



# Supporting Informed Feeding Decisions

Information on infant feeding options for health care professionals



AHS 20-Hour Breastfeeding Course

Last updated February 2020

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# Supporting Informed Feeding Decisions

For health care professional use only

## About this resource

This evidence-informed reference document will support you in using the principles outlined in the Informed Feeding Decisions (IFD) module to provide objective and tailored information relevant to each feeding option below. You may electronically bookmark or print this document and use it to familiarize yourself with essential background knowledge on each feeding option. This document is best used following completion of the IFD module which provides the core concepts and foundation required to apply this knowledge and move away from organizing information on each feeding option as either benefits or risks.



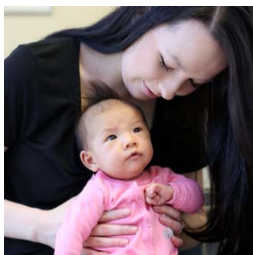
### Breastfeeding and Parent's Own Milk

The term *breastfeeding* relates to both direct breastfeeding and feeding parent's own milk unless otherwise specified. Parent's own milk means human milk expressed by a lactating parent for the purpose of feeding to their own infant/child.



### Donor Human Milk (DHM)

The term *Donor Human Milk* (DHM) relates to pasteurized milk from an accredited Human Milk Bank which follows guidelines set by the Human Milk Banking Association of North America (HMBANA).



### Infant Formula

The term *infant formula* refers to all commercial formulas including standard cow's milk formulas and infant formulas with other considerations.

This resource contains the most up-to-date evidence and information specific to each feeding option. The information is structured in table format according to the following sections:

- Health benefits to the parent and child
- Common safety issues and precautions
- Health risks
- Examples of contextual factors that may influence a parent's informed feeding decision

Information is also included on mixed feeding considerations and non-recommended feeding options.

Further details on infant feeding options are available through the AHS 20-Hour Breastfeeding Course. Visit [ahs.ca/hcpbreastfeeding](https://ahs.ca/hcpbreastfeeding) for more information.




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## Strength and Type of Evidence<sup>1,2</sup>

Strength	Type	Description
★ ★ ★ Strong	Scientific	<b>The evidence is convincing and there is a likely relationship with the feeding option.</b> The evidence is based on meta-analyses or systematic reviews of many epidemiological studies showing consistent associations between the exposure and outcome. This evidence is stable and the association is biologically plausible.
	Clinical	This evidence is based on high quality and up-to-date clinical practice guidelines or protocols from credible sources. It may not be deemed necessary or ethical to study the relationship.
★ ★ Moderate		<b>The evidence suggests there is a possible relationship with the feeding option.</b> The evidence is based on meta-analyses or systematic reviews of epidemiological studies showing relatively consistent associations between the exposure and outcome. These studies may have smaller sample sizes, residual confounding factors or lack of prospective cohort study designs. Although there may be biological plausibility, more studies would strengthen the evidence.
★ Weak	Study Design	<b>There are significant limitations to the evidence due to study design limitations.</b> The evidence is largely based on reviews of case-control studies and/or may have inconsistencies due to small sample sizes, methodological heterogeneity or residual confounding factors. Caution is advised when referring to this evidence.
	Insufficient	<b>There are significant limitations to the evidence due to insufficient evidence.</b> The evidence is insufficient and based on findings of a few single studies which are merely suggestive. More well designed research is required before drawing any conclusions from the evidence.
	Conflicting	<b>There are significant limitations to the evidence due to conflicting evidence.</b> The available evidence is conflicting and based studies that report different effects. It is unclear if this is because no true relationship exists or because of other limitations. For the time being, conclusions cannot be drawn from the evidence.
No evidence		There are no studies or reports on the topic to date.

## Legend

Symbol	Description
	The health effect is associated with any amount of the feeding option.
	There is a dose-dependent relationship between the feeding option and the health effect. Exclusivity and/or increased amount/duration has a greater effect.
	There is a contraindication to using this feeding option.

### Sharing Information with Families

The terminology used in this document is intended for health care professionals. Use your clinical judgment to determine the terms you use with each family, based on their context. Keep in mind that it is often best to avoid using the term “health risk” with families, as new evidence suggests that the use of risk language with parents may not be effective or appropriate.<sup>3,4</sup>

See examples below for ideas of how you can translate information in this document into your daily practice with families.

