



SCC DIAGNOSTICS TOOL BOX



R-MC-1: Klebsiella Mastitis – Its Source is More Than Just the Bedding

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I've been hearing a lot from dairies lately concerned about Klebsiella mastitis. Many are particularly troubled since they do not use sawdust bedding. Some farms using sand are reporting Klebsiella mastitis problems. Case reports in veterinary journals during the early 1970s associated sawdust bedding with Klebsiella mastitis. For a long time we thought Klebsiella mastitis could be controlled by simply changing to another bedding source. However, recent studies indicate that sawdust may have gotten a bad rap and that Klebsiella bacteria are basically everywhere. A recent Cornell study on New York dairies showed that 80% of all manure samples from scrape alleys, 95% of rumen content samples, 80% of fresh cut corn, 30% of TMRs, 63% of bedding samples, and 84% of samples from water troughs were all positive for Klebsiella bacteria. When legs and teats were swabbed, over 50% were contaminated with the bacteria. Cow hygiene scores were correlated to the degree of Klebsiella contamination.

Klebsiella bacteria are everywhere, and the largest contributor into the cow's environment is manure where the bacteria's nutrient requirements are favorably met and their growth apparently fostered by the more starchy diets fed to modern dairy cows. This, coupled with the higher rates of passage through the high producing cow's digestive system, has perhaps contributed to the survival of these bacteria in the cow's environment and the apparent increase in Klebsiella mastitis prevalence.

Treatment of clinical Klebsiella mastitis is unrewarding. Klebsiella bacteria are resistant to antibiotics and are very devastating to cows. Many of these cows either die or are prematurely culled from the herd.

So how can we address the problem considering prevention is the only practical strategy?

Keep cows healthy: Well-fed stress-free cows will have stronger immune systems and will be more capable of fighting off disease. A coliform core antigen vaccine may also be somewhat helpful. Although these vaccines are not labeled to be efficacious against Klebsiella, there is some evidence that they strengthen the immune system's response to these bacteria. These vaccines will not reduce the number of new infections but they may reduce the severity of the infections lessening the impact on cows becoming infected.

Improve cow hygiene: Cleanliness of the lower rear legs, feet and udder has a significant effect on somatic cell counts. A Minnesota study of 1191 cows on 9 Minnesota dairies (using a cow hygiene scoring scale of 1 to 5) showed each change in scoring unit resulted in a 40,000 to 50,000 change in SCC.

Improve bedding management: Bedding bacteria counts are positively related to teat end bacteria counts, which are positively correlated with intra-mammary infections. Whatever type of bedding material is used, environmental bacterial growth will occur once the bedding is placed in a freestall. The rate of bacterial growth is affected by numerous factors. When implementing bedding management, consider the following factors:

- **Crowding** – More cows will mean more manure and urine.
- **Nutrition** – “High” production cows are eating more and will pass more manure into their environment.

- **Stall cleaning** – Soiled or wet bedding should be removed from stalls a minimum of every milking.
- **Stall design** – Stalls inappropriately designed increase the risk for fecal and urine contamination of the bedding.
- **Alley scrapping** – The more frequent, the better. Alleys should be scraped a minimum of every milking. Slotted floors offer the advantage of all moisture immediately draining away.
- **Ventilation** – Since bacteria require moisture, anything that can be done to reduce accumulation of moisture in the bedding will reduce bacterial growth.
- **Bedding storage** – Keep bedding dry.
- **Weather** – Higher ambient temperatures in combination with higher humidity will result in higher bacterial growth. Weather cannot be directly controlled but you can intensify bedding management to compensate.
- **Bedding frequency** – This will depend on whether inorganic (sand) or organic bedding is being used. In organic bedding, the greatest bacterial growth occurs in the first 24 to 48 hours after it has been placed in the stall. Therefore, organic bedding ought to be changed at a minimum of every other day. Ideally, sand bedding should be replaced every 5 to 7 days and maintained above the level of the curb.
- **Bedding strategies** – Using no bedding does not work! Neither does doing a poor job of bedding. The principle idea is to keep bedding bacteria counts as low as possible where that bedding has contact with the udder. Therefore, the cleanest, least contaminated bedding should be under the cow's udder.

Finally, excellent pre-milking cow prep is a MUST: Cow prep is your last line of defense and the most important means of protecting cows from getting *Klebsiella* or any of the environmental mastitis infections. Therefore, take adequate time to clean and disinfect teat surfaces, especially the teat end.

