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THE PRODUCTION

OF

HIGH GRADE MILK

WITH A

MILKING MACHINE

New York Agricultural Experiment Station
Geneva, N. Y.
1914

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Milking machines not perfect.

Everyone who sees a milking machine operate for the first time comes away with the feeling that here, at last, is a cleanly method of milking. But those who have studied the matter realize that not all milking machines are so constructed that they will produce clean milk easily and none of them will do so unless they are operated and cared for as they chould be.

Construction and operation.

It is true that the pails used with the commoner types of milking machines found in New York State are covered and protected from the entrance of coarse dirt In some machines a special effort has been made to shut out stable air and others have been constructed with cotton filters through which all air that enters the machine is filtered. After the manufacturer has done his part, however, **faulty operation and care of the machine may easily prevent the successful production of a clean milk.** One way of testing gross carelessness in operation is to filter pint samples of machine-drawn milk tbrough cotton. It will be found that many of these samples will contain enough coarse dirt to show readily on the cotton. This is especially true if the operator of the machine has been careless and has allowed the

teat cups to become loosened or to fall to the floor. Under these circumstances, the teat cups act like vacuum cleaners and suck dirt from the udder, teats or floor. **But the greatest difficulties arise because few farmers understand how to keep a machine bacteriologically clean.**

Can high grade milk be produced by machine milkers?

Milk drawn by machine milkers has been produced at the Station since 1907. Difficulties were met in the attempt to produce a milk containing a low germ content but they did not prove uncontrollable by methods which are available on many dairy farms.

It is true that the Station has tried but one kind of machine and so is not in a position to state that other makes of machines would have been equally successful. There is, however, no evident reason why milk containing low numbers of bacteria cannot be produced by other machines on the market. In our case we have had a man to operate the machine who is more efficient than the average workman, but not more efficient than many workmen found on dairy farms. He is careful in the operation of the machine and is usually successful in keeping out coarse dirt. But more important than this; **the machines are kept clean by methods which have been tried out and found to be efficient.** One instance has come under the observation of

the Station where a farmer has produced certified milk with a milking machine and has had no difficulty in keeping well within the limit of 10,000 bacteria per cubic centimeter in a 12-month test. In this case the precautions taken to secure good results were even greater than those taken at the Station. On the other hand, four instances have come to the attention of the Station where farmers with an equipment scoring nearly perfect on the commonly used dairy score cards were producing machine-drawn milk which contained millions of bacteria per cubic centimeter as it left the stable. In each case the owner thought he was careful but he was not using efficient methods of keeping the machines clean.

Methods of keeping machines clean.

The methods used by us in keeping our machines clean are as follows: Immediately after milking is finished, about three gallons each of clean, cold water, hot sal soda water, and clean hot water are sucked in succession through each machine. The machines are then taken apart. The metal parts are sent to the dairy for a thorough steaming once daily. The teat cups and rubber tubes are immersed in a 13 per ct. salt solution and remain in this brine at all times when not in use. When they are taken out for use, they are carefully rinsed under a hot water faucet. Once a week these parts are sent to the dairy and given a thorough cleansing. This

method of keeping the machines clean has proved to be a satisfactory one, but better methods will undoubtedly be found. Some other methods are in general use but none of them have been tried at the Station as yet.

Other methods of keeping tubes.

During the past few years it has been claimed that the addition to the brine of a small amount of chloride of lime (bleaching powder, a common disinfectant obtainable at any drug store) makes a much more efficient method of keeping the teatcups and rubber tubes (Cornell Agri. Exp. Sta., Circular 18, 1913). In using this, care must be exercised not to use it in tanks or on parts of the machine which are corroded by this chemical. Some cases where this method has been tried have been investigated by the Station and the use of the chloride of lime found to be giving satisfaction except for the corrosion of the machines noted above. Some of the dealers are urging that the rubber parts of the machins be kept in a solution of lime water. No recent tests of this method have been reported or have come to the attention of the Station. Two earlier reports by experiment stations discuss this method, one favorably and the other unfavorably (24 Ann. Rpt. Wis. Agr. Exp. Sta., p. 214-223, 1906, and Bul. 47, Storrs Agr. Exp. Sta., 1907). Some other suggestions have been made and are being tried in practice but no comparative tests

have yet been published. They must all be regarded as experimental.

Method of operation. The machine in use at the Station is one which provides against the entrance of dirt, with the air which enters the machine, by the use of cotton filters. Tests reported in Bul. 317 of this Station showed that the use of these cotton filters is important. Without them the germ content of the milk was ordinarily above 10,000 per cubic centimeter.

Best policy to pursue. In view of these facts the farmer who is contemplating the installation of machine milkers should examine very critically the claims made in regard to its ability to produce clean milk. The farmer who already has a machine should make some provision to use an efficient method of cleaning and caring for it. The only way in which the efficiency of the methods used can be determined is to have bacteriological tests of the milk made. Farmers who install machine milkers must expect to be compelled to produce clean milk with them. Where difficulties are met, the Station is very willing to give the benefit of its experience and to help in securing good results.