# Lactose overload

Many healthy, thriving, babies develop gastric symptoms, such as; excessive gas and frequent, watery bowel movements* due to lactose overload, which is associated with **large, frequent feeds.** These symptoms cause tummy pains. A baby with tummy pain can appear to be hungry because he seeks to feed in an attempt **to relieve this discomfort**, (which it does but only temporarily). However, the extra feedings could further add to the vicious cycle of lactose overload and gastric symptoms.

**Watery bowel movements without other symptoms is very normal for a baby and not automatically a sign of lactose overload.*

Unfortunately, all too often 'lactose overload' is mistakenly diagnosed as lactose intolerance or food or milk allergy or intolerance (to dairy foods or other foods in the mother's diet). A breastfed baby may be either weaned from the breast onto a lactose-free formula or the mother feels compelled to make dietary restrictions. Both of which are unnecessary and unhelpful in this situation. This problem of lactose overload can be resolved simply by making appropriate changes to feeding management. A mistaken diagnosis may result in a formula fed baby being switched to soy or lactose free formula.

## What is lactose?

Lactose is the sugar (carbohydrate) found in milk and milk products. It is present in the milk of all mammals but is not found anywhere else in nature. Breast milk contains around 7 percent lactose.

Most cows' and goats' milk based infant formulas contain a similar percentage of lactose as breast milk. Soy based infant formulas and most 'hypoallergenic' infant formulas have *no* lactose.

Lactose is a disaccharide, which means it's a combination of 2 sugars joined together. As a disaccharide it is too large to be absorbed by the body, so it needs to be broken down into glucose and galactose, which are monosaccarides (single sugars), by the digestive enzyme 'lactase'. Glucose and galactose can then be absorbed into the blood stream and used by the body.

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## Why is lactose important?

**Lactose** is important to a baby's health. It aids in the absorption of calcium and phosphorus and supports the growth of good bacteria in the intestinal tract. [Good bacteria are major players in the prevention of disease. They inhibit the growth of harmful microorganisms – bacteria, viruses, and parasites - that live in the intestinal tract and those entering the body in food and fluids. Good bacteria help to keep the walls of the intestines healthy, preventing harmful microorganisms from entering into the blood stream. Good bacteria also aid in the digestion of lactose.]

**Galactose**, a simple sugar that comes from the breakdown of lactose, is vital to a healthy brain and nerve tissues. Galactose can be found is some foods, but milk containing lactose will be a baby's only source of galactose during the early months - an important time of rapid brain growth and development.

**Glucose**, the other simple sugar that bonds with galactose to form lactose in milk. Glucose is essential for energy, growth and cell development. Without glucose in the diet a baby will use body fat as a source of energy, and lose weight. A baby will not survive if deprived of glucose for a long period. Most foods, including lactose-free milk, will be broken down or converted into glucose in the body.

## What is lactose overload?

Lactose overload - also called 'functional lactase insufficiency' - is a common but poorly recognized problem affecting countless numbers of breastfed and bottle-fed babies in the early months of life. The number of babies affected is unknown owing to the transient nature of the symptoms associated with this problem. The distress experienced by babies suffering GI discomfort due to lactose overload is typically dismissed as 'its normal' or misdiagnosed as colic, reflux, lactose intolerance, or milk protein allergy or intolerance.

**Why newborns are vulnerable:** When a baby displays GI symptoms related to lactose overload, this means she is receiving more lactose than her little body is capable of digesting. There are numerous reasons why this might occur.

Newborn babies are especially vulnerable to lactose overload because they have limited ability to self-regulate their dietary intake owing to the presence of their sucking reflex. The sucking reflex, which disappears around 3-4 months of age, is triggered by pressure on the baby's hard palate by the mother's nipple, the nipple of a feeding bottle, a pacifier, the baby's fist, or a parent's finger. Once the sucking reflex has been triggered, the baby will suck regardless of whether she is hungry or not. Because a reflex is an involuntary, automatic response, she cannot not suck. The presence of a baby's sucking reflex increases the risk of *overfeeding* if parents are not careful, especially in the case of bottle-fed babies.

