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Mastitis is a Disease-- Control is an Everyday Task

A comprehensive mastitis control program will effectively control infections caused by both environmental and contagious pathogens.

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Herd mastitis problems can be caused by both environmental and contagious pathogens (disease-causing organisms). These problems may occur separately or simultaneously. Various testing techniques are necessary to determine the type of causative organism and the infection level of the herd or individual cow. Appropriate tests include the CMT (California Mastitis Test), milk market somatic cell count (SCC), Dairy Herd Improvement Association (DHIA) SCC and laboratory cultures of milk from infected cows. Depending upon test results, mastitis control strategies may need to be changed to address both associated infections and types of pathogens. A good control program must consider all possible causes of the disease. No potential disease risk should be ignored. The most appropriate action to prevent or eliminate a disease depends upon the causative agent, so accurate diagnosis is essential. Cows that are non-responsive to therapy should be culled.

Development and implementation of a comprehensive mastitis control program will generally reduce the herd infection level. This applies to infections due to both contagious and environmental pathogens. The most com- mon contagious pathogens are *Staphylococcus aureus*, *Streptococcus agalactia* and *Mycoplasma* sp. Common environmental pathogens include *Escherichia coli*, *Nocardia*, *Klebsiella* sp.,

Enterobacter sp., *non-agalactia Streptococcus* sp., *Citrobacter, Proteus, Pseudomonas* and *Serratia* sp. The essential elements of a practical, comprehensive and effective mastitis control program are outlined in Basic Principles of Mastitis Control (*NebGuide G95-1253*). Application of, and strict long-term adherence to, the practices outlined therein will enable the dairy producer to maintain favorable SCC levels. A more complete coverage of mastitis control strategies and a series of producer-oriented self-help checklists are included in *Mastitis Control Guidelines* (EC87-726).

Infections due to contagious pathogens tend to result in high SCC levels and are often of longer duration. In contrast, the response to and manifestation of infections due to environmental pathogens are highly variable because the cow's immune system responds differently to the pathogenic characteristics of specific organisms. Consequently, SCC response depends upon the specific pathogen and the capabilities of the animal's immune system to cope with the agent involved. Fortunately, most infections caused by environmental pathogens are controlled or eliminated by the cow's own defense mechanism with no intervention by the producer. This may account for the wide variation in SCC levels experienced in some cases. Occasionally, infection by certain pathogens is so severe that udder gangrene and/or endotoxemia occur. Under these circumstances the cow may die within 12-24 hours due to interference with or failure of normal and vital body functions. Critical times for exposure to environmental pathogens are during the cow's dry period, close to calving, and in periods of high humidity and warm temperatures, especially if the cow environment is wet.

Our goal is for all dairies to maintain bulk tank SCC levels of 300,000 or less. Higher levels indicate a serious mastitis problem in your herd. Your personal goal should be to reach 300,000 and then to reduce your average SCC by 50,000 per year until you reach and maintain levels at 100,000 or less. Sustaining SCC levels at 100,000 or less requires diligence and dedication to details on a daily basis. Lapses in your attention to details that were accept- able with an SCC of 300,000 become unacceptable and intolerable if you are to maintain an SCC of 100,000 or less. The economics of milk marketing bonus programs associated with low SCC levels make low SCC goals economically worthwhile and rewarding. Benefits include less involuntary culling, increased milk production, reduced labor, less milk dumped, reduced risk of antibiotic contamination, lower veterinary costs and a better quality product.

Like any fine-tuned system, as the expected level of performance increases, the acceptability of compromises decreases. To achieve the necessary level of control, you must "tighten the management screws" and keep them tight every day! Some producers refer to this as "nit-picking." In practical terms it means every part of your "management machine" must be kept in top operating condition every day. As with a winning race car, any "misfiring" of any "spark plug" in the "engine" that drives your management machine becomes unacceptable. Any deficiency in your milk production system or management program must be addressed immediately.

Our experience with infections caused by environmental pathogens suggests the primary reason some low SCC herds seem to have more "environmental mastitis problems" is failure by management to "identify and tighten all the loose screws" or to keep them tight. Maintaining a low SCC level requires **strict, unwavering adherence to basic mastitis control program strategies**. Failure to promptly correct even minor deficiencies in any aspect of the milk production system will increase the risk of new infections. Continual and dedicated attention to each of the following areas is essential.

Basic Management

Maintain complete individual cow records of all health and performance-related problems. The more you use and maintain your records, the better the return on your investment. DHIA and individual cow SCC records are essential and must be utilized. Keep udder hair clipped. Keep feet well-trimmed and

healthy to promote exercise, feed intake and good overall health. Use the CMT on all questionable cows and to help determine when infections are occurring. Record test results.

