



## MASTITIS AND MILK PRODUCTION

THE term "mastitis" or "garget" signifies inflammation of the udder. It is usually caused by a germ infection. The udder is a highly sensitive organ; when injured or exposed to cold, its normal resistance to infection is lowered, and the disease germs establish themselves.

A number of different types of germs are able to infect the udder. Some of these cause attacks of "acute" mastitis, which may be recognized by such symptoms as high fever, "stary" coat, loss of appetite, reduction of milk flow, and severe inflammation of the udder. The milk may be watery, bloody or stringy. Sometimes so much udder tissue is destroyed that the infected quarter is lost. In severe cases the cow may die. The disease germs nearly always remain in the udder after the cow appears to have recovered from the attack, ready to cause another acute attack when the resistance of the udder is again lowered. There is no difficulty in telling when a cow has an attack of acute mastitis, and all milk from such quarters should be discarded.

There is also another type known as "chronic" mastitis, which is far more common and is responsible for decreased milk production and the loss of many cows from the herd. This type is caused by infection with a germ known as *Streptococcus agalactiae* and is often called streptococcic mastitis. The outstanding feature of chronic mastitis is the slow but gradual progress of the disease. Consequently its presence is often not recognized until the udder is seriously damaged. In many instances the milker does not realize that a cow is suffering from chronic infectious mastitis. For months after infection takes place the quarter and the milk from it may look perfectly normal. In time, a few small flakes may occasionally be seen in the foremilk. A competent veterinarian may be able to detect slight changes (hardened areas) in the udder tissue. As time goes on, more and more of the milk-secreting tissue is destroyed, leaving hard "scar" tissue in its place. The yield of milk is gradually reduced, flakes and clots appear more frequently, and the composition of the milk shows greater changes. Occasionally there may be mild "flare-ups" with some swelling and thick milk, after which the quarter appears to return to normal. The condition is progressive, generally spreading to other quarters, until finally the cow is no longer worth keeping.

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## Detection of Mastitis

There is no single test which will detect all cases of chronic mastitis, but the following three tests taken together are reasonably reliable: physical examination of the udder, examination of the milk for flakes or clots, and the brom-thymol-blue test.

### *Physical Examination of the Udder*

This method requires considerable skill and is most successfully carried out by a veterinarian with special training along this line. In the absence of such assistance, if the farmer follows the directions given many affected animals may be detected. The examination is carried out immediately after milking. First, the balance of the udder is observed. An infected quarter may be either smaller or larger than the corresponding quarter. An acute attack of mastitis often destroys sufficient glandular tissue to leave a "slack" quarter. Again, a smaller quarter may be due to chronic mastitis. In this case the udder tissue feels lumpy and irregular compared with the smooth regular surface of the tissue in a normal quarter. On the other hand, an infected quarter may be larger than normal due to slight inflammation.

The deeper tissue is next examined with the hands, lifting each quarter and kneading vigorously into the depths of the tissue. Normal udder tissue should be soft and elastic, although some "meaty" udders remain fairly firm after milking out. If definite lumps of hard tissue can be felt, or if the whole quarter is harder due to more generalized changes, it is fairly certain that the quarter is infected. Comparison of one quarter with the others is helpful in deciding whether or not a quarter is abnormal. Occasionally a quarter will show a hard lump or area as a result of "hooking" or other injury; in the absence of other evidence of infection such a quarter should not be condemned, but it should be considered suspicious if mastitis is present in the herd.

The amount of tissue change should be recorded. This, together with the findings from the other tests to be described, will form the basis for the segregation of the animals.

While physical examination cannot detect all cases of infection, particularly in the initial stages where there is little or no change in the udder tissue, it will detect those quarters showing the most damage from the disease. These quarters generally shed large numbers of germs in the milk and are the ones mainly responsible for spreading the disease.

### *Examination of Milk by Strip-Cup*

A strip-cup consists of a pint-size metal cup with a fine wire mesh strainer-type lid (a piece of black cloth may be used instead of wire mesh). When the first few streams of milk are carefully directed upon the screen, any flakes or clots can easily be seen. It should be borne in mind that the milk from infected cows will not show flakes or clots at every milking. These frequently appear only at intervals; hence a single test with the strip-cup will detect only a portion of the infected cows. If done at least daily, and a record kept of the cows showing clotted milk, this is probably the most efficient practical test for the detection of chronic mastitis.

### *Brom-Thymol-Blue Test*

When an "indicator" known as brom-thymol-blue is added to normal milk, the milk turns yellowish-green in colour, but similarly treated foremilk from infected quarters is usually a darker-green or bluish-green shade. This reaction generally shows up at an earlier stage of the infection, before clots or

flakes appear in the milk or definite changes can be noted in the udder tissue. Consequently, in the hands of a technically trained person, this test is quite valuable.