Overfeeding is a common problem for **bottle-fed babies** in the early months because newborn babies cannot control the flow of milk though an artificial nipple (which is often stiff); stop when they want to stop (because of their sucking reflex); or indicate when they have had enough (owing to their immaturity in physical development). The risk of overfeeding is increased if the flow rate of the nipple is too fast and/or the parent misreads the baby's behavioral cues and offers feeds too often. (See hungry baby for other reasons why babies overfeed.)

The situation is even more complex for **breastfed babies** because the ratio of fat in breast milk is constantly changing - within a single feed and from feed to feed. The fat content of the milk received will influence the volume of milk a baby consumes. While exclusively breastfed babies don't generally overfeed (though this can happen in certain situations) they can receive more lactose than their intestinal tract can handle owing to foremilk-hindmilk imbalance. This is *not* a condition or problem related to the mother's milk, rather it's a problem related to the mother's feeding management. Foremilk-hindmilk imbalance occurs when a nursing mother has an oversupply of breast milk (more than her baby needs) and switches her baby between breasts too soon. Her baby may then receive disproportionate amounts of low-fat foremilk in relation to high-fat hindmilk. The baby needs to consume larger volumes of low-fat foremilk compared to high-fat hindmilk in order to receive sufficient calories to meet her growth and energy needs, and in doing so she may also receive more lactose than her intestinal tract is capable of digesting.

Some medications such as antibiotics, antacids and acid suppressing medications, can negatively impact on the growth of good bacteria in the intestinal tract. This can make it harder for a baby to adequately digest lactose.

## What causes lactose overload?

When all is running smoothly, lactose will be broken down into simple sugars - glucose and galactose in the small intestines by a digestive enzyme called 'lactase'. Galactose and glucose can then be absorbed into the blood stream through the wall of the small intestines, where it can then be used by the body. Only small amounts of undigested lactose enter the large intestine (bowel).

Babies have limited ability to produce the enzyme *lactase* within any particular time period. Normal healthy babies are capable of digesting lactose sufficient for healthy growth, but they may not be able to digest *excessive* amounts of lactose.

A baby's digestive system can become overloaded by lactose from large volume feeds, low-fat feeds, and/or frequent feeding patterns. The larger the volume of milk in a baby's intestinal tract, the quicker it travels through. Large volumes of milk can pass through a baby's small intestines too quickly for all of the lactose to be digested.

The nutritional content of milk also influences the speed at which it travels. Fat slows down the rate at which milk will pass through the stomach and intestinal tract. Because foremilk is lower in fat compared to hindmilk, this means it will travel through the small intestines faster. Plus, a breastfed baby who receives mostly low-fat foremilk will want to feed more often (in order to receive sufficient calories for her growth and energy needs) compared to if she consumed more high-fat hindmilk. So she consumes large volumes of low-fat milk that travels through her small intestines at a rate that is too fast for all of the lactose to be digested.

It's the amount of milk present in the intestinal tract at the time, rather than the amount consumed in a single feed, that matters. So it's possible for a baby to consume more milk and thus lactose than she can handle as a result of small, frequent feeds. Frequent feeding patterns also affect the rate of flow through the intestinal tract. As milk begins to empty from the stomach into the small intestines this stimulates the gastro-colic reflex. This reflex causes contractions of the intestinal wall, which then pushes the contents along. It's the body's way of making room for the new feed. (The gastro-colic reflex action is why newborn babies often poop or pass gas during feeding and grunt at times.) If a baby is fed again before the lactose in the previous feed is fully digested, the gastro-colic reflex may push some of the undigested lactose from the previous feed from the small intestines through to the large intestine.

All is good so far. It's the next stage where problems occur for the baby.

**Then what happens?** If the milk travels through a baby's small intestines too quickly for all of the lactose to be digested, large amounts of undigested lactose can be pushed into the large intestine. There the undigested lactose (which is a sugar) draws in extra water through the intestinal wall through a process called 'osmosis'. Intestinal bacteria (both good and bad) normally present in the bowel ferment the undigested lactose. The fermentation process produces intestinal gas. The end result for baby is bloating, intestinal cramps, frequent watery/sloppy, foul smelling bowel motions, and lots of flatus (farts). Stools are acidic and can scald baby's little bottom if left in contact with the skin too long.

The bloating, intestinal cramps, and acidic poop cause discomfort/pain for the baby. She acts like she's hungry because she has learned that feeding provides comfort, which it does - but only temporarily. The addition feed may provide another large feed, or another feed with a disproportionate amount of foremilk to hindmilk (in the case of a breastfed baby), which results in more lactose and potentially more gas, cramps, watery stools and more abdominal discomfort for baby... and so the cycle continues.

