

# The Importance Of Scientific Milking In Mastitis Control

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THE prevention and control of mastitis, regardless of its cause, is definitely a herd management problem. Its success depends almost entirely upon the dairyman himself, his family and his employees. If they have the will and

desire to control the disease it can be done, otherwise it will be a failure.

The veterinarian has an important part to play, but it is a minor part compared to that of the dairyman. The veterinarian's first responsibility is clearly to inform the farmer as to what mastitis comprises. In recent years much has been written about this dairy malady in all the farm papers, bulletins and commercial literature. More recently space has been given to the treatment of mastitis and nearly always the results have been spectacular with a high percentage of recoveries. This has all led to confusion in the minds of dairymen and has made it difficult for the practitioner, as they expect him to have the same results, which in many instances is impossible.

The dairyman's picture of mastitis is the cow with the broken-down udder, secreting abnormal milk, and he will give a picture of how she fell and injured the udder, or he may lay the cause to some brand of feed. Dairymen with these mistaken ideas seldom if ever make much progress in controlling mastitis because

they cannot see the necessity of following certain rules that bear no significance.

Every link in the chain of control is important, and if one link is neglected the chain is broken and the control program is liable to failure. The first important step is to prevent infection due to infected animals being brought into the herd. The raising of herd replacements is strongly recommended. In this way infected animals are never introduced from the outside. It takes a great deal of care, however, to raise replacements. If calves are not properly housed, kept clean and properly fed, they may become infected with mastitis organisms already present in the barns. It is a common practice to feed calves mastitis milk or to have mastitis animals for nurse cows and then infection is bound to occur.

## Care of Calves

When calves are selected to be raised for herd replacements, careful examination should be made of the udder tissue to observe the placement of teats. If they are not normal the calf should not be raised, as such animals invariably make poor milkers. If supernumerary teats are present they should be clipped off. If allowed to remain, when the animals mature the supernumerary teat may interfere with the proper application of teat-cups, and may also become infected with mastitis organisms and later show evidence of clinical mastitis.

A very common and objectionable habit among young calves that are pail-fed milk is to suck one another's mammary tissue. This occurs after each feeding and results in the opening of the teat ducts and per-

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mitting infection from the buccal cavity to enter. A low-grade chronic infection is set up and upon freshening one or more blind quarters may be detected, or even quarters discharging pus. The infection may lie dormant for several months after freshening and then suddenly clinical symptoms of mastitis will be manifested by redness, swelling, fever and abnormal milk. Preventing this habit is much more satisfactory than any cure.

Placing a home-made anti-sucking ring in the nose of each calf a day or two after birth will serve to prevent the calves from sucking each other. The ring is made as follows: an 8-inch piece of galvanized wire is wound around a 2-inch pipe set in a vise. The two ends are then bent forward and sharpened. The ring is then threaded through the nose cartilage and the pointed prongs will hang down and forward, away from the nose. When the calf attempts to suck another calf the points will prick the latter and the calf will resist his sucking attempt. If equipment and space are available the younger calves may be kept in separate pens or they may be stanchioned during the feeding period, thus preventing them from reaching one another.

Milk from mastitis cows should be pasteurized or boiled before being fed. A small 14-quart tin pail heater is ideal to heat such milk. Nipple pails are recommended for calf feeding and should be cleaned and sterilized after each use.

### **Additions to Herd**

When additions to the herd are made care should be taken to be sure that the udders are healthy and free from mastitis infection. It is best to have a veterinarian examine every cow that enters the herd. Many cows sold at public sales and auctions have had histories of udder upsets; they are sold when the condition in the udder can be least detected, usually when dry, or about the time the cow is to drop a calf. Whenever possible a bacteriological examination should be made in conjunction with a physical check-up of the udder. The presence of excessive numbers of any organism should warrant segregation of the animal, or refusal to purchase it. Some

veterinarians who do not have the facilities of a laboratory have become skilled in the art of examining udders and are able to select healthy udders according to Udall's method of classification. Some of these animals may shed mastitis organisms in the milk but this should not cause any undue harm if stable sanitation and proper milking are conducted.