It must be borne in mind, however, that this test is not infallible. Milk from infected quarters frequently gives different reactions at different milkings, so that a normal colour does not guarantee freedom from infection. On the other hand, milk from quarters free from infection may show the darker colours. This is particularly true of cows recently freshened or in the last month of lactation. *This test merely shows whether or not the milk is abnormal in reaction; it must not be used as the sole basis for deciding whether or not a cow is infected.*

### Control Measures

In many cases the farmer will of necessity have to plan and carry out his own fight against mastitis. Whenever possible, however, the services of a qualified veterinarian should be obtained. In addition to prescribing treatment for acute cases, he can aid in diagnosing chronic mastitis, particularly carrying out physical examinations and the more technical tests.

#### *Stable Hygiene*

Good stable hygiene is an important factor in the control of mastitis. This includes housing in roomy, well-bedded stalls with proper partitions to prevent teat injuries, and general cleanliness of stalls and gutters. Exposure of the udder to cold should be carefully avoided at all times, and especially during and after freshening.

#### *Segregation*

By the combined use of the tests described, it is possible to detect the majority of infected cows. Depending upon the amount of the infection present, the owner must decide whether he is going to rid his herd of the disease or attempt to carry on by segregating and controlling in so far as possible its spread to healthy animals. If the number of infected animals is small, these should be sold to the butcher and thus removed from the herd. If the amount of infection present is considerable and the cows too valuable to sacrifice, then those infected should be placed at one end of the row, thus dividing the herd into a healthy and an infected group. The healthy cows should always be milked first and every effort taken to prevent the transfer of organisms from infected to non-infected animals. First-calf heifers are usually free from infection and may generally be placed in the clean row. Recently freshened, older cows and newly purchased animals should be carefully tested on several occasions before being placed in the clean group. Repeated tests should be carried out in order that recently infected animals may not be left too long in the healthy group.

#### *Precautions at Milking Time*

See that the udder is completely milked out at regular intervals. Milk dry-handed; wet-hand milking spreads the germs very easily. Do not milk foremilk on to the floor or bedding as this may permit infection of a neighbouring animal. Never use teat dilators or unsterilized milk tubes; these often spread the disease. Milk tubes should only be used under the supervision of a veterinarian.

The special measures outlined below will help in preventing the mastitis germs from spreading to healthy udders:

1. Before each milking, prepare a pailful of hypochlorite solution to contain 400 parts of chlorine per million parts of water (commercial products carry directions for making up various strengths of solution). Soak two clean towels or cloths in this solution. Wring one out, carefully wipe the udder and teats, and return the cloth to the pail. Use the second cloth in a similar manner for the next cow. Continue with the remaining cows. This gives the chlorine a chance to kill any mastitis germs and prevents their being carried on the cloth to the next cow. Replace the solution with a fresh lot when it gets too dirty. Wash the cloths and hang them up to dry after each milking.

2. When milking, rinse the hands in hypochlorite solution and wipe dry before passing to the next cow. Dip milking machine teat-cups in a similar solution.

3. After each cow is milked, immerse the teats in hypochlorite solution to kill any germs left there.

4. Always milk healthy cows first.

### Treatment

There is no cure for chronic infectious mastitis, and little that can be done in the way of treatment, hence the emphasis on prevention. Drugs or vaccines may sometimes cause a temporary improvement, but usually the germs remain in the udder after treatment. Treatment is applicable particularly to attacks of acute mastitis *and to injuries to the point of the teat, which latter almost invariably result in chronic mastitis infection.* To be effective, any treatment must be applied at the first sign of trouble.

There is no "cut-and-dried" method of treatment which is uniformly effective in all cases of acute mastitis. Various factors have to be considered which can only be determined by a veterinarian. If a veterinarian is not immediately available, the farmer must do what he can along the following lines: Bathe the affected quarter gently with hot water for half an hour three or four times daily; after drying thoroughly, apply hot antiphlogistene and a suspensory bandage to relieve the weight of the udder; keep the cow blanketed and as quiet as possible; remove the germ-laden milk from the quarter frequently, taking care that the udder tissue is disturbed as little as possible; never massage the udder during an acute attack; reduce the amount of concentrates and feed lightly twice daily with bran mashes containing one-half ounce of saltpetre, but avoid the use of drastic cathartics such as Epsom salts.

Injuries to the point of the teat should be treated promptly by soaking the teat in a disinfectant solution such as potassium permanganate,  $\frac{1}{4}$  teaspoonful to 1 quart of water. Use an egg cup to apply the solution to the point of the teat, holding it there for five minutes. After soaking the teat thoroughly, apply an antiseptic ointment such as iodized vaseline. Do not use teat tubes or teat dilators under any circumstances.

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