

Prevalence and Risk Factors for Skin Lesions on Legs and Neck in Dairy Cattle in Free Stall Housing in Norway

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The laying and feeding area is an essential part of bovine free stall housing. Skin lesions at the legs and the neck of dairy cattle may be an indicator of dysfunctional building design. Skin lesions on the legs and the neck of dairy cattle are common and dependent on housing design (Weary and Tazskun, 2000; Zurbrigg et al., 2005).

Study Material

In this study, 232 herds were investigated in the housed period between September 2006 and June 2007. A model was established to investigate the risk factors related to the presence of lesions, (including hair loss, swelling and wounds), on the legs and the neck of dairy cattle. Ten randomly selected cows in each farm were investigated, all together 2,335 dairy cows. Separate models were developed to investigate risk factors related to the presence of knee and hock lesions. The herds were categorized into two groups when making models for neck lesion. One dataset was based on 1148 cows (n= 115 herds). These were selected from farms with post-and-rail designs (n=86 herds) and with combination of barriers (n=29 herds). The second dataset on 1168 cows (n=117 herds) were selected from farms with only vertical feed barriers.

Results

The herd level prevalence of skin lesions on the neck of the 2335 cows observed was 21%. Cows from herds with post-and-rail barriers had a prevalence of 42 %, with vertical barriers 4 % lesion, in herds with a combination of both horizontal and vertical barriers 30 % of cows had neck lesions. Mean prevalence for hock lesions was 60.5 % (SD 21.2) with a median value of 64 %. For knee lesions this prevalence was 35.3 % (SD 25.7) with a median of 30%. Most lesions were found on hock and front knee with a prevalence of 60.5 % and 35.3 %, respectively. Only 3 % to 9 % of cows had lesions on hips, fetlocks and thighs. With regard to the hock recordings, 40 % of the legs had no lesions, 53 % had hair loss, 1.3 % had swelling, and 6 % had wounds. Only one open wound was found on a hock in the total of 2,335 cows investigated. On the front knee, no lesions were found in 65 % of the legs, 30 % had hair loss, 5 % had swollen front knees, only 1.4 % had wounds, and no open wounds were found.

Risk factors for leg lesions

Cows in herds with a soft free-stall base gave an odds ratio (OR) for knee lesions and hock lesions of 0.22 and 0.62 respectively, compared to a herd with harder free-stall base, such as concrete and compact rubber mats. There was an increased risk of hock lesions when the length in the lying area in a double row was > 250 cm, OR = 2.96 compared to ≤ 250 cm, and when the length of the

lying area against a wall was > 260 cm, OR = 2.11 compared to ≤ 260 cm. For knee lesions the risk increased if a row against a wall was > 270 cm OR = 1.72 compared to ≤ 270 cm. Hock lesions were also associated with lame cows, OR = 5.76 versus non lame cows, and with cows in their 2nd or higher parity, OR = 1.27, versus cows in their 1st parity. Lesions on the knee were strongly associated with farmers negative attitudes towards animals in pain, OR= 3.28, versus those with positive attitudes, cows in the beginning of their lactation, OR=1.84, versus those at the end of their lactation, and tall animals OR= 1.27 versus smaller animals (Kielland et al, 2009).

Risk factors for neck lesions

With decreasing importance (strength of association), the following neck lesion risk factors were found to be significant in herds with post-and rail barriers; Brisket boards lower than 63 cm (OR=3.6), no feed stalls (OR=10.9), totally mixed rations (OR=3.8), cows later than 30 DIM (OR =1.9), 1000kg less in milk production (OR=1.4), feeding roughage 2 or fewer times (OR=1.9), only post-and-rail feed barriers present (OR=1.8) compared to combinations and farmer disagreement with the statement “animals experience physical pain as humans do” (OR=1.9) compared to agreeing. In herds with Tombstone barriers risk factors which reduced the risk where brisket boards between 31 to 50 cm high Diagonal barriers increased the risk when brisket boards were less than 31 cm (OR=3.7), between 31-50 cm (OR=5.7) and highest risk were with Diagonal barriers on brisket boards higher than 50 cm (OR=7.2).

Using the estimates found, ORs could be predicted for cows at average height (133.5cm), with a production level according to a 10% level of total range of milk production at 5700kg. These cows would then have an OR of 2.21 compared to cows with a production level at 90% level of total range of milk production at 8300kg. Feed barrier design is associated with skin lesions on the neck of cows and particularly with the presence of a post-and-rail design. To minimize the risk of neck lesions the post-and rail barrier should have a top rail at a height higher than 109 cm (especially for cows taller than 126 cm) and a brisket board above 63 cm. Feed stalls was found to be a preventive association. Feeding roughage three or more times daily and the feeding of an unmixed ration was also a preventive factor (Kielland et al., submitted).

Conclusions

These results demonstrate the fact that free-stall design is of importance in relation to skin lesions as well as characteristics of individual animals and the farmer. Important risk factors are bedding material, stall length, feed stalls, entrance to feeding place, lame cows, parity, days in milk, feeding strategy and farmers' attitude toward pain.

References

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