



YINI and WGO, working together for supporting you with your lactose intolerance

Q1. What is the role of lactose?

Lactose is the principal sugar (or carbohydrate) naturally found in milk and dairy. Lactose is composed of **glucose** and **galactose**, two simpler sugars used as energy directly by our body. Lactase, an enzyme, splits lactose into glucose and galactose.

Human milk contains 7.2% of lactose (only 4.7% of lactose in cow's milk), which provides **up to 50% of an infant's energy needs** (cow milk provides up to 30% of an infant's energy needs). Although glucose could be found in several types of foods, **lactose is the only source of galactose**.

Galactose has various biological functions and serves in neural and immunological processes. Galactose is a component of several macromolecules (cerebrosides, gangliosides and mucoproteins), which are important constituents of nerve cells membrane. Galactose is also a component of the molecules present on blood cells that determine the ABO blood types.

According to more recent studies, **lactose may play a role in the absorption of calcium** and other minerals such as copper and zinc, especially during infancy. Moreover, if it is not digested in the small intestine, **lactose may be used by the intestinal microbiota** (the microorganism population that lives in the digestive tract) as a nutrient (prebiotic). Lactose and other milk sugars also promote the growth of bifidobacteria in the gut and may play a life-long role in countering the aging-associated decline of some immune functions.

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Q2. What is the lactose maldigestion?

Lactose maldigestion is the difficulty to digest lactose, a type of sugar naturally found in milk and dairy food. Lactose maldigestion concerns most people in the world. It is due to the normal reduction of the activity of lactase, the enzyme that transforms lactose into glucose and galactose, both simpler sugars used by our body for energy and various functions. Lactose maldigestion appears after weaning, when the activity of lactase begins to naturally decline.

For most individuals, this **lactose maldigestion produces little or no symptoms**. Lactose maldigestion varies between different populations and on whether dairy products are consumed during adulthood. Lactase activity decline is more common in people of Asian, African, South American, Southern European, and Australian Aboriginal heritage than in people of Northern European (Scandinavia, the British Islands and Germany) descent.

Sources:

- Adolfsson O, Meydani SN, Russell RM. Yogurt and gut function. *Am J Clin Nutr* 2004;80:245-56.
- Szilagyi A. Adult lactose digestion status and effects on disease. *Can J Gastroenterol Hepatol* 2015;29:149-56.

Q3. What is the lactose intolerance?

Lactose intolerance is the inability to digest lactose that results in intestinal discomfort such as **bloating, diarrhea, and gas**. However, these symptoms are **not specific to lactose intolerance** and can be associated with psychological factors, such as stress and emotional trauma, or intestinal dysfunctions occurring, for example, during infection or malnutrition. It is important to remind that lactose intolerance is not a disease but a condition. It means that it is **not deleterious for your health**. It is also important that lactose intolerance **shall not be confused with cow's milk protein allergy**.

Sources:

- Crittenden RG, Bennett LE. Cow's milk allergy: a complex disorder. J Am Coll Nutr 2005;24:582S-91S. Luyt D, Ball H, Makwana N, et al. BSACI guideline for the diagnosis and management of cow's milk allergy. Clin Exp Allergy 2014;44:642-72.
- Misselwitz B, Pohl D, Fruhauf H, Fried M, Vavricka SR, Fox M. Lactose malabsorption and intolerance: pathogenesis, diagnosis and treatment. United European Gastroenterol J 2013;1:151-9.

Q4. What is the difference between lactose maldigestion and lactose intolerance?

There is a difference between these two situations.

In both cases (lactose maldigestion and intolerance), only a fraction of lactose is digested.

Non-digested lactose enters the colon.

For some individuals, the bacterial fermentation of non-digested lactose in the colon results in one or many symptoms such as bloating, diarrhea, and flatulence. This is called lactose intolerance. **Thus, lactose intolerance is lactose maldigestion that results into one or many of these symptoms.**

Moreover lactose intolerance concerns very few people, whereas lactose maldigestion concerns 70-75% of the world population.

Sources:

- Adolfsson O, Meydani SN, Russell RM. Yogurt and gut function. *Am J Clin Nutr* 2004;80:245-56.
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Q5. How to be sure that one is lactose intolerant?

