Sand or Sawdust?

Bacterial Counts in Bedding

In an attempt to improve cow comfort, many dairymen have changed, or are considering a change, from organic to sand bedding. Another perceived advantage of sand is that it does not support the growth of mastitis-causing bacteria as well as organic bedding. However, there is very little research data to support this perception. The objectives of this study were to compare bacterial counts in bedding, on teat ends and in teat canal milk when free stalls were bedded with sand versus sawdust.

Eight cows were assigned to each of two treatment groups balanced by parity, stage of lactation, intramammary infection status at the beginning of the trial and teat end score. Each group was moved to the other treatment after 3 weeks. Fresh bedding was added every 7 days but manure was removed daily as needed to keep stalls visibly clean and dry. Cow activities were recorded for 24 hours prior to the sample collection on a time-lapsed video recorder to estimate the time spent lying down for each treatment pen and for each stall. Bedding samples were collected four times a week from the back one-third of each stall. Teat swabs and milk samples were taken three times a week during the morning milking. Bedding samples were analyzed for dry matter content and pH. All collected samples (bedding, teat swabs and milk) were analyzed for concentrations of three major groups of mastitis-causing bacteria: coliforms, Klebsiella and Streptococci.

Results for the analysis of bedding samples are summarized in the graphs on the right. More coliforms and Klebsiella were found in sawdust than in sand. Surprisingly, sand contained as many Streptococci as sawdust bedding. Also, the pattern of bacterial counts over time was different for the two kinds of bedding. In sawdust, bacterial populations increased steadily for the first 2 days after adding fresh bedding and then stabilized. There was no clear time pattern of bacterial counts in sand.

Teat swab samples showed very similar results to bedding samples. More coliforms and Klebsiella were found on the teat ends of cows housed on sawdust than on those housed on sand. However, cows on sand had more Streptococci on their teat ends than those housed on sawdust. Over the course of each week, as stalls became wetter and dirtier, bacterial populations steadily increased on the teat ends of cows housed on sawdust; those on sand showed no clear pattern of bacterial accumulation.

Bacterial populations were also monitored in teat canal milk samples. However, no significant bacterial counts were found. This may have been due to the short-term of the project and the relatively few animals used.

In summary, the results of this study clearly demonstrated higher counts of coliforms and Klebsiella bacteria in sawdust bedding and on the teat ends of cows housed on sawdust than in sand and on teat ends of cows housed on sand. Similar levels of Streptococci were found in sand and in sawdust bedding. Moreover, Streptococcus populations were higher on the teat ends of cows housed on sand than on those housed on sawdust.

source: Gosia Zdanowicz & Jim Shelford, University of BC