

ENVIRONMENTAL MANAGEMENT AND MILK QUALITY

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Mastitis is a significant cause of economic loss on dairy farms. The losses arise from decreased current and future production, treatment costs, milk discard costs, quality premium losses, and premature death and culling. These losses need to be minimized through timely implementation of economically justified interventions.

The foundation of all mastitis control programs revolves around two very simple things: reducing the amount of bacteria on the cow's teat and preventing the bacteria from getting into the cow's udder. Recommendations for control of mastitis must be evaluated in light of the impact on these two factors. There are three areas to be addressed when attempting to achieve progress on these two factors.

- Milking equipment
- Milking technique
- Environment

If there is a major breakdown or bottleneck in any one of these areas, that area can become the limiting factor in preventing mastitis. Resolving a major bottleneck tends to produce dramatic results and can quickly improve a farm's milk quality. However, in today's progressive dairies attempting to produce milk with bulk tank counts of 250,000 cells/ml or less, it is most often a minor breakdown in all three areas that can lead to problems preventing a producer from reaching the goal of preventing mastitis.

There is ample evidence that the frequency of intra-mammary infection is directly related to the level of exposure of the teat to bacteria. The industry has developed successful monitoring tools, has effective and proven post-dips and pre-dips, and has standards for milking equipment and milking techniques. However, we have tended to ignore management's responsibility to present an extremely clean cow to the milking center. If we simply blame the cow and react by cutting her tail off or burning the hair off her udder to remove contamination, we probably will still have mastitis problems.

We can also adjust milking system so that we have a vacuum level of 13.2 instead of 13.1 or a pulsation ratio of 60:40 instead of 61:39, or switch liners. However, problems often remain. We can change milking technique and write endless protocols, have our milkers wear gloves, back flush units, and debate the merits of sequential vs. territory milking procedures, yet too often problems remain.

Why do farms that implement many of the above expert recommendations still have mastitis problems? I would respectfully suggest that these recommendations cannot succeed if we continue to present cows to the milker with teats are covered organic material and bacteria. It doesn't matter if the operation is a dry lot, a freestall, a stanchion barn or a grazing herd; proper maintenance of freestalls, dry lots, tie stalls and field traffic areas are a necessity if we are going to control the bacteria level on the cow teat.

There are multiple references describing proper freestall design. Obviously, when a cow is thinking "you want me to lay in this!?" production as well as SCC is going to suffer. However,

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just as a perfectly designed and functioning milking center is doomed to failure if proper milking technique is not employed, even well designed freestalls are doomed to failure without the proper and continuous maintenance.

There are four basic areas involved in freestall maintenance:

- Daily maintenance
- Bedding maintenance
- Stall bed maintenance
- Stall partition maintenance

Poor bedding and stall maintenance are the most common reasons good freestall designs become completely dysfunctional and result cows being presented to the parlor with filthy udders.

Stall partition maintenance needs to be done on an as needed basis, but it needs to be done immediately, not after we hurt a cow. Partition cost is minimal when compared to that of an injured cow.

Refilling frequency of bedding will vary on the type of bedding used. Obviously, concrete will not need to be maintained as much as sand. However we do not want to sacrifice cow comfort and production for ease of maintenance. Regardless, the proper slope needs to be maintained to encourage stall use and allow proper position in the stall. Stall refilling can be facilitated through mechanical means so that it can be done on a regularly scheduled basis as well as in a labor efficient manor. While once per week can work in some barns, many dairies require more frequent bedding refilling.

However, daily maintenance of the bedding is still required. This may involve nothing more than a rake and spot cleaning several times a day as cows are moved to the parlor. Ultimately, providing the labor resources to maintain stalls properly becomes a management decision, based on the economics of producing a quality product.

Feed and alley lanes need to be clean 2-3 times daily in freestalls barns. Flush systems, manual scrapping, or alley scrappers are all highly successful if done on a frequent repeatable basis. Once per day is simply not enough.

In summary, a well-maintained freestall is a wonderful place for a cow, but there is nothing “free” about it. It requires daily, consistent and ongoing maintenance.

Dry lot design will vary on the climate, geological and EPA restrictions. It has been recommended that the size of a dry lot including feed lanes and shades should be from 400-600 sq. ft. cow. Proper slope for drainage is a must. A 2-3% slope perpendicular to the feed lane with a 1% longitudinal slope along the feed face has proven effective. Excessive slope must be avoided, especially in wetter environments.

Dry lots should be cleaned daily. Situations that increase cow density such as congestion under shade areas may require more than daily maintenance. Just as proper freestall design is important, proper shade design is also. Recommendations are that shades be 18-20 ft tall and 20-24 ft wide. The space required per cow is 38-42 sq. ft. A solid shade structure tends to be more effective than movable ones.

Just as there is no such thing as a “free stall” there is no such thing as a “dry lot”. When weather conditions deteriorate in dry lots, the tendency is to pick up the pace on lane scrapping, but ignore where the cow is spending the majority of her time. This is often done with the justifiable excuse that it is not possible to get into the lot to clean it do the weather conditions. Weather cannot be used as an excuse when attempting to produce a quality product. Lots also need to be maintained on a daily basis. Feed lanes, crossover lanes, waters and shades need to be

maintained at least daily and in certain times of the year more than that. If not done at least daily we will soon end up with shades that are impossible to clean or lots that are no longer functional.

We must emphasize, “clean” but not forget about cow comfort. Depending on the dry lot base, we will need to balance cleanliness with cow comfort. In a dry lot, cows should be scattered out across the lot. Bedding may need to be considered during certain times of the year. Not only will it provide cow comfort it will help keep the animal clean as well as absorb moisture.

Supplemental bedding in dry lots should be considered whenever cattle began to congest or congregate under shade due to the heat or wet conditions. Inorganic bedding offering the advantage of being a poor environment for bacteria growth and keeps the animals clean which promotes moisture drainage away from the cow. It is ideal in areas where fans and misters or corral coolers are being used.

Organic bedding is less expensive and usually readily available. It has the disadvantages of requiring more maintenance and the opportunity to become a primary source of mastitis pathogens if not maintained.

The bottom line is that reducing the exposure of environmental bacteria on the cow’s teats needs to be a primary concern in any mastitis control program, regardless of the type of housing system. Getting cows clean cannot be totally conducted in the milking center. It must begin outside with proper housing design, proper bedding, ongoing maintenance, and attention to the details that result in bringing the cows to the barn that are not only dry and comfortable, but are also clean if we are to maximize milk quality and ensure profitability.