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# Is Raw Milk Safe? Health Risks and Legal Facts Explained

*Authored by Bhaswati Chowdhury, Graduate Student, Department of Food Science and Technology, Virginia Tech; Rachel Cheng, Assistant Professor, Department of Food Science and Technology, Virginia Tech; Renee Boyer, Professor and Extension Specialist, Department of Food Science and Technology, Virginia Tech; and, Lester Schonberger, Associate Extension Specialist, Department of Food Science and Technology, Virginia Tech.*

## What You Will Learn

- **Raw milk can contain harmful germs** like *Salmonella*, *E. coli*, and *Listeria*, which can cause serious illness or even death, especially in vulnerable people.
- **Raw milk supports bacterial growth easily** if contaminated, since its rich nutrients provide an ideal environment for germs.
- **Pasteurization makes milk much safer** by using heat to kill harmful germs without significantly changing the milk's nutritional value.
- **Recent outbreaks of disease** have been directly linked to consuming raw milk and raw milk products, including raw cheeses and herd-share programs.
- **Virginia law bans raw milk sales** for direct consumption.

## What is Raw Milk?

Raw milk is milk from dairy animals (such as cows, goats, and sheep) that has not been pasteurized (or heated) to kill harmful germs.

## How Pasteurization Makes Milk Safer to Drink

Pasteurization became widely adopted in the early 20th century to reduce illnesses and deaths associated with consuming raw milk.

Consuming raw milk can expose you to harmful microorganisms, such as bacteria, parasites, and viruses, that can result in illness (for example, listeriosis and salmonellosis). Symptoms include vomiting, diarrhea, abdominal cramps, and flu-like symptoms such as fever, headache, and body aches. In some people, including children under 5, persons over 65, and those with weakened immune systems, symptoms can be more severe or cause death.

Figure 1. A farmer hand-milking a cow

## How Raw Milk Becomes Contaminated with Harmful Bacteria

Cows and other dairy animals can carry many of these microorganisms without becoming sick themselves, making it challenging to know whether a cow is a carrier. Contamination of raw milk usually occurs during milking, when feces from the cow or the environment (such as the stall or bedding) come into contact with the milk during handling, transport, and storage.

Due to milk's naturally nutrient-rich properties, raw milk can support bacterial growth if it is contaminated.

Highly pathogenic avian influenza (HPAI), also known as bird flu, is a highly contagious and often fatal disease in poultry that can spread from wild birds to domestic poultry, other birds, livestock, and occasionally to humans. Since March 2024, an H5N1 outbreak has affected 900+ dairy herds across 16 states in the U.S., marking the first detection in cows. The virus has been detected in raw milk and can infect individuals who consume it. Pasteurization kills the virus, ensuring that H5N1 does not affect the quality or safety of pasteurized milk products.

## What Happens to Milk During Pasteurization and Processing

In addition to using heat to kill microorganisms, it also stops some chemical reactions that can cause milk to spoil. The milk you can buy in the store also undergoes several processes to standardize the fat content (for example, producing 2% and nonfat milk) and keep the fat from separating (homogenization). Milk is often fortified with essential nutrients such as vitamins D and A, further enhancing its nutritional value.

The heat treatment applied to milk during pasteurization has little effect on the vitamin content in the milk; in fact, only Vitamin C (which milk is not a good source of) is significantly reduced during the heating process. Levels of vitamin A decrease when the fat content of the milk is reduced to produce lower-fat milks (nonfat, 1%, or 2% milk), so milk processors fortify it by adding back Vitamin A. Vitamin D is also commonly added to pasteurized milk, a practice that began in the 1930s as a public health initiative aimed at reducing rickets in children.

## Outbreaks Linked to Consumption of Raw Milk and Raw Dairy Products

Raw milk, consumed by less than 5% of the population in the United States, but accounting for roughly 97% of all dairy-related outbreaks of illness, poses significant risks. A 2022 study found that 78% of outbreaks linked to raw milk occur in states where it is sold in retail stores or through herd shares.

Between 1998 and 2018, 202 outbreaks were linked to raw milk, resulting in 2,645 illnesses and 228 hospitalizations. The risk of contracting listeriosis (an infection caused by the bacteria *Listeria monocytogenes*) from raw milk is 156 times higher than from pasteurized milk.

A *Salmonella* outbreak tied to raw milk across four states from Fall 2023 to June 2024 sickened at least 165 people, primarily children. The farm involved had previously been linked to eight outbreaks of *E. coli*, *Listeria*, and *Campylobacter*, all of which were associated with raw milk and raw cream products. Raw milk cheeses have also been implicated in recent outbreaks. In February 2024, Raw Farm brand raw cheddar cheese was linked to a multistate *E. coli* outbreak that sickened 11 people, resulting in five hospitalizations.

## Sale of Pasteurized and Unpasteurized Milk in the U.S. vs Virginia

The U.S. Food and Drug Administration (FDA) requires that all fluid milk intended for human consumption that will be transported across state lines be pasteurized. This does not apply to milk collected, processed, and sold within a state, so they have the authority to set their own requirements.

In Virginia, the sale of unpasteurized milk for direct human consumption is illegal. However, the state allows the sale of raw milk cheese if it has been aged at a temperature above 35°F for a minimum of 60 days. The raw milk used in these cheeses must also meet strict standards to ensure it is safe and compliant with health regulations.

Virginia does not regulate cow or herd share arrangements, allowing individuals to legally consume raw milk from cows they own. However, it's important to note that raw milk from cow-share arrangements can still harbor harmful germs. A recent outbreak linked to consuming raw milk from cow-share arrangements occurred in Tennessee in 2022, where Shiga toxin-producing *Escherichia coli* infected infants, one of whom developed life-threatening complications.

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