It's not possible to self-diagnose lactose intolerance. This includes the tests you could find on the Internet, as these tests are not scientifically validated.

To be sure, lactose intolerance must be diagnosed. **The diagnosis of lactose intolerance** is solely performed under **strict medical control** with an *ad hoc* hydrogen breath test. This test includes an oral challenge with a standard dose of lactose (usually 20 to 50 g) followed by the detection, in the exhaled air, of hydrogen produced by the intestinal flora and by the occurrence of one or several/many of the following symptoms: **bloating, diarrhea, and flatulence.**

Often, lactose intolerance is self-diagnosed by individuals who experience intestinal discomfort after the consumption of dairy products. When they undergo the correct medical diagnosis, **only 50% of individuals with self-diagnosed lactose intolerance see their condition confirmed.** The severity of symptoms is generally over-reported with self-diagnosis.

Nevertheless, the diagnosis of lactose intolerance should not rule out any other underlying digestive pathology.

Sources:

- Hermans MM, Brummer RJ, Ruijters AM, Stockbrugger RW. The relationship between lactose tolerance test results and symptoms of lactose intolerance. *Am J Gastroenterol* 1997;92:981-4.
- Nicklas TA, Qu H, Hughes SO, Wagner SE, Foushee HR, Shewchuk RM. Prevalence of Self-reported Lactose Intolerance in a Multiethnic Sample of Adults. *Nutrition Today* 2009;44:222-7.
- Suarez FL, Savaiano DA, Levitt MD. A comparison of symptoms after the consumption of milk or lactose- hydrolyzed milk by people with self-reported severe lactose intolerance. *N Engl J Med* 1995;333:1-4.

Q6. Does lactose maldigestion and lactose intolerance imply to avoid dairy products?

For lactose intolerants and maldigesters, avoidance of milk and dairy products could have health consequences. All medical organizations recommend that lactose maldigesters and intolerants should not avoid dairy foods in order to prevent nutrients shortcomings. Lactose maldigesters and intolerants should adapt their diet.

Small amounts of lactose can still be consumed without triggering any symptoms. The consumption of yogurt, which contains live bacteria that help digesting the lactose it contains, and of cheeses that contain low or no lactose is possible and even encouraged (cheddar, provolone, mozzarella, etc.).

Lactose-free food or avoidance of dairy food is only needed for the rare infants with congenital lactase deficiency. Total lactase deficiency is rare (less than 50 patients in the world, mainly in Finland). It is a genetic disorder called congenital lactase deficiency.

Lactose supplemented food are also not necessary for lactose maldigesters and lactose intolerants.

Sources:

- Black RE, Williams SM, Jones IE, Goulding A. Children who avoid drinking cow milk have low dietary calcium intakes and poor bone health. *Am J Clin Nutr* 2002;76:675-80.
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- Vandenplas Y. Lactose intolerance. *Asia Pac J Clin Nutr* 2015;24 Suppl 1:S9-13.

Q7. Could yogurt be consumed by lactose maldigesters and intolerants?

Yes. Yogurt is a type of predigested food that contains sugars, proteins and fats, broken into simple forms.

Lactose maldigesters and lactose intolerants can consume yogurt because the lactose in yogurt is digested more efficiently than any other dairy sources. Why? Yogurt is a form of fermented milk that contains **live bacteria**, *Lactobacillus delbrueckii subsp. bulgaricus* and *Streptococcus thermophilus*, at least 10^8 live microorganisms per gram of yogurt. These bacteria produce their own lactase, which breaks down some of the lactose contained in yogurt. **Live cultures in yogurt improve digestion of lactose in yogurt in individuals with lactose maldigestion.** This claim is moreover, approved by the European Food Safety Authority. Therefore, for lactose maldigesters and intolerants, **yogurt is an easy way to digest milk.**

Sources:

- Commission CA. Codex standard for fermented milks. Food and Agriculture Organization United Nation Roma 2003:1-5.
- Efsa Panel on Dietetic Products N, Allergies. Scientific Opinion on the substantiation of health claims related to live yoghurt cultures and improved lactose digestion (ID 1143, 2976) pursuant to Article 13(1) of Regulation (EC) No 1924/2006. EFSA Journal 2010;8:n/a-n/a.
- Savaiano DA. Lactose digestion from yogurt: mechanism and relevance. Am J Clin Nutr 2014;99:1251S-5S.

