

N U T R I T I O N FACT SHEET

■ LACTOSE INTOLERANCE

Inability to digest significant amounts of lactose is called lactose intolerance. It results from a shortage of the enzyme lactase, which is normally produced in the small intestine. Lactase breaks down lactose, the main sugar in milk, to glucose and galactose that can be absorbed into the bloodstream.

Symptoms

When lactose is not digested, it remains in the intestine and draws water and salt into the gut. The larger than normal mixture moves rapidly into the large intestine where the lactose is fermented by bacteria to short-chain organic acids and hydrogen. These events cause one or more of the following symptoms: abdominal bloating and cramping pain, nausea and vomiting (more in children), rumbling, gaseousness, flatulence and diarrhea.

Types

There are three types of lactose intolerance:

■ **Congenital lactose intolerance** - a rare genetic condition where there is very little or no lactase enzyme from birth.

■ **Primary lactose intolerance** - where lactase enzyme activity can fall gradually after weaning in normal, otherwise healthy people. It is by far the most common form of lactose intolerance. It is unlikely to be a problem until after 5 to 7 years of age.

■ **Secondary lactose intolerance** - when a disease or medical condition of the gut results in a low lactase enzyme level (e.g., inflammatory

bowel disease, intestinal parasites, intestinal infections, treatment with some antibiotics and cancer drugs and gastrointestinal surgery). This is usually a transitory condition.

Prevalence

Primary lactose intolerance is the norm for much of the world's population. In fact, it is only people of northern and western European ancestry who can usually tolerate milk products throughout adulthood. In the United States, the incidence of lactose intolerance varies for different populations:

- > 80% of Asian-Americans
- > 79% of Native Americans
- > 75% of African-Americans
- > 51% of Hispanic Americans
- > 21% of Caucasian Americans

Diagnosis

Lactose intolerance is formally diagnosed using one of the following tests:

- lactose tolerance test
- hydrogen breath test
- stool acidity test

In all of the tests, individuals are given an oral lactose load, and then blood, breath or stool

measurements are made to determine how well the lactose is being digested. These are expensive and sometimes inconclusive tests.

Lactose malabsorption can be suspected when symptoms of intolerance appear anywhere from 15-30 minutes to several hours after milk consumption.

Treatment

The main goal of treatment is to control symptoms while maintaining adequate nutrient intake. There are three principles that should be followed: 1) reduce or restrict dietary lactose, 2) ensure nutritional adequacy, and 3) use commercially available enzyme substitutes.

Reduce or restrict dietary lactose

Reduction in the intake of milk and milk products is usually required to treat all forms of the disease. In most cases, except congenital lactose intolerance, some lactose can still be tolerated as the lactase enzyme is seldom totally absent. Individuals will have to play detective to determine how much dairy they can tolerate.

Foods with the highest lactose content are fresh and powdered milk, buttermilk, evaporated milk and sweetened condensed milk. For some people, limiting or eliminating all or most of these foods from the diet is all that is required. A lot of people can tolerate some milk, they just can't have too much at a time. Cheese (hard and soft), yogurt and ice cream contain less lactose and can sometimes be tolerated by lactose intolerant individuals. Occasionally all foods that contain any lactose need to be eliminated. This would include most prepared and processed foods as well as many types of breads, dry cereals, candy/cookies and sugar substitutes.

Lactose is often added to prepared foods such as breads, breakfast cereals, margarine, salad dressings, baking mixes and instant foods. People who must avoid all lactose should be counseled to read labels and exclude all foods where these words appear:

milk or milk solids (includes lactose nonfat milk solids)
sweet or sour cream
whey
caseinate

curds
lactoglobulin
milk by-products
buttermilk

For infants with a lactose intolerance, clinical management involves replacing a milk-based formula (Similac) with a lactose-free formula (Isomil) for a period of several days to weeks. This should only be done under a physician's order. A lactose-free formula is not recommended in the routine treatment of diarrhea. It is only after prolonged diarrhea that the ability of the gut to produce lactase is impaired.

Ensure nutritional adequacy

Dairy products are a major source of nutrients in the basic American diet. For those who must restrict milk intake, calcium adequacy is the major nutritional concern. To ensure adequate intake, lactose intolerant people should try to include some dairy products into their diets. Here are some tips to increase tolerance:

- Consume dairy products with meals because lactose is better tolerated when mixed with other foods.
- Take small not large portions of lactose-containing foods. Four to 6 oz of milk are often tolerated at meals.
- Vary meals that have lactose-containing foods with meals that are low in lactose-containing foods.
- Higher-fat dairy foods such as whole milk and ice cream may be better tolerated than low-fat dairy foods by people with primary lactose intolerance.
- Cocoa, as in chocolate milk, increases tolerance to dairy products.
- Choose a brand of yogurt that contains active cultures (look for the new "Live & Active Cultures" seal). The bacterial cultures promote lactose break down in the gut.
- Heated milk products such as custard, soup and pudding may be better tolerated than cold milk products.

Lactose intolerant people can also include calcium sources other than dairy products in their diet. *Table 1* lists foods that contain as much calcium as one cup (8 oz.) of milk. Fish sauce, a condiment used by many Southeast Asian Americans, provides a significant amount of calcium. Calcium-fortified soy milks are a suitable replacement for milk as is the enzyme treated milk, Lactaid. Nondairy creamers do not adequately replace milk in the diet and may contain lactose.

Calcium supplements may be required for people who are severely lactose intolerant.

Table 1: Calcium sources equivalent to one cup of milk

1/4 cups dark green leafy vegetables
(broccoli, spinach, dark leafy greens)

2½ to 3 cups cooked dried beans or peas
(pinto, baked, black, chick)

1½ cups firm tofu

3 oz. canned sardines or salmon (*eaten with bones*)

6 to 7 corn tortillas

1 cup calcium-fortified orange or grapefruit juice

3 oz. almonds

Use enzyme substitutes

For people who are very sensitive to lactose or who have trouble limiting their intake of foods that contain lactose, lactase additives can be used. Lactase substitutes come in two forms:

- drops that are added to milk
- tablets that are ingested before a meal or snack.

Both forms help to digest the lactose so that symptoms are minimized. The results of their use in patients is variable. Lactase additives are available from drug stores without a prescription.

Additional References

Martens, R.A. and Martens, S. *The Milk Sugar Dilemma: Living with Lactose Intolerance*. 2nd Edition. Medi-Ed Press, East Lansing, MI. 1987.

Dobler, M.L. *Lactose Intolerance*. Revised Edition. The American Dietetic Association. 1991.