



## ENSURING DAIRY QUALITY & SAFETY FROM FARM TO REFRIGERATOR

### SUMMARY

Milk and other dairy products are among the safest, highest quality foods in the U.S. as a result of government and industry regulatory and quality control programs. Vigilance at every stage of dairy production, processing, and distribution contributes to dairy's safety record. Consumers also play an important role in maintaining the quality of milk and other dairy products.

The U.S. Food and Drug Administration (FDA) has primary responsibility for the safety of milk sold in interstate commerce. Among its many activities, this government agency oversees the federal Grade A Pasteurized Milk Ordinance (PMO), which is the primary safeguard for the nation's milk supply. The dairy industry, including farmers and dairy processors, not only adheres to government regulations regarding milk production and processing, but also adopts many voluntary practices to protect dairy foods.

Ensuring milk's quality and safety requires proper attention to conditions on the farm to retail outlets. On the farm, dairy farmers provide each animal with safe,

comfortable housing, nutritious feed, regular veterinary care, and sanitary milking procedures. At the dairy processing plant, every load of incoming milk is tested for quality and milk is pasteurized to assure its microbiological safety.

Dairy processors take measures (e.g., refrigerated storage, sanitary procedures) to prevent post-pasteurization contamination of milk and other dairy products. Retailers and consumers maintain the safety and quality of milk and other dairy foods by keeping these foods at proper temperatures and by following recommended handling practices. Dairy foods are regularly monitored from farm to retail outlets to ensure compliance with government food safety regulations.

Consumers can be assured that the dairy industry, along with the U.S. government, continually places the utmost importance on the quality and safety of milk and other dairy products, making them among the safest, highest quality foods in the U.S. **D**

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## INTRODUCTION

Public awareness of food safety issues has reached new heights in the past decade. When consumers were asked about the importance of various factors when shopping for food, nutrition and product safety ranked second only to taste (1). Specifically, 71% of shoppers rated product safety as very important, while 91% rated safety as very or somewhat important (1). Additional evidence supporting increased interest in food safety is found in the 2000 edition of the *Dietary Guidelines for Americans* (2), which, for the first time, includes a guideline on food safety.

Milk and other dairy products are among the safest foods in the U.S. (3). A complex system of stringent regulations by government agencies, along with industry control programs, helps ensure the quality and safety of dairy products (3-5). For example, pasteurization of milk and other dairy products helps to ensure the microbiological safety of these foods (3,6,7).

This *Digest* reviews government regulatory and dairy industry programs that protect the quality and safety of milk and other dairy products. Also included are tips for consumers to maintain milk's quality.

## A SHARED RESPONSIBILITY FOR MILK QUALITY AND SAFETY

Government at federal, state, and local levels, all sectors of the dairy industry (e.g., dairy farmers, processors, retailers), and consumers share the responsibility for safeguarding the quality and safety of America's milk (2,3,5,8,9). A number of federal government agencies have major roles in food safety activities, including those related to dairy foods (10,11). The U.S. Food and Drug Administration (FDA) takes primary responsibility for the safety of milk sold in interstate commerce. The FDA develops standards for dairy foods, conducts research to improve detection and prevention of possible contaminants, and inspects dairy processing plants, imported products, and feed mills (10). The FDA's

Center for Veterinary Medicine monitors feeds eaten by cows and animal health. Milk is tested repeatedly from the cow to the supermarket dairy case to ensure safety and quality. If the product fails to meet safety and quality standards, it does not reach the consumer.

A major role of the FDA is to oversee the federal Grade A Pasteurized Milk Ordinance (PMO), which is the primary safeguard for the nation's milk supply (3). State regulatory agencies (e.g., Dairy Division of state Departments of Agriculture or Health) enforce regulations and generally have major responsibility for public health and food safety issues (8). FDA milk specialists in regional offices provide scientific, technical, and inspection assistance to state regulatory agencies to oversee compliance with regulatory policies and procedures.