Q8. How often can yogurt be consumed by lactose maldigesters and intolerants?

National and international organizations such as the Food and Agriculture Organization of the United Nations recommend the **daily consumption of fat-free and low-fat (1%) dairy products such as yogurt**. Several national nutrition organizations such as the US Dietary Guidelines for Americans and French Nutrition and Health National Program (Programme National Nutrition Santé) even recommend that adults consume three servings of dairy product daily.

These recommendations apply to lactose maldigesters and lactose intolerants also. Lactose maldigesters and intolerants can still **consume lactose, in modest amounts**, up to 12 g in one intake or up to 24 g, preferably in small amounts across the day, during meals, without experiencing symptoms.

Sources:

- Bailey RK, Fileti CP, Keith J, Tropez-Sims S, Price W, Allison-Otley SD. Lactose intolerance and health disparities among African Americans and Hispanic Americans: an updated consensus statement. *J Natl Med Assoc* 2013;105:112-27.
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- Suarez FL, Savaiano DA, Levitt MD. A comparison of symptoms after the consumption of milk or lactose- hydrolyzed milk by people with self-reported severe lactose intolerance. *N Engl J Med* 1995;333:1-4.

Q9. What are the nutritional benefits of yogurt for lactose maldigesters and intolerants?

First, yogurt is a **type of fermented milk**, which contains a lot of nutrients, such as carbohydrates, proteins, lipids, minerals and vitamins. Yogurt has a similar micronutrient composition as milk, generally with a good **bioavailability** and **affordability**. Yogurt has also a low energy density.

Yogurt is a good **source of calcium** and other minerals such as magnesium, potassium and zinc. Yogurt is also low in sodium. Yogurt contains B (B1, B2, B3, B6, B9 and B12), A and E **vitamins**.

Yogurt is an excellent source of **high-quality proteins**, whey and casein proteins, which lead to a reduction in appetite and aids muscle and bone growth.

Yogurt has a higher concentration on **conjugated linoleic acids** than milk. Conjugated linoleic acids are reported to have immunostimulatory and anticarcinogenic properties. Yogurt is also a **source of lactose**, which is the natural sugar found in dairy food. Lactose is composed of glucose and galactose, two simpler sugars used as energy directly by our body and as substrate for macromolecules involved in various biological functions such as neural and immunological processes.

Because it contains **live bacteria that can digest the lactose** it contains, yogurt is recommended for individuals with lactose intolerance.

Sources:

- Adolfsson O, Meydani SN, Russell RM. Yogurt and gut function. *Am J Clin Nutr* 2004;80:245-56.
- Bos C, Gaudichon C, Tome D. Nutritional and physiological criteria in the assessment of milk protein quality for humans. *J Am Coll Nutr* 2000;19:191S-205S.
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Q10. Why does lactose intolerance occur?

Lactose is a type of sugar, naturally found in milk and dairy products. In the intestine, lactose is transformed by lactase, an enzyme, into glucose and galactose, both simpler sugars, which are used by our body for energy and various functions. Most people have difficulty digesting lactose. It is due to the normal decline of lactase activity after weaning, called **non-persistence of lactase**. Symptoms of lactose intolerance generally do not occur until there is less than 50% of lactase activity.

At the genetic level, the gene coding for lactase, *LCT*, becomes normally less active with age. **In some individuals**, lactase production in the intestine is sustained and they **keep the ability to digest lactose after infancy**, while others lose this capacity and can experience intestinal discomfort regarding the amount of lactose they consume. Lactase activity decline is more common in people of Asian, African, South American, Southern European, and Australian Aboriginal heritage than in people of Northern European (Scandinavia, the British Islands and Germany) descent.

Lactose intolerance occurs when **lactose maldigestion** results into one or many symptoms of intestinal discomfort such as **bloating, diarrhea, and gas**.