<b>Health Benefit Examples</b>	<ul style="list-style-type: none"><li>• <b>Strong – Scientific:</b> You mentioned that you are concerned about cancer. Any breastfeeding will likely offer some protection against ovarian and endometrial cancer. The longer you breastfeed, the greater the protection.</li><li>• <b>Moderate:</b> You mentioned you have a family history of inflammatory bowel disease. The best available evidence tells us that breastfeeding may provide your baby some protection from inflammatory bowel disease. The longer you breastfeed, the greater this protection.</li><li>• <b>Weak – Study Design:</b> You mentioned you’d like to breastfeed to increase your baby’s IQ. The best available evidence says that there could be a relationship between breastfeeding and increased IQ. However, there are many factors that influence IQ and the increase in IQ from breastfeeding could be quite small. There are other health benefits of breastfeeding that we know more about...</li><li>• <b>Weak – Insufficient:</b> We’re still learning about the gut microbiome and how it may affect a child’s health. Until we know more, it’s best to remember that any amount of breastfeeding or breast milk for any length of time will benefit you and your baby. The longer breastmilk is provided, the greater the health benefits for both of you.</li><li>• <b>Weak – Conflicting:</b> We still don’t know if breastfeeding can protect your baby from allergies because the studies on this topic come to different conclusions. There are other health benefits of breastfeeding that we know more about...</li></ul>
<b>Health Risk Examples</b>	<ul style="list-style-type: none"><li>• <b>Strong – Scientific:</b> I know you’re worried about your baby coming early. When babies are born preterm or have a low birth weight, avoiding formula can help protect them from a serious bowel infection.</li><li>• <b>Strong – Clinical:</b> Breastfeeding is not recommended when there are open Herpes Simplex Virus (HSV) lesions on both nipples, as HSV could be passed to your child this way. Once the lesions are healed, you can continue to breastfeed.</li><li>• <b>Weak – Insufficient:</b> You mentioned you heard feeding formula would increase your baby’s risk of an ear infection. While we do know that babies who are fed formula may get ear infections more often than exclusively breastfed babies, we are still learning about if the infections are due to the formula, or some other reason.</li></ul>

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	<ul style="list-style-type: none"><li>• <b>No evidence:</b> To date, there haven't been any reports of disease transmission or harm to a baby from donor human milk from an accredited milk bank.</li></ul>
Safety Issue Examples	<ul style="list-style-type: none"><li>• Nicotine from tobacco passes into your breastmilk. It can make your baby more likely to refuse feedings, be fussy, sleep poorly and spit up. The best thing you can do for you and your baby's health is to cut down or quit using tobacco. If you choose to use tobacco, it's still important to continue to breastfeed as breastmilk has many benefits...</li><li>• If you decide to feed your baby using a bottle, let your baby control the flow of milk and follow their feeding cues...</li></ul>
Contextual Factor Examples	<ul style="list-style-type: none"><li>• You said you had a hard time breastfeeding your first child. I wonder if you would like to talk about it as every breastfeeding experience is different, even from child to child. If I know a little more about the challenges you had, I might be able to offer some strategies to prevent them from occurring again. However, no matter how you decide to feed your baby, I am available to provide information and support to help you with your goals.</li><li>• You mentioned that you'll be away from your baby during school hours. Would it be helpful to discuss how your feeding goals and potential options might fit into your plan?</li></ul>



## Breastfeeding and Parent's Own Milk

Breastfeeding provides numerous unparalleled health benefits for the breastfeeding parent and child. Breastmilk will meet the nutritional needs of the healthy term infant for the first six months, then is recommended in addition to complementary foods for 2 years or longer.<sup>5</sup>

### Health benefits for the parent

Positive health outcomes for the parent that are associated with breastfeeding or parent's own milk, as demonstrated in the scientific and clinical evidence.

