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Mastitis Control Programs

by

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The control of bovine mastitis is the biggest challenge the large animal practitioner is faced with today. When combined with reproductive disease control, it is a valuable service to the dairyman and a good source of income for the veterinarian. In most areas of the country, there is a real demand for preventive veterinary medicine. Probably, a group or partnership practice with specialists programmed for periodic visits to the dairy farm is the best approach to mastitis and reproductive disease control.

The dairyman derives a larger dollar return from his investment in reproductive and udder disease control and prevention than from most other operational expense.

Early in his professional career, the busy veterinarian must learn to undertake consultation with only those who are capable of and willing to implement his recommendations on a continuing basis. The veterinarian must acquire an understanding and appreciation of the economics of his recommendations if he expects to maintain his position in modern day agribusiness.

The veterinarian’s basic responsibility is to convince his clients that they cannot live with mastitis. It is much too costly a condition from the standpoint of loss in milk production alone. In the average herd, 40% of all quarters are infected and the resulting inflammation results in a decreased milk secretion from the affected quarter.

In any concerted approach to mastitis control, the veterinarian has some responsibilities to fulfill before attempting to pro-
vide a professional service to his clients.
1. He must understand the complex physiology of milk production.
2. He must acquire a working knowledge of the fundamental principles of milking machine operation and be able to make a few simple checks so that he can recognize mechanical faults.
3. He must have a microbiology laboratory at his disposal and become competent in the accurate interpretation of their reports.

At this point, four terms must be understood before proceeding. *Intramammary infection* (IMI) is diagnosed by the detection of 200 or more colony-forming units/ml in 2 or more samples of milk from one quarter. There usually is only one type of microorganism and never more than three types recovered. Almost 100% of all mastitis is primarily related to IMI. *Non-clinical mastitis* is a form of disease where the milk and udder are clinically normal, but there is an increased somatic cell content in the milk associated with an established IMI. Most control programs are based on reduction of nonclinical mastitis. *Control* is the process of limiting a disease to its present level (a reduction in prevalence is implied within this definition). *Prevention* is the reduction in the rate of new disease (e.g., IMI) to zero (or near zero).

In any mastitis control program, some chronically infected cows will most likely have to be removed from the herd because of failure to respond to treatment or for other equally important reasons. Also, treatment of IMI at anytime during lactation or the dry period, without initiation of an effective program for prevention of new IMI can provide only limited success in control of mastitis.

Two basic types of mastitis control programs exist today: Bacteriological control and management control. Both types are based on eradication of IMI. More than 90% of IMI is caused by *Staphylococcus aureus* and streptococci. *Streptococcus agalactiae* (SA) is probably the most common cause of IMI in the cows in the United States. Herd eradication of SA is aimed at elimination of the microorganism from infected quarters and the herd environment. The cost of eradication is at least $10 for each cow in the herd and most of the cost is incurred from dumping antibiotic contaminated milk. A program is in effect in Connecticut, New York, Massachusetts, and Denmark as well as other areas.

An outline of a program aimed at herd eradication of SA is as follows.
1. Culture gravity cream from a sample of bulk tank milk on a selective medium.
2. If the culture is negative for SA, repeat monthly culturing until all cows within the herd are lactating during at least one sampling time.
3. If SA is detected, initiate teat dipping and collect samples of milk from all quarters of all lactating and dry cows.
4. Immediately treat with penicillin all quarters shedding SA.
5. Collect quarter milk samples from all cows in the herd 14 days after the last treatment.
6. Repeat steps 3, 4 and 5 until 2 or more consecutive tests of the entire herd are negative for SA.
7. Monitor each SA-free herd by periodic culturing of gravity cream from a sample of bulk milk.

Many practitioners approach mastitis control by treatment of clinical cases only. This offers only temporary relief of the clinical condition and will eradicate no more than an average of 15% of the IMI associated with the clinical condition. The program in Ontario is primarily aimed at treatment of IMI and when a herd leaves the program it takes less than 2 years for the level of IMI to return to a high level.

There are several different management approaches to mastitis control. The alert veterinarian should always be on the lookout for cure-all gimmicks such as feed additives including antibiotics and vitamin mineral mixes. IMI is an infectious, contagious disease and most of these materials will be of little value. The sale of cows as they develop clinical mastitis has been advocated. Some practitioners presented with an abnormal milk problem will run a screening test, such as the California Mastitis Test (CMT) on all quarters and...
initiate treatment of all quarters that show a positive reaction. A much better procedure is first to correct all known faulty management practices. Then, 1 or 2 months later, samples of milk from each quarter should be checked bacteriologically for detection of IMI and subsequent treatment.

Other management programs advocate dipping or black flushing of milking machine clusters between cows. Segregation of the herd into three groups based on the results of the CMT has been recommended. To be of value, segregation should be based on the results of periodic bacteriological examination of milk from all cows.

The most effective approach to mastitis control is the Milking Time Hygiene—Dry Cow Medication Program. Hygiene at milking time includes dipping of all lactating cows' teats in a proven effective disinfectant solution following every milking. This procedure destroys two general groups of microorganisms that are on the skin on the teat end and in the distal end of the teat canal: those bacteria that can grow on the skin and those that were transmitted to the area by the milking technique. Dry period medication, as currently recommended, includes infusion of a long-lasting antibiotic preparation into every quarter after the last lactational milking. This simple procedure not only acts as a treatment to eradicate IMI, but also acts to prevent new IMI during the dry period. To be the most effective, both milking time hygiene and dry cow medication must be used concurrently within each herd. In initiation of this control program in a herd, all quarters of all cows near calving might be infused with antibiotics in a quick release base. It might be advisable to consider two infusions into each quarter with a 2 or 3 day interval between consecutive infusions. All quarters of cows in the first part of the dry period should be infused with antibiotics in a long acting base.

An outline of the benefits derived from control and prevention of IMI include:

1. Increased milk production
   A. Noninfected quarters
   B. Longer economically productive life
   C. Less death
2. Fewer heifer replacements
3. Less discarded milk
   A. Adulterated
   B. Abnormal
4. Decreased labor costs
5. Decreased veterinary costs
   A. Services
   B. Drugs

In any mastitis control program it is essential to:

1. Improve the milking technique.
2. Require competent routine preventive maintenance of an efficient mechanical milking system.
3. Dip all teats in a proven effective disinfectant solution after every milking.
4. Carry out an effective dry period medication program.

References