Lactose maldigesters are encouraged to consume lactose in small amounts (up to 12 g in one intake, and up to 24 g across the day, which represents one and two bowls of milk, respectively). Yogurt, which contains live bacteria that help digesting the lactose it contains, and cheeses that contain low or no lactose (cheddar, provolone, mozzarella, Grana padano, etc.) are good alternatives for lactose maldigesters.

Sources:

- Adolfsson O, Meydani SN, Russell RM. Yogurt and gut function. *Am J Clin Nutr* 2004;80:245-56.
- Bailey RK, Fileti CP, Keith J, Tropez-Sims S, Price W, Allison-Otley SD. Lactose intolerance and health disparities among African Americans and Hispanic Americans: an updated consensus statement. *J Natl Med Assoc* 2013;105:112-27.
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- Szilagy A. Adult lactose digestion status and effects on disease. *Can J Gastroenterol Hepatol* 2015;29:149-56.

Q11. How common is lactose intolerance?

Lactose intolerance concerns very few people while lactose maldigestion concerns 70-75% of the world population. There is a difference between these two situations.

Lactose maldigestion is due to the normal incapacity of our intestine to transform lactose into glucose and galactose, both simpler sugars used by our body for energy and various functions. Lactose intolerance however is lactose maldigestion that results in one or many symptoms of intestinal discomfort such as **bloating, diarrhea, and gas**.

Lactose maldigestion appears after weaning, when the activity of lactase begins to naturally decline. Lactose maldigestion varies between different populations and on whether dairy products are consumed during adulthood. Lactase activity decline is more common in people of Asian, African, South American, Southern European, and Australian Aboriginal heritage than in people of Northern European (Scandinavia, the British Islands and Germany) descent. Total lactase deficiency is rare (less than 50 patients in the world, mainly in Finland). It is a genetic disorder called **congenital lactase deficiency**. The severity of symptoms depends on the degree of lactase deficiency and they usually include nausea, abdominal cramps and bloating, vomiting, flatulence, diarrhea, dehydration, loose stool, metabolic acidosis, the presence of lactose in urine and a distended abdomen. **Lactose-free diet is only needed for the rare patients with congenital lactase deficiency**.

For lactose intolerants and maldigesters, avoidance of milk and dairy products could have health consequences. Small amounts of lactose can still be consumed without triggering any symptoms. The consumption of yogurt, which contains live bacteria that help digesting the lactose it contains, and of cheeses that contain low or no lactose is possible and even encouraged (cheddar, provolone, mozzarella, Grana padano, etc.).

Sources:

- Adolfsson O, Meydani SN, Russell RM. Yogurt and gut function. *Am J Clin Nutr* 2004;80:245-56.
- Black RE, Williams SM, Jones IE, Goulding A. Children who avoid drinking cow milk have low dietary calcium intakes and poor bone health. *Am J Clin Nutr* 2002;76:675-80.
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Q12. Are there any health consequences of lactose intolerance?

Lactose intolerance can impair quality of life but has, likewise, **no direct consequence on health**. Likewise lactose maldigestion has also **no consequence on health**. Yet, perceived or diagnosed lactose intolerance is one of the reasons for limiting or avoiding dairy food. Thus, the only health consequence of lactose intolerance comes from the **possible nutrient shortcomings consequent to dairy avoidance**, such as low calcium intake. As stated by the European Food Safety Authority, low calcium intake may impair the maintenance of **normal bones and teeth**.

In order to reach the required calcium intakes, **lactose maldigesters are recommended to consume other forms of dairy products such as cheeses** that contains low or no lactose (cheddar, provolone, mozzarella, Grana padano, etc.) and **yogurts that contain live bacteria, which improve the digestion of the lactose contained in yogurt**. Indeed, yogurt consumers have overall a better calcium intake, a more balanced diet than non-yogurt consumers. Thus, yogurt is a marker of a good quality diet.

Sources:

- Bailey RK, Fileti CP, Keith J, Tropez-Sims S, Price W, Allison-Ottoy SD. Lactose intolerance and health disparities among African Americans and Hispanic Americans: an updated consensus statement. *J Natl Med Assoc* 2013;105:112-27.
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Q13. Can yogurt be consumed by all?