Strength	Relationship	Positive Health Outcomes for the Parent
★★★ Scientific	●●	There is convincing evidence that any breastfeeding may reduce the risk of ovarian <sup>6,7</sup> and endometrial cancer <sup>8</sup> – the benefit is greatest with a longer duration of breastfeeding.
		There is convincing evidence that exclusive, predominant breastfeeding may be associated with a higher likelihood of lactational amenorrhea at 6-months postpartum. <sup>9</sup>
★★	●●	Any breastfeeding may reduce the risk of type 2 diabetes – the benefit is greatest with a longer duration of breastfeeding and/or exclusive breastfeeding. <sup>9-13</sup>
		Any breastfeeding may reduce the risk of breast cancer – the benefit is greatest with a longer duration of breastfeeding and/or exclusive breastfeeding. <sup>14,15</sup>
		Those who breastfeed, notably those who breastfeed for a longer duration, may be less likely to have hypertension. <sup>13,16,17</sup>
★ Insufficient	N/A	There is not enough evidence to suggest a relationship between breastfeeding and rheumatoid arthritis. <sup>18</sup>
		In those with type 1 diabetes, there is not enough evidence to suggest that insulin requirements in the postpartum period are uniquely reduced with breastfeeding. <sup>19,20</sup>
★ Conflicting	N/A	The evidence to date is conflicting thus the relationship between breastfeeding and postpartum weight retention remains unknown. <sup>21</sup>
		The evidence to date is conflicting thus the relationship between breastfeeding and osteoporosis remains unknown. <sup>9</sup>
		The evidence to date is conflicting thus the relationship between breastfeeding and postpartum depression remains unknown. <sup>9</sup>

★★★ Strong

★★ Moderate

★ Weak

● With any amount/duration

●● Dose dependent

⊘ Contraindication



## Health benefits for the infant

Positive health outcomes for the child that are associated with breastfeeding or parent's own milk, as demonstrated in the scientific and clinical evidence.

Strength	Relationship	Positive Health Outcomes for the Infant			
★★★ Scientific	●●	There is convincing evidence that any breastfeeding may reduce the risk of acute otitis media in the first 2 years of life – the benefit is greatest with a longer duration of and/or with exclusive breastfeeding. <sup>22</sup>			
		There is convincing evidence that any breastfeeding may reduce the incidence and risk of hospitalization for respiratory (e.g. pneumonia) and gastrointestinal infections (i.e. diarrhea) up to 5 years of age – the benefit is greatest with exclusive breastfeeding. <sup>23,24</sup>			
		In preterm and very low birth weight infants, there is convincing evidence that any breastfeeding reduces the risk of necrotizing enterocolitis – the benefit is greatest with a longer duration of breastfeeding and/or exclusive breastfeeding. <sup>25</sup>			
	N/A	Although the biological activity and nutritional composition of parent's own milk may be reduced or altered during storage, handling and preparation, many beneficial biological molecules unique to human milk are preserved. <sup>26</sup>			
	N/A	The available evidence suggests there is no association between breastfeeding and cholesterol levels. <sup>27</sup>			
★★	●●	Any breastfeeding may reduce the risk of SIDS – the benefit is greatest with exclusive breastfeeding. <sup>28,29</sup>			
		Any breastfeeding may be associated with a lower likelihood of childhood obesity and this relationship is stronger with a longer duration of breastfeeding. <sup>32</sup>			
		In preterm infants, any breastfeeding may reduce the risk of retinopathy of prematurity (including severe cases) – the benefit is greatest with exclusive breastfeeding. <sup>25,33,34</sup>			
		Any breastfeeding may reduce the risk of childhood leukemia <sup>35</sup> and inflammatory bowel disease <sup>36</sup> – the benefit is greatest with a longer duration of breastfeeding.			
	●	Breastfeeding during a painful procedure (e.g. immunization) may reduce acute pain and crying. <sup>37,38</sup>			
		In preterm infants, any breastfeeding could reduce the risk of bronchopulmonary dysplasia. <sup>43</sup>			
	N/A	The available evidence suggests that there is no association between any breastfeeding, breastfeeding at time of gluten introduction, exclusive breastfeeding nor duration of breastfeeding and celiac disease. <sup>30,31</sup>			
★★★ Strong	★★ Moderate	★ Weak	● With any amount/duration	●● Dose dependent	⊘ Contraindication



## Health benefits for the infant (continued)

Positive health outcomes for the child that are associated with breastfeeding or parent's own milk, as demonstrated in the scientific and clinical evidence.

