

Association between floor type and behaviour, skin lesions, and claw dimensions in group-housed fattening bulls

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Abstract

Rubber mats covering concrete slatted flooring are a developing market in dairy barns but remain rare in beef cattle facilities. The aim of this study was to investigate the effects of covering slatted concrete floor with perforated rubber mats on behaviour and occurrence of skin and claw lesions in fattening bulls.

The groups of six bulls each with a total average age of 9.8 months were kept over 1 year on either slatted concrete (CONCRETE PEN) or on slatted concrete covered completely (RUBBER PEN) or partially (CHOICE PEN) with perforated rubber mats. Every quarter-year, behaviour (preference of flooring, lying, aggression, mounting) was recorded. In two-weekly intervals the incidence of skin lesions was examined. At 12 and 18 months of age the rising time of the bulls was measured. At the beginning of the study and after slaughter claw dimensions were recorded.

Bulls in the CHOICE PEN preferred ($P < 0.01$) the rubber coated area throughout the experiment. Animals in the RUBBER and the CHOICE PENS showed more lying periods ($P < 0.01$) and had a lesser incidence of skin lesions ($P < 0.01$) compared to bulls in the CONCRETE PEN. Bulls in the CHOICE PEN needed less time for rising (2.7 ± 0.3 s) than bulls in the CONCRETE PEN (4.4 ± 0.5 s, $P < 0.01$). Net claw growth differed significantly between all pens (RUBBER > CHOICE > CONCRETE; $P < 0.05$).

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In conclusion, the results of this study indicate that rubber coated slatted flooring has a positive influence on the housing conditions of beef cattle.

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1. Introduction

Beef cattle is mostly housed on concrete slatted flooring. This is of economic advantage as concrete is an easy-to-process and cheap material, but it has a considerably negative impact on the animals' well being in that it does not meet the ethological and biomechanical demands of cattle especially with regard to their claws (Benz, 2002). The European Council Directive 98/58/EC concerning the protection of animals kept for farming purposes demands "the provision of housing, food, water, and care appropriate to the physiological and ethological needs of the animals, in accordance with established experience and scientific knowledge" (European Council, 1998).

The pressure on the market price of beef on the one hand and the consumers' demand for species-appropriate livestock production on the other hand necessitate looking for compromises. One possibility seems to be the housing of beef cattle on rubber coated concrete slatted flooring. This combines a labour-saving, self-cleaning management system with pasture-like effect on cattle behaviour and locomotion (Benz and Wandel, 2004). These rubber mats allow the claws to sink in some millimetres, so that the impact load is reduced and lateral slipping is avoided. Tied dairy cows kept on rubber slatted flooring lie down and get up normally and without any increased risk of slipping (Hultgren, 2001). Lameness, one of the most important welfare and economic concerns in the dairy industry, seemed to be positively influenced by rubber alley surfaces (Vokey et al., 2001). In addition to a concentrate diet, the type of flooring had a great influence on claw lesions in primiparous cows (Bergsten and Frank, 1996). Deficient blood circulation to the claw's corium, followed by laminitis, sole ulceration, and white zone lesions (Boosman et al., 1991), can be avoided due to prolonged resting times (Voges et al., 2004). The latter was observed in bulls that were offered soft and elastic flooring (Irps et al., 1988). Regarding the interaction of floor and claw health Mueller et al. (2005) identified small claw and skin lesions resulting from walking and lying on cracked concrete floor in 9% of 340 post mortem examinations of dairy cows as the cause of lethal infections.

Research regarding the use of rubber coated slatted flooring in beef finishing facilities is rare. Lowe et al. (2001a) reported that rubber coated flooring did not have a significant effect on live-weight, carcass gains and composition, and meat quality, respectively. However, bulls kept on perforated rubber mats were significantly dirtier than those on other surfaces (solid floor bedded with straw, slatted floor covered with rubber strips; Lowe et al., 2001a). Regarding food safety, this fact could be very important for finishing bulls, especially if there were no differences between the bulls housed on concrete and those kept on rubber mats as regards skin and/or claw lesions. It should be obvious that bulls prefer rubber mats to concrete and, moreover, this has already been proven by Lowe et al.

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