The Environment and Mastitis Control

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The environment plays a huge role in cow performance as well as mastitis control. Keeping the cows clean, dry and comfortable is the secret to any dairies success. There is little doubt that keeping cows comfortable is the key to higher milk production and lower cull rates. I have claimed for years that if a dairy farmer is able to listen to what their cows are telling them, they will have a much higher ability to have a successful and profitable dairy. If they ignore what the cows are saying, the dairy usually struggles with many different problems.

Cows will tell you something is wrong when they won't enter the parlor or barn, stand part way into the stalls, not eat the feed due to sore necks, are limping around due to sore feet or swollen hocks, don't like to be milked or don't drink water. Pay attention to these important signs because the cows are telling you something is not right.

If cows have dirty teats at milking time, the risk to new infections is much higher.

The first thing to do is score the cleanliness of the cow's legs and udder. There is an excellent article written by Dr. Noritisugu Abe in Hoard's Dairymen in June 1999 that clearly shows the relationship to dirty legs and udder contamination.

One of the most important protocols that can be developed for a dairy is proper stall maintenance. It is very important that the cow and her udder are always laying on a clean and comfortable surface. At every milking, all manure and wet bedding must be removed from the stall and fresh bedding placed over the wet spots. If over 5% of the stalls need to be cleaned, then adjustments need to be made with the neck rail in a free stall barn or the trainer in a stanchion/tie stall barn. The first step in reducing the risk of new infections is keeping the manure and urine out of the stalls.

In free stall barns, I recommend that the person who goes to get the cattle for the parlor needs to have a combination rake/scraper in their hands. As they calmly move cattle toward the parlor, they rake out the wet spots and pull fresh

bedding over those spots. When they get to cross alleys, they then need to scrape all the manure out of these areas. Keeping the stalls and cross alleys clean is a job that must be done at every milking in both free stall and stanchion/tie stall barns.

I believe one of the most important factors in cow health and milk quality is the free stall loop design. Many people have gotten carried away and feel the free stalls need to be bigger. It seems to me that it is only a matter of time when we will have all cows housed in their own little box stalls. The wider stalls will make animals dirtier, increase labor requirements to maintain the stalls, increase building costs by having less stalls per barn, and decrease milk quality. Many of the Canadian milk quality specialists are constantly complaining that the wide stalls are not the answer when it comes to lower milk quality. If the proper loop is installed that allows the cow to lunge forward or to either side, the size of the stall does not need to be made larger. Of the ten highest producing dairies in my practice (>13,600 kg), all have free stalls that are only 117cm wide. The neck rails are 117-120 cm above the bedding and 160cm forward from the back of the curb. Lay down rates, cull rates, and SCC are all in the excellent range when compared to other dairies. Cow comfort means cows are kept clean, dry, and comfortable without extra labor required. When building a barn, be sure the design you select does not reduce your ability to make the highest profit possible.

When designing barns to reduce the risk of manure splashing on their legs, the alleys need to be wider so there is less manure per square meter. On the feed alley, the minimum width should be 5 meters. On the cow alley, the width should be 4 meters. By having wider alleys, there will be less manure to splash on the cow's legs and udders. A recent trial showed that in barns where the stalls are head to head, the outside cow alley has approximately 25% of the total manure while the feed alley has over 75% of the total manure. Proper alley width makes a huge difference when it comes to mastitis control.

The outside yards need to be cement and scraped regularly. It is all right to store manure on the cement yard as long as cattle do not have access to the piles. The critical area is where the cows exit the cement yard. On most farms, the area along the edge of the cement is where the deepest mud is. If the mud hole is in this area, there will be a higher incidence of mastitis and foot problems. The best way to avoid this problem is to limit the cows exit area to one gate with a culvert in place to keep the area dry. You want to make a mounded walk way with excellent drainage for the animals to exit to the pasture. All low spots need to be fenced off in the pastures to avoid mud holes for the cows to lie in. All feeding areas need to be properly designed so mud holes do not develop around the feeders. All of these areas are breeding grounds to new mastitis infections.

Bedding also plays a huge role in mastitis control. Without any doubt, the absolute gold standard in bedding is clean sand. Sand is inorganic and will not grow bacteria very well and it gives the cows great footing so they can get up and down quickly and easily. Sand will give you better milk production, better cow health, and better milk quality. There will be less sick or broken cows on herds that use sand. If you don't want to use sand, then it is up to you to select your best poison.