## Symptoms

- A breastfed baby's bowel motions can be liquid, frothy or 'explosive' (shoot out with force) and have a slightly offensive odor.
- A formula-fed baby's bowel motions tend to be sloppy and foul smelling.
- Bloating.
- Cramps.
- Excessive gas (farting) - foul smelling.
- Irritability/screaming.
- Sleeplessness or wakefulness.
- Baby appears to be constantly hungry.
- Baby gains large amounts of weight (which is not the case when a baby is lactose intolerant).
- Baby is usually less than 3 months old, but in some cases this problem can continue up to the age of 5-6 months.
- The baby might also spit up or regurgitate milk (not due to lactose overload but rather overfeeding which causes symptoms of lactose overload).
- Fussing during the feed and bearing down.
- Extreme grunting in early hours of the morning.

The intensity of GI symptoms can vary in degree (mild, moderate or severe) depending on the amount of lactose present in the large bowel at the time. The baby could suffer from intestinal discomfort at different times of the day and night and at other times appear unaffected.

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## Lactose overload vs lactose intolerance

The GI symptoms associated with lactose overload and lactose intolerance are due to the fermentation of undigested lactose in the large bowel. Hence, the GI symptoms for both problems are the same. A baby troubled by lactose overload will have false positive results when tested for lactose intolerance. These tests check the baby's stools (poop) for indications of acid, which is present when lactose is fermented in the large bowel (which will occur with both problems).

In the case of **lactose overload,** it's the *excess* lactose, beyond what is normal, that the baby has trouble digesting. Although irritable due to GI discomfort, the baby is physically well and gaining weight well. [Rarely, a breastfed baby might display poor growth as a result of this problem.]

In the case of **lactose intolerance,** the baby is unable to digest *normal* amounts of lactose. This means the baby, whose main or only source of nutrition is milk, will be deprived of the calories that lactose provides (while she is fed milk containing lactose). She will quickly *become unwell and lose weight*. (See our article of lactose intolerance for more.)

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## Consequence of misdiagnosis

The symptoms of lactose overload are often mistakenly attributed to problems such as colic, reflux, lactose intolerance or milk protein allergy or intolerance. A mistaken diagnosis can trigger an unfortunate chain of events that has the potential for unintended and potentially harmful consequences for the baby further down the track.

**Breastfed babies:** Many nursing mothers are mistakenly advised to cease breastfeeding and to give their babies a lactose-free, soy or hypoallergenic formula (all of which contains no lactose). Unfortunately, lactose-free formula will relieve the GI symptoms associated with lactose overload and so the baby will become more settled. This is unfortunate because the baby's GI symptoms could have been relieved within 24-hours ***while continuing to successfully breastfeed*** once the mother makes appropriate adjustments to her breastfeeding practices. The baby, now weaned onto infant formula, will be deprived of the many long-term health benefits that breast milk and breastfeeding have to offer.

**Formula-fed babies** can also experience negative consequences owing to a misdiagnosis. Lactose-free formula will relieve GI symptoms related to lactose overload – the symptoms of which occur owing to overfeeding – and the baby will appear to be more settled. However, switching to lactose-free formula merely *masks the symptoms* of lactose overload without addressing the underlying cause of the symptoms which is overfeeding. Masking the symptoms in this way may mean the baby continues to overfeed, increasing the risk that the baby might gain excessive amounts of weight. Excessive weight gain in infancy has been linked to obesity problems in later life, even if the baby later slims down. Lactose-free formula is rarely necessary when the reasons for overfeeding have been addressed.

Incorrectly labelling a healthy, thriving, yet irritable baby as 'lactose intolerant' may result in a lifetime of unnecessary dietary restrictions. The effect of long-term use of a lactose-free formula (which does not include galactose) on babies' brain development has not been fully studied.

A misdiagnosis of this problem occurs more often than you might think. (See Why others often fail.) Many health professionals have not heard of lactose overload and how this relates to feeding management. Nor are they aware of the intricacies involved in breastfeeding or bottle-feeding healthy babies, and they type of support babies require from caregivers to regulate their milk intake. Receiving feedback from parents that their baby is more settled after switching to lactose-free formula gives the health professional the false impression that their diagnosis was correct and they are then more likely to advise other parents to do the same; unaware that there are far more effective ways to manage this problem and promote a baby's contentment.