### **The Milking Herd**

Milch cows should be examined frequently by a competent veterinarian. In the case of herds that experience little or no trouble, an examination every six months should be sufficient. This would keep the management well informed as to any physical changes in the udder as well as detecting any new infection. Badly infected herds should be examined at least every 90 days. Bacteriological examination of individual quarters should always be made whenever possible at the time of examination.

All animals found free from infection, excessive indurations, and secreting normal milk should be stanchioned by themselves at one end of the milking line. All animals that are infected with *Streptococcus agalactiae* but which have otherwise normal udders and are secreting normal milk, should be stanchioned next in line, to be milked after the first clean group. All badly infected animals with indurated udders, discharging abnormal milk, should be housed by themselves. All animals beyond recovery should be disposed of as soon as possible.

### **Predisposition**

Trauma no doubt is the most important factor in predisposing infection. It is impossible to define what constitutes trauma of the udder. The mammary gland has been developed to such an extent that it is unable to withstand the treatment that it must take in the everyday life of the cow. Evolution is not progressive in every respect, and this holds true of the bovine udder. Even though the capacity of the udder has been increased, it has also been made weaker and more delicate.

When a cow is in a recumbent position there is considerable pressure placed upon the udder by the upper leg. If the cow beds are not of sufficient length, as is usually the case, the udder hangs over the edge of the bed. The delicate tissues when placed under such strain must be traumatized. All too frequently cow beds are constructed with the main thought in mind of keeping the cow clean, rather than for comfort and protection of the udder. Ample clean and dry bedding is very important to udder health. The udder should be kept off a hard or cold floor. Some cows have a habit of standing with their back feet in the drop, permitting the teats to touch the edge of the drop. If the edge of the drop is soiled the teats are constantly soiled while the cow is in this position, which may result in irritation of the skin at the teat end. Animals are frequently stanchioned too closely together, resulting in teats being stepped on. This one condition alone is the cause of more swollen and infected quarters than any other reason. The ends of the teats are pinched many times without any visible evidence of tissue damage, yet sufficient damage has been done for bacterial invasion, and sooner or later clinical symptoms will be noticed. The teat dilator and the milk tube, common on all farms, are guilty of causing injury when improperly used. Continuous use of these will irritate the mucous membrane of the teat duct and sooner or later the teat canal and quarters will show evidence of inflammation, resulting in acute or chronic mastitis.

### Spider Teat

The "spider teat," which is nothing more than an infection of the duct at the end of the teat, usually results in a "set-up" quarter. This condition is further irritated by hand milking, as it requires greater pressure to express the milk from the teat.

Soaking the teat in a warm antiseptic solution for 10 to 15 minutes until the tissues are soft and pliable many times removes the necessity of hand milking or the use of a milk tube. Temperature changes which might result in chilling or cold drafts may cause rapid infection. The

use of harsh disinfectants, sloppy barnyards and wet bedding may result in chapping. When this condition involves the end of the teat it frequently results in the infection traveling up the teat canal.

The majority of dairymen seldom think of the aforementioned conditions as having any serious relation to mastitis.

A clean barn is important and necessary. Cattle diseases are always less frequent in clean barns. The floors and beds should be kept as dry as possible, as bacteria do not thrive in a dry environment. Absorbent material should be used in the gutter to do away with moisture, thus preventing udders and tails from becoming soiled. Lime and superphosphate spread on the floor keep down odors and aid in keeping the floors dry.

### Milking Operation

In the past little or no attention has been given to the milking operation. If the cows were milked beginning with the clean group and finishing with the infected animals, with no milk left in the udders, it was considered sufficient. It is now recognized that the milking act itself if not conducted properly is injurious to the udder. A cow likes to be milked, and if everything associated with milking is carried out in a correct manner, she will respond with a "let down," and the milk can be taken either by hand or machine.

However, the vast majority of cows are not properly milked; in fact they are milked when the milker or operator wants to milk, rather than when the cows themselves are ready to be milked. For the udder to function properly the act of milking should take place only when the physiological processes of "let down" have taken place. Milking may then be conducted as nature intended it should be—by taking the milk from the udder within the shortest period possible. Three to four minutes, by machine, should be sufficient.

The following routine if carefully followed will result in cows being milked better, with healthier udders, higher production, more fat and longer lactation periods:

1. Milking should take place at regular

intervals. Cows are creatures of habit and respond to regularity. Regularity in milking also tends to promote more uniform daily production weights.