Strength	Relationship	Positive Health Outcomes for the Infant
★★★	N/A	The available evidence suggests there is no association between breastfeeding and blood pressure. <sup>27</sup>
★ Design	💧💧	A longer duration of any breastfeeding is associated with less dental caries up to 12-months. <sup>39,40</sup> A longer duration of any breastfeeding could reduce the risk of childhood/adolescent asthma. <sup>41</sup>
	💧	Breastfeeding could reduce the risk of type 2 diabetes in adolescence. <sup>27</sup> There could be a relationship between breastfeeding and higher cognitive development (e.g. higher IQ). <sup>42</sup>
	N/A	Although there is convincing evidence that exclusively breastfed infants have a different gut microbiome than infants fed formula <sup>44</sup> , the relationship between breastfeeding, the gut microbiome and subsequent health outcomes is complex and not sufficiently studied or understood. There is not enough evidence to suggest a relationship between breastfeeding and greater cardiorespiratory fitness in childhood <sup>45</sup> nor a decreased likelihood of sleep disordered breathing. <sup>46</sup> In preterm infants, the evidence to date is conflicting thus the relationship between breastfeeding and late onset sepsis remains unknown. <sup>25</sup> Generally, there is not enough evidence to suggest that there are differences or similarities in health benefits between those fed at the breast versus those fed expressed breastmilk by other methods.
★ Insufficient	N/A	The evidence to date is conflicting thus the relationship between breastfeeding and malocclusions remains unknown. <sup>47,48</sup> The evidence to date is conflicting thus the relationship between breastfeeding and type 1 diabetes <sup>49-51</sup> and breastfeeding and allergies (including eczema) remains unknown. <sup>41</sup>
★ Conflicting	N/A	

★★★ Strong

★★ Moderate

★ Weak

💧 With any amount/duration

💧💧 Dose dependent

🚫 Contraindication

## Safety issues

Modifiable factors that present a hazard unless precautions are taken to mitigate the safety concern.

Collection, storage, preparation, and feeding	Tobacco	Alcohol
<ul style="list-style-type: none"> <li>Use of parent's own milk (expressed breastmilk) requires safe collection, storage, preparation and handling to reduce the potential for safety concerns and contamination.<sup>52</sup></li> <li>If the parent's own milk is fed using a bottle, paced bottle feeding should be encouraged to make the milk flow manageable for the infant and support cue-based feeding.<sup>52</sup></li> </ul> <p>For more information on breastmilk collection, storage, preparation, and feeding, refer to <a href="http://healthparentshealthychildren.ca">healthparentshealthychildren.ca</a></p>	<ul style="list-style-type: none"> <li>Breastfeeding should be encouraged in cases when the breastfeeding parent uses tobacco.<sup>53,54</sup> Although nicotine and other components of tobacco are passed through breastmilk to the infant, breastfeeding helps protect the infant from the negative effects of tobacco exposure.<sup>53,54</sup></li> <li>Breastfeeding parents should be advised to stop or reduce tobacco use while continuing to breastfeed, and to protect the infant from exposure to second and third-hand smoke.<sup>54</sup></li> </ul> <p>For more information on tobacco reduction for breastfeeding parents, refer to the AlbertaQuits <a href="#">Baby Steps Help Guide</a><sup>55</sup> and <a href="http://healthparentshealthychildren.ca">healthparentshealthychildren.ca</a></p>	<ul style="list-style-type: none"> <li>It is safest for breastfeeding parents to avoid alcohol, as it is transferred into breastmilk.<sup>56</sup></li> <li>If the breastfeeding parent decides to have an occasional alcoholic drink, it is important to wait for the alcohol to completely clear the breastmilk before breastfeeding (usually a minimum of 2-3 hours).<sup>56</sup></li> </ul> <p>For more information on alcohol and breast-feeding, refer to the AHS <a href="#">Nutrition Guideline: Nutrition for the Breastfeeding Mother</a><sup>56</sup> and <a href="http://healthparentshealthychildren.ca">healthparentshealthychildren.ca</a></p>

## Safety issues (continued)

*Modifiable factors that present a hazard unless precautions are taken to mitigate the safety concern.*

Cannabis	Opioid Dependency Treatment	Other Medications
<ul style="list-style-type: none"> <li>Breastfeeding parents should be strongly advised to stop or at least reduce their use of cannabis while breastfeeding.<sup>57</sup></li> <li>Tetrahydrocannabinol (THC) and other components of cannabis are stored in the breast tissue and build up in breastmilk with continued use.<sup>54</sup> These components are then passed through breastmilk and absorbed by the infant.<sup>54</sup></li> <li>There is very limited evidence on the health effects of cannabis for breastfeeding parents and infants. However, there is cause for concern regarding the potential negative effects of cannabis on infant brain development.<sup>54,57</sup></li> </ul> <p><i>For more information on cannabis, refer to <a href="http://healthyparentshealthychildren.ca">healthyparentshealthychildren.ca</a></i></p>	<ul style="list-style-type: none"> <li>Stable maintenance of opioid agonist medication (methadone/buprenorphine) can be used if the breastfeeding parent is not currently using illicit substances and has no other contraindications.<sup>54,58</sup></li> </ul>	<ul style="list-style-type: none"> <li>Many medications are compatible with breastfeeding. See online resources <a href="#">LactMed</a> and <a href="#">Hale's Medications &amp; Mother's Milk</a> for up-to-date information.</li> </ul> <p><i>For more information on safe medication management for breastfeeding parents, refer to the AHS Provincial Medication Reconciliation Policy.</i></p>

