associated with iron deficiency anemia,^{22,23,24} as children may fill up on milk, displacing iron rich foods in their diet. Offering milk in an open cup may help to avoid excess consumption.^{3,25}

For children who are breastfed at 1 – 2 years of age, approximately $\frac{1}{3}$ of a child's energy should generally come from breastmilk and the remaining $\frac{2}{3}$ from complementary foods.¹⁶ Children who are overly reliant on breastmilk as their main source of nutrition may consume insufficient amounts of complementary foods,¹⁶ which can put young children at risk of nutrient deficiencies, such as iron.¹⁷ For children consuming a combination of breastmilk, cow's milk and/or formula, the total amount of milk from all sources should be no more than 2 cups (500 mL) per day. Cow or goat's milk and formula should be offered in an open cup to avoid excess consumption.²⁵

For more information on iron and excessive milk consumption, refer to the *Nutrition Guidelines: [Iron](#) and [Healthy Feeding Relationship](#)*

For information related to calcium and vitamin D, refer to the *Nutrition Guidelines: [Calcium and Vitamin D](#)*

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At what age can a child drink lower fat milk?

Children 2 years of age and older can be offered lower fat milk choices (skim, 1% or 2% or fortified soy beverage) to drink. This transition to lower fat choices can be gradual.²⁶

Skim milk is an inappropriate choice for children younger than 2 years.³ Lower fat milks are low in energy and may cause growth faltering.³ If a child is offered 1% or 2% milk before 2 years of age, a referral to a dietitian or a physician/pediatrician is recommended to ensure that the child is growing well.³ In addition, advise parents to provide higher-fat, nutritious foods that are an important source of energy such as breastmilk, 3.25% milk, cheese, avocado, nut butters, and some fish such as salmon or trout.²⁷

What if a child does not drink milk?

Older infants and young children who do not receive breastmilk and who refuse to drink fluid milks can still receive milk as part of other foods (e.g. in soups, smoothies, added to cereal). Encourage parents to continue to offer small quantities of milk at meals and snacks (Satter, 2000) as a child's vitamin D needs may not be met with milk alternatives such as yogurt, cheese, and drinkable yogurt.²⁸ These products may not be fortified with sufficient vitamin D.

For children 12–24 months who are unable to drink milk due to an allergy or intolerance, or follow a vegetarian or vegan lifestyle, advise parents to offer commercial infant follow-up soy formula.³ Over 2 years of age, if milk is not consumed, *Eating Well with Canada's Food Guide* recommends a fortified soy beverage.²

When milk products are removed from the diet, protein, calcium and vitamin D intakes are decreased and must be replaced through other sources. A Registered Dietitian can assess if a child is meeting their nutrient requirements and can suggest ways to adjust dietary intake.

For more information, refer to the Nutrition Guidelines: [Infant Formulas and Plant-Based Beverages](#)

Are plant-based beverages appropriate alternatives for milk in children?

Children Under 2 Years of Age

Plant-based beverages are not appropriate in the first 2 years of life. These beverages do not support proper growth and development as they are lower in protein, fat, and calories, and may not be fortified with calcium and vitamin D.^{3,29} Infants who are drinking a commercial soy formula should drink a *follow-up* soy formula from 12 – 24 months of age.

If fortified soy beverage is being offered occasionally as a complementary food (i.e. in addition to breastmilk or cow's milk as the main milk source) unflavoured, fortified soy beverage is recommended.³⁰

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Children 2 Years of Age and Older

If milk is not consumed, *Eating Well with Canada's Food Guide* recommends a fortified soy beverage.² If parents choose a plant-based beverage as a milk alternative for their child age 2 years and older, they should look for a product that:

- is labelled as fortified or enriched;³¹
- provides at least 6 g of protein per 250 mL (1 cup);³¹
- provides at least 30% Daily Value of calcium and vitamin D per 250 mL (1 cup); and
- contains less than 10 g of sugar per 250 mL (1 cup).³²

For more information on plant-based beverages, refer to the [Nutrition Guideline: Plant-based Beverages](#).

For more information on soy formulas, refer to the [Infant Formulas for Healthy Term Infants Compendium and Summary Sheet](#).

Is unpasteurized milk safe?