As you can see, it's important to your baby's health to **get the diagnosis right!**

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# What you can do

## Breast fed babies

The key to correcting the problem of foremilk-hindmilk imbalance, which leads to lactose overload, is to ensure your breasts are adequately emptied before switching sides.

If you are currently offering both breasts at each feeding, try to extend feeding time on each breast to ensure your baby has adequately emptied the first breast before switching sides. (Observe your baby's feeding behavior to decide when it's time to switch rather than watching the clock. While your baby is contentedly feeding, there is no need to switch sides. She will let you know when she needs to be switched.) If this does not relieve her GI symptoms, try one-sided breastfeeding.

How often you would need to feed from the same breast before switching to the other side would depend on the degree of oversupply (mild, moderate or extreme) and how often you feed your baby. If you have an overly abundant supply of breast milk it may be necessary to offer your baby the same breast multiple times (2, 3 or 4 times) before your breast is adequately drained (not that breasts every fully empty). This will mean your baby gets lower volumes of milk but the proportion of fat in the milk will be increased with each feeding. The higher fat content will help to slow down the rate at which the milk flows through her intestinal tract. This will allow more time for the lactose to be digested in her small intestines and minimise GI symptoms related to lactose overload. The higher fat content will also mean your baby will feel more satisfied and she may then not want to feed as often.

**IMPORTANT:** Caution should be used with same side feeding as it can decrease supply (which is what you want when you have an oversupply but not to the point where it becomes an undersupply). When making changes to feeding management it is important to closely monitor the number of wet diapers your baby has each day. There should be 5 or more wet disposable diapers or 6 or more wet cloth diapers each day. A weekly weight check may also be helpful to reassure you that your baby is getting enough nourishment. Also be guided by your baby's feeding behavior. If she's fussing at the breast and it feels soft, offer the other side.

## Formula fed babies

- How much formula to discover if your baby is overfeeding.
- What are common reasons for overfeeding.
- Try to encourage your baby to go 3 - 4 hours between feedings during the day (timed from the beginning of one feeding to the beginning of the next).
- If your baby is feeding quickly (under 10 minutes), slow down the feed by using a slower nipple or give your baby brief breaks during the feed.
- Respond to your baby's feeding cues and stop the feed when she indicates she wants to stop. Don't try to make her empty the bottle.
- Discourage a bottle-feeding-sleep association by keeping your baby awake during the feed or or waking her if she becomes sleepy while feeding.
- If your baby is currently on low-lactose or lactose-free formula once you have addressed reasons for overfeeding (above) you may find you can return her to regular formula.

### How to tell when things are under control

You will know when you have this problem under control when your baby's stools decrease in frequency, thicken in consistency, and she become less gassy and more settled. Green stools will gradually become yellow/mustard color.

Making appropriate adjustments to infant feeding practices can be very effective in relieving a baby's GI discomfort associated with lactose overload; however, feeding strategies alone won't necessarily guarantee her contentment. Baby care problems are not rationed to one per baby. A lactose overload problem often develops as a result of a underlying infant sleeping problem. It can also develop when parents misinterpret their baby's desire to suck at times of tiredness, when bored, when over-stimulated, when uncomfortable and for pleasure, as hunger.

### Facts about breast milk and lactose

Lactose is produced in breast milk independent of what the mother eat or drinks. Whether she drinks milk or eats dairy food or not, the amount of lactose in her milk will be the same

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## How we can help!

The feeding recommendations described in this article and found elsewhere on the Internet are generalized; suitable for most but not all cases where a baby is experiencing discomfort due to lactose overload. General feeding advice will not be sufficient for every baby experiencing lactose overload as the circumstance differ between individual babies.

Relieving a baby's discomfort and promoting a baby's contentment are not necessarily achieved by feeding management alone. In order to promote your baby's contentment it might be necessary for you to take additional steps like learning more about infant development and behaviour so that you can gain accuracy in interpreting her hunger and feeding cues; and understand how babies sleep and how parents influence their baby's sleep (for better or worse) so that you can make informed decisions about the best way to settle your baby to sleep within the context of your unique family situation.

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