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PRODUCE CLEAN MILK

By CHAS. N. SHEPARDSON



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DO YOU LOSE CREAM THIS WAY?

PRODUCE CLEAN MILK

By CHAS. N. SHEPARDSON

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The proper care of milk and cream at the source of production means hundreds of dollars annually to the producer both in the price received for his product and in an increased consumption which will cause a greater demand. The importance of milk and its products as a food is generally recognized but the necessity of keeping it clean, wholesome and appetizing is frequently overlooked. It is the purpose of this bulletin to call attention to some of the more important things in handling dairy products.

PURE MILK

Pure milk has three essential requirements* namely: safety, decency and nutritive value.

To be **safe** it must be free from all organisms which might cause disease. Of the most common diseases carried thru milk, there are two classes: those carried by the cow, the best example of which is tuberculosis, and those getting into the milk from other sources, such as typhoid fever, scarlet fever and diphtheria.

Decency implies freedom from dirt and filth. Milk may be sterilized so that it contains no harmful organisms and yet it may contain considerable manure and other filth, which, tho harmless in itself, is extremely distasteful to the person consuming the milk.

Its nutritive value is determined by the milk solids and is not usually affected by any sanitary measures. The prime essential here is to have cows that give rich enough milk to conform to the requirements of law, as to the percentage of fat and total solids in the milk.

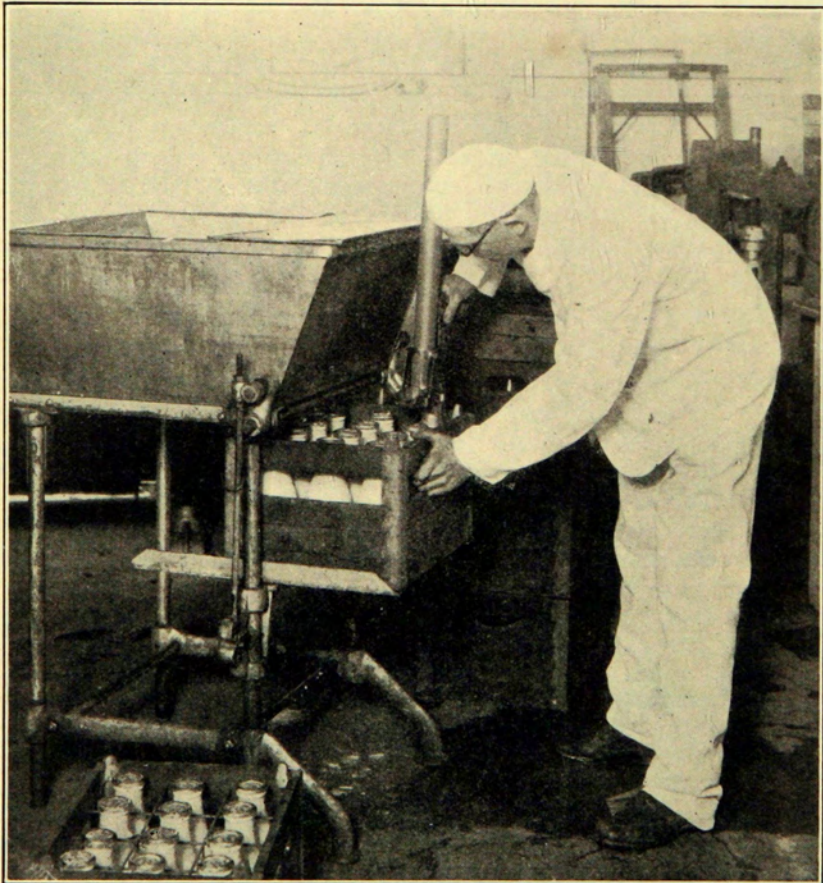
PREVENTION OF DISEASE

Tuberculosis.—The most common milk-borne disease is tuberculosis. This disease is wide spread among cattle and is particularly dangerous to children. In the case of cows having tubercular udders the organism may pass directly into the milk. However, the more common source is from manure and other particles of dirt which may have picked up the organism in the digestive tract or from the slobberings of the animal.