2. Everything should be made in readiness for milking. Machines, pails, towels, dip pails, etc., should all be placed in the rear of the first cow to be milked. Everything must be at finger tips so nothing may interfere with milking after it has once started.

3. Wiping and manipulating the udders is the most important act in preparing the animals for milking. Individual udder towels, immersed in warm water of 130° F. to which has been added sufficient chlorine to make a solution of 250 p.p.m., should be used. The hot water is a substitute for the warm, moist mouth of the calf. The manipulation and wiping act is a stimulus, resulting in the "let down."

4. A few streams of milk from each quarter should be foremilked into a strip cup. The normal seal which forms on the end of the teats between milkings is opened. The teat and gland cistern is drained of the first milk, which is low in fat and high in bacteria. If abnormal milk is present it will be found on the strip cup screen. The use of the strip cup is the final act in preparing the udder. The washing and foremilked should be completed just prior to the application of the teat-cups. If prepared too far in advance of the machine the muscles in the udder which contract to squeeze the milk out into the larger cistern become fatigued and the intra-glandular pressure is lowered, which will result in slow and incomplete milking. If this is extended over a period of time, loss of milk and fat production will be experienced. This condition is not conducive to udder health.

5. When the teats and lower parts of the udder are distended after preparation, it is an indication that the "let down" has occurred and the teat-cups should be immediately applied. Teat-cups should never be applied before the cow is ready, as minor irritation in the teat cistern may be the result, with ultimate infection. The cups should remain on the udder only so long as there is a flow of milk. Three to four minutes should be sufficient time in

which to milk the average high-producing cow with a normal udder.

The secret of fast milking is to take the greatest quantity in the first minute of "let down," when the pressure within the udder is at its peak. Never leave the cups on the udder after the milk flow ceases.

When the lower portion of the udder becomes soft and flabby it is an indication that the udder is empty. This is determined by manipulation of the udder while the units are still attached. If residual milk is present it may be taken by machine or by hand stripping.

### **Machine Stripping**

Machine stripping can be easily performed at the time the operator checks the udder. A slight amount of pull is placed on the unit with one hand, while the quarters are stroked with the other. The manipulation should coincide with the pulsations. By so doing the tubules and sinuses within the udder are straightened, permitting the remaining milk to flow more freely to the teat cistern. The pressure placed on the unit will pull the cups down away from the base of the teat, relieving the pinching off action at this point. Some makes of teat-cups tend to cause a collapse of the teat and gland sinus as the milk flow diminishes. Leaving them on invites injury, which may lead to infection.

This manner of stripping prevents extraneous material from getting into the milk. Sanitation and health departments are encouraging its adoption.

### **Hand Stripping**

Hand stripping is the most common practice, although machine stripping is fast replacing it. This method is used when the units are removed abruptly, with little or no inspection. A few full hand squeezes on each teat should be sufficient to remove all residual milk, if the cow has been properly milked. The act should never be prolonged, as many cows are made slow milkers in this manner. The thumb and forefinger should be used only when necessary on a very short-teated

cow. All hand stripping should be done immediately upon removal of the units so that the milking operation may be completed in one act. The amount of stripplings from cows properly milked should not exceed 0.5 pounds.

Teat-cups should be rinsed in a pail of clean water to remove all milk from the liners, then a pail of chlorine water with at least 250 p.p.m. of available chlorine between each cow. This is to prevent the spread of infection from one cow to another by means of the teat-cup. The water

the teats should be immersed in an anti-septic solution, which rinses off all milk from the moistened ends of the teats. If milk is allowed to remain on the ends of the teats it might act as food for bacterial growth, which might enter the milk duct and cause mastitis. The dipping can be performed as follows: a long-handled dipper or ladle is filled with chlorine solution and each teat is dipped individually; the solution is then discarded. This method makes sure that the teats of each cow are dipped in clean, fresh chlorine solution.



