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French scientist Louis Pasteur first used the process which bears his name, pasteurization, between 1860 and 1864, to preserve wine and prevent it from turning to vinegar. This allowed French sailors on long sea voyages to have good wine to drink. In 1873 Dr. Abraham Jacobi of New York City first applied the process to milk in the United States. He advised a pasteurization heat treatment of milk used for feeding infants. His suggestion drastically reduced infant mortality. In 1908 Chicago was the first city in the world to require pasteurization of the milk supply. Since this early start, milk pasteurization has developed to the method that is used today throughout the world.

The Food and Drug Administration, United States Public Health Service, defines pasteurization in the Grade "A" Pasteurized Milk Ordinance as "the process of heating every particle of milk or milk product to at least 145°F. and holding it continuously at or above this temperature for at least 30 minutes, or to at least 161°F. and holding it continuously at or above this temperature for at least 15 seconds, in equipment which is properly operated and approved by the health authority: Provided, that milk products which have a higher milkfat content than milk and/or contain added sweeteners shall be heated to at least 150°F., and held continuously at or above this temperature for at least 30 minutes, or to at least 166°F., and held continuously at or above this temperature for at least 15 seconds, Provided further, that nothing in this definition shall be construed as barring any other pasteurization process which has been recognized by the United States Public Health Service to be equally efficient and which is approved by the state health authority."

Home pasteurization of milk can be done several ways. You may need to purchase a home pasteurizer. Montgomery Wards and Sears mail order catalogs are among the firms that sell these on special order\*. Follow the directions given with the home pasteurizer.

Milk also can be pasteurized using a double boiler. Heating milk directly over a burner will scorch it and cause a strong cooked or burned flavor. To pasteurize in a double boiler:

1. Fill bottom section with water

## Pasteurization of Milk

2. Add milk to top section and cover
3. Heat to 165°F., use an accurate thermometer to check temperature. Learn to estimate time needed to bring the milk to 165°F.
4. As soon as milk temperature reaches 165°F., cool it immediately by immersing the top section of double boiler in cold running water or ice water. Quick cooling minimizes development of a cooked flavor and growth of spoilage bacteria that might survive this heat treatment.
5. If a second container is necessary to store milk in the refrigerator, use glass jars with covers that are clean and have been sanitized in a boiling water bath or in a mechanical dishwasher. Keep fingers out of the jar when filling.
6. Store milk in the refrigerator. Properly handled home pasteurized milk should keep under refrigeration for 7 to 10 days.

### Why Pasteurize Milk?

Prior to widespread adoption of milk pasteurization, epidemics of many diseases were caused by raw milk consumption. Diseases such as streptococcal sore throat, scarlet fever, diphtheria, typhoid fever, tuberculosis, and many others were transmitted by raw milk. Other factors that also have helped to reduce the incidence of these milk-borne epidemics are: better farm sanitation and inspection; testing and vaccination of the milk cows; quarantine methods used in purchase of new animals; animal disease eradication programs; and increased consumer and producer awareness of the problems associated with drinking raw milk. Regardless of these listed factors, public health authorities throughout the United States and the world feel that the one most significant factor in reducing the occurrence of milk-borne disease has been the adoption of pasteurization of milk for human consumption.

Why is milk pasteurized? The primary reason is to destroy any disease-producing bacteria that might be present. A secondary effect that is more economical than a health safeguard is that the shelf life of the milk is increased by destroying any spoilage bacteria in the milk.

Farm sanitation practices and animal health safeguards through the years have reduced and changed the types of bacteria present in the milk as it comes from the cow, but these practices do not assure that the milk is completely free of disease-producing micro-organisms. A competent laboratory's detailed analysis takes several days to complete and is necessary to assure the milk is free of pathogenic micro-organisms. The only way to make sure milk is safe and free of pathogenic micro-organisms is pasteurization.

In Minnesota it is illegal to offer raw milk for sale, Chapter 32, Section 32.393, Subdivision 1 of the laws of the State of Minnesota states "No milk, fluid milk products, or goat milk shall be sold, advertised, offered or exposed for sale or held in possession for sale for the purpose of human consumption in fluid form in this state unless the same has been pasteurized and cooled, as defined in section 32.391; provided, that this section shall not apply to milk, cream, skim milk, or goat milk occasionally secured or purchased for his personal use by any consumer at the place or farm where the milk is produced."

#### **Effect of Pasteurization on Nutritive Value of Milk**

Occasionally claims are made that pasteurization destroys the nutritive value of milk. This is not true. The pasteurization heat treatment has very little if any effect on the nutritive value. Many years ago when milk was boiled for long periods or oversterilized when canned, there may have been some effect on the nutritive value. But since then milk processing has advanced to the point where the heat treatments used today have essentially no effect on the nutritive value of milk.

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Milk is consumed because it is an excellent source of protein, fat, carbohydrate, calcium, and other minerals, riboflavin, vitamins A, D, niacin, pyridoxine, biotin. The only nutrients affected by pasteurization are vitamin C and thiamine, but milk is not a good source of these vitamins anyway. They are readily available in other foods.

Milk is an excellent food, a source of many of the nutrients required for life. Handle it properly, consume it daily, and enjoy good health.

#### **\*Montgomery Wards – Farm and Garden Book**

Pressed-back, 5 quart (89FX20129M)

Pressed-back, 8 quart (89FX20130M)

Agitator, 2 gallon (89FX20128M)

#### **\*Sears – Farm Catalog**

2 gallon (32AF96032)

Prices for these home pasteurization units range from about \$45 to \$65.

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