Yes. And more specifically, yogurt is **recommended for lactose maldigesters and lactose intolerants** because the lactose in yogurt is digested by the lactase produced by **live bacteria** *Lactobacillus delbrueckii subsp. bulgaricus* and *Streptococcus thermophilus*.

Yogurt is a good **source of several micronutrients** such as calcium, magnesium and high-quality proteins, which help to control appetite and glycemia. Yogurt consumption helps to **improve the overall diet quality** and promotes the replacement of less healthy foods. Yogurt consumption is associated with a **lower risk for type 2 diabetes**.

Sources:

- Efsa Panel on Dietetic Products N, Allergies. Scientific Opinion on the substantiation of health claims related to live yoghurt cultures and improved lactose digestion (ID 1143, 2976) pursuant to Article 13(1) of Regulation (EC) No 1924/2006. EFSA Journal 2010;8:n/a-n/a.
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Q14. Is lactose intolerance related to allergy?

No. Allergy is a **hypersensitivity of the immune system** to some elements in the environment that causes no to little problem to most people. Common food allergies are to peanuts, cow's milk, eggs, tree nuts, fish, shellfish, soy and wheat. In cow's milk allergy, the **immune system overreacts to one or more proteins** contained in cow's milk such as caseins and whey proteins. Symptoms include hives, swelling, nausea and wheezing and can arise within an hour and even up to 72 hours after drinking cow's milk.

Lactose intolerance is related to lactose, which is not a protein but a type of sugar naturally found in milk and dairy. It's the inability to digest lactose that results in bloating, diarrhea, and gas. **Lactose is not a milk protein but a sugar and it is not targeted by the immune system.**

People suffering from cow's milk allergies should avoid milk and dairy foods whereas **people with lactose intolerance should not avoid milk and dairy foods** but rather consume dairy in modest amounts, up to 12g in one intake or up to 24 g, preferably in small amounts across the day, during or at the end of a meal (not at beginning), without symptoms. Lactose intolerants are also recommended to consume different forms of dairy such as yogurt, which facilitates lactose digestion, and some cheeses like aged-cheeses, which contain very low to no lactose.

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Q15. What are the symptoms of lactose intolerance?

Lactose intolerance manifests itself by one or many of the following symptoms: **bloating, diarrhea, and flatulence**, which occur after lactose consumption.

Lactose, the sugar naturally found in milk and dairy, is usually **transformed in the intestine by lactase**, an enzyme, into glucose and galactose, both simpler sugars used by our body for energy and various functions. The activity of lactase is high during infancy and slowly decline after weaning. In some individuals, for whom the activity of lactase is reduced, **undigested lactose** consequently enters the colon where it is **fermented by the resident microbiota** (the microorganism population that lives in the digestive tract). **Bacterial fermentation** leads to the formation of gas (hydrogen, carbon dioxide, methane), lactic and acetic acids, which increases gut transit time and intracolonic pressure, resulting possibly in bloating, diarrhea, and flatulence.

The amount of lactose that triggers these symptoms differs among individuals. Most of individuals with difficulty to digest lactose (lactose maldigestion) can consume lactose in dairy foods in modest amount, up to **12 g of lactose in one intake** or up to 24 g in small amounts across the day during or at the end of a meal, **without experiencing the symptoms mentioned above**.

For that matter, the European Food Safety Authority has issued a scientific opinion that claims that the consumption of live yogurt cultures in yogurt, *Lactobacillus delbrueckii subsp. bulgaricus* and *Streptococcus thermophilus*, improves digestion of lactose in yogurt in individuals with lactose maldigestion.

Sources:

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Q16. Can lactose intolerance get better?

The **regular consumption of dairy food** in individuals with difficulties to digest lactose could lead to an **adaptation of their gut microbiota** (the microorganism population that lives in the digestive tract) and to an **improvement of symptoms**, which allow them to consume more dairy foods.

The consumption of live bacteria can increase the presence of certain bacteria strain without, however, changing the overall gut microbiota constitution.

Yogurt contains **live bacteria**, *Lactobacillus delbrueckii subsp. bulgaricus* and *Streptococcus thermophilus*, which break down some of the lactose it contains, making it easier for individuals who have difficulty digesting lactose.