The dairy industry, including farmers and dairy food processors, protects the quality and safety of milk and other dairy products by abiding to, under penalty of law, strict government food safety regulations related to health and animal care, cleanliness and sanitation, and processing procedures. In addition, the dairy industry adopts a number of voluntary practices to ensure milk safety. Dairy farmers work closely with government extension agents and land-grant universities to apply state-of-the-art production and safety practices to farming operations. Many dairy processors voluntarily implement quality control procedures, such as the Hazard Analysis Critical Control Point (HACCP) system (11-13). Dairy retailers and consumers, by properly handling and storing dairy foods, also play a role in ensuring dairy quality and safety.

## DAIRY FOOD SAFETY CONTROLS

The Pasteurized Milk Ordinance (PMO) (3), Good Manufacturing Practices, and Hazard Analysis Critical Control Points (12,13) are important controls used by the dairy industry to help provide consumers with a safe milk supply. The PMO is one of the most effective instruments for protecting the quality of Grade A milk (3).

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*The responsibility for protecting the quality and safety of milk and other dairy products is shared by the U.S. government, all sectors of the dairy industry (e.g., dairy farmers, processors, retailers), and consumers.*

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The PMO provides a set of requirements for milk and dairy product safety, milk hauling, sanitation, equipment, and labeling. The extensive requirements cover milk from production at the farm to shipment from the processing facility to retail outlets (3). More than 95% of all the milk produced in the U.S. conforms to Grade A requirements as defined in the PMO (5). All Grade A raw milk for pasteurization and all Grade A pasteurized milk and milk products must be produced, processed, and pasteurized to conform with specific quality standards, and with sanitation requirements (3). The National Conference on Interstate Milk Shippers, along with participants from federal, state, and local regulatory agencies, industry, and academia, help to establish standards and regulations related to the PMO (4).

Good Manufacturing Practices (GMP), a code of behavior established by the dairy industry and FDA, is an indispensable part of protecting milk's quality. The practices relate to methods and control procedures used in dairy plants for the processing, packaging, and storage of milk and milk products. Examples of GMP followed in dairy processing plants include cleaning and sanitizing food-contact surfaces, good air quality, appropriate employee hygiene, and proper maintenance of equipment. GMP helps to protect milk from post-pasteurization contamination.

Hazard Analysis Critical Control Points (HACCP), a voluntary, structured, and scientific approach to ensure food safety, is being adopted by the dairy industry (7,11-13). Unlike traditional GMP in which procedures are carried out independently from one another, HACCP is a system of overall process control that identifies potential hazards (e.g., harmful microorganisms or their toxins) or critical situations (e.g., post-processing contamination) before they occur and outlines appropriate controls at each step to minimize these hazards.

## FROM FARM TO REFRIGERATOR

Ensuring milk's quality and safety requires proper attention to conditions at every step in the process, from the farm to the consumer.

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*America's dairy farmers are dedicated to providing consumers with safe, high quality milk and dairy products. Their commitment to quality also means caring for their animals and the land.*

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**On the farm.** To produce an abundant, safe supply of high quality milk, dairy cows must be healthy (3). Dairy farmers make sure each animal receives safe, comfortable housing by providing specialized bedding and personal resting spaces. Dairy cows are fed high-quality diets containing protein, vitamins, and minerals several times a day. Also, dairy cows are vaccinated to ensure good herd health and prevent disease.

Dairy farmers meet regularly with veterinarians and animal nutritionists to discuss overall health management and disease prevention. In addition, farmers milk their cows by milking equipment up to three times each day, which reduces stress on the udder. After milking, milk is cooled within two hours to at least 45° F and maintained at no higher than this temperature until processing at the dairy plant (3). Milk goes directly from the udder to an insulated bulk tank from where it is transported to the processing plant. Government officials regularly inspect dairy farms to assure compliance with strict sanitation regulations and monitor transportation practices from the farm to the processing plant.

**At the dairy processing plant.** Prior to unloading raw milk at the dairy plant, dairy cooperatives and processors test all incoming milk for a variety of safety and quality parameters (3). If safety standards are not met, the tanker load of milk is discarded and the farm identified as the source of this milk must bear the cost of the entire tank load of milk. State and regulatory agencies monitor the dairy processor's surveillance activities by making unannounced on-site inspections to collect milk samples and review industry reports



(3). Recent data indicate that less than one tanker of milk in 1000 tested did not meet safety standards (14). This tank load of milk was rejected and disposed of in a manner removing it from the human and animal food chain.

