PRODUCTION OF CLEAN MILK

G. F. Woods, '27

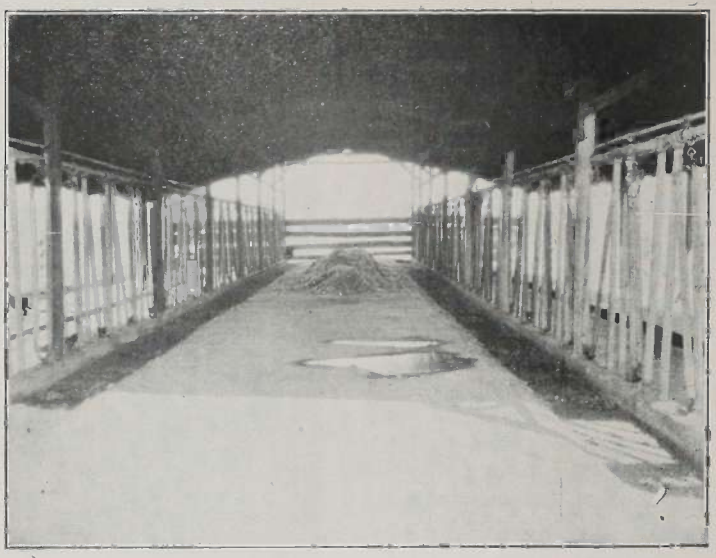
Methods More Important Than Equipment On The Small Retail Dairy; Bacterial Counts Prove The Importance Of Sanitation In The Handling Of Milk

Many farmers have found that a retail milk trade is the most profitable way of disposing of their product, especially in districts where the dairy industry has not reached a high state of development and the volume of milk is insufficient to assure the success of a local creamery. Since the value of milk as a food, especially for children and sick people, is universally recognized there is a ready sale for good, clean milk in any town.

More care must be taken with the milk to assure a high grade product than if the milk is to be sold to a creamery, although the importance of clean milk for dairy products, such as butter and cheese, cannot be overemphasized . Milk is extremely perishable and is a possible carrier of disease germs, hence the consuming public demands milk of good quality,

The methods used by the producer are more important than his equipment. This fact is recognized by the official score card for dairy farms which allows sixty percent for methods and 40 percent for equipment. However, the average man will not take the time or precautions necessary to assure the production of first class milk without a certain amount of properly constructed equipment.

To be sure of putting on the market a wholesome product, the farmer must have healthy cows. If the milk is contaminated at it's source with pathogenic or other undesirable bacteria, no amount of care on the part of the persons handling the milk will make it a safe food, unless it is pasteurized. Pasteurizing of milk is an expensive process and not many small daries can afford to install the equipment and operate it. (In Tucson pasteurization has increased the price of milk 2 cents per quart). So if it is sold as raw milk, the cows must be in a good healthy condition and be free from such diseases as will be transmitted to man. No person who has a contagious disease or is a carrier of such a malady should be allowed near the milker or be allowed to associate with those persons who handle the milk. To safeguard the public against the spread of disease through its milk supply all cows should be T. B. tested and the health of the employees certified to by a competent physician.



A Sanitary Dairy Barn

The ideal milk for direct consumption is that which is in the same wholesome condition as it is when it comes from the cow. It should be the aim of the producer to deliver to the consumer the milk as near the ideal condition as possible. To obtain this end the total number of bacteria should be kept as low as possible and all foreign material such as dirt and manure be excluded. This can be possible only where the utmost care and cleanliness are observed from the time it is drawn from the cow until it is bottled and delivered to the customer.

Particles of dust and dirt that fall from the udder of the cow during the process are a source of contamniation. Therefore any operation causing dust to rise in the air, such as feeding or cleaning the stables should be done at such a time as not to leave dust in the air at milking time. Each cow should be thoroughly groomed prior to milking to remove loose hairs and dirt that may adhere to her body. Keeping the hairs clipped from the udder and the flanks will aid in keeping the cow clean and eliminate to a great extent the possibility of hairs falling into the milk. Before each milikng, the udder and flanks should be washed with clean water and wiped dry with a clean cloth. A disinfectant such as B. K. added to the water will greately increase the efficiency of the washing. The water serves also to dampen any small particles of dirt or loose hairs remaining on the cow causing them to adhere and thus not fall off into the milk so readily. Another means of keeping foreign material from dropping into the milk is the use of the small top milking pail. Theoretically, milk, if properly handled, should not need straining, but under average conditions there will occasionally be sediment found which should be removed before the product is put on the market. Cotton disks placed on a metal strainer, or a good grade of cotton flannel is satisfactory for removing sediment. The milk should be strained before it is run over the cooler and as soon after milking as possible to prevent the solid particles from dissolving.