Sand works extremely well in both free stall barns and stanchion/tie stall barns. Dairies that put sand in stanchion/tie stall barns see less hock and leg injuries, less stepped on teats, and better lay down rates. With sand, you only need to bed once a week so you save on labor as well. Sand minimizes many of the negatives to any housing type.

A recent study done at the University of Wisconsin has calculated the value of sand over mattress beds with organic bedding. Twelve herds of similar size were evaluated for two years. Six of the herds used sand bedding and the other six had mattresses with organic bedding. There was a $500 advantage per cow per year when housed on sand. The sand herds had lower lameness, healthier legs, lower cull rates, and over 1000 kilograms more milk production than the mattress herds. This $500 advantage can buy a lot of manure handling equipment. Using sand definitely pays by giving the cow more comfort.

The organic beddings that are most commonly used are straw, wood products, and manure. Each of these beddings has their own weaknesses and it is important for the dairy farmer to manage them correctly. If straw is going to be used, it should be clean, dry and chopped. Straw has the highest level of Environmental Streps, moderate levels of Klebsiella, and low levels of Coliforms. When looking at wood products, it is very important that the wood products contain little bark and are dry. Green wood products can be high in bacteria which can cause serious clinical mastitis.

When looking at wood products, the courser the shavings the fewer bacteria present. Fine sawdust contains more bacteria thus there is a greater risk involved. Wood products have the highest level of Coliforms, moderate levels of Klebsiella, and low levels of Environmental Streps. Manure products are probably the most difficult to manage. For the best results, the manure products need to be composted so the heat kills the majority of bacteria. Using wet manure products can lead to serious mastitis problems.

No matter which organic bedding you use, it is critical to keep adequate amounts under the cows and keep it clean and dry. As organic bedding is allowed to build up, so do the bacteria numbers. The best program is to remove all bedding every day and replace it with clean and fresh bedding.

Unfortunately, this system is not very practical or economical to most dairy farms.

Several items are available to reduce bacteria growth in stalls. The addition of lime or calcium carbonate will change the pH of the bedding and help reduce bacteria growth. I recommend that the stall be scraped to the bare surface and then a light layer of lime is placed on the stalls. After the stall has been covered with lime it is very important that an adequate layer of bedding be placed over it.

Another product called Tek-trol can be used to spray the stalls weekly. This is strongly recommended in stalls with mattresses or rubber mats. Once a week, the back 60 cm of the stall is clean off and then sprayed with the Tek-trol solution. After the stalls are sprayed, fresh bedding is placed over the area.

The management of the pre-fresh and calving areas plays a big role in herd performance. Unfortunately, many dairies think they are doing their animals a favor by putting them on a bedding pack prior to calving. As I consult around the world, I have not yet found a dairy that really does a great job of managing a bedding pack. In fact, most bedding packs are really manure packs and a key source of bacteria to the udder and reproductive track. It has been my experience that dairies that keep the pre-fresh animals in well maintained stalls until a few hours prior to calving have had the best success. These dairies move the animals to an individual calving pen. The animals will be in these pens several hours before calving and up to 24 hours after calving.

When I evaluate dairies, one of the highest levels of new mastitis infections is in animals that have just freshened. If animals start their lactation infected, it will be a long year and put the rest of the herd at risk to having a higher SCC. Often times, the first lactation animals have the highest level of new infection at calving time. So instead of a fresh heifer diluting the bulk tank SCC, they actually contribute to the increase in SCC. My goal is to have less than 15% of the heifers or cows with a SCC over 200,000 on their first test after calving. If it is higher than that, there is over 700 kg of lost milk production in those animals for the lactation regardless of where the SCC goes on the second or third test period.

Another tool that reduces bacteria on a cow's udder is flaming or clipping the hairs off the cow's udders. The ideal time to flame udders is one week prior to calving so the animals calve with udders that are clean. When the fine udder hairs are removed, less bedding sticks to the cow's udder thus there are fewer bacteria available. There are many ways to remove the udder hair, however, udder singeing seems to work the best and is the quickest.

No matter if you have free stall cows or stanchion/tie stall cows, udder flaming works very well. Most of my herds flame all animals one week before calving

and all milking cows as needed. Keeping the fine udder hairs off the udder does reduce the risk to new infections.

When evaluating a dairy for mastitis control, make sure you evaluate the areas that the cows are housed for 24 hours a day. This means you need to get outside and walk around to make sure you locate any potential problem areas. Remember, the key to any successful dairy is keeping the cows clean, dry, and comfortable 24 hours a day. If the cows are happy, the end result is usually a very productive and profitable dairy. Remember, listen to the cows!