CORNELL ---------- *DAIRY SCIENCE FACTS*
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Why Pasteurize? The Dangers Of Consuming Raw Milk

Milk is a natural liquid food. It is nutrient-rich; it contributes high-quality protein, essential vitamins, and minerals, including calcium, to the diet. Since prehistoric times humans have used milk in many ways: to drink; to churn into butter; to produce cheeses and other cultured or fermented products, such as yogurt and buttermilk; and to combine with other foods and ingredients to make frozen desserts, candy, and baked goods.

Bacteria In Milk

Milk, like many other foods and the environment around us, contains bacteria. Bacteria can be classified into three general types:

1. Beneficial or Benign
2. Spoilage
3. Harmful or Pathogenic

Beneficial bacteria help make food products people like to eat. For instance, cheese, yogurt, and buttermilk are dairy foods that are produced with the help of beneficial bacteria. Benign bacteria are harmless organisms which have no effect on the food or human or animal health. Spoilage bacteria cause foods to smell, taste, look, and feel bad. Spoilage bacteria cause milk "to go bad" and produce foul smells and off flavors. Harmful or pathogenic bacteria are the ones that make people and animals sick. Recently, news headlines and stories about illness and even deaths caused by harmful bacteria such as *E. coli* 0157:H7 and *Salmonella* have become more common as awareness of microbiological food safety hazards increases.

Most of the bacteria in fresh milk from healthy animals are harmless. However, rapid changes in the health of a milk animal or of the dairy farmer, or contaminants from polluted water, dirt, manure, vermin, air, cuts, and wounds can make raw milk potentially dangerous if these factors introduce harmful bacteria into the milk. And since milk is such a nutritionally complete food, it provides an excellent medium for growth of bacteria if it is mishandled.

Health Hazards Of Raw Milk

Decades ago, before pasteurization of milk was mandated by government agencies, milk contaminated with harmful bacteria was linked to several serious diseases including typhoid fever, diphtheria, septic sore throat, scarlet fever, dysentery, Q-fever, and other kinds of foodborne illness. Other diseases, including tuberculosis and undulant fever (brucellosis), can be transmitted to people in raw milk from diseased animals. Milk pasteurization was initially designed to kill the bacterium that caused tuberculosis, considered to be the most heat resistant pathogen found in raw milk. As recently as the 1960's the temperatures at which milk is pasteurized was increased slightly to insure destruction of the bacteria, *Coxiella burnetii*, which causes Q-fever.

Provided with support from the New York State Milk Promotion Order; Dairy Farmers dedicated to the production, manufacture and distribution of quality dairy products.

In addition to the hazards historically associated with raw milk, scientists and some unfortunate consumers have recently become painfully aware of some new strains of harmful bacteria, called "emerging pathogens," which also can get into milk and make people sick -- or even die. Some of these names may sound familiar because the same harmful bacteria can be associated with several different kinds of food; they include *E. coli* 0157:H7, *Listeria monocytogenes*, *Salmonella typhimurium* DT-104, *Campylobacter jejuni*, and *Yersinia enterolitica*. Some of these bacteria, such as *E. coli* 0157:H7, are particularly dangerous to young children, the elderly, and people with compromised immune systems, and can cause death or serious, life-long adverse health conditions. Others, including *Salmonella typhimurium* DT-104, have shown alarming resistance to many commonly used antibiotics, so infections caused by these bacteria are very difficult to treat.

Pasteurization Protects Dairy Product Consumers

Food safety specialists strongly recommend that milk be pasteurized for home use. Some farm families may regularly consume raw milk without any ill effects and, perhaps over time they have built up bodily immunities to some milkborne diseases. However, it is strongly recommended that raw milk NEVER be given to babies or toddlers on the farm, or any person on the farm who is suffering from a chronic disease or a suppressed immune system. In addition, it is strongly recommended that raw milk NOT be given to farm visitors or public customers at farms; raw milk consumption could expose these people to unnecessary and/or extremely costly and painful risks for which a milk producer could be held legally responsible. Milk offered for sale is subject to strict regulation by local and state authorities, and a permit to sell raw milk is required. By law, milk shipped interstate to be sold at retail stores must be pasteurized.

Pasteurization, named for Louis Pasteur (who first developed the process for other foods), is a moderate but exact heat treatment of milk which kills bacteria that cause disease. In addition, pasteurization and careful packaging in clean, sanitized containers help retard spoilage of milk so it lasts longer after it is purchased. Pasteurization does not completely sterilize milk and milk that is not properly handled can become re-contaminated after the heat treatment. Rapid cooling after pasteurization, sanitary handling, and storage in a clean, closed container at 40^{o}F or below will minimize contamination and spoilage problems of milk.

To learn how to pasteurize milk at home refer to Agriculture Fact Sheet Number 57, entitled, *Milk Pasteurization For The Family* Farmer, (United States Department of Agriculture, August 1981) available through Cooperative Extension Offices.

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References:

Agriculture Fact Sheet Number 57: *Milk Pasteurization For The Family Farmer*, USDA, August 1981.
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