



Legislative Council Staff

Nonpartisan Services for Colorado's Legislature

Memorandum

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TO: Interested Persons

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SUBJECT: Raw Milk and Public Health

Summary

This memo analyzes the public health implications of raw milk consumption, noting that while proponents cite perceived taste and nutritional benefits, scientific evidence shows unpasteurized dairy products cause significantly more illnesses and outbreaks than pasteurized dairy products. Raw milk may have a protective effect against early-childhood asthma and allergies; however, there are also risks of life-threatening infections, particularly for vulnerable populations like children. Direct sales of raw milk remain illegal in Colorado, though consumers can access raw milk through legal exceptions like herd-shares.¹

Introduction

In 1987, the US Food and Drug Administration (FDA) prohibited the distribution of raw (un-pasteurized) milk across state lines.² However, raw milk is widely accessible within most states through a variety of laws and regulations. Many states have passed legislation legalizing farm-to-consumer sales of raw milk, including [North Dakota](#) and [Iowa](#).³ Other states legalized the sale of raw milk at retail stores (e.g., [Washington](#)), made raw milk available through herd shares (e.g., Colorado), or permitted selling it as pet food (e.g., [West Virginia](#)).

In addition to being un-pasteurized, raw milk is often non-homogenized. Pasteurized milk, particularly local and organic milks, can also be non-homogenized. In non-homogenized milk, the fat rises to the top to form a layer of cream. Milk that has been through [homogenization](#), a

¹ Section 25-5.5-117, C.R.S.

² [21 C.F.R. § 1240.61](#)

³ In January 2026, the Iowa Legislature introduced [bill SF2112](#) to eliminate the 2023 law that permitted raw milk sales.



mechanical treatment process, has smaller fat globules more densely distributed throughout the milk that will not cluster at the top. A lack of homogenization appears to be an important feature to some raw milk consumers who described the taste of raw milk as “creamy” and “smooth,” ([Markham et al. 2014](#)).

Proponents of raw milk have promoted it as more nutritious or natural; however, researchers have noted that websites promoting raw milk may share confusing or misleading information (e.g., using the terms “raw” and “organic” somewhat interchangeably) ([Sillence et al. 2016](#)).⁴ Many cite perceived health benefits, taste, concerns about food processing, and dissatisfaction with modern food production as reasons for drinking raw milk rather than pasteurized milk ([Katafiasz and Bartlett 2012](#); [Markham et al. 2014](#)⁵; [Mullin et al. 2014](#)).

Based on data from the 2016 Food Safety Survey and the 2019 Food Safety and Nutrition Survey conducted by the FDA, 4.4 percent of adults in the U.S. reported drinking raw milk at least once in the past year ([Lando et al. 2022](#)). Adults consuming raw milk were more likely to be younger (18 to 35 years old), live in rural areas, and reside in states that legalized the retail sale of raw milk. Two in five raw milk consumers drank it more than once per month. Frequent raw milk consumers who drank it at least once per month tended to have lower levels of college completion (24.3 percent) than occasional consumers who drank it less than once per month (40.9 percent).

Pasteurization

Louis Pasteur invented pasteurization in 1863 in an effort to make milk last longer without spoiling and to prevent disease transmission. Essentially, pasteurization is a heat treatment that eliminates pathogenic microorganisms found in milk products. These heat treatments reduce the number of pathogens in milk and improve the shelf life of milk by reducing bacteria responsible for spoilage, thus ensuring that milk products are safe for human consumption.

[Common pasteurization techniques](#) include vat pasteurization (145°F for 30 minutes), high temperature short time pasteurization (161°F for 15 seconds), and ultra pasteurization (280°F for two seconds). Each technique brings milk to a specific temperature for a specified amount of time and then immediately cools the milk to a recommended temperature for storage. New alternative technologies to pasteurization are emerging that could better retain sensory and nutritional properties of milk, while still inactivating harmful pathogens. These non-thermal

⁴ While this article is behind a paywall, the authors made [a draft available online](#).

⁵ This article is behind a paywall, but Legislative Council Staff has a copy from the authors available upon request.



techniques include high-pressure processing, power ultrasonics, and pulsed electric fields ([Rabbani et al. 2025](#)).

Effects of Pasteurization on Milk Quality

Milk is composed of water and nutritional components (e.g., carbohydrates, minerals, proteins, fats, vitamins). Pasteurization increases Vitamin A concentrations, but the process decreases total fat by about 0.5%, as well as folate, Vitamin B1, Vitamin B2, and Vitamin C ([Macdonald et al. 2011](#)). It is important to note that all of these vitamins are found at low concentrations in milk except for Vitamin B2.⁶

A small portion of whey proteins may denature (change) due to pasteurization, but protein denaturation has no impact on the nutritional quality of protein ([Lucey 2015](#)). Minerals, such as calcium and phosphorus, are heat-stable during pasteurization and remain unaltered ([Macdonald et al. 2011](#)).