## Health risks

Negative health outcomes for the parent or child that are associated with the feeding option, as demonstrated in the scientific and clinical evidence. This association cannot be modified.

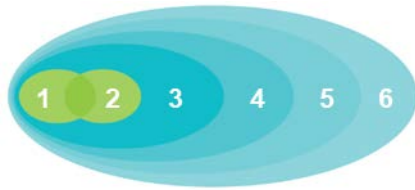
Strength	Relationship	Negative Health Outcomes & Contraindications
★★★ Clinical		Breastfeeding and/or breastmilk feeding may be contraindicated in the following circumstances: <ul style="list-style-type: none"> <li>• Active HSV lesions located on or near both nipples where the infant would latch; active HSV lesions on or near both nipples that could contaminate breastmilk during expression.<sup>59-61</sup></li> <li>• Caution should be taken in cases of Hepatitis C when the parent's nipples are cracked and bleeding, due to increased risk of viral transmission to the infant.<sup>53,62</sup></li> <li>• Caution should be taken in cases of Hepatitis B when the parent's nipples are cracked and bleeding, due to increased risk of viral transmission to the infant.<sup>62,63</sup></li> <li>• Use of medications or medical treatments not compatible with the parent's own milk feeding.<sup>53,64</sup></li> <li>• Use of illicit substances not compatible with the parent's own milk feeding.<sup>58,65,66</sup></li> <li>• Certain serious parental infections (e.g. active and untreated tuberculosis) that may be transmitted to the infant through physical contact while breastfeeding.<sup>53</sup></li> <li>• Prematurity or illness resulting in the infant's inability to breastfeed at breast or tolerate enteral feeds.</li> <li>• Within the Canadian context, a breastfeeding parent infected with HIV and/or human T-cell lymphotropic viruses.<sup>53,59,67,68</sup></li> <li>• Inborn errors of infant metabolism (e.g. galactosemia).<sup>59,60,64</sup></li> </ul>
★ Design		Infants breastfed for greater than 12 months could be more likely to have dental caries. <sup>39</sup>
★ Insufficient	N/A	There is not enough evidence to suggest that there are differences in health risks between those fed at the breast versus those fed expressed breastmilk by other methods.

Strong	Moderate	Weak	With any amount/duration	Dose dependent	Contraindication
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## Contextual factors

Factors that may be perceived, valued or experienced differently based on the socio-ecological context of the parent. These factors and their importance may differ from one parent or caregiver to another or change over time.



Each parent has their own set of contextual factors that may be related to:

1. Breastfeeding parent
2. Child
3. Friends, close supporters and home life
4. Health care system
5. Community
6. Society

Use the LEARN model to better understand the parent's context and what's important to them. Use the socio-ecological model to better understand the types of factors that can influence feeding decisions.<sup>69,70</sup>

Example contextual factors that may influence a parent's decision to breastfeed or feed their own milk:

*Previous experience with breastfeeding*

*Perception of convenience, which may be influenced by various factors, such as comfort level with breastfeeding in public or desire to feed without supplies or equipment*

*Workplace or school accommodation for breastfeeding/breastmilk expression*

*Personal or cultural perceptions of infant feeding responsibilities*

*Level of decision certainty (e.g. the decision to not breastfeed is difficult to reverse)*

## Donor Human Milk

Donor human milk (DHM) is an appropriate alternative to parent’s own milk in cases when the parent’s own milk is not available or sufficient to meet the infant’s needs.<sup>71</sup>

### Health benefits for the infant

*Positive health outcomes for the child that are associated with feeding DHM, as demonstrated in the scientific and clinical evidence.*

