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Extension Extra

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Health Risks of Drinking Raw (Unpasteurized) Milk

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with review by Dr. E. Kim Cassel, SDSU Extension dairy specialist

Why be concerned about drinking raw milk?

All milk and milk products have the potential to transmit pathogenic (disease-causing) organisms to humans. All the nutritional components that make milk and milk products an important part of the human diet also support the growth of these pathogenic organisms. People who prefer, for whatever reason, to drink raw milk face the greatest risk of contact with these pathogens. Dairy producers selling or giving raw milk to friends and relatives put them at risk for foodborne illness.

Worldwide, illness from contaminated milk and milk products has occurred since cows have been milked. Milk is an ideal medium for the growth of many microorganisms, including food pathogens. Early in this century, milk was discovered to transmit tuberculosis, brucellosis, diphtheria, scarlet fever, and Q fever to humans. Fortunately, over the decades, the threat of these diseases and the incidence of outbreaks involving milk and milk products have been greatly reduced due to improved sanitary milk production practices and pasteurization.

However, a variety of microorganisms still contribute to isolated illnesses and outbreaks. Raw (unpasteurized) milk has been associated with illness caused by microorganisms such as *Listeria*, *Campylobacter*, *Yersinia*, *Salmonella*, *Staphylococcus*, and *Escherichia coli*.

What is pasteurization?

Pasteurization destroys most disease producing organisms and limits fermentation in milk, beer, and other liquids by partial or complete sterilization. The pasteurization process heats milk to 161°F (63 °C) for 15 seconds, inactivating or killing organisms that grow

rapidly in milk. Pasteurization does not destroy organisms that grow slowly or produce spores.

While pasteurization destroys many microorganisms in milk supplies, improper handling after pasteurization can recontaminate milk.

Many dairy farms have a home-pasteurizing machine to pasteurize small amounts of milk for personal use. Raw milk can also be pasteurized on the stovetop. Microwaving raw milk is not an effective means of pasteurization because of the oven's uneven heat distribution. For more information on purchasing and caring for home pasteurization machines, contact your county Extension agent.

Ultra-high temperature (UHT) processing destroys organisms more effectively as the milk essentially becomes sterile and can be stored at room temperature for up to 8 weeks without any changes in flavor.

How do microorganisms enter the milk supply?

The environment contains a wealth of microorganisms that find their way to the hair, udder, and teats of dairy cows and migrate up the teat canal. Some cause an inflammatory disease of the udder known as mastitis. Others enter the milk without causing any disease symptoms in the animal.

Yet more organisms can also enter the milk supply during the milking process when equipment used in milking, transporting, and storing the raw milk is not properly cleaned and sanitized.

Cold storage of milk (< 40°F) slows the growth of most microorganisms.

What are common pathogens in milk?

Salmonella. Salmonellosis is the most common disease transmitted in raw milk. Pasteurized milk, powdered milk, and cheese have also been implicated in salmonellosis outbreaks. In these cases, milk that had been pasteurized was recontaminated during further processing.

The organism is shed in the feces of cattle and picked up on the animal's hair or teats. Many strains of *Salmonella* can cause foodborne illness in humans, and all strains exhibit the same disease symptoms. Gastroenteritis is a common symptom.

Pasteurization destroys the *Salmonella* organism.

Listeria monocytogenes. This organism is widespread and is found principally in soil. In humans, listeriosis may cause serious illness, especially in pregnant women, causing stillbirths or infant death soon after birth.

Pasteurization inactivates *Listeria monocytogenes*.

Yersinia enterocolitica. This common organism has been isolated from many foods of animal origin including milk, cheese, and red meat. *Yersinia* inhabits waters such as streams, lakes, and wells and spreads from there to warm-blooded animals.

Gastroenteritis is the most common symptom of yersinosis. Often the symptoms of this disease mimic those of appendicitis.

Yersinia enterocolitica is destroyed by pasteurization.

Campylobacter jejuni. This organism has been isolated in raw milk and meat. It can cause mastitis in dairy cattle on rare occasions and has been isolated in the feces of many species including dogs, cats, rodents, cattle, sheep, swine, and poultry.

Symptoms include vomiting, cramps, bloody diarrhea, mild enteritis, or severe enterocolitis. Individuals who have recovered from the disease may suffer a relapse.

Campylobacter jejuni is destroyed by pasteurization.

Staphylococcus aureus. *Staphylococcus aureus* is a common cause of mastitis in dairy cattle, and it can also enter the milk supply from sores on the teats of cows or from the hands and nasal discharges of dairy farmers and workers. The *Staphylococcus* organism produces an enterotoxin when raw milk is held at temperatures above 50°F. Sufficient amounts of enterotoxin in foods can cause illness.

The incidence of staphylococcal intoxication has been greatly reduced by pasteurization.

Escherichia coli O157: H7. Recent investigations indicate that young dairy cattle are a reservoir for this organism. Fecal contamination is a likely source of *Escherichia coli* O157: H7 in raw milk.

Escherichia coli O157: H7 can cause hemorrhagic colitis and hemolytic uremic syndrome in humans. Temperature abuse during holding and shipping can cause significant growth of *Escherichia coli* O157: H7. Milk should be stored at temperatures below 40°F to inhibit the growth of *Escherichia coli* O157: H7.

Pasteurization destroys this organism.

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