**1. Milk at same time every milking—it has a favorable effect on milk “let-down.”**

**2. Have everything in readiness. Avoid noise and confusion. Do not attempt other jobs at the same time.**

**3. Wipe each udder with cloth and warm water (130° F.) containing 250 p.p.m. of chlorine.**



**4. Draw a few streams from each quarter into strip cup. Inspect for abnormal milk.**

**5. Next apply teat-cups immediately. Take full advantage of milk “let-down” induced by steps 3 and 4.**

**6. Remove teat-cups at end of 3 to 4 minutes. Strip briefly by hand or machine.**

in the pails should be changed about every 15 cows, or more often if necessary to insure proper sanitation. The milk cock in the operating head must be open when the cups are dipped so as not to form an air lock, preventing the chlorine from reaching the full length of the cup. Rinsing also keeps the cups free from sediment.

As soon as the cow has been stripped

When hand stripping is conducted, the milker's hands should be rinsed in a chlorine solution between cows. Mastitis organisms may be carried from cow to cow by the milker's hands, as well as by the teat-cups.

Frequently there are cows that do not milk completely in one or more quarters. Ordinarily the blame for incomplete milk-

ing is placed on the machine. A mechanical milker in poor repair may be the cause—low vacuum, worn pulsators and liners not properly stretched will result in incomplete milking. Most frequently, however, the cause is in the udder or individual quarter itself. An injured meatus with scar tissue, commonly called a spray teat, partially closes the opening thus preventing a normal stream of milk to be taken from the teat. A chronic thickening of the teat canal and long-necked tumors which hang in the duct will interfere with the free and easy flow of milk. Stricture and obstructions at the base of the teat between the gland and teat cistern may be responsible.

Quarters infected with chronic mastitis, with marked or distinct indurations which have replaced the secreting tissue and smooth musculature with scar tissue, will prevent building up sufficient milk pressure to express the milk out into the lower sinuses. The tubules and sinus are also obliterated, thus preventing free passage of milk. Congenital anatomical conditions of the udder and teats such as tight sphincter and overly large fleshy and cone-shaped teats may cause difficulty in complete milking.

### Sanitary Care

The sanitary care of the milking machine should never be overlooked by a practicing veterinarian when he is putting into operation the mastitis control program. If a dairyman adheres to all other rules set up for mastitis control, and then neglects to sterilize the milker after each milking, infection may be transmitted throughout the herd.

If an extra unit is at hand, all infected individuals can be milked with this single unit, which should be used for that purpose only. Hot water of at least 190° F. is strongly recommended for sterilizing purposes. The water can easily be sucked through each unit by vacuum. Units should then be placed upon a solution rack, and a 0.4 percent lye solution should be used in the solution rack, which acts as a satisfactory sanitizing agent.

## Camp Reporter Tells Work Of 1943 Graduate

Whether GI chow in the mess hall or food in the Post Exchange, it can't be served and it can't be sold until examined by scientific experts known formally as veterinarians.

"Our job," says Lt. Floyd W. Thompson, Chief of the Veterinary Department, "is to safeguard the soldier from damaged food and see that the government gets what it pays for."

This entails work and plenty of it. When most GI's are infuriated by the first call for reveille, Lt. Thompson and assistant, Tec 5 Curtis Pinder, are already inspecting the nearby farms and dairies, and procuring milk samples for tests made in Northington's Biology Laboratory.

"We check for sanitation and temperature," says Lt. Thompson. "Both raw and pasteurized milk must be kept below 45 degrees Fahrenheit. The Biology Lab tests for quantity and type of bacteria, pasteurization and percentage of butter fat. The Army requires that milk contain 3.25 percent butter fat, but our milk usually runs over that figure. It is untouched by human hands once it reaches the stainless steel vats of the dairy."

Meats and produce are not only examined when arriving at the hospital, but they are inspected daily in each mess hall. Meat triers resembling fat steel ice-picks are used to detect bad odor and color. The trier is plunged into the meat close to the bone and if it has an offensive odor when withdrawn or bears a green, or in the case of beef a sometimes black color, it is rejected.

"Besides our daily inspections," said Lt. Thompson, "we administer free care and service to small pets owned by military personnel of this hospital. We're proud of our combined lab and workshop. We have everything there from balling guns for shooting ounce capsules down horses' throats, to the last word in drugs and vaccines. We've treated many dogs for rabies."

—*Newspaper, Northington Base Hospital*