



Beyond the Bloat: Why Confusing Dairy Allergies and Lactose Intolerance Can Be Dangerous

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doi.org/10.5281/VeterinaryToday.23000136

Abstract

Lactose intolerance (LI) and cow's milk allergy (CMA) are two distinct adverse reactions to milk that are frequently confused because of overlapping gastrointestinal symptoms. LI is a non-immune digestive disorder caused by inadequate lactase activity, resulting in the malabsorption of lactose and symptoms such as abdominal pain, bloating, flatulence, and diarrhoea. In contrast, CMA is an immune-mediated reaction to cow's milk proteins, particularly casein and β -lactoglobulin, and may involve the gastrointestinal, dermatological, and respiratory systems, with severe cases resulting in anaphylaxis. The clinical presentation of LI is generally dose-dependent, whereas CMA may be IgE-mediated, producing rapid reactions, or non-IgE-mediated, producing delayed gastrointestinal and inflammatory manifestations. This distinction is particularly important in India, where lactose malabsorption is highly prevalent, while CMA is an important concern during infancy and early childhood. Gastrointestinal symptoms in infants with CMA may lead to misdiagnosis as lactose intolerance, potentially resulting in inappropriate dietary management. Lactose-free dairy products may be suitable for individuals with LI but remain unsuitable for those with CMA because milk proteins are still present. Management therefore differs substantially, ranging from lactose reduction or lactase supplementation in LI to strict milk-protein avoidance and specialized hypoallergenic formulas in CMA. Accurate differentiation through appropriate clinical evaluation is essential to prevent unnecessary dietary restrictions and ensure adequate nutritional intake, particularly in infants and young children.

Keywords: Lactose intolerance; Cow's milk allergy; Lactose malabsorption; Milk proteins; Lactase deficiency; IgE-mediated allergy; Non-IgE-mediated allergy; Infant nutrition; Hypoallergenic formula; Dairy products; Gastrointestinal symptoms; India.

Lactose Intolerance or Cow's Milk Allergy? Understanding the Difference

Milk is an important part of the human diet

and is often introduced during infancy and childhood. However, some people experience unpleasant or even serious reactions after

consuming milk. Two conditions are particularly important to distinguish: **lactose intolerance (LI)** and **cow's milk allergy (CMA)**.

Although the two conditions can produce similar digestive complaints, they are fundamentally different. Lactose intolerance results from difficulty digesting **lactose, the natural sugar in milk**, whereas cow's milk allergy results from an **immune reaction to proteins present in cow's milk**. Confusing the two can lead to inappropriate dietary restrictions and, particularly in infants, delayed recognition of a potentially serious allergy.

Lactose Intolerance and Cow's Milk Allergy: Two Very Different Conditions

The simplest way to understand the difference is to ask: **Is the problem with digesting milk sugar, or is the immune system reacting to milk proteins?**

Lactose Intolerance: A Digestive Problem

Lactose intolerance occurs when the small intestine does not produce enough **lactase**, the enzyme required to digest lactose. Undigested lactose passes into the large intestine, where it is fermented by intestinal bacteria. This fermentation produces gases and other compounds that can result in gastrointestinal discomfort.

Typical symptoms include:

- Abdominal pain or cramps
- Bloating
- Flatulence
- Diarrhoea
- Abdominal rumbling or discomfort

The severity of symptoms is often **dose-dependent**. A person may tolerate a small amount of lactose but develop symptoms after consuming a larger quantity. Importantly, lactose intolerance is **not an immune-mediated disorder**.

Cow's Milk Allergy: An Immune-Mediated Reaction

Cow's milk allergy is fundamentally different. Here, the immune system reacts abnormally to one or more proteins in cow's milk, including **caseins and whey proteins such as β -lactoglobulin**.

CMA can affect several organ systems and may produce symptoms involving the:

- Gastrointestinal tract

- Skin
- Respiratory system

In severe IgE-mediated reactions, exposure to milk protein can result in **anaphylaxis**, a potentially life-threatening allergic reaction requiring urgent medical attention.

Key Differences at a Glance

Feature	Lactose Intolerance	Cow's Milk Allergy
Basic mechanism	Inadequate digestion of lactose	Immune reaction to milk proteins
Main trigger	Lactose (milk sugar)	Cow's milk proteins
Immune system involved?	No	Yes
Common symptoms	Bloating, gas, abdominal pain, diarrhoea	Gastrointestinal, skin and respiratory symptoms
Typical presentation	More common as lactase activity declines with age	Particularly important during infancy and early childhood
Severe systemic reaction	Not expected	Possible, including anaphylaxis
Dietary approach	Reduce lactose or use lactose-free/lactase-treated products	Avoid cow's milk proteins when medically indicated

Recognizing the Symptoms

Lactose Intolerance: Symptoms Often Depend on the Amount Consumed

Lactose intolerance does not necessarily mean that a person must avoid every dairy product. Tolerance varies considerably between individuals and depends on factors such as the amount of lactose consumed, the individual's residual lactase activity, and whether the food is consumed with

other foods.

Many people with lactose malabsorption can tolerate some lactose without significant symptoms. Larger quantities, however, may result in progressively greater gastrointestinal discomfort. This is one reason why a person may be able to eat a small amount of yoghurt or cheese but experience bloating or diarrhoea after drinking several glasses of milk.

Cow's Milk Allergy: Symptoms Can Extend Beyond the Gut

Cow's milk allergy can produce a much broader range of manifestations.

