

enzyme lactase. Cystic fibrosis, sprue, celiac disease, kwashiorkor, and infections (such as giardiasis or rotavirus) may cause a temporary or permanent lactose intolerance.

The primary symptoms of lactose intolerance include abdominal pain, abdominal bloating, flatulence, diarrhea, and nausea after the ingestion of lactose. The onset of symptoms occurs within 30 minutes to several hours of lactose consumption. Lactose intolerance is often perceived as an allergy or IBS; however, a dairy allergy is often immediate and accompanied by a skin rash or hives, and IBS is triggered by ingestion of fat, caffeine, sorbitol, and fructose in addition to lactose ([Carter and Attel, 2013](#)).

Lactose intolerance may be diagnosed on the basis of the history and improvement with a lactose-reduced diet. The breath hydrogen test is used to positively diagnose the condition. After ingesting 50 grams of a lactose solution, breath samples in lactose-deficient individuals will yield a higher percentage of hydrogen ( $\geq 20$  ppm [parts per million] above baseline). In infants, lactose malabsorption may be diagnosed by evaluating fecal pH and reducing substances after ingesting a lactose load; however, fructose, gastric motility, and water excretion can alter the sensitivity of the test ([Carter and Attel, 2013](#)).

Treatment of lactose intolerance is elimination of offending dairy products; however, some advocate decreasing amounts of dairy products rather than total elimination. Most individuals with lactose intolerance can tolerate a single serving of lactose (12 grams) per day, especially when consumed with food ([Shaukat, Levitt, Taylor, et al, 2010](#)). The enzyme, lactase, can be added to foods or beverages to promote the breakdown of lactose. One concern is that dairy avoidance in children and adolescents with lactose intolerance will contribute to reduced bone mineral density ([Setty-Shah, Maranda, Candela, et al, 2013](#)). It is recommended that individuals with lactose maldigestion who do not experience lactose intolerance symptoms continue to consume small amounts of dairy products with meals to prevent reduced bone mass density and subsequent osteoporosis. A systematic review of interventions to reduce lactose intolerance symptoms found insufficient evidence on the use of probiotics ([Shaukat, Levitt, Taylor, et al, 2010](#)). Because dairy products are a major source of calcium and vitamin D, supplementation of these nutrients is needed to prevent