Cow Housing and Environment

Clean, dry and comfortable--at all times--are no longer negotiable goals or standards. Clean, dry conditions limit the growth of pathogens and exposure of the cow to non-healthful conditions. Comfortable cows maintain health easier and have fewer disease problems. Make sure free- stalls are clean and dry throughout the bedding depth, not just on the surface.

Do not allow cows access to ponds or other standing bodies of water. Such practices are an invitation to disaster, as these water sites contain many types of bacteria and are continually contaminated by animal fecal material. Allowing cows access to standing water is also a violation of the Federal Pasteurized Milk Ordinance. Many states have similar restrictions.

An insect control program is essential. An effective program must include strategies to control lice, ticks, house and stable flies, etc. The first and most important step in controlling fly breeding is proper management of manure and other materials such as spoiled silage, spilled feed, weeds and pooled water. Be sure your insect control program also covers calves and heifers. Farmstead cleanliness is an essential part of an insect control program.

Milking System Function

Keep it operating like a fine-tuned race car. Routine problem prevention maintenance is cost-effective. This includes thorough and complete evaluation of all functions and components at least once per 1000 hours of operation. Don't over-use inflations or assume other system components will last indefinitely. Pulsator function should be graphed and evaluated at least once every 90 days. Vacuum regulators should be serviced at least monthly.

Milking Procedures

Be sure you use the milking system properly and are milking dry, clean--not cleaned--cows. (Having to wash or clean more than 1-2 percent of your cows in preparation for milking indicates a serious deficiency in the design or management of the cow environment.) Limit air admission during unit attachment. Use hose supports to align the unit with the udder. Be certain claw vacuum is relieved before unit is withdrawn. Dip every teat of every cow after every milking with a product having appropriate ingredients and proven effectiveness.

Veterinary Practices

Respond promptly and effectively to any indication of health problems. Keep teats healthy. Check foremilk from every quarter at every milking. (This also aids in effective milk let-down.) Keep teat dip applicators clean. Establish a milking order so infected and high SCC cows are milked last. Seek out and use the services of a knowledgeable and skilled veterinarian on a regular basis.

Extraneous Voltage

Maintain the on-farm wiring system to reduce the risk of current leakage and equipment failures. Contact your utility company if you see any damage to their electrical distribution system or suspect a

problem. Both the primary (utility company) and secondary (on-farm) systems must be well designed and maintained, and working properly, to minimize the risk of extraneous voltage problems.

Nutrition

No direct link between nutrition and mastitis is known to exist other than deficiencies severe enough to suppress overall health by limiting immune system function. (In a non-sanitary environment, an unhealthy cow spending more time lying down increases exposure of her teats to potential pathogens. These conditions increase the risk of infection, so cleanliness is a must.) Provide fresh feed for cows as they exit the milking area. This will encourage cows to remain standing while the teat sphincter muscle closes the teat orifice after any milking

Genetics

The transmitting ability of resistance to mastitis appears to be minimal and may only be circumstantial. However, selecting sires whose daughters have good teat placement, well-suspended udders, good feet and legs, moderate teat length and who exhibit a tendency towards low SCC levels and similar desirable characteristics is worthwhile. Differences between susceptibility to contagious vs. environmental pathogens have not been evaluated. Although worthy of consideration, do not base your breeding program on SCC tendency only. Genetic tendency is of little benefit in a poorly managed herd.

Vaccination

Presently, several companies manufacture and market approved vaccines to aid in the control of specific types of udder infections. These have proven helpful in reducing some environmental mastitis and occasional *Staphylo- coccus aureus* infections in first-calf heifers. Fringe benefits may include reduced risk of acute coliform infections and prevention of possible gangrenous mastitis from a few of the other available vaccines.

Vaccination is not a substitute for proper management. Avoid the tendency to place too much confidence in the vaccine preparation and neglect the importance of sanitary milking procedures, proper milking system func- tion and sanitation of the cow environment. Mastitis problems can only be managed or controlled with total quality management. Vaccines and antibiotics are only tools to aid in the total control program. **Consult your veterinarian about the use of vaccines**.

Purchasing Herd Replacements

Always take steps to avoid buying problems. Purchase replacements only from low SCC herds and herds with a good, routine health program. Arrange to test lactating cows with a cow side test prior to the sale and com- bine these results with DHIA records to more fully evaluate possible purchases. Have a veterinarian conduct an examination of animals identified as potential herd replacements. Isolate all new animals from the main herd for at least 30 days to allow further evaluation and time for any necessary actions to reduce the risk of disease introduction.

Summary

The dairy industry includes diverse farm management systems. Many factors are involved in determining the ultimate profitability of each operation. Herd management programs that reduce the risk of disease and need for and use of antibiotics should be implemented and maintained. Consider mastitis vaccines only as part of a total herd management program, each area of which has been addressed and

verified as an effective part of your mastitis control program. In all instances, knowing what organisms are affecting your cows is of vital importance.

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