

Lactose intolerance

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The severity of the common symptoms of lactose intolerance (diarrhoea or loose motions, wind and abdominal pain, bloating and discomfort) depends on the level of lactase insufficiency in an individual. Most affected patients have some persisting lactase activity and are able to tolerate small amounts of lactose.

Remember

- Lactose is a disaccharide that naturally occurs in milk derived from mammals, including cows, sheep and goats. It is made up of the two monosaccharides glucose and galactose, and requires hydrolysis by the enzymic action of lactase for its absorption.¹
- Lactase enzyme is secreted by epithelial cells lining the small intestine. Causes of lactase insufficiency may be congenital (very rare), primary or secondary. Primary, or 'delayed onset', lactase insufficiency affects more than half of the world's population, particularly non-Caucasian populations, including Asians, Southern Europeans and Aboriginals. About 90% of Asian people are affected, compared with an estimated 10% of people of Caucasian descent.² Secondary deficiency may occur due to co-existing or recent giardiasis, viral infections, coeliac disease, bacterial overgrowth or Crohn's disease.³

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Assessment

- People who are lactase deficient may be called 'lactose intolerant' or 'lactose malabsorbers'. Without enough lactase, lactose continues unabsorbed to the large intestine, and is there fermented by bacteria. This fermentation can cause the common symptoms of diarrhoea or loose motions, wind and abdominal pain, bloating and discomfort.²
- If lactase intolerance is suspected in patients presenting with abdominal symptoms, a simple test of monitoring symptoms after the drinking of a glass of milk may informally suggest lactose malabsorption. In such cases, a reduction of dietary lactose and the monitoring of symptom improvement may be a useful trial to determine if further investigations are warranted.
- Lactase deficiency can be investigated by assessing the concentration of lactase in small bowel biopsies, although this is not commonly performed. Less invasive investigations include:²
 - breath tests: a rise in hydrogen or methane production after consuming a lactose load can indicate lactose malabsorption (these gases are produced in the bacterial fermentation of undigested lactose in the colon)
 - blood glucose level measurement



Figure. Although milk and yoghurt are high-lactose foods, hard cheeses are virtually lactose-free and are a good source of calcium for people who have lactose intolerance.

at baseline and at one and two hours after consuming a lactose load: a rise in blood glucose levels indicates lactase activity (glucose derived from the lactose by the action of lactase is absorbed into the blood).

Management

- The degree and severity of symptoms depends on the level of lactase insufficiency. A large lactose load is not usually tolerated, and symptoms may occur after consuming half a glass of milk (125 mL).⁴ However, small amounts of lactose often are tolerated, because of persisting residual lactase activity. It has been shown that one glass (250 mL) of milk per day (containing about 12 g of lactose) is tolerated, equating to about 4 g of lactose per meal/serve.¹ Small amounts of milk added to tea and coffee throughout the day are likely to be tolerated.⁴
- In patients with secondary lactose intolerance, symptoms usually

Table. Lactose contents of foods and beverages and suggested alternatives⁵

Food or drink	Suitable alternatives
High-lactose (more than 4 g per serve)	
Milk (cow, sheep, goat)	Lactose-free milk (lactase-treated) Soy milk Rice milk
Yoghurt	Lactose-free yoghurt Soy yoghurt*
Custard	Make with lactose-free milk Soy custard
Moderate-lactose (0.1 to 4 g per serve)	
Ice-cream	Soy-based ice-cream * Lactose-free ice-cream
Soft/unripened cheeses (e.g. cottage, cream, mascarpone, quark, ricotta)	Limit use; if consumed in great quantities, take lactase enzyme at same time
Cream	Limit use; if consumed in great quantities, take lactase enzyme at same time
Lactose-free (less than 0.1 g per serve)	
'Hard/ripened/block' cheeses (e.g. brie, camembert, edam, feta, gouda, mozzarella, parmesan, swiss, tasty/cheddar)	–
Lactose-free milk	–
Soy cheese*	–
Soy milk*	–
Foods and drinks suitable for use by patients on a lactose-free diet (less than 4 g/serve)	
'Splash' of regular milk in tea and coffee	
Milk or milk powder present as a minor ingredient in foods (e.g. in cakes, chocolate, biscuits)	
Margarine	
* Ensure fortified with calcium.	

improve or resolve with treatment of the underlying disease.

- Milk and milk products need not be completely withdrawn from the diet, as not every product made from milk contains lactose (hard cheeses, for example are virtually lactose-free) and they are valuable sources of

calcium. The lactose contents of various foods and beverages are given in the Table.⁵

- People who remove dairy foods from their diet may be at an increased risk of low bone mineral content and development of osteoporosis later in life.⁶ Referral of patients to an

Accredited Practising Dietitian who specialises in gastrointestinal nutrition is recommended.

- Dietary management suggestions include:
 - choosing low-lactose and lactose-free products when possible (Table)
 - spreading consumption of lactose-containing foods and beverages over the day (avoiding eating large quantities at a time)
 - using lactase enzyme (available as drops and tablets from pharmacies)
 - ensuring lactose-free alternatives are calcium-fortified if rice- or soy-based.
- Infant formulas, enteral formulas and oral nutritional supplements without lactose are available. MT

References

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COMPETING INTERESTS: Dr Shepherd has written several books on gluten free and low FODMAP cookery, which include information for people with lactose intolerance. She is co-owner of the FODMAP trademark. (FODMAP refers to poorly absorbed shortchain carbohydrates, including lactose.)