

Why Does Drinking Milk Make Some People Sick?

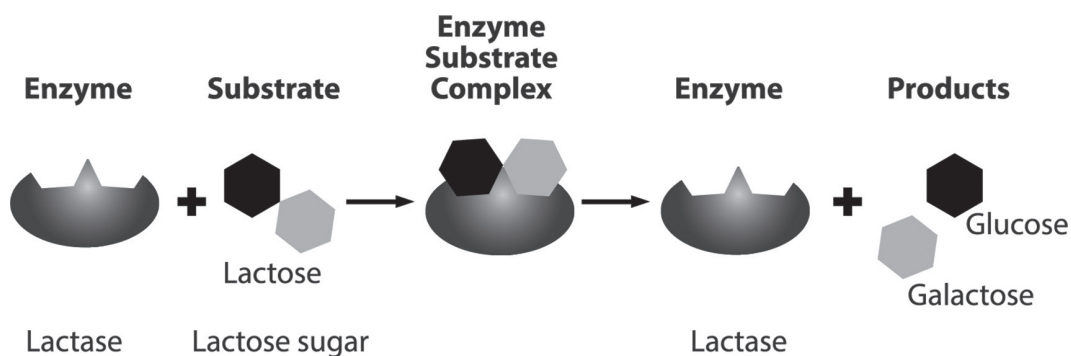
Humans are the only animal known to drink the milk of another species regularly. Still, for most humans (and for all other mammals), the body loses the ability to digest lactose (sugar in milk) because the body eventually stops producing the **lactase** enzyme. (The words *lactose* and *lactase* look similar, but mean different things: **lactose** is the sugar in milk, while **lactase** is an enzyme that breaks down lactose.) After early childhood, the gene that codes for the lactase enzyme begins to “turn off” or stop being expressed.



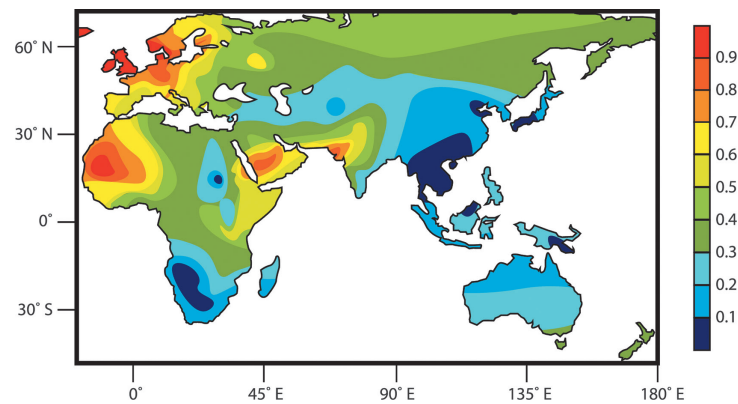
Many human populations use milk produced by other species as a source of food.

Once a person’s lactase gene turns off, the body can no longer digest and absorb the lactose. The lactose remains in the small intestine, where bacteria that live in the gut will eat the lactose sugar as food. This results in the production of gases, leading to nausea, stomach cramps, and diarrhea, which can be very uncomfortable.

However, for some people, expression of the lactase gene remains “on.” People with this type of mutation continue to make lactase enzymes and retain the ability to digest lactose sugar throughout their lives. This trait is called **lactase persistence**. Only about one-third of human adults have this trait that allows them to digest lactose in milk after early childhood.



Almost every mammal is born producing the lactase enzyme that allows them to break down lactose, the sugar in milk. Only some humans keep making this enzyme after early childhood.



This map shows the frequency of the lactase persistence trait across several continents. This trait varies widely among human populations, both between and within continents.

Scientists have identified several different mutations that all result in lactase persistence. This suggests that the ability to continually digest lactose has evolved multiple times in different human populations. These mutations may have helped people in these populations access more food sources and better nutrition in their environments.

Because of this genetic variation, people vary in whether they can easily digest lactose sugar after early childhood. However, many commonly eaten dairy products have some or all of the lactose removed. For example, yogurt is produced by adding beneficial bacteria to grow in milk. These bacteria digest the lactose in the milk as food during yogurt production, reducing the amount of lactose in the yogurt. Many cheeses are also made with beneficial bacteria that break down lactose. This is why some people who do not produce lactase can still tolerate some dairy products.

Some people who cannot digest lactose consume lactase supplements to help them comfortably eat dairy products. Others prefer to avoid dairy products and instead choose milks, ice cream, or yogurts made from plant ingredients like nuts, soy, or grains, which do not contain lactose.



Many types of food made from animal milk, such as ice cream, yogurt, and cheese, are also available in plant-based forms.

Sources:

Gerbault, Pascale, Anke Liebert, Yuval Itan, Adam Powell, Mathias Currat, Joachim Burger . . . Mark G. Thomas. "Evolution of Lactase Persistence: An Example of Human Niche Construction." *Philosophical Transactions of the Royal Society of London. Series B, Biological Sciences* 366, no. 1566 (2011): 863–877.