Strength	Relationship	Positive Health Outcomes for the Infant			
★★★ Scientific	◆◆	In preterm and low birth weight infants, there is convincing evidence that DHM feeding is shown to reduce the risk of necrotizing enterocolitis. <sup>25</sup>			
		Although the biological activity and nutritional composition of DHM may be reduced or altered during pasteurization, storage and preparation, some of the beneficial biological molecules unique to human milk are preserved. <sup>72-74</sup>			
★ Insufficient	N/A	Health benefits of DHM may be similar or different than those of breastfeeding/parent’s own milk feeding; however, this has not been sufficiently studied.			
		There is insufficient evidence on the health benefits of DHM for healthy term infants. <sup>75</sup>			
		In preterm infants, there is not enough evidence to suggest that DHM feeding reduces risk of retinopathy of prematurity, late onset sepsis or bronchopulmonary dysplasia. <sup>25</sup>			
★★★ Strong	★★ Moderate	★ Weak	◆ With any amount/duration	◆◆ Dose dependent	⊘ Contraindication

## Safety issues

*Modifiable factors that present a hazard unless precautions are taken to mitigate the safety concern.*

The following precautions are recommended to mitigate common safety concerns associated with donor human milk.

Storage, preparation, and handling	Feeding	HMBANA safety precautions
<ul style="list-style-type: none"> <li>If available, use of DHM outside of hospital requires safe storage, preparation and handling to reduce the potential for safety concerns and contamination.<sup>71</sup></li> <li>In hospital, guidelines and protocols are in place to reduce the potential for administration errors and contamination.<sup>76</sup></li> </ul> <p><i>Note: Relevant information will be provided by the designated milk bank or pharmacy upon purchase of DHM.</i></p> <p><i>For more information on handling of DHM in hospital, see the AHS Policy – Expressed Breast Milk: Safe Management.</i></p>	<ul style="list-style-type: none"> <li>If DHM is fed using a bottle, paced bottle feeding is recommended to make the milk flow manageable for the infant and support cue-based feeding.<sup>52</sup></li> </ul> <p><i>For more information on feeding, refer to <a href="http://healthyparentshealthychildren.ca">healthyparentshealthychildren.ca</a></i></p>	<ul style="list-style-type: none"> <li>In regulated milk banks, all DHM undergoes a full safety assessment (screening, pasteurization and microbiological testing) before being distributed in Canada. All employees and volunteers must comply with protocols and procedures set by the Human Milk Bank Association of North America (HMBANA), Health Canada and the Canadian Food Inspection Agency to ensure the safety of DHM.<sup>71,77</sup></li> </ul> <p><i>For more information on milk bank procedures and safety standards, see the <a href="#">HMBANA</a>, <a href="#">Northern Star Mothers Milk Bank</a> and <a href="#">Health Canada</a> websites.</i></p>



## Health risks

Negative health outcomes for the child that are associated with DHM, as demonstrated in the scientific and clinical evidence. This association cannot be modified.

Strength	Relationship	Negative Health Outcomes for the Infant
No evidence	N/A	<ul style="list-style-type: none"> <li>To date, there are no reported cases of infectious disease transmission with use of DHM.</li> </ul>

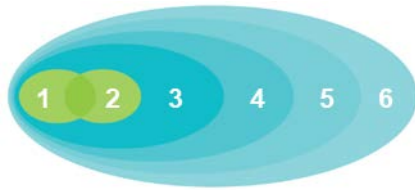
  

★★★ Strong	★★ Moderate	★ Weak	💧 With any amount/duration	💧💧 Dose dependent	🚫 Contraindication
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For information on informal (peer-to-peer) shared breastmilk, see Non-Recommended Feeding Options.

## Contextual factors

Factors that may be perceived, valued or experienced differently based on the socio-ecological context of the parent. These factors and their importance may differ from one parent or caregiver to another or change over time.



Each parent has their own set of contextual factors that may be related to:

1. Parent
2. Child
3. Friends, close supporters and home life
4. Health care system
5. Community
6. Society

Use the LEARN model to better understand the parent's context and what's important to them. Use the socio-ecological model to better understand the types of factors that can influence feeding decisions.<sup>69,70</sup>

### Example contextual factors that may influence a parent's decision to feed DHM:

*Accessibility, which may depend on availability and indication for use*

*Personal or cultural preferences related to supplementation*

*Financial considerations, including personal financial means and access to extended health/financial support or subsidy to cover the costs of feeding DHM*

## Infant Formula

Commercial Infant formula sold in Canada will meet the nutrition needs of infants and is the only recommended alternative to breastmilk for infants younger than nine months of age.<sup>78</sup>

### Health benefits for the infant

*Positive health outcomes for the child that are associated with infant formula, as demonstrated in the scientific and clinical evidence.*

Strength	Relationship	Positive Health Outcomes for the Infant
No evidence	N/A	To date, there is no evidence on the positive health outcomes of infant formula for infants and children, compared to other feeding options.

