

## Resources

More information on milk pasteurization, food safety and other related topics can be found online at:

Center for Hygiene & Health in Home & Community  
[www.simmons.edu/hygieneandhealth](http://www.simmons.edu/hygieneandhealth)

U.S. Food and Drug Administration  
“Pathogens and Contaminants”  
[www.fda.gov](http://www.fda.gov)

National Dairy Council  
[www.nationaldairycouncil.org](http://www.nationaldairycouncil.org)

Dairy Farming Today  
[www.dairyfarmingtoday.org](http://www.dairyfarmingtoday.org)

American Dietetic Association:  
[www.eatright.org](http://www.eatright.org)  
[www.mypyramid.gov](http://www.mypyramid.gov)

Center for Food Safety  
[www.centerforfoodsafety.org](http://www.centerforfoodsafety.org)



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### **Nutritional Benefits of Milk**

Milk is a nutrient dense food that provides 9 essential nutrients:

- Calcium (300 mg per 8-oz cup)
- Vitamin D
- High Quality Protein
- Potassium
- Vitamin A
- Vitamin B12
- Riboflavin
- Niacin
- Phosphorus

Scientific research has found no significant nutritional difference between pasteurized and raw milk. In addition, no relationship between raw milk consumption and disease prevention has been noted.

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## MILK Pasteurization & Potential Pathogens



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“Raw milk” is milk from cows, goats, or sheep that has not been pasteurized. Because it has not been pasteurized it carries a high risk of containing microorganisms that have the potential to cause foodborne illness.

According to the CDC, the Center for Disease Control, more than 1000 people in the United States have gotten sick from consuming raw milk products over the past 10 years. Both the CDC and the Food and Drug Administration (FDA) “strongly advise against the consumption of raw milk”.

### Potential Pathogens

Bacterial organisms enter the milk supply from manure, the cow themselves, dirt, water, human contact during the milking process, or contamination during transportation.

Unpasteurized milk is a vehicle for transmission of pathogenic organisms, such as:

- *Listeria monocytogenes*: Especially dangerous to pregnant women. Pasteurization inactivates.
- *Escherichia coli* O157:H7: Fecal contamination is the main source for cross-contamination of raw milk. Store milk at 40° F or less to inhibit growth. Pasteurization destroys.
- *Campylobacter spp*: Pasteurization destroys.
- *Salmonella spp*: Pasteurization destroys.
- *Yersinia enterocolitica*: Found in streams, lakes, and wells. Spreads from water to animals. Pasteurization destroys.
- *Staphylococcus aureus*: Produces toxins that can cause severe illness. Of particular concern when milk is kept at temperatures > 50°F. Pasteurization and proper storage temperatures greatly reduce the chance of staphylococcal intoxication.



### Symptoms of Foodborne Illness

Common symptoms of bacterial foodborne illness include, but are not limited to:

- Diarrhea
- Vomiting
- Fever
- Stomach/Abdominal pain
- Headache
- Exhaustion/Body ache



People with weakened immune systems, such as children, the elderly and pregnant women are most at risk for severe infections from pathogenic bacteria in raw milk.

### Pasteurization

Pasteurization is the process of heating milk in order to kill the majority of pathogenic microorganisms and greatly reducing the risk for foodborne illness. It also destroys spoilage causing enzymes and bacteria in milk, increasing milk's shelf life. Pasteurization does not destroy organisms which produce spores..

Two types of pasteurization are commonly used for milk products:

1. **High-Temperature-Short-Time Treatment (HTST)**: Milk is heated to 161° F for 15 seconds and then rapidly cooled. This is the most commonly used technique.
2. **Low-Temperature-Long-Time Treatment (LTTLT)**: Milk is heated to 145° F for 30 minutes.

### Antibiotics

Every milk tank is tested for antibiotics to ensure it meets the government's strict safety and quality standards. If a tank of milk were to test positively for antibiotics it would be recalled and not sold.

### Hormones

All milk contains hormones. Cows naturally produce the bovine somatotropin hormone, often referred to as bovine growth hormone (BGH). Traces of BGH are naturally secreted when cows are milked.

The synthetic version of this hormone, recombinant bovine growth hormone (rBGH), is often injected into lactating cows to extend their milk production period, increasing production by 10-15%.

According to the World Health Organization (WHO) and the FDA, milk produced from cows treated with rBGH is safe for human consumption. Studies have concluded that rBGH does not adversely affect animal health and that dairy products produced from cows given rBGH are safe. However, the use of rBGH remains controversial worldwide. Numerous European nations have banned its use until additional testing looking at its safety to both cows and humans has been done.

### Label Lingo

- **Reduced Lactose Milk**: The lactose content of milk has been reduced by adding the enzyme lactase to pasteurized milk. Compared to normal milk, there is a 70% reduction in lactose content.
- **Lactose-free milk**: 99% lactose free.
- **Organic Milk**: Produced from cows that were raised and fed without the use of any pesticides, synthetic fertilizers, synthetic hormones, or antibiotics.



Organic milk and regular milk have equivalent nutritional value, both providing nine essential nutrients. The USDA and the American Dietetic Association (ADA) concur that regular milk is “as pure, safe, and nutritious as organic milk”.