*"The Modern Milk Problem" by McNutt

The surest protection from this disease is to have all cows tested at least annually for tuberculosis by a competent veterinarian and all reactors removed. All new animals brought into the herd should be tested at the time of purchase. The tuberculin test is relatively simple and should never be neglected if the milk is to be kept free from this disease.

Diseased Udders.—No milk should be used from cows with udder infection of any kind. This is particularly true of slimy or ropy milk which may be the cause of outbreaks of septic sore throat. In addition to the above, milk produced within fifteen days before or five days after calving should not be used.



A SIMPLE AND INEXPENSIVE BOTTLER AND CAPPER REDUCES DANGER OF CONTAMINATION FROM HUMAN HANDS

Water Supply.—The water supply may be a source of infection for typhoid fever and other human diseases. The drinking water of the animals and the wash water used in cleaning utensils should be clean and pure. Particular attention should be given to the location of the well with reference to corrals and privies so that there shall be no danger of the run-off from these places getting into the water.

Health of Workers.—Attention should also be given to the health of the workers around the dairy. Many human diseases are carried thru milk and no person, suffering from any disease, should be allowed to work around a dairy or handle milk utensils. Nor should a person who is caring for a sick person go from the sick room to handle milk or milk utensils.

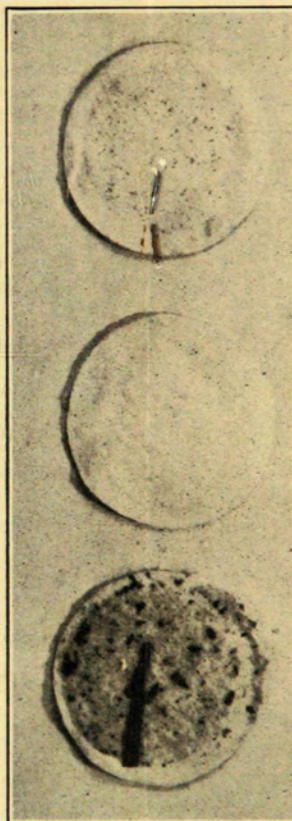
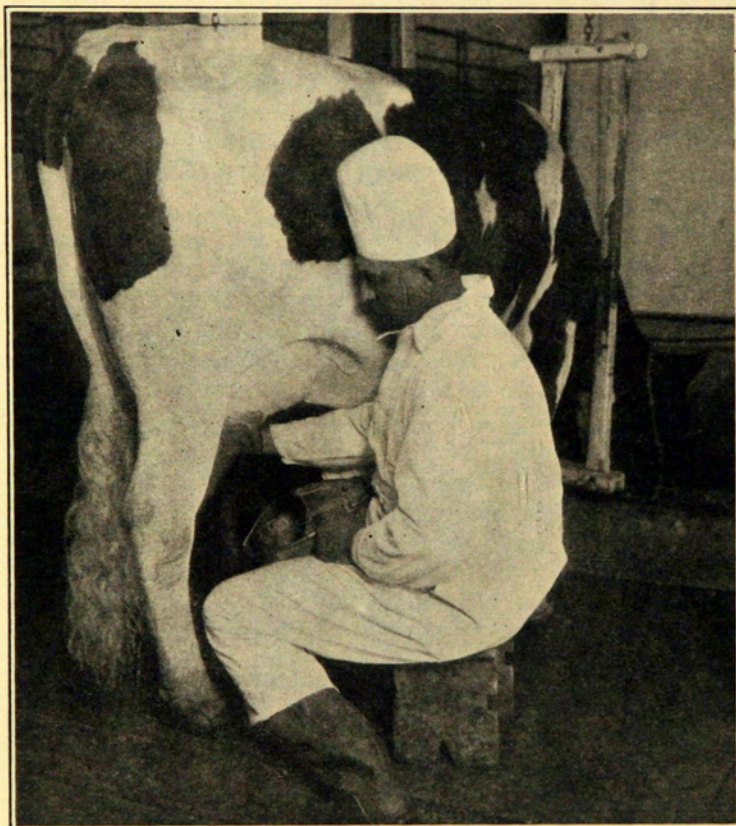
Flies.—One of the most common carriers of disease is the fly. All milk rooms should be kept free from flies, and accumulations of manure and filth should be prevented. The natural conditions around any stable are conducive to flies and it is only by the greatest care that they can be kept down and this big danger reduced to a minimum.

