

## Lactose intolerance



### Not an allergy

Lactose intolerance is not the same as cows' milk protein allergy. The former is a reaction to the milk sugars; the latter is an immune response to dairy proteins.

“Even minor tummy upsets can lead to lactose problems...”

### Low lactose foods

- Naturally made yoghurt
- Cheddar cheese
- Ice-cream

### Lactose lesson

Lactose is a naturally occurring sugar found in animal breastmilk, for example, cows', goat and human milk. Per 100 ml, breastmilk has about 7 mg of lactose. Most infant formulas have about 7 mg also, though they don't come packaged with compounds to help digest it. Cows' milk has around 5 mg.

It appears that lactose may perform a special function in early childhood development, which is why lactase production (the enzyme that digests lactose) drops off as our bodies begin to cease growing rapidly, settling down by around 4 years of age. So, while our ability to digest lactose reduces with age, it nonetheless forms a function in human nutrition.

### What is lactose intolerance?

Lactase is produced in the small cells that line the intestinal canal; hence any condition that affects the health and integrity of these cells can impair lactase production.

Food entering the intestinal tract is broken down into smaller units that can then pass into the inner workings of the body for use. To digest food we need a huge array of enzymes and factors, occasionally some may be low or even missing, and lactase is a good example. When lactase is low (or in rare extreme cases, not present), this impedes the body's ability to break lactose into smaller sugars (glucose and galactose). The undigested lactose continues to pass along the intestinal tract and as it goes bacteria works on it, causing a fermenting process that results in gas forming and water being drawn into the area. It is this process that leads to some of the symptoms of lactose intolerance (LI), including bloating, flatulence, diarrhoea and tummy pains.

Our production of lactase drops off markedly over our first four years. However, in some cultures where pastoral activity such as dairy farming has a long history, there appears to have been a genetic adaption over time that inhibits the slowing of lactase production. Interestingly lactose intolerance genes are not dominant genes.

Even those with mild lactose intolerance can, it seems, 'up-regulate' the enzymes involved in lactose digestion via continual small exposure to lactose. Basically, over time we can gain a tolerance to a certain level of lactose. Having said this, like so many things in nutrition, you can still have lactose intolerance and not show any symptoms.

### Types of lactose intolerance

Genetic lactose deficiency in newborns is quite rare and in such cases urgent medical intervention is necessary. Most cases of lactose intolerance are due to a genetic disposition to low lactase and this is generally influenced by ethnic background.

LI can also occur secondary to gastric upsets, a bout of gastroenteritis or parasitic infection. And while this is often a temporary issue, in little ones the younger the baby the longer they are likely to take to recover (up to eight weeks). In babies, LI can lead to runny (more than normal), frothy stools, irritability and excessive wind. Keep in mind also that anyone suffering from conditions that affect the intestinal tract, for example celiac disease, may also experience greater rates of LI. Iron deficiency also appears to interfere with lactose digestion and absorption.

There appears to be an interesting phenomenon of 'lactose overload', which can mimic lactose intolerance in babies. Nursing mothers, who have an overly abundant supply of milk, can find the baby experiences symptoms similar to lactose intolerance. For more on this, visit the Australian Breastfeeding Association website.

### Who is at risk?

Generally those most affected are from cultures that haven't had a great deal of exposure to pastoral practices such as dairy farming. Rates of LI include:

- Indigenous Australians – about 70%
- Asians – 93%
- Greeks – about 50%
- Middle Eastern cultures – around 40%
- Those whose family history originates in Northern Europe – around 5-10%

### Don't confuse lactose intolerance with cows' milk protein allergy (CMP)

CMP involves the immune system, which reacts to protein molecules that have passed into the bloodstream. It is quite different from lactose intolerance, generally more severe, appears affected by the maternal diet, has a familial factor and can interfere more with the diet.

### Lactose intolerance and breastmilk

A range of issues have been reportedly linked to lactose intolerance in infants, including reflux, colic, eczema and so on. The levels of lactose in breastmilk appear resistant or independent of a nursing mother's lactose intake, hence altering your diet if you are breastfeeding is not likely to change the lactose your baby receives. There have also been claims that lactose levels change during a feed, with some anecdotal evidence that expressing off the fore-milk may reduce the 'lactose load' to baby. Such theories are hotly debated and evidence either way is yet to be forthcoming. To date, it appears lactose levels stay fairly consistent during a feed.

A breastfeeding mother is rarely advised to cease feeding in cases of lactose intolerance: the many compounds in breastmilk appear to assist lactose digestion as well as assisting in immune support and development.

### Lactose intolerance and formula-fed bubs

While formula is today far superior to what it once was (and we all seem to have come out okay), it of course isn't breastmilk and we are not likely to ever be able to create in a lab the rich living substances in breastmilk. Most infant formulas use cows' milk as their base and babies tend to be more likely to experience issues on such formula. However, technology has seen the advent of a variety of formulas to better meet the individual needs of infants. For example you can buy whey- or casein-dominant formula (whey is generally better tolerated, especially by younger infants); AR or anti-regurgitation formulas; partially or extensively hydrolysed (HA) or amino acid (such as Neocate) formula, where the milk proteins are broken down to greater degrees (respectively) to reduce the risk of reaction (it's often the protein components of foods that are responsible for allergic reactions); low lactose (and in some cases lactose-free); 'enhanced' brands that may have a combination of fish oils, probiotics, nucleotides and more.

