

SAND BEDDING AND COLIFORM MASTITIS – A CASE REPORT

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Introduction

Considerable debate exists over the thresholds of concern for bacterial contamination of bedding materials in stalls used for lactating dairy cows. In addition, different bedding materials may behave differently in terms of their ability to transfer bacteria to the teat end (Zdanowicz et al., 2004). This case report explores the association between bacterial contamination of sand bedding and clinical mastitis on a commercial dairy farm.

Materials and Methods

A 1314 cow Holstein dairy herd was visited in October 2002, with a complaint of rising clinical case rate. The herd was housed in a 2-row freestall barn, with sand bedding and milked three times per day through a double 22 parallel parlor. Annual cow case rate for clinical mastitis was 56.1% with the distribution of clinical cases by DIM demonstrating a peak at 60-90 DIM. Individual cow SCC trends indicated an elevated new infection rate in lactating cows beyond first test. Culture samples from 121 clinical quarter cases of mastitis taken during the previous 4 months were processed through the Wisconsin Veterinary Diagnostic Laboratory. 17% were due to *Klebsiella spp* and 18% due to *E.coli*, 6% of cases were due to *Streptococcus dysgalactiae*, 3% *Enterococcus spp*, and 48% of cases had no significant growth.

Poor teat end health and hygiene practices in the treatment parlor were factors from the investigation that needed to be addressed. However, the quality of sand bedding was suggested as a source of environmental pathogens, and the focus of further investigation. Fine sand was added to the free stalls every 7 days, and the beds leveled each milking. Samples of fresh sand were taken on delivery and from the stalls in the fresh (30-180DIM) first lactation and mature cow pens on day 5 of the filling cycle. Latex gloves were worn for sampling and in each pen, a handful of grossly uncontaminated sand was collected from the rear of 10-15 stalls in each pen. The samples were sent on ice to the Udder Health Laboratory at the University of Minnesota for bedding analysis.

Results and Conclusions

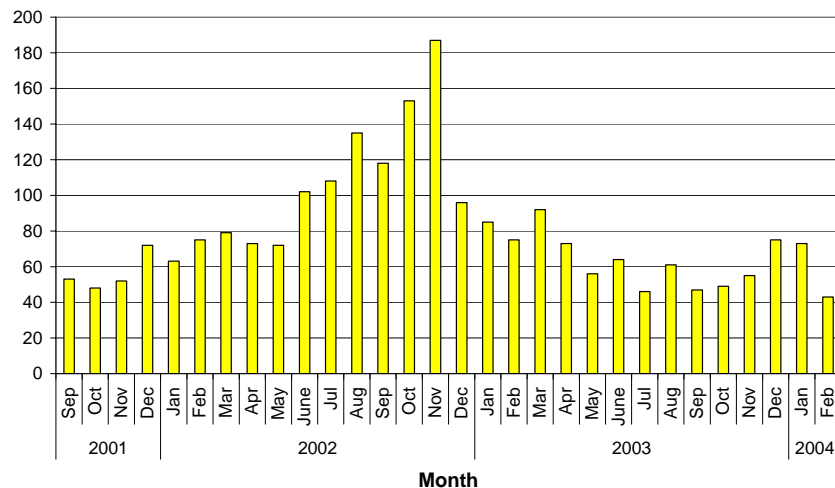
Bedding sample results are shown in Table 1. Streptococcal counts were extremely elevated, exceeding 15 million CFU/ml. In contrast, coliform counts were moderately elevated at 97,500 and 142,500 CFU/ml in the heifer and mature cow fresh pens respectively. The threshold for concern for coliform contamination of bedding material is typically 1 million CFU/ml. However, experiences on other farms visited by the author suggested that the observed levels might pose a risk for intra-mammary infection.

Table1. Bedding counts by bacterial species for fresh sand and sand obtained from freestalls on day 5 of the fill cycle.

CFU/ml	Coliforms	Environmental Streptococci	Staphylococci	Total Bacterial Count
Fresh sand	150	75,000	50	75,200
Day 5 sand heifer fresh pen	97,500	15,500,000	50,000	15,602,500
Day 5 sand mature cow fresh pen	142,500	74,500,000	12,500	74,655,000

In November 2002, sand was removed from all lactating cow stalls and coarse washed mason sand was used to re-fill the stalls. Hygiene standards in the treatment parlor were improved.

Figure 1. Quarter cases of clinical mastitis by month before and after sand removal from the free stalls in November 2003.



Clinical case rate response to the intervention is shown in Figure 1. Coliform counts in sand samples taken in a similar manner at subsequent visits to the farm have been uniformly <2,000CFU/ml, while streptococcal counts continue to exceed 5 million CFU/ml. Clinical mastitis rate has been maintained at goal levels and continues to be predominantly coliform. A threshold of 100,000/ml for the coliform count in sand has been used on several other farms to direct similar interventions, with consistent improvements in clinical case rate.

References

Zdanowicz M, Shelford JA, Tucker CB, Weary DM, von Keyserlingk MAG. Bacterial populations on teat ends of dairy cows housed in freestalls and bedded with either sand or sawdust. J Dairy Sci 87: 1694-1701, 2004