REDUCTION OF BACTERIA COUNTS

From the economic viewpoint, the bacteria count of milk is one of the most important factors. In the case of market milk, the keeping quality is affected almost directly by the growth of bacteria. Every year many farmers have milk cut in grade, or turned back, entirely due to the high bacteria content and consequent poor keeping quality. The same is true of churning cream. Cream that is very sour or gassy cannot be made into first-class butter and as the quality of the butter is reduced the price paid for the cream is cut in proportion so that the farmer stands the loss. Much of this loss could be eliminated by giving attention to some of the more important factors in producing the milk. While there are several factors that enter into bacterial control, the following are generally considered the most important; (1) clean cows, (2) small-top pails, (3) clean, sterile utensils, (4) prompt and efficient cooling and storage at proper temperatures.*

Clean Cows.—Much of the contamination in milk comes from the body of the cow. The flanks, belly and udder are usually covered with long hairs that serve to catch dust, manure and other material which drops into the pail during milking. These long hairs should be kept clipped short to reduce this danger as much

*Kelley and Clement "Market Milk"



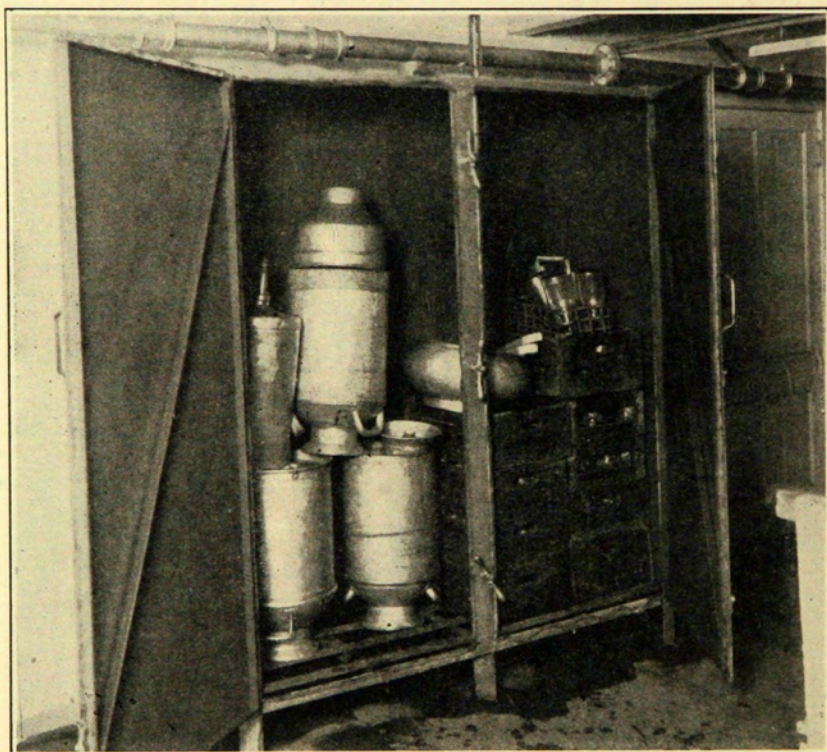
FROM WHICH DAIRY DO YOU BUY MILK? THE MAN ON THE LEFT IS PREPARED TO SERVE YOU SAFE, DECENT NUTRITIVE MILK. THE MAN ON THE RIGHT IS CARELESS AND HASN'T TAKEN TIME TO CLEAN UP. THE TOP DISC IN THE CENTER PICTURE SHOWS THE SEDIMENT IN A QUART OF MILK FROM THE CLEAN COW AND THE BOTTOM DISC, THAT FROM THE DIRTY COW. MUCH OF THIS CAN BE REMOVED BY PROPER STRAINING AS SHOWN BY THE CENTER DISC, BUT THINK OF THE PART THAT DISSOLVES AND IS NOT REMOVED BY THE STRAINER.

