Lactose Intolerance
Dr. Robert P. Heaney

“. . . I know I should drink more milk, but I can’t. I am lactose intolerant . . .”

Is that true? What is lactose intolerance? What does it mean for patients with osteoporosis?

Lactose is the name given to the sugar that is contained in milk. It’s what biochemists call a disaccharide, which means it is a complex of two simple sugar molecules, glucose and galactose. It’s the principal carbohydrate in the milk of all mammals. It’s an important source of energy during growth, but to be utilized by the body, it first must be split into its component sugars. This is accomplished by an enzyme that is a part of the digestive juices of infants, called lactase. [There is a hint here for you cross-word puzzlers. The technical names for sugars usually end in –ose, while the technical names for enzymes, usually end in –ase.]

Lactose is not found in foods other than dairy and, under ancestral conditions, after weaning, lactose typically disappeared from the diet, human as well as lower animal. The body, in its wonderful economy, reduces its production of lactase as we grow older, starting sometime after weaning. Under ancestral conditions, lactase simply wasn’t going to be needed again. That gradual loss of lactase activity occurs to a greater extend in individuals of East Asian or African extraction than in those of European ancestry, but we all lose some as we grow older. The problem is that about 10,000 years ago humans began to domesticate milk-producing animals, and thus dairy products entered the post-weaning diet. Our intestines, programmed as they had been over the millions of years of primate evolution, have had very little chance to catch up with this relatively very late addition to the adult human diet.

In the technical lingo of the field, the relative absence of lactase in the digestive systems of many adults is called “lactase nonpersistence”, and the fact that milk sugar cannot be easily digested by such individuals is termed “lactose maldigestion”. In individuals who are lactose maldigesters, lactose, instead of being split and absorbed, moves into the distal bowel where the bacteria that normally reside there digest the sugar for their own use, producing hydrogen gas in the process. Sometimes that hydrogen gas produces abdominal symptoms such as bloating, flatulence, cramps, or diarrhea. It’s that condition, induced by the unaccustomed consumption of milk, that is called “lactose intolerance”. But not all lactose maldigesters have symptoms. In fact, most do not. Studies of national population samples, consisting of people of different racial backgrounds, have shown that only about 14% of the adult population has any symptoms at all that could be related to lactose ingestion, even though the prevalence of lactose maldigestion must have been 3–5 times higher than the number with symptoms.

It’s important to understand that lactose is not found in all dairy products, but mainly in milk and milk products, and not in products such as cheese. That’s partly because the molds making the cheese utilize the lactose as a source of energy, and partly because lactase, being water soluble, is carried off in the whey. Moreover, live culture yogurts, which do contain lactose, also contain organisms that break down the lactose for us, and hence neither hard cheeses nor live culture
yogurts are likely to evoke the symptoms of lactose intolerance. It’s also important to understand that the symptoms of lactose intolerance are dependent upon how much lactose we ingest. The amount of lactose in one-half serving of milk (4 ounces) has never been shown to cause symptoms, even in those who complain of serious lactose intolerance. That fact provides a hint as to how we can deal with the problem in those who would like to be able to drink milk and yet do have symptoms.

But, before launching into treatment, it’s useful also to understand the relationship that exists between us as human beings and the many billions of micro-organisms that live with us in our bodies, many of them in our intestinal tracts. Those of us of an older generation were taught to fear germs. They were bad, or dirty, or caused disease, or all of the above. Manufacturers have made millions of dollars by selling us products such as antiseptics and disinfectants. Some germs are, indeed, harmful, but most are friendly, most of the time.

One of the friendly things these bacteria do is to help us digest complex compounds in our food that our intestines aren’t equipped to handle. One good example are the foods that we recognize as gas-forming, such as beans and the cruciferous vegetables – and, in the case of the subject of this article, milk. The bacteria in our intestines are capable of producing the enzymes needed to digest these foods. But our intestinal organisms are thrifty. They won’t produce the needed enzymes unless we consume the foods containing these compounds regularly. What, after all, would be the point of an organism making a metabolic expenditure to produce enzymes that it wasn’t going to use? As it turns out, our intestinal organisms are quite capable of producing lactase for us, but only so long as we provide them with a diet that contains milk on a regular basis.

As a result someone who complains of severe lactose intolerance symptoms can almost always be brought up to the point of consuming three full glasses of milk per day without symptoms if they build up the exposure gradually, slowly getting the bacteria in our intestines used to such a diet. The program usually goes something like this: add a half a glass of milk with a main meal on day 1, then a half a glass to two meals on day 2, and so forth until one builds up to three full servings per day. And here’s the important point: you have to keep drinking that milk, or the bacteria will stop producing the enzyme needed to digest it for you. So, obviously, this strategy only works for people who want to be regular milk drinkers.

What can we do for individuals who want to be able to drink milk, but only occasionally? They may well experience symptoms (even though, as we have seen, most maldigesters never actually do). There are two options available. One is to use lactose-reduced or lactose-free milk, generally available in most grocery stores and the other is to take a small tablet containing lactase at the time one drinks the milk. These tablets are also generally available over the counter in drug or grocery stores.

Getting enough calcium is important, and getting it in conjunction with the many nutrients that are contained in milk is even better than getting it in supplement form. One thing is clear: lifelong milk avoiders – for whatever reason – run an increased risk of suffering osteoporotic fractures. So if lactose intolerance appears to be a barrier to you, then it is helpful to know that you can train your body (and its friendly bacteria) to digest the lactose for you. Or, you can get the needed calcium and other nutrients from alternative dairy products, such as hard cheese or
live culture yogurts. Either way, don’t let lactose intolerance get between you and your getting enough of the nutrients you need for bone health.