Note: Preterm infants born with a birth weight of  $\leq 1500$  grams may benefit from fortification of breastmilk with Post-discharge Preterm Formula initiated in hospital and continuing after discharge until normal growth is achieved.<sup>79</sup>

If parents' own breastmilk is not available, preterm infants may benefit from fortification of DHM with human milk fortifiers, pre-term formula or term formula in hospital.<sup>80,81</sup> This is based on gestational age, growth and other circumstances. Prior to discharge infants will be transitioned to either a Post-Discharge Preterm Formula or Term formula as needed to support adequate growth.<sup>79</sup>

*For information on Post-discharge Preterm Formula, refer to the AHS [Nutrition Guideline: Post-discharge Preterm Formula \(PDF\)](#).*

## Safety issues

*Modifiable factors that present a hazard unless precautions are taken to mitigate the safety concern.*

The following precautions are recommended to mitigate common safety concerns associated with infant formula.

Storage, preparation, and handling	Feeding	Manufacturing
<ul style="list-style-type: none"> <li>Safe storage, preparation and handling is needed to reduce the potential for contamination.<sup>82</sup></li> </ul> <p><i>For more information on safe storage, preparation and handling refer to the AHS <a href="#">Nutrition Guideline: Safe Preparation &amp; Handling of Infant Formula</a>, and <a href="http://healthyparentshealthychildren.ca">healthyparentshealthychildren.ca</a></i></p>	<ul style="list-style-type: none"> <li>If infant formula is fed using a bottle, paced bottle feeding is recommended to make the milk flow manageable for the infant and support cue-based feeding.<sup>52</sup></li> </ul> <p><i>For more information on infant formula feeding, refer to <a href="http://healthyparentshealthychildren.ca">healthyparentshealthychildren.ca</a></i></p>	<ul style="list-style-type: none"> <li>All commercial infant formulas undergo a full safety and nutritional quality assessment before they can be sold in Canada. All manufacturers, importers, and distributors of infant formula are responsible to ensure their products comply with Canadian legislation.<sup>78</sup></li> <li>Purchase of commercial infant formula from the internet or other countries is cautioned, as the formula may not meet Canadian safety and nutrition guidelines.<sup>78</sup></li> </ul> <p><i>For more information on Canadian safety precautions refer to the AHS <a href="#">Infant Formulas for Healthy Term Infants Compendium</a></i></p>

## Health risks

Negative health outcomes for the child that are associated with infant formula, as demonstrated in the scientific and clinical evidence. This association cannot be modified.

Strength	Relationship	Negative Health Outcomes for the Infant
★★★ Scientific	◆◆	In preterm and low birth weight infants, there is convincing evidence that the use of infant formula is shown to increase the risk of necrotizing enterocolitis. <sup>83</sup>
	◆	Although infant formula meets the nutritional needs of healthy term infants <sup>53</sup> , it does not possess the human bioactive factors that are unique breastmilk. <sup>84,85</sup>
★★★ Clinical	N/A	Powdered formula is not sterile and may not be recommended for certain infants (e.g. preterm and immunocompromised). <sup>53</sup>
★ Insufficient	◆	For infants under 6 months of age, any use of infant formula may be associated with an increased risk of otitis media but the available evidence directly examining this association is limited. <sup>86</sup>
★ Conflicting & Insufficient	N/A	The evidence to date is insufficient and conflicting thus the relationship between infant formula and atopic dermatitis, type 1 diabetes, type 2 diabetes, asthma, or hospitalization for lower respiratory tract infections remains unknown. <sup>86</sup>

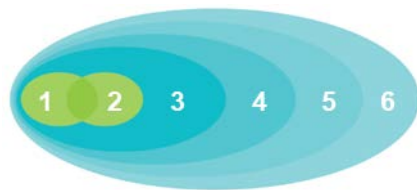
  

★★★ Strong	★★ Moderate	★ Weak	◆ With any amount/duration	◆◆ Dose dependent	⊘ Contraindication
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For information on homemade formula, see Non-Recommended Feeding Options.

### Contextual factors

Factors that may be perceived, valued or experienced differently based on the socio-ecological context of the parent. These factors and their importance may differ from one parent or caregiver to another or change over time.



