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Essentials in Clean Milk Production
Michigan State University Extension Service
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Issued February 1930
4 pages

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ESSENTIALS IN CLEAN MILK PRODUCTION

By G. MALCOLM TROUT

More than one-half of the milk produced in Michigan is consumed as fluid milk. Much of this milk is of inferior quality. At present, there is considerable agitation over the quality of the milk supply in Michigan as in other sections. The result has been an increase in the demand for a higher grade milk. Health officials have long recognized the importance of a clean milk supply to the health of the public. Accordingly, milk ordinances have been adopted by nearly every town and city and with them, the inspection and grading of milk becomes imperative. This bulletin presents, in a concise form, the essential steps in the production of high quality milk.

What is High Quality Milk?

High quality milk is the milk normally secreted from the healthy udder of a disease-free cow, produced under sanitary conditions with healthy attendants and cooled and held at 50° F., or below, until consumed. High quality milk is not dirty milk with the dirt strained out—high quality milk never contained dirt or contamination at any time.

The Cow.

The source of pure, wholesome milk is a clean, healthy cow. Unless the cow is tested for bovine tuberculosis regularly and all reactors removed from the herd, safe milk cannot be produced even with the best equipment and methods. Cows having a strong reaction to the blood test for abortion disease should be eliminated from the herd as soon as possible.

Garget also affects the quality and safety of the milk. This udder infection most frequently makes its appearance in the spring and fall, at which time the udder is thought to be more susceptible to infection because the cow may lie on the cold, damp ground, thus chilling the udder. Milk from cows badly infected with garget should never be mixed with the regular milking but should be kept separate and discarded.

Much milk obtained from clean healthy cows receives a liberal baptism of dirt from the coat of the cow at the time of milking. This is one of the important sources of contamination. Clip the long hairs from the flanks and udder and so prevent manure and bedding from adhering loosely to the udder. Prevent dirt from falling into milk pail by brushing the flanks and udder and by wiping the udder with a clean damp cloth previous to milking.

Michigan State College

Extension Division

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Printed and distributed in furtherance of the purposes of the co-operative agricultural extension work provided for in the Act of Congress, May 8, 1914. Michigan State College and U. S. Department of Agriculture co-operating.

The cleanliness of the barn often reflects the cleanliness of milk production. The barn should be well lighted and ventilated to carry off stable and cow odors. Such odors are readily absorbed by milk. The manure should be removed daily to a sufficient distance from the barn so the odors will not drift back into the milk room. A tight ceiling prevents chaff and dust from sifting down and contaminating the air and milk during milking.

Feeding.

Since hay carries a large amount of bacteria-bearing dust, it should not be fed until after milking. Also silage should not be fed until after milking because of the possibility of silage flavor carrying over into the milk. There is no harm, however, in feeding the grain ration at time of milking.

The Milker.

Exercise personal cleanliness. Wash the hands with soap and water before beginning the milking. Milk with clean, dry hands. The practice of dipping the fingers into the milk and softening the teats with the wet hand is exceedingly dirty and filthy. This practice can not be condemned too severely. The milker's clothing should be clean and free from dust but not necessarily white. The milker should be free from any infectious diseases as these may be carried and transmitted through the milk.

Significance of the Bacterial Count.

The quality of the milk is often determined by the number of bacteria which it contains. The unit of measurement is the cubic centimeter (about 20 drops). Market milk cannot be produced entirely free from bacteria, although the number normally present in milk as it is drawn from the udder is insignificant in comparison to the numbers of bacteria per c. c. found in milk several hours later when it reaches the milk plant. The bacterial count furnishes a crude index to three things, namely:

1. The cleanliness of production.
2. The temperature to which the milk was cooled.
3. The age of the milk.

Discard the First Few Streams of Milk

The first two or three streams of milk for each teat often contain large numbers of bacteria. Since this milk is quite low in fat it may as well be discarded. A separate cup fitted with a 100-mesh screen wire has been found to be very satisfactory as a receptacle for this milk. By milking through this fine mesh screen, the first signs of garget may be more easily detected and treatment begun at once.