Yes, you can get non-dairy formula that won't have lactose, however, research suggests that about 40-50 per cent of infants reacting to cows' milk-based formula will also react to formulas such as soy-based ones, depending on family allergy history.

### How can LI be diagnosed?

- ★ Hydrogen breath test – detects the additional hydrogen made by the undigested lactose and fermentative processes. Keep in mind that in infants six months or younger these are often positive and so may not provide a definitive answer.
- ★ Elimination diet – by removing lactose from the diet for a period of time and if symptoms disappear you can be fairly sure of lactose intolerance, even more if you reintroduce it and the symptoms reappear.\*
- ★ Trial lactose-free milk compared to ordinary milk and monitor.\*
- ★ Stool acidity test – may also be an option.

\* Not suitable for children under 12 months

### Where is lactose found?

- ★ Human breastmilk has one of the highest levels of lactose; remember though that it appears to have an important function in early infancy development.
- ★ Unprocessed cows' milk, goat and sheep milk are very similar.
- ★ Because butter is made by separating the water part from the fat it is lower in lactose (lactose isn't found in the fatty layer of milk).
- ★ Yoghurt (real yoghurt that is) contains small amounts of lactose. However, proper fermented yoghurt naturally contains lactase from the healthy bacteria. However, those thickened milk 'yoghurts', on the other hand, tend to be higher in lactose.
- ★ Like butter, many cheeses are also low in lactose.
- ★ Many products also have added milk (milk solids, modified milk ingredients, even lactose itself). It can turn up in sausages, gravy powder, cereals, pre-prepared meals, snack bars, protein powders, medications and much more.

Here's a tip though: Kosher products labeled 'pareve' are milk free. If you see a 'D' on the label though, dairy may be present or at the very least the product was made with equipment that has also touched milk products.

<b>Figure 1 Lactose and calcium content of selected dairy foods</b>			
<b>FOOD</b>	<b>SERVE</b>	<b>LACTOSE (gms)</b>	<b>CALCIUM (mg)</b>
MILK – regular	1 cup/250 ml	12	295
MILK – reduced fat	1 cup/250 ml	13	340
<b>YOGHURT – regular</b>	<b>200 gm</b>	<b>9</b>	<b>390</b>
YOGHURT – low fat	200 gm	12	420
<b>CHEESE – cheddar</b>	<b>40 gm</b>	<b>0.02</b>	<b>310</b>
CHEESE – creamed cottage	30 gm	0.1	28
CHEESE – Swiss	28 gm	1	354
BUTTER	1 tsp	0.03	1
ICE -CREAM	2 scoops /50 gm	3	55

Source: Adapted from Gastronomet and Wikipedia

### Moving forward

Being lactose intolerant doesn't mean you will never be able to cope with lactose-containing foods again. As we know there tends to be a dose factor: some people can tolerate up to a certain amount of lactose before they get into any problems. Others can also 'outgrow' or adapt to their intolerance over time.

### Start out slow and low

With children, if you suspect a lactose issue, don't opt to remove all dairy from their diet, as this can cause a number of nutrient issues. Instead you may want to abstain for a short period then introduce small amounts of low-lactose foods. Go slowly, making changes only once every three or so days. Once you get to a point where you begin to notice symptoms, just under this may be your starting point. Allow the body to build up some tolerance and in a month see if you can increase the amount of lactose-containing foods without any problem. You may find that it doesn't work, that is fine; stick with the level that is workable. Multiple allergies or reactions are best dealt with under the supervision of a suitably qualified health professional.

Here are a few tips to help make life easier:

- ★ Don't avoid all dairy, it is an important food group; many dairy products, such as yoghurt, are low-lactose (see Figure 1).
- ★ Opt for full-fat dairy products; fat-reduced products tend to be more concentrated in lactose, plus the fat slows the passage of the milk through the intestines, giving the body a better chance to digest the lactose.
- ★ Most adults can tolerate up to about 240 ml (a smidge under a cup) of milk; children may tolerate a little less, which is fine given one cup of milk can account for all of their calcium and a great percentage of their daily calories.
- ★ There are some milks that have had the lactose pre-digested. Also try varying your dairy foods and spreading them out over the day to reduce a large 'hit'.
- ★ Remember all those lovely calcium-enriched 'milk' alternatives such as soy, rice, almond and oat. While plant-based fluids generally aren't as rich in calcium, potassium or vitamins A or D and of course have no B12, many are now being fortified with these nutrients. They also provide other benefits that animal products don't, in the way of plant compounds thought to reduce many diseases. So all it means is mix things up to reap the benefits of all food groups.
- ★ Drink milk with other foods to slow the passage of the lactose down.
- ★ Look out for lactose that has been added to products; read ingredients panels carefully.
- ★ Lactase drops can help, although results appear quite mixed.
- ★ Watch for foods with milk solids; milk can appear in all sorts of foods, so if you have to, read labels carefully.
- ★ Some suggest adding lactobacillus (a probiotic used to start yoghurts) to milk to help digest the lactose.

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