

Using recycled manure solids as a bedding material in a freestall dairy barn

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Interest in using recycled manure solids (RMS) as a bedding material for dairy cattle is increasing. RMS could provide farmers more economical and renewable option for bedding. Research on the effects of RMS on animal health and welfare is still sparse, and most of the available information is from deep-bedded systems. Thus we wanted to study use of RMS-bedding in freestall dairy barn with mattresses. In this study, we followed two groups of 24 lactating dairy cows during cross-over study of two three-month periods; first the other group with RMS-bedding and the second group with peat-bedding and then vice versa for the next three months. Both RMS and peat were spread in stalls three times a week, minimum of 10 l/stall/day, on average 500 liters at a time. Manure was separated on the same day with screw separator (sieve 0.5 mm). Dry matter content (DM) of RMS was analyzed weekly. Every second week animals were scored for cleanliness (hind legs/hind quarter/udder) and milk somatic cell count (SCC) was analyzed. Bacteriological milk samples were taken, if the SCC exceeded 400 000 cells/ml. Generalized estimating equations were used to model the effect of bedding, group and period on cleanliness, and a linear mixed model for the effect of bedding, group, period, parity and milk yield on SCC. DM of RMS was low, on average $24.6 \pm 2.0\%$ (\pm SD), compared to recommended 35%. There were 1.51 higher odds ($p < 0.05$) for udder to be clean when RMS was used compared to peat-bedding. In hind legs ($p < 0.01$) and hind quarter ($p < 0.05$) period only affected cleanliness significantly. Bedding material did not affect SCC, but with higher parity ($p < 0.0001$) and lower milk yield ($p < 0.001$) SCC was higher. The group also affected SCC ($p < 0.05$). The most prevalent bacteriological finding with both bedding materials was coagulase-negative Staphylococcus. Environmental mastitis occurred four times, with RMS-bedding only. Connection between these infections and RMS cannot be ruled out. However, considering cleanliness and SCC, RMS did not adversely affect the health and welfare of dairy cows. Still, proper management of hygiene is vital for minimizing the potential risks associated with RMS-bedding.

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