

Comparison of Dairy Cow Behavior in Sand and Mattress Freestall Barns in Relation to Lameness

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Introduction

The objective of the study was to identify behavioral differences between cows housed in freestalls bedded with deep sand and cows housed in freestalls with rubber crumb mattresses, which may explain differences in lameness prevalence observed between the two types of farm.

Materials and Methods

Twelve Wisconsin dairy herds were selected to include six sand-stall herds (SAND) and six mattress-stall herds (MAT). At a single milking, all lactating cows were locomotion scored and the prevalence of clinical lameness was calculated for each herd. For the duration of one 24-hour period, the mature cow high-group pen on each farm was video filmed. Ten cows per farm were randomly selected and color marked with spray paint, so that they could be individually tracked. Each cow was locomotion scored. Location in the pen, activity and time spent performing each activity was recorded for each marked cow. Data were analyzed using the PROC MIXED procedure of SAS. A mixed-effect model was created to investigate differences in cow behavior between SAND cows and MAT cows.

Results

Mean (SE) lameness prevalence was significantly higher in MAT herds (24.0%, 2.1) than in SAND herds

(11.1%, 1.3). Mean (SE) lying time averaged 12.0 (0.22) hours per day for normal cows in both SAND and MAT herds. Time standing in the stall with all four feet on the platform or perching with two feet on the platform and the rear feet in the alley was significantly different between the two groups. Normal cows in MAT herds stood in stalls for 2.4 hours per day compared to cows in SAND herds that stood for 1.7 hours per day ($P = 0.048$). Time up in stall for slightly lame cows in MAT herds was 4.4 hours per day compared to 2.1 in SAND herds ($P < 0.0001$). For moderately lame cows in MAT herds, time up in stall was 6.1 hours per day compared to 1.8 in SAND herds ($P = 0.0183$). Moderately lame cows in MAT herds had 46% fewer lying sessions per day, and lay down for only 10.0 hours per day.

Significance

We speculate that the surface traction provided by sand allows lame cows to rise and lie down more easily, without fear of slipping, thereby maintaining normal lying session behavior in cows with sore feet. The pain and fear of slipping associated with rising and lying in lame cows on a mattress-stall surface leads to extended bouts of standing in the stall during a lying session. Extended time spent standing in the stall may be detrimental to claw health, increasing the duration of lameness in MAT herds.