Besides the contamination by the air and by particles of foreign material falling into the milk, there remains that which comes from the unsterilized utensils. The greater the number of pieces of equipment

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the milk comes in contact with, the greater the chance of further bacteria and dirt being added. Some idea can be gained, of the amount of bacteria added to milk from utensils that are not thoroughly sterilized, by the following table taken from Illinois bulletin 204.

Condition of Utensil,	Bac. per (C. C.)
Normal count, utensils sterile	5,000
Three milk pails added	54,315
1 strainer added	7,315
1 clarifier tank added	8,038
1 clarifier added	141,340

Since some utensils are necessary it is important that they be strictly clean and sterilized. To properly clean any utensil it should first be rinsed in cold or luke warm water, then washed with hot water containing washing soda. A good brush should be used, but not a rag as it will only smooth over any adhering milk. The wash water is rinsed off with clean water and the utensil sterilized.

Sterilization may be accomplished by heat or chemicals, live steam being the most practical and most efficient sterlizing agent .Cans and similar utensils may be heated over a jet of steam for several minutes and allowed to dry and air. A good method is to place them in a well ventilated place where the sun's rays can strike them, but wehre they are protected from flies and dust. The heat from the steam will dry the can if a lid is not placed on it. Any moisture left in a utensil will furnish an opportunity for bacterial growth. Bottles can be sterilized by placing them in a large box with a tight fitting door and turning in the steam for twenty or thirty minutes. They may be left in the sterilizer until used and thus prevent contamination.

To sterilize with chemicals, a solution is made and the utensils dipped in it. They may then be placed where they can sun and air. Several chemicals such as B. K. and Sterilac are on the market for this purpose. or a home-made stock solution can be made as follows: Add one pound of finely powdered chloride of lime to one gallon of water; allow to stand twenty-four hours with several stirrings during the day. Pour off the clear fluid into a dark colored bottle and cork tightly. Use in the proportion of one fluid ounce to five gallons of water.

The original contamination of milk is surprisingly small compared with the bacterial count made after several hours. This is brought out in an investigation made by Ayers, Cook, and Clemmer and is reported on in U. S. Department of Agriculture Bulletin 642. Hence the large number fo bacteria often found in milk is usually due to growth introduced during handling. By cooling promptly after milking and holding at a low temperature this growth can be checked to a great extent. The following table taken from New York Department of Agriculture Circular 10, shows the development of bacteria at different temperatures.

Temperature Bacteria per C.C.

Temp.	Bac. Per C.C.	Time Held
40° F.	4,000	12 hrs.
45° F.	9,000	12 hrs.
50° F.	18,000	12 hrs.
55° F.	38,000	12 hrs.
60° F.	453,000	12 hrs.
70° F.	8,800,000	12 hrs.
80° F.	55,300,000	12 hrs.

By running the milk over the cold surface of a milk cooler in a thin film, undesirable and cowy ordors e eliminated. However, the air that comes in contact with the milk must be pure and free from dust. To keep the air in a satisfactory condition the milk house must be located away from contaminating surroundings and the conditions inside the house be such that no undesirable odors are given off. Since a certain amount of steam and foul air is given off in the washing room, the milk should be handled in a separate room. The entire house should be kept well ventilated, but protected from drafts and dust laden air. There should be an abundance of window space for the admission of sunlight as this is one of the best means of keeping the house in a sanitary condition.

The most important factors in the production of clean, safe milk may be briefly stated as follows: Keeping the bacteria count low by excluding all foreign material, through sterilization of equipment, cooling promptly, and holding at a low temperature to prevent the development of any bacteria that have been introduced.

The food value of eggs has no relation to the color of the shells. Browns and whites are similar inside.

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be Professor of Botany, and Botanist of the Agricultural Experiment Station, and in this dual capacity can render valuable assistance to Arizona cattlemen and farmers.

Wash Quilts With Care

Suds made of pure soap, a little ammonia and warm water are good to soak a quilt for 30 minutes. Then souse and squeeze it in fresh suds, but do not rub. Rinse in two waters of the same temperature. Do not wring it, but hang it dripping over two lines. When partly dry, beat it lightly with a rattan carpet beater to fluff up the filling.

Life of linoleum can be lengthened considerably by giving it a good coat of varnish occasionally.

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Keep pullets away from old hens so that they can be fed and handled separately.

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Look over your fire prevention equipment before winter comes.