Pasteurizing milk results in up to a 25 percent loss of enzymes in milk, including bovine immunoglobulin (cows' antibodies for immune protection), lactoperoxidase (an antibacterial enzyme), and plasmin (affects flavor development in cheeses). Alkaline phosphatase, which contributes to protein processing and bone mineralization, is the only enzyme completely destroyed by heat. Other enzymes are generally unaffected ([Rabbani et al. 2025](#)).

Effects of Un-Pasteurized Milk on Human Health

Raw milk consumers often claim that raw milk reduces symptoms of lactose intolerance. However, no existing evidence confirms that claim ([Macdonald et al. 2011](#); [Rabbani et al. 2025](#)). Raw milk may enrich the gut microbiome with *Lactobacilli*, but consumption has not been shown to reduce the effects of lactose intolerance. Scientists at Stanford University School of Medicine specifically tested whether raw milk or pasteurized milk improved lactose intolerance and found that neither improved lactose intolerance ([Mummah et al. 2014](#)). Both raw and pasteurized milks resulted in the same symptoms in adults.

Proponents of raw milk also promote it for reducing asthma and allergies. To identify whether raw, unprocessed cow's milk has a protective effect on asthma and allergies, scientists conducted a meta-analysis of all studies worldwide that explored this relationship ([Brick et al.](#)

⁶ Vitamin B2 (riboflavin) is found primarily in meat and fortified foods as well as some nuts and green vegetables. [Deficiency is very rare](#) in the U.S.



2020).^{7,8} The scientists' analyses corroborated that raw milk consumption in early life (<1 to 5 years old) has a protective effect on asthma, current wheeze, hay fever or allergic rhinitis, and atopic sensitization. However, scientists did not recommend consumption of raw milk, and did not claim that raw milk "cures" these conditions. The authors concluded their paper by strongly discouraging raw milk consumption "because of the minimal but real risk of life-threatening infections." In other words, they perceived the risks to young children consuming raw milk to be greater than the benefits.

Scientists do not yet know what it is about raw milk that contributes to a beneficial effect on asthma and allergies. Due to the difficulties with confounding and bias in observational studies, including those in the meta-analysis above, more research and stronger forms of research for establishing causality are needed to understand this relationship.

Disease Transmission

Whereas scientific evidence supporting or refuting the nutritional benefits of raw milk is limited, significant and strong scientific evidence exists on foodborne illnesses linked to raw dairy products, including milk and cheese. Lack of pasteurization comes with risks of illness and outbreaks, particularly for people with weakened immune systems or who are pregnant, as well as for children and older adults ([Mungai et al. 2015](#)).

Un-pasteurized dairy products cause an estimated 840 times more illness compared to pasteurized dairy products ([Costard et al. 2017](#)). Those affected by illness from raw milk consumption tended to be younger (48 percent of people falling ill from raw milk were aged 0-19 years) and occurred more often in states where sale of raw milk is expressly allowed (78 percent of occurrences) ([Koski et al. 2022](#)).

Common symptoms of milk-borne infections include abdominal cramps, diarrhea, nausea, vomiting, and fever. In severe cases, Guillain-Barre syndrome⁹ or hemolytic uremic syndrome¹⁰ can occur. Pregnant people, children, and immunocompromised people are at higher risk from infection.

⁷ A meta-analysis, [one of the strongest forms of health research](#), combines data from multiple studies statistically to show the overall effects.

⁸ While this article is behind a paywall, the authors made [an open-access copy](#) of their paper available online.

⁹ Guillain-Barre syndrome is an autoimmune disorder where the immune system damages nerves.

¹⁰ In hemolytic uremic syndrome, small blood vessels become damaged and inflamed leading to blood clots and kidney failure.



Milk inside a cow is typically sterile, unless the cow has an active infection like mastitis or avian influenza. In general, the dairy milking process involves cleaning and disinfecting a cow's udders, followed by attaching a vacuum-operated milking machine up to three times a day for a healthy cow. While measures are taken to clean and sanitize dairy cattle prior to milking, milk can become contaminated by equipment, workers handling the cows, fecal matter, dirt on udders, water used to clean the udders, aerosols, or dust. Poor hygiene, like inadequately dried udders or using the same towel to dry off multiple cows, creates higher pathogen risk.

