

# Perspective Paper

A photograph of various dairy products arranged on a light-colored wooden surface. In the foreground, there is a large glass pitcher filled with white milk, a small glass bowl of white yogurt, and a white ceramic dish containing shredded cheese. To the left, a wedge of Swiss cheese with holes sits on a wooden cutting board, along with a wedge of Brie cheese and a small glass bowl of ricotta cheese. In the background, there is a small glass pitcher of milk and a glass of pink smoothie.

## **Lactose: Scientific Distinction for Public Health Policy**

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## KEY TAKEAWAYS:

- Lactose, a naturally occurring carbohydrate, intrinsic to milk, is part of the inherent nutrient package that contributes to the overall health benefits of dairy foods.
- Metabolically and nutritionally distinct from free sugars, lactose is digested more slowly, promotes satiety, and does not produce the same glycemic or metabolic response as added sugars.
- Evidence links dairy consumption, including lactose-containing dairy foods, with improved health outcomes, such as reduced risk of type 2 diabetes.
- The World Health Organization (WHO) explicitly excludes lactose from added and free sugar definitions in its global

According to the WHO, free sugars - those added to foods and beverages by the manufacturer, cook or consumer, and sugars naturally present in honey, syrups, fruit juices and fruit juice concentrates - threaten diet quality by providing excess calories without micronutrients, contributing to unhealthy weight gain and increased risk of obesity and various non-communicable diseases (NCDs).<sup>1</sup> Naturally occurring sugars, on the other hand - those found in whole foods, such as fruits, vegetables, and milk - are not considered free sugars. While all types of sugar contribute to what is commonly termed “total sugar” on a nutrition label, sugars differ in their composition and impact on the human body, with lactose being a prime example of a unique, naturally occurring disaccharide (two simple sugars) carbohydrate that can have a positive effect on health.

As front-of-pack labeling rules and sugar reformulation targets tighten globally, it's critical for the dairy sector to set the record straight: lactose is intrinsic to milk, part of its nutrient-rich matrix, and not a free sugar driving overconsumption of empty calories.

## Lactose: A Functional Carbohydrate Within the Dairy Matrix

Lactose is a disaccharide carbohydrate, composed of glucose and galactose. It occurs naturally in dairy and plays a supportive role in gut health and satiety regulation. Some gut bacteria can metabolize lactose into lactic acid and short-

chain fatty acids, which may have beneficial effects on gut health and **immune function**, including increasing the integrity of the gut barrier and **reducing inflammation**.<sup>2,3</sup>

For individuals who experience symptoms of lactose intolerance, there are low-lactose options in the dairy case, such as lactose-free milk and fermented dairy, including kefir and yogurt, and hard cheeses, which contain minimal amounts of lactose. Even so, research indicates people who experience symptoms of lactose intolerance can tolerate up to 5g of **lactose**, or about 100ml of milk, without noticing symptoms.<sup>4</sup> Moreover, there is even evidence suggesting individuals can **shift their gut microbe populations** toward more lactic acid bacteria and reduce symptoms of lactose intolerance simply by adding small amounts (<12 grams) of lactose to their daily diet.<sup>5</sup>

This function of promoting lactic acid bacteria (e.g., *Bifidobacteria*) growth and producing metabolites to improve human health has led some researchers to call lactose a **conditional prebiotic** (food for healthy gut bacteria) for those with lactose intolerance.<sup>6</sup>

As a disaccharide, lactose must be broken down by the enzyme lactase into the smaller, easier to absorb sugars, glucose and galactose, before it can be used for energy. This process of digestion and absorption happens more slowly in a complex molecule like lactose, giving lactose a **lower glycemic index** and contributing to more stable blood glucose levels.<sup>6</sup> Further, lactose has a **low sweetness level**, reducing the likelihood of overconsumption.<sup>7</sup>

Lactose may also help **consumers feel full** by **regulating the concentration of the “hunger hormone” ghrelin**, which communicates to the brain when it is time to eat.<sup>8,9</sup> Studies have found that consuming lactose reduces ghrelin levels and appetite more than consuming glucose.

