Lactose Intolerance

Lactose and Lactase Enzyme:
Lactose is a natural sugar present in dairy products. As it exists in milk products, lactose cannot be absorbed by the human intestines. It has to be digested (broken down into simpler products) before being absorbed. The digestion process needs a facilitator (enzyme) to bring about the chopping of lactose into 2 simpler products (glucose and galactose), that in turn are more readily absorbed by the intestines than the larger molecule of lactose. The enzyme responsible for the digestion of lactose is called Lactase.

Lactase Enzyme: Root of Lactose Intolerance:
Lactase is normally present in the lining of the small intestines, but the amounts present vary by the ethnicity and the age of the individual. In the US, it is estimated that 60%-90% of adult African Americans and Asians have low levels of lactase enzymes, compared to 5%-15% of Caucasians. Additionally, there is loss lactase enzyme production with age, which also varies according to ethnicity. For example, **Chinese and Japanese infants generally lose 80% to 90% of lactase activity within three to four years after weaning; while white Northern Europeans may take up to 18 to 20 years for lactase activity to reach its lowest level.** As such, one might be born with low levels of the lactase enzyme and manifest lactose intolerance at birth (congenital lactase deficiency), or else be born with normal levels and gradually lose the enzyme with time (lactase non-persistence). Lactase non-persistence accounts for over 2/3 of all lactase deficiency.

Manifestation of lactose intolerance:
When the amount of lactase present in the intestinal lining drops below the amount needed to digest ones consumption of lactose, rather than be absorbed in the small intestines, the lactose is carried further downstream into the colon, where it is acted on by the bacteria in the colon, resulting in symptoms of “Lactose Intolerance” which would include:

- Change in bowel habits, becoming more frequent, and looser in texture.
- Increase in the amount of gas in the intestines, manifesting with bloating, rumbling sounds and passage of gas rectally.
- Abdominal discomfort.
These symptoms arise because the lactose remains undigested in the intestines and reaches the colon where it is acted upon by the bacteria in the colon, producing gas, mucus and acidic products which irritate the colon and make the stools looser and more frequent. Lactose ingestion by individuals who are lactose intolerant only causes symptoms and does not cause damage to the body or injury to the gut. It can however, worsen the symptoms of other diseases such as colitis, particularly if the disease is active.

**Diagnosing lactose intolerance:**
In the majority of time, lactose intolerance is suspected anytime one feels the above-mentioned symptoms that follow within one or a few hours following consumption of lactose-containing products. Once suspected, one can either abstain from lactose containing products or follow the recommendations listed below to manage his diet, or else the patient can be further tested for lactase deficiency. Hydrogen breath test is the best diagnostic test to determine if a person is lactase-enzyme deficient. The patient should fast for 12 hours before the test. The test begins by having the patient exhale into a container and then having him/her drink a liquid solution containing lactose. Breath samples are collected every 15 minutes, over a two-hour period. Normally, breath contains a minimal amount of hydrogen, but if hydrogen levels rise to 12 ppm or higher above the baseline measurement, lactase deficiency and lactose malabsorption would be strongly suspected. The diagnosis of lactose intolerance requires the presence of both symptoms and an abnormal Hydrogen breath test.

**How to manage lactose intolerance:**

1. **Consume dairy products that have reduced lactose:** These would include brand-name “Lactose-Free” products that are readily available in supermarkets, such as Lactaid, Horizon Organic, and Dairy Ease lactose-free milk. The lactose in these dairy products would have been “pre-digested” with lactase enzyme. There are a variety of lactose-free dairy products that exist on the market in addition to milk, and these include: ice cream, yogurt, cottage cheese, and yogurt. These products typically contain anywhere from none to 2 g of lactose per serving. Goat milk has a 1/3 lower lactose content per cup when compared to cow milk.

2. **Lactase enzyme supplementation:** Lactase enzyme is available in tablet form, under the brand names: Lactaid, Lacto Digest, Source Naturals, and Nature’s Way. When taken around the same time that a lactose-containing product is consumed, the lactase enzyme would help in digesting the lactose and lessening the symptoms of lactose intolerance. The number of tablets to be taken can vary a lot according to the amount of lactose present in the product being ingested and how much lactase enzyme is present in the intestines. The products are very safe, and one can safely use a higher number of pills if the symptoms are not being controlled with a smaller dose.

3. **Probiotics:** Probiotics are considered human-friendly bacteria or yeast that are used for various conditions affecting the gastrointestinal tract. Probiotics contain some lactase enzyme and can be used to help digest lactose-containing products.
4. **Consume the lactose product with meals:** Individuals with lactose malabsorption can tolerate larger amounts of lactose with meals and if small servings (1/4 to 1/2 cup) are distributed throughout the day. The meal slows down the flow of food through the gut, hence increasing the contact time between the lactose product and the enzymes present in the wall of the intestines.

5. **Fat milk vs. skim milk:** Though healthier, skim milk passes through the intestines at a faster pace than fat-containing milk, and hence a person consuming skim milk is more apt to have symptoms of lactose-malabsorption than one consuming fat-containing milk. Chocolate milk would be an example of fat-containing milk, which is better tolerated than skim milk.

### Foods Containing Lactose
- Milk, low fat milk, skim milk, chocolate milk, buttermilk.
- Sweetened condensed milk.
- Dried whole milk, instant non-fat dry milk.
- Low fat yogurts (Yogurt brands with active bacterial culture are often easier to digest).
- Frozen yogurt
- Ice cream
- Ice milk
- Sherbet
- Cheeses
- Cottage cheese
- Cream
- Butter

### Foods That May Contain “Hidden” Lactose
- Non-Dairy creamers
- Powdered artificial sweeteners
- Foods containing milk powder
- Bread/Cake
- Margarine (including some that are labeled as 100% corn oil).
- Creamed soup
- Pancakes/waffles
- Puddings/custards
- Confections (including chocolate)
- Certain cold cut meats