Moreover, if it is not digested in the small intestine, **lactose may be used by the intestinal microbiota** as a nutrient (prebiotic). Lactose and other milk sugars also promote the growth of bifidobacteria in the gut and may play a life-long role in countering the aging-associated decline of some immune functions.

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Q17. Can lactose intolerance be self-diagnosed?

It's not possible to self-diagnose lactose intolerance. This also includes the tests you could find on the Internet, as these tests are not scientifically validated.

Usually, self-diagnosis is based on dairy avoidance and on the presumed consequent cessation of symptoms. Yet, **lactose intolerance cannot be diagnosed outside strict medical control.** The proper way to diagnose lactose intolerance is to measure, in the exhaled air, the hydrogen produced by the intestinal flora after consumption of a standard dose of lactose (usually 20 to 50 g) and when one or many of the following symptoms occur: **bloating, diarrhea, and flatulence.** This diagnosis if performed under medical control.

When a medical diagnosis is performed, only 50% of self-**diagnosis of lactose intolerance is confirmed.**

Sources:

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Q18. What do the medical organizations recommend regarding lactose maldigestion and intolerance?

Several international and national medical organizations, including the European Food Safety Agency, the Food and Agriculture Organization of the United Nations and the US National Medical Association, recommend that **lactose maldigesters and intolerants should not avoid dairy foods** in order to **prevent nutrients shortcomings**. Instead, lactose maldigesters and intolerants should adapt their diet.

Lactose maldigesters and intolerants can still **consume lactose, in modest amounts**, up to 12 g in one intake or up to 24 g, preferably in small amounts across the day, during meal, without experiencing symptoms. Several organizations also **recommend the consumption of yogurt containing**, at least, 10⁸ live bacteria *Lactobacillus delbrueckii subsp. bulgaricus* and *Streptococcus thermophilus*, which **improve lactose digestion** and **prevent symptoms** in lactose intolerants.

The World Gastroenterology Organization has put forth a similar statement, to consume fermented dairy products containing probiotics, with proven benefits on digestive health, which is a tip from their *10 global diet and lifestyle tips on how to improve digestive health*, <http://www.worldgastroenterology.org/UserFiles/events/WDHD/2012/10%20Global%20Tips/10-Global-Tips-english.pdf>.

Sources:

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Q19. Does lactose intolerance imply to consume lactose-free food?

Lactose intolerants don't need to consume lactose-free food. Lactose-free food is only needed for the rare infants with congenital lactase deficiency, a genetic disorder characterized by the absence of lactase, the enzyme that transforms lactose. Lactose is the sugar naturally found in various amount in dairy products, such as milk, cream, yogurt and cheeses.

Lactose intolerance is due to **lactose maldigestion**, i.e. the reduced capacity to digest lactose, which results into one or many symptoms such as bloating, diarrhea, and flatulence. **Most people with lactose maldigestion can consume dairy food without experiencing any symptoms.** Lactose may be consumed in modest amounts, up to 12 g in one intake or up to 24 g, preferably in small amounts across the day, during or at the end of a meal (not at beginning), without symptoms. They are also encouraged to **consume altered forms of dairy** food such as some cheeses that contains low or no lactose (cheddar, provolone, mozzarella, Grana padano, etc.) and yogurt. Yogurt contains live bacteria that improve the digestion of lactose it contains in lactose maldigesters.

In addition, regular dairy food consumption by lactose maldigesters could lead to colonic adaptation by the gut microbiota (the microorganism population that lives in the digestive tract) and may allow them to consume more dairy foods.

Thus, **avoiding dairy foods** may not only be unnecessary to manage lactose intolerance, but it may also lead to **nutrient shortcomings**, which may result in **adverse health effects** such low calcium intake and poor bone health.

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Q20. Is lactose intolerance related to lifestyle or to eating habits?

No, lactose intolerance is **not related to lifestyle** but can be related to eating habits and to individual variability. Some individuals can digest lactose, while others cannot.

Indeed, the ability to digest lactose (a type of sugar naturally found in milk and dairy products) is due to the persistence of lactase (an enzyme) in the intestine, where lactose is transformed into glucose and galactose, for energy and various functions. Lactase activity reaches its maximum at birth and slowly declines after weaning. **Lactase activity may persist in some populations where dairy products are consumed into adulthood**, especially Caucasians from Northern Europe (Scandinavia, the British Islands and Germany) and specific communities in Asia, Africa, South America, Southern Europe and Australia.