## Implications for Public Health Policy

Whereas excessive intake of free or added sugars has been associated with poor dietary quality, obesity, and risk of NCDs, there is no reported evidence of intake of naturally occurring lactose in milk leading to adverse events.<sup>1</sup> In fact, dairy consumption is linked to several positive health outcomes such as lower risk of obesity, type 2 diabetes, and cardiovascular disease. Lactose’s unique metabolic behavior, coupled with the presence of beneficial nutrients found in dairy products – such as high-quality protein, calcium, vitamin B2, and iodine – reinforces why it should be differentiated from free sugars.

These outcomes are critical not to overlook. Encouraging appropriate dairy consumption can help prevent micronutrient deficiencies and improve other health

outcomes while supporting continued inclusion of appropriate amounts of dairy in global diets.

The WHO recognizes this distinction, excluding lactose from the definition of added sugars. The WHO 2015 guideline on sugar intake recommends limiting free sugar consumption to less than 10% of total daily energy intake but excludes lactose from these thresholds.<sup>1</sup> The WHO explicitly states that naturally occurring sugars like those found in fruits, vegetables, and milk should not be counted as added sugars.

## DAIRY LEADERSHIP: A CALL TO ACTION

- Educate the public on the role of lactose in the dairy matrix, including dairy foods' broader nutrition and health benefits.
- Advocate for regulatory and labeling frameworks that distinguish lactose from free and added sugars.
- Support ongoing research on dairy's role in reducing the risk of NCDs.

## A Path Forward

Understanding the distinction between naturally occurring carbohydrates such as lactose and other added or free sugars is key to developing appropriate policy for human health. Public policy frameworks that encourage consumption of nutrient-rich foods such as dairy can help close gaps in nutrient adequacy and drive positive health outcomes.

*For more information on the Global Dairy Platform's Perspective Papers or our Quarterly Webinar Series, please reach out to Dr. Beth Bradley at [beth.bradley@globaldairyplatform.com](mailto:beth.bradley@globaldairyplatform.com).*

### References

1. WHO. Guideline: Sugars Intake for Adults and Children. World Health Organization; 2015. [https://iris.who.int/bitstream/handle/10665/149782/9789241549028\\_eng.pdf](https://iris.who.int/bitstream/handle/10665/149782/9789241549028_eng.pdf)
2. Parada Venegas D, et al. 2019. Short chain fatty acids (SCFAs)-mediated gut epithelial and immune regulation and its relevance for inflammatory bowel diseases. *Front Immunol* 10: 277.
3. Li M, van Esch BC, Wagenaar GT, Garssen J, Folkerts G, Henricks PA. 2018. Pro- and anti-inflammatory effects of short chain fatty acids on immune and endothelial cells. *Eur J Pharmacol* 831: 52-9.
4. Kable ME, et al. 2023 Association of estimated daily lactose consumption, lactase persistence genotype (rs4988235), and gut microbiota in healthy US adults. *J Nutr* 153(8): 2163-73.
5. Forsgård RA. 2019. Lactose digestion in humans: intestinal lactase appears to be constitutive whereas the colonic microbiome is adaptable. *Am J Clin Nutr*. 2019 110(2): 273-9.
6. Szilagyi A. 2004 Redefining lactose as a conditional prebiotic. *Can J Gastroenterol*. 18(3):163-167.
7. Dominici S, et al. 2022. Lactose: Characteristics, food and drug-related applications, and its possible substitutions in meeting the needs of people with lactose intolerance. *Foods*. 11(10):1486.
8. Romero-Velarde E, et al. 2019. The importance of lactose in the human diet: Outcomes of a Mexican consensus meeting. *Nutrients*. 11(11):2737.
9. Anguita-Ruiz A, et al. 2025. Alternative biological functions of lactose: a narrative review. *Crit Rev Food Sci Nutr*. 22:1-4.