Raw or unpasteurized milk is not recommended due to the risk of foodborne illness. The major symptoms resulting from drinking unpasteurized milk include:

- Vomiting
- Diarrhea (which may be bloody)
- Stomach cramps or abdominal pain
- Life-threatening kidney failure³³

Pasteurization is a process that kills harmful bacteria that can cause foodborne illness while keeping the nutritional properties of milk intact.³⁴ Therefore, *Food and Drug Regulations* require that all milk available for sale in Canada be pasteurized.³⁴

Although, it is illegal to sell unpasteurized milk in Canada, some people access raw milk from farms. It is important to note that although some Canadians prefer raw milk because they believe it is healthier, any possible benefits are far outweighed by the serious risk of illness from drinking raw milk.³⁴

Although it is not recommended, if a parent chooses to provide raw milk to their child, it should be pasteurized before it is consumed. Parents should be advised that it will also not contain the vitamin D that is added to commercial Canadian cow's milk. Information on home pasteurization can be found at:

<https://myhealth.alberta.ca/Alberta/Pages/how-to-pasteurize-milk.aspx>

Does milk contain hormones and antibiotics?

Milk produced and sold in Canada does not contain added hormones. The growth hormone recombinant bovine somatotropin (rBST) which increases milk production is not approved for use in Canada. Milk produced in the United States of America may contain rBST.³⁵

Milk produced and sold in Canada does not contain antibiotics. Antibiotics are used to treat diseases in animals. If a cow is sick and needs medicine such as antibiotics, the milk she makes while she's on medications and for a period of time after must be discarded.³⁶

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What is the difference between organic and conventional milk?

The main difference between organic and conventional milk production are the farming practices. Organic producers do not use synthetic pesticides, herbicides, fungicides or nitrogen-based fertilizers.³⁷ Canadian organic production follows strict standards as set out in the Canadian Organic Standards.³⁸ Organically raised dairy cows are not confined to pens and are given living conditions that allow them access to a pasture during the grazing season, as well as access to open air at other times weather permitting.³⁸ Similar to conventionally raised cows, the milk from organic cows that are being treated for illness must be discarded while they are sick.^{36,38} Organic cows that are treated for illness are typically kept out of production longer after treatment and the withdrawal period is twice the regular period or at least 2 weeks, whichever is longer. Treatment with antibiotics results in a milk withdrawal period of at least 30 days, after the last day of a course of treatment, or a withholding period that is twice the label requirement, whichever is longer. If an animal is treated with antibiotics more than once in a year, it is permanently removed from production.³⁹ Evidence suggests organically produced food may contain less exposure to pesticides but does not suggest they are more nutritious compared to conventional foods.⁴⁰

What are considerations for the use of toddler formulas?

Toddler formulas are also referred to as toddler nutritional supplements or more commonly as 'Growing-up milk' or 'toddler milk' such as Enfagrow A+™, Similac® Go & Grow®, Good Start® 3 Toddler Transition, Gerber® Graduates Toddler Drink and store brands such as President's Choice® Toddler and Parent's Choice™ Toddler. They are marketed as an alternative or complement to breastmilk or fluid milk for children older than 12 months of age.^{41,42,43} Toddler milks are not necessary or recommended for healthy toddlers. Consuming toddler milks can displace breastmilk and other healthy foods in the diet. They can be more costly, have added sugars and do not provide additional benefits when compared to breastmilk or standard, age-appropriate milk. Some potential risks of using toddler milks include over and under dilution due to improper mixing.⁴⁴

It is recommended that young children (toddlers) eat a variety of healthy foods to supply the majority of their nutrients, rather than relying on fortified toddler formulas.⁴² Nutrient needs can generally be met by following *Eating Well with Canada's Food Guide*.²

If parents and caregivers offer toddler formulas instead of cow's milk, advise them to check that the product contains key nutrients, such as calcium, vitamin D, vitamin A, protein, and fat, in comparable amounts to cow's milk and to limit use to 2 cups (500 mL) per day.⁴⁵

Are flavoured milks appropriate to drink?

Flavoured milks such as chocolate milk contain the same nutrients as plain cow's milk but are usually lower fat and contain added sugars. Plain, 3.25% milk is recommended over flavoured milks, such as chocolate milk, or flavoured soy-based beverages, such as chocolate and vanilla, which contain added sugar.¹⁰

Are there any resources related to feeding healthy infants and children that I can use with my clients?

For nutrition resources visit Nutrition Education Materials at www.albertahealthservices.ca/nutrition/Page11115.aspx and click on **Infants or Children/Adolescents**.

For more information related to healthy infants and children see [Healthy Parents Healthy Children](#).

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