Lactose intolerance can occur in individuals with lactose maldigestion, the reduced capacity to digest lactose, which consumes **large amounts of lactose** in one intake (>12 g) or across the day (>24 g) apart from meals.

Lactose intolerance is a type of **lactose maldigestion**, which results into one or many of the following symptoms: **bloating, diarrhea, and flatulence**.

Similar symptoms of lactose intolerance can be observed after consumption of some short chain carbohydrates, the FODMAP (Fermentable, Oligo-, Di-, Mono-saccharides And Polyols), which are poorly absorbed in the small intestine.

Lactose maldigesters, including lactose intolerants, can consume foods containing lactose such as dairy products, in small amounts. Yogurt consumption is particularly encouraged since yogurt contains live ferments, *Lactobacillus delbrueckii subsp. bulgaricus* and *Streptococcus thermophilus*, which have been officially acknowledged to improve digestion of lactose in yogurt, in individuals with lactose maldigestion.

Sources:

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Q21. Is intestinal discomfort due to lactose intolerance?

Not always. Lactose intolerance can occur when **lactose maldigestion**, the reduced capacity to digest lactose, results into one or many of the following symptoms: **bloating, diarrhea, and flatulence**.

Lactose is a type of sugar naturally found in milk and dairy products. In the intestine, lactose is transformed by lactase, an enzyme, into glucose and galactose, both simpler sugars used by our body for energy and various functions. The activity of lactase is high during infancy and slowly declines after weaning. In some individuals, a residual lactase activity is maintained. Undigested lactose subsequently enters the colon, where it is **fermented by the resident microbiota** (the microorganism population that lives in the digestive tract). **Bacterial fermentation** is responsible for the formation of gas, lactic and acetic acids, which increase gut transit time and intracolonic pressure, resulting possibly in bloating, diarrhea, and flatulence.

Symptoms generally do not occur until there is less than 50% of lactase activity, compared to the level of lactase activity before weaning.

However, the symptoms associated to lactose intolerance are **not specific of this condition** and can be observed in other frequent **gastro-intestinal dysfunctions** such as irritable bowel syndrome, inflammatory bowel diseases (Crohn's disease and ulcerative colitis) and intolerance to FODMAP (Fermentable, Oligo-, Di-, Mono-saccharides And Polyols, which are short chain carbohydrates poorly absorbed in the small intestine). **Psychological factors** such as somatic anxiety, stress and depression can also cause the occurrence of these symptoms.

Moreover, a temporary **lactose malabsorption**, appearing in case of infectious diarrhea, radiotherapy, mucosal damage due to coeliac disease or some medicine use, can also give rise **to similar symptoms**.

Thus, **self-diagnosis of lactose intolerance** based solely on intestinal discomfort and made without proper medical diagnosis, **is not possible**. Self-diagnosed lactose intolerance can lead to unnecessary avoidance of dairy food.

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Q22. Is yogurt part of a healthy diet?

Yes of course. First of all, a healthy diet helps to preserve or even enhance overall health. A healthy diet complies with the dietary guidelines regarding the macro and micronutrient contents.

National and international organizations such as the Food and Agriculture Organization of the United Nations and the US Dietary Guidelines recommend the **daily consumption of dairy products such as yogurt.**

Several scientific studies have reported that regular consumers of yogurt have a better **overall quality diet**, a more **diverse** and **balanced** diet that **respects the dietary guidelines** regarding nutrient intakes, than non-consumers.

Recent studies showed that adult yogurt consumers are more likely to be physically active and are less likely to smoke than non-yogurt consumers are. Yogurt consumers have also a better knowledge of the relationship between food and health than those who do not eat yogurt.

Yogurt consumption is also associated with **lower levels of circulating triglycerides**, glucose, and lower systolic blood pressure and insulin resistance.

Yogurt consumption could also be involved in the **control of body weight** and energy homeostasis since analysis of cohorts have shown that regular consumers of yogurt gain less weight over time than non-consumers.

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