Each parent has their own set of contextual factors that may be related to:

1. Parent
2. Child
3. Friends, close supporters and home life
4. Health care system
5. Community
6. Society

Use the LEARN model to better understand the parent's context and what's important to them. Use the socio-ecological model to better understand the types of factors that can influence feeding decisions.<sup>69,70</sup>

### Example contextual factors that may influence a parent's decision to feed infant formula:

*Previous experience with infant formula*

*Perception of convenience, which may be influenced by various factors, such as infant formula preparation and storage considerations*

*Return to work or school*

*Personal or cultural perceptions of infant feeding responsibilities*

*Costs associated with purchasing infant formula and feeding equipment*

## Mixed Feeding

Parents may decide or need to feed both breastmilk and formula or use a combination of different feeding methods such as direct breastfeeding, bottle feeding, cup feeding, syringe feeding, finger feeding or an at-breast supplementation system or a bottle. Tube feeding may also be used when medically indicated.

Mixed feeding may occur for short or long periods of time.

As with other feeding options, parents and caregivers will benefit from tailored information (related to each feeding option or method being considered) and acknowledgment of contextual factors to make mixed feeding achievable, manageable, and safe.

Example contextual factors that may influence a parent's decision to mixed feed:

*Medical considerations, where a single feeding option and/or method may not be sufficient to meet the infant's nutritional needs (e.g. breastfeeding following breast surgery)*





*Personal or cultural preferences related to infant feeding options and responsibilities*

*Commitment level to maintaining milk supply while using infant formula*







## Non-Recommended Feeding Options

### Informal (peer-to-peer) shared breastmilk

Strength	Relationship	Negative Health Outcomes & Contraindications			
★★ ★ Clinical		The use of shared breastmilk (i.e. family, friends, or strangers) is not recommended due to health risk concerns <sup>87</sup> , including the: <ul style="list-style-type: none"> <li>• potential risk for contamination or adulteration of the milk with harmful substances (both microbial and chemical)<sup>88,89</sup></li> <li>• lack of controls in the collection and storage of shared breastmilk</li> <li>• lack of knowledge or understanding of the shared breastmilk donor’s health history</li> <li>• potential risk for infectious disease transmission</li> </ul>			
★★★ Strong	★★ Moderate	★ Weak	 With any amount/duration	 Dose dependent	 Contraindication

### Homemade formula

Strength	Relationship	Negative Health Outcomes & Contraindications			
★★ ★ Clinical		Homemade infant formula is not recommended as an alternative to breastmilk or commercial infant formula. <sup>53,90</sup> For more information, refer to the AHS <a href="#">Nutrition Guideline: Homemade Infant Formula</a> .			
★★★ Strong	★★ Moderate	★ Weak	 With any amount/duration	 Dose dependent	 Contraindication

### Appendix

#### Evidence Review Methods

It is important to recognize the limitations of the evidence in order to provide parents and caregivers with quality information. The evidence on feeding options is extremely complex, constantly changing, and varies in strength.

In this reference document, a rigorous process was used to ensure reporting of the highest quality and best available evidence. This process follows the recommendations for evidence-informed public health set by the [National Collaborating Centre for Methods and Tools \(NCCMT\)](#). Upon defining the population, exposure, comparison, outcome (PECO) and questions of interest for each topic/feeding option, evidence was searched according to the 6S-Search Pyramid. Each search was facilitated by a Knowledge Resource Service (KRS) librarian within AHS. Databases searched included Medline, PubMed, CINAHL, TRIP, Google Scholar and Summon (KRS database) and clinical practice guidelines, systematic reviews and meta-analyses were prioritized. Single research articles were only included for key areas of interest with emerging evidence or where no other forms of evidence were found. These guidelines/articles were critically appraised (by two reviewers where possible) using the appropriate tool (AGREE II, Health Evidence Quality Assessment tool, SIGN or CASP) and low quality studies were excluded. The relevance and adaptability of the remaining studies was considered for the Alberta context. Finally, the strength of the remaining evidence was classified according to the definitions outlined in the legend on page 3 (i.e. single studies being weak/insufficient evidence).

The scope of these reference documents is limited to evidence from developed countries (as much as possible) and reflects what is likely generalizable to our patient population. Compared to other similar documents, it may also include more recent studies, where higher quality evidence (e.g. has addressed or included studies that have addressed or considered the influence of confounding factors) shows a more convincing or less convincing association between the feeding option and the health outcome in question.

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