as possible. The cows should be groomed daily and the udders wiped with a damp clean cloth before each milking. A dry cloth or brush will not take up all of the dust while a cloth that is too wet will leave some moisture that may drip into the milk. Eliminate as much of the contamination as possible at its source and it will be easier to control the quality of the milk.

Small-Top Pails.—The type of pail used in milking is also a big factor in controlling the amount of sediment and the number of bacteria in the milk. Small-top pails, having a greatly reduced opening, will naturally reduce the amount of dirt getting into the milk. The exposed area of an open pail is about 115 square inches while that of a small-top pail is only about 28 square inches offering only one-fourth as much space for the dirt to get in.

The pail should be solidly constructed and free from cracks or rough seams so that it may be easily cleaned.

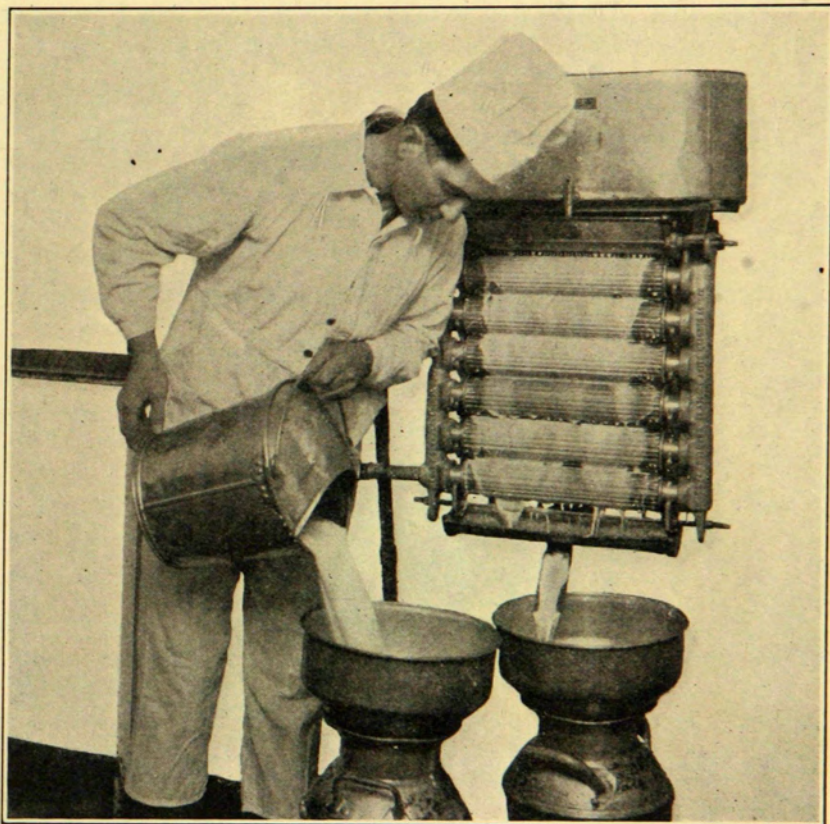
Sterile Utensils.—Dirty utensils are a source of bacterial contamination. Utensils in good condition need careful attention in cleaning and those that are dented or have open or rough seams are almost impossible to clean properly. All utensils including the separator should be washed thoroly with a brush in a good washing-powder solution, and scalded with boiling water after each using. Rags and greasy soaps should not be used. A good brush and an alkali powder will give much better results and the brush is easier kept clean. Particular care should be taken to rinse all utensils thoroly to eliminate any danger of a washing powder or other objectionable flavor being carried into