Raw milk is pasteurized or heated in properly designed and operated equipment according to specific time and temperature requirements to ensure milk safety (3). To extend their shelf life, some dairy products are ultrapasteurized, or are heated at ultrahigh temperatures and packaged in aseptic containers (3,5). Pasteurized milk and milk products are routinely tested for proper pasteurization and other indices of product safety and quality (3).

Pasteurization is required by law for all Grade A fluid milk and milk products moved in interstate commerce for retail sale (3). The FDA currently requires pasteurization for all fresh or soft-ripened cheeses, but allows use of raw milk for hard cheeses such as Cheddar that are aged for at least 60 days. Regulatory agencies recognize this length of aging of cheese to be as effective as pasteurization for protecting cheese's safety. Over the past century, pasteurization has proven to be consistently effective in ensuring the safety of milk and other dairy products.

After pasteurization, the product is cooled quickly and held at 38 to 40° F until packaged and sold. Packaging operations are inspected and monitored, and packaged dairy products are subject to random testing for safety and quality. To prevent post-pasteurization contamination, dairy processors rely on refrigerated storage and safe processing and handling procedures. Dairy industry and government officials regularly inspect dairy processing plants to assure compliance with strict sanitation requirements. Also, the dairy industry is adopting HACCP as an additional tool to ensure the safety of dairy products (13).



*Milk and dairy products undergo a number of safety, quality, and sanitation procedures such as pasteurization, making them among the most highly regulated and safest foods available to consumers.*

**At retail outlets and consumer handling.** Dairy case temperatures are carefully monitored at retail outlets such as grocery stores, and products are tested to confirm safety and quality. Likewise, public health officials regularly inspect foodservice facilities to ensure that strict government sanitation, food storage, and food handling requirements are being followed and that the dairy products offered are safe.


Consumers can help maintain the quality of milk by taking the following steps:

- Examine containers for leaks and other damage when purchasing dairy products.
- Check the “sell-by” or “use by” dates on product containers. The “sell by” date refers to how long the grocery store can keep the product for sale in the dairy case. When properly cared for, milk generally stays fresh for 2 to 3 days after this date. The “use by” date indicates how long the product maintains its quality at home.
- Pick up milk and other perishable dairy foods immediately prior to checking out of the store, especially in hot weather.
- Take dairy products home from the store immediately after purchasing and store at a refrigerated temperature of 40° F or below (without freezing).

## CONCLUSION

Milk and other dairy foods are among the safest, highest quality foods in the U.S. Stringent government regulations and dairy industry programs, along with continued vigilance at every stage of production, processing, pasteurization, and distribution contribute to the safety and quality of milk and other dairy products. By taking a proactive approach, the dairy industry, working with government agencies, can effectively meet new food safety challenges as they may arise and continue to provide consumers with safe, high quality dairy products. **D**

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O'Hare International Center, 10255 West Higgins Road,  
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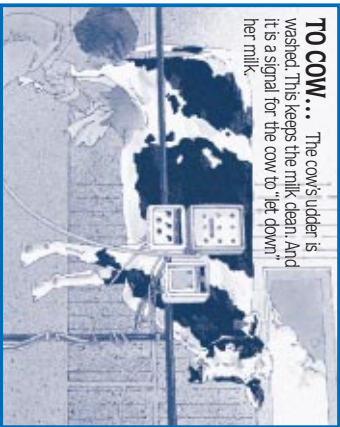
# MILK

FROM COW TO YOU

**FROM SUN AND GRAIN...** Cows eat grass, chopped corn, hay, mixed feed, and water. Then the cow's body uses these foods to make milk.



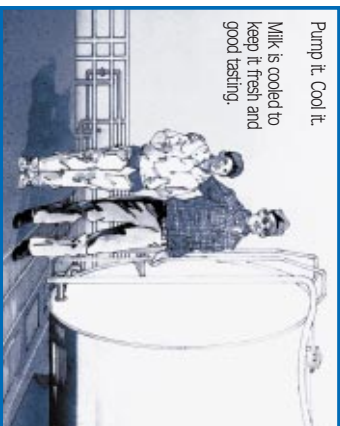
**TO COW...** The cow's udder is washed. This keeps the milk clean. And it is a signal for the cow to let down her milk.