Use Small-top Milk Pail

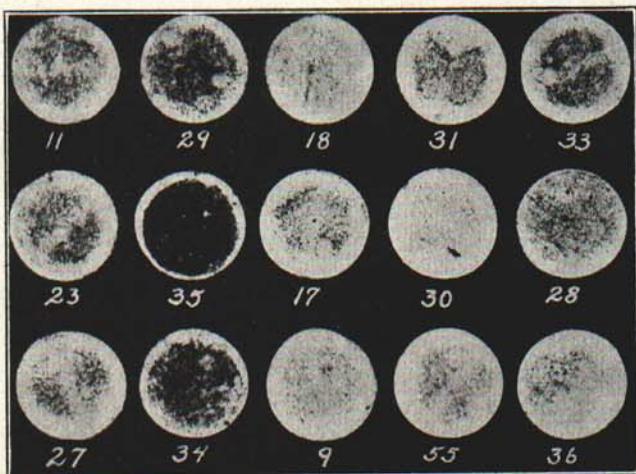
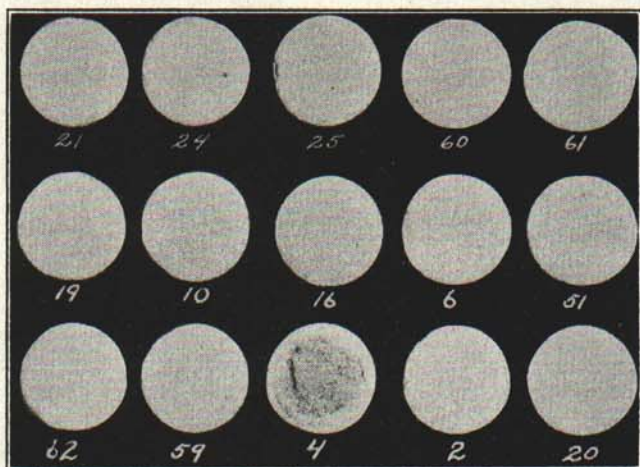
Much of the dirt which gets into milk falls from the flanks and udder into the pail during milking. By using a small-top or covered-top milk pail approximately 80% of the dirt, which otherwise would fall into the milk pail, can be eliminated. A large portion of this dirt is soluble and once in the milk, it cannot be taken out.

Use Cotton Pad Strainer

The strainer has been found to be an important source of contamination. Discard the wire strainer since it can be cleaned only with difficulty. Use cotton disc strainers which remove much of the fine dirt as well as all the coarse particles. After each milking the disc should be replaced by a new one.

Wash Utensils Thoroughly and Sterilize

The pails, milk cans, strainers, coolers and other utensils are the source of the greatest contamination of the milk. There are four essentials in the proper care of utensils. These are: Washing, rinsing, scalding and drying. Each step is



Each of these discs show the dirt contained in one pint of milk. The milk samples were obtained from Michigan farms in a whole milk area. The clean discs in the upper cut show clean milk production under conditions as explained in this bulletin.

important. Scrub the utensil with a fibre dairy brush using a washing powder in luke warm water. Never use a dishrag as this usually leaves an unpleasant odor. Soap rinses off with difficulty, and therefore, should not be used. After scrubbing the entire surface of the utensil, it should be rinsed in clean water. Utensils may be satisfactorily sterilized by any one of the three following methods:

1. By submerging in scalding water for three minutes.
2. By steaming for fifteen minutes in a closed steam chamber.
3. By submerging in a disinfecting (chlorine) solution for a few minutes.

To complete the proper cleaning of dairy utensils, place them on a sunning rack to air and dry. Clean and sweet smelling dairy utensils help make clean milk production possible.

Remove Milk From Stable Immediately After Milking

Milk readily absorbs surrounding odors. Stable and silage odors are particularly objectionable in milk. Removing the milk from the stable immediately after milking is a safeguard against absorbed flavors.

Cool Milk Promptly to 50° F.

At proper growth temperatures bacteria multiply every 30 minutes, whereas, at low temperatures (below 50° F.) they multiply slowly, if at all. Cool the milk promptly after it is drawn from the udder. Water cools milk from twenty to thirty times faster than air. A tubular surface cooler is preferred to tank cooling because the temperature of the milk is reduced to a satisfactory storage temperature at once. Such a cooler also aerates the milk and removes any strong odors. When tank cooling is used, the milk should be stirred every fifteen minutes. To determine how thoroughly the milk has been cooled, use a dairy thermometer.

Holding Tank Essential

The holding tank in the milk house when used properly will reduce the temperature of the milk below 50° F. and keep the temperature low until it is delivered to the milk plant. For this reason the holding tank must have sufficient refrigeration capacity to insure proper storage temperature. This tank must be provided with fresh water daily. Slimy, stagnant water in the holding tank is often the source of bad flavors and odors and also organisms which cause ropy milk.

Steps in Producing Clean Milk

1. Test herd regularly for diseases and remove all reactors.
2. Clip long hairs from flank and udder.
3. Brush flank and udder and wipe with a damp cloth previous to each milking.
4. Keep stable air free from dust by feeding hay and other dusty feeds *after* milking.
5. Milk with *clean, dry* hands.
6. Use a *small top* milk pail.
7. Use a cotton pad strainer.
8. Remove the milk from the stable *immediately* after milking.
9. Cool milk promptly to 50° F. with water or ice.
10. Hold milk below 50° F. away from odorous surroundings.
11. Protect the milk during transportation from the low temperature of winter and from the sun and high heat of summer.
12. Discard the dishrag and soap. Use a *fibre brush* and *washing powder* instead.
13. Sterilize all utensils by submerging in scalding water for three minutes, steam chamber for fifteen minutes, or in a good chlorine solution.
14. Sun and air all utensils daily.
15. Allow only healthy persons to work about barns or in handling milk or milk apparatus.