ALL BOTTLES, CANS, AND OTHER UTENSILS SHOULD BE STEAMED DAILY

the milk. If the utensils can be sterilized in steam this is the most desirable but if there are no facilities for this, boiling water may be substituted. However, a satisfactory sterilizer can be made by putting a false bottom about three inches from the bottom of an old wash boiler. With a small amount of water in the bottom of the boiler, the utensils can be placed on the false bottom and covered. Then place the boiler on the fire and allow it to boil for thirty minutes and sufficient steam will be generated to sterilize the utensils. Too much attention cannot be called to the fact that all utensils should be thoroly cleaned after each using.

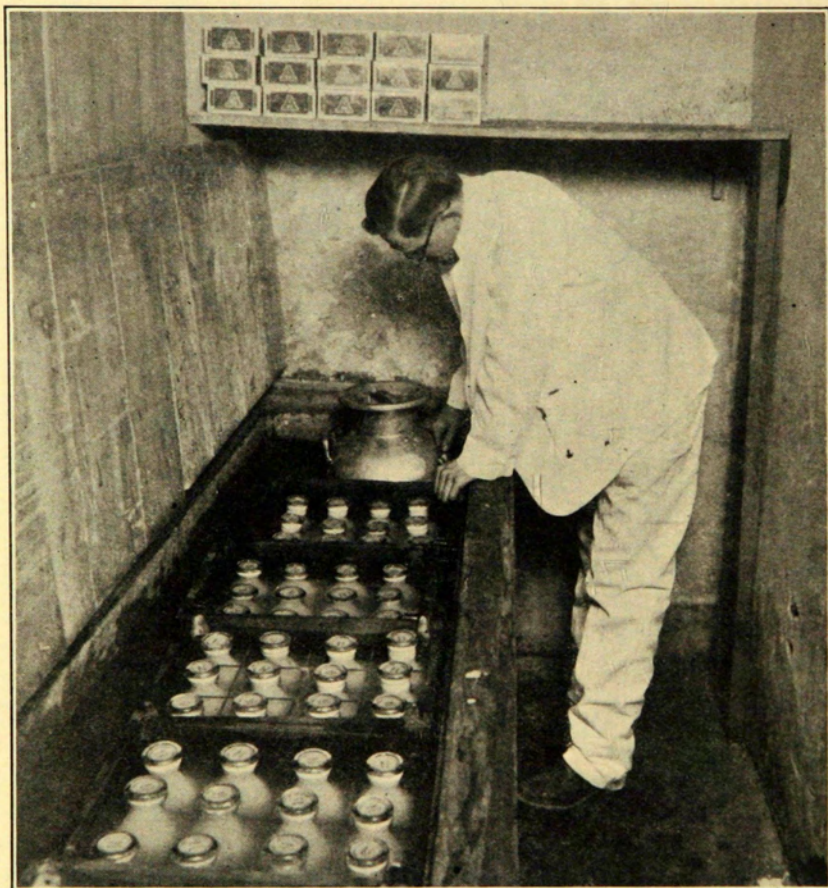
Cooling.—The steps mentioned thus far have to do with preventing the introduction of bacteria. However, it is impossible to eliminate all contamination and so it is necessary to keep down the growth of these organisms which are still present. This is best done by prompt cooling.



STRAIN AND COOL ALL MILK IMMEDIATELY AFTER MILKING

The most efficient method of cooling milk is by the use of a surface cooler. This not only cools the milk quickly but also aerates it, allowing the animal odor to pass off. Where running water is available, the tubular cooler is the best. In many places, this is not practical and then the conical cooler can be used. This cooler has a large chamber that can be filled with water and ice if available and the milk is run over the outer surface. While the holding tank may be used for cooling cream it is not rapid enough to cool a large can of milk thru in time to prevent considerable growth of bacteria; nor does it allow the escape of undesirable odors.

