

Leaflet AC.

**HOW TO PRODUCE
MILK WITH A LOW
GERM CONTENT**

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

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No minute directions for doing
Every farmer this are given in this leaflet but
can do it certain essential methods for con-
trolling the germ content of milk
are emphasized. There is no dairy farmer in the
State of New York whose equipment is so poor
that he cannot produce milk containing less than
10,000 bacteria per cubic centimeter **provided the
milk is handled in a cleanly manner and is properly
cooled.** With good business methods the cost of
production need not be markedly greater than for
ordinary milk.

The essential requirements which
Essential must be carried out if milk contain-
requirements ing few bacteria is to be con-
tinuously produced are:

1. Cows must be kept so clean that the amount
of loose dirt which falls from their bodies is held to
a minimum.
2. Milking must be done in a cleanly manner.
3. Small-mouthed milk pails must be used.
4. Pails, strainers, milk cans and other utensils
must be kept **scrupulously clean.**
5. The milk must be **cooled immediately** after
being drawn and **kept cold** until delivered.

Some unessential refinements which
Unessential are frequently urged upon farmers
refinements as being necessary for the produc-
tion of a milk with a low germ
content are:

1. Discarding the foremilk.

2. Washing the cows' flanks and udder with germicides or wiping the udder with a damp cloth.

3. Clipping the long hairs about the flanks and udders or using a vacuum cleaning method of cleaning the cows.

4. Special precautions for keeping down the dust in the stable.

5. Expensive barn construction and special interior finishes.

Some of these things may be advisable for other reasons and none of them cause an increased germ content of the milk but they may all be classed as unessential for they have little or no influence upon the germ content of the milk and tend to increase the cost of production.

There are bacteriologists who will feel that some of these statements are stronger than they should be but they are based on the outcome of our experiments with the Station Herd and on studies in other barns nearby. Milk containing less than 10,000 bacteria per cubic centimeter is and has been continuously produced from the Station Herd by the use of methods which do not differ essentially from those given above.

The Station cows are kept reasonably clean but no excessive precautions are taken to keep them clean such as wiping the udder with a damp cloth, washing the cow or clipping. Because of the fact that the stable is a comfortable one the hair on the bodies of the animals is never as long as it is in some stables.

The udder

While it is well known that the fore-milk contains a larger number of bacteria than milk drawn during later stages of the milking progress, yet the increase in the total number of bacteria due to this cause is so slight that it is negligible even in the production of a milk containing less than 10,000 bacteria per cubic centimeter. The udder has been found to discharge an average of 428 bacteria per cubic centimeter in an examination of 1230 samples of milk drawn from 78 cows. The entrance of these bacteria into the milk is unavoidable. There were such marked differences in the number of bacteria discharged by different cows that a much greater influence on the total germ content of the milk could have been produced by a selection of animals than by discarding the foremilk.

The milking process

It is important that a small-mouthed milk-pail be used. In our experiments, we found that more than one half of the bacteria which get into the milking during the milking process could be kept out by the use of a small mouthed pail. Cleanly personal habits of the milker himself are likewise important. Milking with wet or dirty hands should not be tolerated in any stable.

Cleaning utensils

The best methods of caring for these on the average farm cannot be given as the utensil problem has not yet been studied sufficiently where steam is at hand for the sterilization of all milking utensils, there need be no trouble on this

score as this is known to be an efficient method for caring for dairy utensils. Unfortunately, this is unavailable on the average farm. The best known substitutes are careful cleansing by ordinary methods, followed by scalding with boiling hot water. **The utensils must be kept cleaner than is ordinarily the case if success in the production of a high grade milk is to follow.**

Barn construction No matter how desirable an expensive, ceiled, painted or whitewashed stable may be from other stand-points, it is not necessary for the production of a milk containing a small number of bacteria. In an examination of the milk of 37 dairy farms as delivered at a milk station, it was found that one of the men continuously produced milk containing less than 10,000 bacteria per cubic centimeter, yet he produced his milk in a stable which scored so low that the milk would have been refused admission into some cities in the state. The secret was a cleanly farmer and an equally clean wife who cared for the utensils. The herd was a small one and was cared for by the one man. Such cases are not uncommon throughout the State.

The milk can In a large part of the State, the farmers deliver their milk in 40-quart cans which are washed by the milk companies. These cans are usually steamed and are regarded as sterile but such is probably never the case. They have been frequently shown to contain hundreds of thousands or millions of loose bacteria which would wash out into the milk. The fault may be due to

poor steaming of the can or a farmer may misuse a well cleaned can after he receives it. The washed cans should be dry and should never be used for anything but fresh milk. If once used they should never be used again until they have been recleaned. The clean cans should always be protected from dirt.

Cooling milk Ice is almost a necessary factor in the production of a high grade milk. It is possible that such milk

could be produced if an especially cool spring were at hand and extreme pains taken to care for the milk in other ways but such an attempt would ordinarily be doomed to failure from the beginning. Many of the large milk companies have already learned the importance of a liberal use of ice in caring for milk and are almost prodigal in its use. Farmers are not always in a position to realize this necessity as clearly as do the dealers for they are not the ones who ordinarily suffer loss because of sour milk and so are not always as careful as they should be. **A satisfactorily cooled clean milk will be found to have a low germ content under all normal conditions.**

factorily cooled clean milk will always be found to have a low germ content under all normal conditions.

The future It is to be hoped that the grading of milk according to its real quality will enable farmers producing a high grade milk to obtain the best price for it. Such is not the case under present conditions but must be made the case before any large quantity of this milk is produced.