IgE-mediated CMA generally develops rapidly after exposure and may cause:

- Hives or urticaria
- Facial or lip swelling
- Vomiting
- Wheezing or breathing difficulty
- Throat or airway swelling
- Anaphylaxis in severe cases

Non-IgE-mediated CMA may develop more gradually and can present with predominantly gastrointestinal manifestations, such as:

- Persistent vomiting or reflux
- Colic-like symptoms
- Diarrhoea
- Constipation
- Blood or mucus in the stool
- Other signs of intestinal inflammation

The wide variation in presentation can make CMA challenging to recognize, particularly when gastrointestinal symptoms occur without obvious skin or respiratory manifestations.

Why the Difference Matters in Infants

The distinction between LI and CMA is particularly important in babies and young children.

Lactose intolerance is relatively uncommon as a primary disorder during early infancy. In contrast, cow's milk allergy is an important food allergy of infancy and may become apparent after exposure to cow's milk proteins through infant formula or, in some cases, through breast milk when maternal dietary proteins are transferred into breast milk.

A major diagnostic challenge is that **CMA**

can present predominantly with gastrointestinal symptoms. Parents or caregivers may therefore assume that the child simply cannot digest lactose. This can result in the wrong product being selected. **A lactose-free formula or lactose-free dairy product can still contain cow's milk proteins.** Removing lactose does not remove milk proteins and therefore does not make a product suitable for a child with confirmed cow's milk protein allergy.

The Indian Context

The distinction is particularly relevant in India because lactose malabsorption is common among Indian populations, with substantial regional variation reported in studies using objective testing such as hydrogen breath testing.

Studies have reported high rates of lactose malabsorption and lactose intolerance in both northern and southern Indian populations. However, **lactose malabsorption should not automatically be interpreted as symptomatic lactose intolerance.** Malabsorption refers to impaired digestion and absorption of lactose, whereas intolerance refers to the occurrence of symptoms following lactose consumption.

This distinction is important when interpreting prevalence figures and when counselling individuals about dairy consumption.

At the same time, cow's milk allergy remains an important consideration in infants presenting with recurrent gastrointestinal, dermatological or respiratory symptoms.

Choosing the Right Dairy Product

Understanding the underlying condition is essential before choosing a dietary alternative.

For Lactose Intolerance

Individuals with lactose intolerance may be able to consume dairy products with reduced lactose, depending on their individual tolerance. Possible options include:

- **Lactose-free milk:** Lactose is enzymatically broken down using lactase.
- **Yoghurt and fermented dairy products:** Fermentation can reduce lactose and may improve tolerance for some individuals.
- **Hard or long-ripened cheeses:** These generally contain very little lactose.

- **Lactase supplements:** Lactase tablets or drops may help some individuals digest lactose.
- **Small portions of dairy:** Some people tolerate modest amounts better than large servings.

Importantly, lactose-free dairy products are **not automatically suitable for people with cow's milk allergy**, because the milk proteins remain present.

For Cow's Milk Allergy

Management of confirmed CMA requires avoidance of the relevant milk proteins under appropriate medical and nutritional supervision.

For infants who require formula, healthcare professionals may recommend:

Extensively hydrolysed formulas (eHF):

Milk proteins are broken down into smaller peptides to reduce their allergenic potential. These are commonly used in the dietary management of many infants with CMA.

Amino acid-based formulas:

These contain individual amino acids rather than intact milk proteins and may be considered for infants with severe CMA or those who do not respond adequately to an extensively hydrolysed formula.

Plant-based beverages:

Soy, oat, almond and coconut beverages do not contain lactose or cow's milk proteins, but they are **not nutritionally interchangeable with infant formula**. Infants should not be switched to plant-based beverages as a substitute for breast milk or an appropriate infant formula without professional guidance.

A Common Mistake: "Lactose-Free Means Allergy-Free"

One of the most important messages for parents and consumers is:

Lactose-free does not mean milk-protein-free.

Lactose is a carbohydrate, whereas casein and whey proteins are proteins. Removing lactose does not remove milk proteins.

Therefore:

Lactose intolerance → problem with lactose.

Cow's milk allergy → problem with milk

proteins.

The appropriate dietary strategy depends on which condition is actually present.

Diagnosis Should Come Before Dietary Restriction

Because symptoms can overlap, self-diagnosis can be misleading. Bloating, abdominal pain, vomiting, diarrhoea, reflux and changes in bowel habits can occur for many different reasons.

For suspected lactose intolerance, healthcare professionals may use dietary assessment, elimination and reintroduction strategies, and, when appropriate, objective testing.

For suspected cow's milk allergy, diagnosis is based on the clinical history and appropriate allergy evaluation. Depending on the type of suspected allergy, supervised elimination and reintroduction or other diagnostic approaches may be required.

Parents should be particularly cautious about independently eliminating milk and dairy products from an infant's diet because inappropriate restriction can compromise energy, protein, calcium, vitamin D and other nutrient intake.

The Bottom Line

Lactose intolerance and cow's milk allergy may look similar at first glance, but they are **not the same condition**.

Lactose intolerance is primarily a problem of digestion: the body has insufficient lactase to adequately digest lactose.

Cow's milk allergy is an immune-mediated condition: the immune system reacts to proteins in cow's milk and can affect the gastrointestinal tract, skin and respiratory system, with severe reactions potentially causing anaphylaxis.

The distinction matters because the management is different. A lactose-free product may help someone with lactose intolerance but may provide no protection against cow's milk protein allergy.

Whenever a child or adult develops persistent or significant symptoms after consuming milk, particularly when symptoms involve the skin, breathing or repeated vomiting, the cause should be evaluated by an appropriate healthcare professional

rather than assumed to be lactose intolerance.

Correct identification of the problem is the first step toward appropriate nutrition, effective symptom management and, in the case of food allergy, prevention of potentially serious reactions.