For storage of either milk or cream, a concrete holding tank is the most practical. This should be arranged with the inlet and a drain valve at the bottom and an overflow pipe just below the



A CONCRETE TANK WITH RUNNING WATER OR ICE IN IT WILL KEEP MILK COOL TILL DELIVERED

level of the top of the cans. The pipe leading from the well to the stock tank should run thru this holding tank insuring a frequent change of water.

Clean Stables.—Stables and milk room need not be elaborate nor expensive but they should be clean. The stable floor should be tight, preferably of concrete and easily cleaned. All manure should be removed daily and should not be piled just outside the door where it will attract flies to the stable. There should be ample provision for light and ventilation.

In the milk room everything should be clean and protected from flies. Do not use the milk room as a junk room for the

storage of all kinds of old equipment. Such things only accumulate dirt and encourage a general carelessness in handling the milk.

UNDESIRABLE FLAVORS

There are several causes of undesirable flavors in milk and cream. The most common of these are: Feed, unclean utensils, unclean surroundings where the milk is handled.

Feed Flavors.—Very frequently, in the spring and fall, undesirable flavors are found in the milk which are due to feed. Among the most common of these feeds are: Beet tops, rye pasture, wild onion, weeds and sweet clover. In many cases it is necessary to use this feed and some method must be found to eliminate the off flavor. Experience at the Colorado Experiment Station has shown that this can be done by removing the cows from the pasture four hours before milking. It can also be helped some by giving them a feed of hay before they go out to pasture so that there will not be the tendency to fill up too much on these other feeds. With two milkings per day, the best practice seems to be to turn the cows on pasture immediately after the morning milking, then bring them up to the corral about four hours before milking and let them have some hay in the feed rack. In most cases they are kept up thru the night with some hay in the feed rack. If the evening milking is done fairly early it may be desirable to turn them out again for two or three hours in the evening, but where this is done they must be brought up again soon enough to permit the flavor to pass off before the morning milking. These flavors are particularly objectionable in market milk but the flavor may also be traced in butter made from cream carrying the flavor. Often the creameries turn back cream carrying these flavors and they always cause a marked decrease in the consumption of whole milk.

A little care and that in using these feeds can eliminate this loss and at the same time permit the profitable utilization of these feeds.

Unclean Utensils, in addition to their effect on the bacterial count, have much to do with the flavor. There is, perhaps, no more objectionable flavor than that of dirty, greasy utensils or those that have been allowed to stand with old sour milk in them. Prompt and careful cleaning, as described above, will eliminate this trouble.

Unclean Surroundings are detrimental to milk flavor. Milk absorbs flavors and odors readily and if it is handled in the sta-



DO NOT LET YOUR CREAM STAND IN THE SUN
IF YOU WOULD AVOID LOSS FROM BOILING

ble or other place where objectionable odors are in the air, these may be picked up by the milk. The same danger exists in storing milk or cream in a cellar where it may be damp and mouldy due to the presence of mouldy vegetables or other causes.

CONCLUSION

It should always be borne in mind that the production of clean pure milk and cream is not only a duty of the producer in order to protect the health of the consumer, but the quality of the product that can be made from the milk or cream will govern to a large extent the price that can be paid for it and the amount that will be consumed. The present per capita consump-

tion of milk is only about one pint per day. When the general quality of our milk is made more appetizing and our consumption is increased to equal that of many European countries, there will be an increased demand for the farmers' product and a correspondingly more profitable market.

As long as the bulk of the cream coming into the creameries is of inferior quality, the price of butterfat will be lower than in sections where a first-grade cream is produced and a fancy butter manufactured.

Aside from the loss in quality, in the summer there is an actual loss in weight due to poor quality cream "boiling over" on the cream station platforms as anyone can see who has visited the express platforms of any city in the summer months. This "boiling" is directly due to bacterial action in cream that is dirty or has not been properly cooled. It is impossible to estimate the pounds of cream that are lost this way each season but certainly it is a big factor.