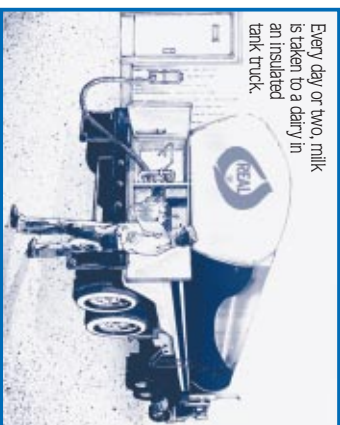
Cows are milked by machine at least twice a day.



Pump it. Cool it. Milk is cooled to keep it fresh and good tasting.



Every day or two, milk is taken to a dairy in an insulated tank truck.



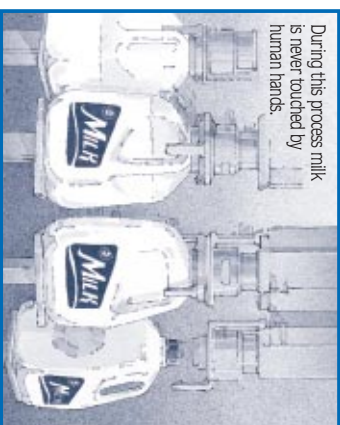
**TO DAIRY PLANT...** Milk is tested to assure its freshness and safety.



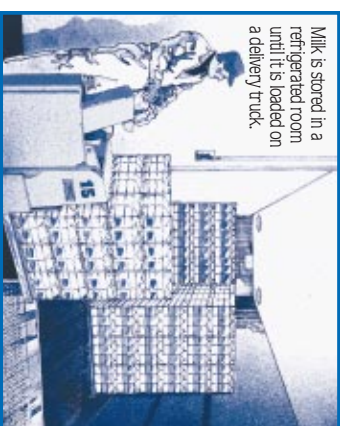
Homogenize and Pasteurize. Milk is heated to a high temperature to kill any bacteria. This keeps milk fresher longer.



During this process milk is never touched by human hands.



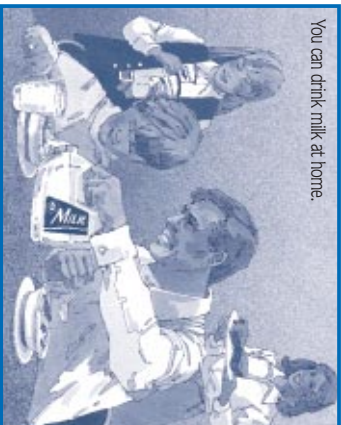
Milk is stored in a refrigerated room until it is loaded on a delivery truck.



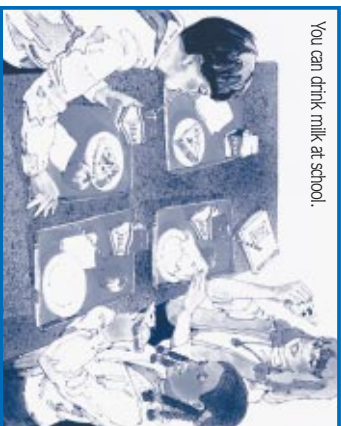
**TO YOU!**



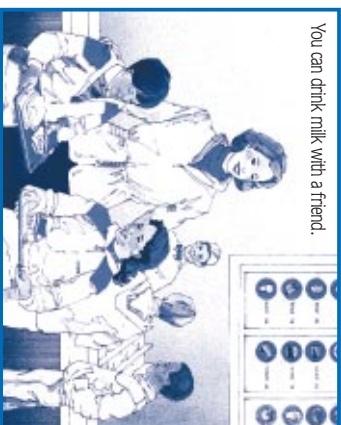
You can drink milk at home.



You can drink milk at school.



You can drink milk with a friend.



Whenever you drink milk, it's good for you. That's because milk helps build strong bones and teeth.

**SO, MAKE MINE MILK!**