Raw milk also easily harbors microorganisms and pathogens because milk is highly nutritious and has a near neutral pH. This ideal growth medium allows common foodborne pathogens to grow in milk, such as [Salmonella](#), [Campylobacter](#), [Listeria monocytogenes](#), [E. coli](#), [Yersinia](#), and [Brucella](#). *Listeria monocytogenes*, *Salmonella*, and *Campylobacter* are estimated to be present in up to 6 percent of raw milk samples ([Williams et al. 2022](#)). Raw dairy products cause 45 times more hospitalizations from infections with these pathogens than pasteurized milk ([Costard et al. 2017](#)). Certain foodborne illnesses from raw milk, like listeria, can result in miscarriage, stillbirth, preterm birth, and newborn death, even if the pregnant person only experienced a mild case. In February 2026, the [New Mexico Department of Health warned residents](#) to avoid consuming raw dairy products after a newborn died from listeria. Experts believed the infection originated in raw milk that the mother consumed during pregnancy. Psychrotolerant sporeforming bacteria, responsible for milk spoilage, also grow at refrigeration temperatures and can be present in milk prior to pasteurization.

The [Highly Pathogenic Avian Influenza \(HPAI\)](#) virus has been found in dairy cows and can be transmitted through raw milk consumption. Studies have shown that both ferrets ([Nooruzzaman et al. 2025](#)) and cats ([Frye et al. 2025](#)) can contract HPAI by drinking infected raw milk. However, pasteurization at 63°C and 72°C degrades avian influenza ([Kaiser et al. 2024](#)).

Outbreaks Resulting from Raw Milk

Illnesses resulting from raw dairy products are rarely, if ever, reported to health authorities. As a result, the number of related illnesses at the state level and nationally remains unknown. Outbreaks are more visible than individual cases since groups of people become ill, making it likelier that public health authorities will identify the root cause. Enhancements to public health surveillance for foodborne disease outbreaks in 1998 also increased the number of dairy-related outbreaks reported ([Langer 2012](#)).

Research on 121 outbreaks that were linked to contaminated dairy products in the United States from 1993 to 2006 found that unpasteurized dairy products (i.e., fluid milk and cheese) caused



150 times more outbreaks and outbreak-associated illnesses than pasteurized dairy products ([Langer 2012](#)). Outbreaks involving unpasteurized dairy products appeared to be more severe, resulting in a higher hospitalization rate (13 percent) than outbreaks involving pasteurized dairy products (1 percent). Illnesses from unpasteurized dairy products impacted a greater number of children and adolescents under 20 years of age (60 percent of patients) than illnesses from pasteurized dairy products (23 percent of patients). Bacteria caused all of the outbreaks linked to unpasteurized dairy products, whereas outbreaks linked to pasteurized dairy products were caused by norovirus (44 percent) and bacteria (55 percent). The norovirus cases likely resulted from an infected food handler post-pasteurization.

According to an agency liaison at CDPHE, Colorado has had [14 outbreaks linked to raw milk since 1989](#), sickening 247 people. The largest outbreak occurred at Wiley's Larga Vista Ranch in Pueblo County in 2016 and resulted in 17 people falling ill.

Raw Milk in Colorado

In Colorado, the sale or redistribution of raw, unpasteurized milk by an individual or retail operation is illegal. However, individuals may acquire raw milk if they are part of a cow or goat share. Herd share owners must enter a written contractual agreement where they pay for partial ownership of an individual cow or goat, or part of a herd. Additionally, the raw milk container must have a prominent warning statement that the milk is not pasteurized. Information must be provided to the purchaser describing the standards used by the farm or dairy for herd health, testing on the animals, and an explanation of testing results.¹¹ Since the program was created in 2005, 288 cow or goat share operations have registered with CDPHE.

Scientists at Colorado State University who conducted qualitative research in northern Colorado with herd-share participants found that the amount of raw milk a household obtained through this mechanism varied from a half gallon every two weeks to five gallons per week ([Markham et al. 2014](#)). While most study participants did not or would not buy pasteurized fluid milk, they did buy, or expressed willingness to buy, other types of pasteurized milk products (e.g., yogurt, butter, cheese). Markham and colleagues noted that participants also expressed a preference for raw milk because they believed that the dairies supplying raw milk were overall better than commercial dairies supplying pasteurized milk, which included sentiment on more humane treatment, and a grazing diet rather than grain. While most study participants expressed a desire for raw milk to be easier to obtain, their preferences for small, local, familiar dairies resulted in

¹¹ Section 25-5.5-117, C.R.S.



many respondents indicating they would not want raw milk produced in mass quantities or sold in stores.

Recent Efforts to Amend Raw Milk Laws

During the 2023 interim, the Water Resources and Agriculture Review Committee recommended a bill for the 2024 session that would have allowed for the sale of raw cow or goat milk when it is sold directly to consumers at the point of production (i.e., the consumer's residence, farmers' markets, or roadside markets). The bill, [Senate Bill 24-043](#), was deemed lost after being laid over on second reading in the Senate.