

Bovine Mastitis

Some factors in its control

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MASTITIS in dairy cattle is responsible for greater economic loss to the dairyman than any other disease. These losses are represented by loss in quantity of milk produced, lower quality of product and loss through sacrifice of animals sold to market because of severe mastitis. Until the last few years too little attention had been given to this important disease. The fact that there was no effective treatment for the condition was no doubt chiefly responsible. The discovery and development of new drugs during the last few years has found some of these agents to be effective against certain agents causing bovine mastitis. As a result considerable study and research is being conducted on this important problem.

The viewpoint of the veterinarian should be one of control rather than treatment of mastitis alone. Control of mastitis involves preventive medicine as well as therapy. In fact, preventive measures should be of primary consideration and therapy used as an adjunct in a control program. It is apparent that successful control of mastitis can be accomplished only if a complete program is decided upon by the veterinarian and his client. Full cooperation of the client is of primary importance. Unless hygienic measures outlined by the veterinarian are carefully

followed by the dairyman in his daily milking operation, the veterinarian can do little toward eradicating the disease from a herd. Individual cases may be successfully treated by the veterinarian only to be reinfected due to insanitary milking procedure.

The most essential part of a control program is the establishment of a milking order in the herd. This means milking all of the non-infected animals first, those of doubtful status next and those known to be infected are always milked last. Accurate diagnosis is very important in placing the animals in their proper place in the milking order. Since the greatest number of cases are chronic and often difficult to diagnose, the diagnosis of these cases presents a problem to the veterinarian.

Diagnostic Tests Used

Various diagnostic tests have been used to detect mastitis. A full discussion of these will not be attempted here. However, a number of them will be mentioned as used in a control program.

The strip-cup is very useful in diagnosis and is one of the simplest tests. This test will detect acute and subacute cases, but very few chronic cases can be detected by only one examination. Almost all chronic cases are preceded by an acute stage and may have acute attacks from time to time during lactation. Acute attacks occur especially at parturition. Thus, if a herdsman would use this simple test and record the positive quarters each day, this record will aid the veterinarian materially. When used regularly at each milking over a period of time, few cases

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either acute or chronic will escape detection by the strip-cup method. Of course, it would be unsatisfactory to use this method of diagnosis alone. Other methods should be used in establishing the infected cows in a herd and arranging them in a milking order.

Efficient Tests

The most efficient tests for udder infection are cultural methods. By these methods the causal organism can be positively identified. Direct microscopic examination of an incubated sample or plating in blood agar rank quite high in efficiency. Hotis tests are highly efficient in detecting infection due to *Str. agalactiae* and can be easily combined with direct microscopic examination. Indirect methods of diagnosis which depend on determination of abnormal constituents of the milk are less efficient, but may be used to good advantage. Leucocyte count, catalase, chloride and bromthymol blue tests are valuable if properly interpreted. Physical examination of the udder is important in determining acute swelling, atrophy, and induration of the udder. Palpation



Fig. 1. The use of a strip cup is a valuable aid in diagnosis if used daily.

of the quarter will aid in determining the extent of damage to the gland by infection. This is important when a decision is to be made as to which animals may respond to treatment and which should be sold. Those with extensive induration usually do not respond to treatment and are the most hazardous to the herd as far as

spread of the disease is concerned. Furthermore, those animals which have atrophied or badly indurated quarters are usually unprofitable to the owner because of diminished milk production.

At least three tests should be used on each quarter examined. The strip-cup and palpation should be employed, one or more of the indirect tests and a cultural method depending upon facilities. If possible more than one examination should be made. Fore-milk rather than stripplings should always be used.

Establish Milking Order

When diagnosis of all of the animals in a herd has been made, they should be arranged in the milking order. Cows free of infection must be milked first always. Those animals showing infection should be milked in order of extent of infection. That is, cows having only one quarter involved should be milked first of the infected group. Any animal in the non-infected group which shows any swelling of the udder or gives any abnormal milk should be put in the infected group immediately. Additions to the herd should be examined and placed in the proper place. First calf heifers which show no gross evidence of infection at parturition are usually free from infection, but should be examined. If possible the infected animals should be isolated and milked with separate milking machine in another barn or separate part of the barn. If the cows are hand milked the infected animals should be milked by a person other than the one milking the non-infected group. In smaller herds where these last considerations cannot be practiced, it is especially important that the milker's hands or the teat cups on the milking machine be disinfected between each cow. This should be done between all cows whether infected or not. Since the most common method of spreading infection is by contaminated teat cups or milkers' hands, this is of utmost importance. It is here that many well planned programs will fail unless the dairyman adheres strictly to these practices.

Washing of the udders should be done in the approved manner. A separate

cloth should be used on each cow and then washed before it is used again. Between milkings the cloths should soak in standard chlorine solution. There are a number of other factors which may contribute indirectly to infection and must be controlled. Injury to the teat or udder and especially the teat orifice renders it highly susceptible to infection. Overcrowding is conducive to injury because of the danger of cows stepping on each other. Inadequate separation of animals by partitions will also increase the number of injuries. Milking on the floor and the feeding of raw mastitis milk to heifer calves should be prohibited.

Disease Controlled

All of the factors mentioned above should be put in operation in order to control the disease in a herd. Many herds in Europe and in this country have been freed of infection in two to three years when this program alone was used. Treatment of suitable cases should hasten the time required to eradicate the disease, save animals already infected from further damage, eliminate possible spreaders of infection as well as increase the quality of milk produced. Failure to improve sanitary conditions in a herd before



Fig. 2. Collecting milk in a sterile tube for cultural examination.

treatment is attempted will result in little progress. Cases may be successfully treated only to be promptly reinfected under such conditions. A number of drugs have been used successfully in the

treatment of chronic streptococcic mastitis. Acriflavine, novoxil, gramicidin, tyrothricin, and sulfanilamide have received the most attention. All have been tried under experimental conditions and figures as to efficiency are quite comparable. The



Fig. 3. Treating a chronic case by the infusion method will save many animals from further damage as well as eliminate the spread of infection.

details of their use should be left for discussion in another paper.

Conclusion

In conclusion it should be emphasized that mastitis control consists primarily of a planned program of hygiene in the dairy herd. The establishment of a milking order is considered essential. Treatment is a valuable aid to a control program, but should begin after hygienic measures have been established if the disease is to be controlled.

In a future issue of the Veterinary Student, Dr. Packer will discuss the treatment of bovine mastitis.

—The Editor.

The Medical Research Institute at Vornonezh, in the U.S.S.R., has prepared a film in which blood is pumped back into a dog from which it was drained ten minutes previously. The heart beat and breathing are restored and the dog continues living a normal life.

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