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Rubber Mats on Slatted Concrete Floors

Impact on Production Criteria, Pregnant Sow Limb and Claw Health and on Hygienic Conditions

Experiences with rubber mats in cattle husbandry raise hopes on their positive effects on limb and claw health in pig keeping as well. In this study limb and claw health were only slightly improved by using rubber mats, which can partially be attributed to including older sows in the study. In pens with rubber mats claw grew longer and the floor was dirtier. Bacterial concentrations were not higher. Further studies need to be carried out over a longer period of time and only with young sows.

Besides poor reproduction, damage of limbs and claws is one the most frequent reasons for sow losses [6] and is often caused by slatted floor of poor quality. Especially in group housing systems with slatted floors, while sows are fighting to establish a hierarchy, damage of limbs and claws occur. Improved flooring conditions for pregnant sows could therefore lead to more wellness, health and economic profitability.

In cattle husbandry application of slatted smooth rubber mats reduced the number of injuries and claw problems, when compared to normal slatted concrete floor [1, 2, 5, 9, 10]. Locomotion of dairy cattle kept on rubber mats seems more natural [7, 8]. Slaughter weight, weight gain and meat gain were higher for fattening bulls kept on rubber mats [3, 4]. This study aimed at finding out, whether smooth rubber mats can improve limb and claw health as well as production criteria of sows. Effects on floor hygiene were also of interest.

Material and methods

The slatted concrete floor of two pens in a ten year old building and the worn out slatted concrete floor of four pens in an old building was fitted out with slatted smooth rubber mats, usually used in cattle housing. To test the effects of the rubber mats 125 pregnant sows with 217 pregnancies were included in the study, more than half of the sows for two or three succeeding pregnancies.

Sows were divided into a control group (on slatted concrete floor) and a trial group (on slatted rubber mats) by using body mass, body condition and number of litters born as criteria. Body mass was taken at the beginning and at the end of group housing period. Number of piglets born alive, litter weight and average birth weight of individual piglets were taken. Immediately before bringing the sows into the group housing pens and when bringing them to the farrowing pens limb and claw health was scored. Frequency and extent of swellings, abrasions, injuries and claw mutilations was noted for all four legs using three degrees: no (= 0), slightly (= 1) and severe (= 2). Sows with severe damage at the time of bringing them to the group housing pens were not included in the study. At the same time length of claws of both hind legs was measured.

Cleanness of the flooring was assessed as 1= „clean and dry", 2 = „slightly dirty (<25 %), 3 = „dirty" (50 %) or 4 = severely dirty (> 75 %). In the ten year old building cleanness of the non slatted lying area was also rated. Cleanness of animals as an average of all sows in one pen was assessed in four degrees ranging from 1 = clean to 2 = slightly dirty, 3 = dirty and 4 = severely dirty. Total number of bacteria on the flooring

Fig. 1: Rubber mats in the pens of an outside climate house

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was taken twice, at the beginning and at the end of the study.

Results and discussion

Production criteria

In this study rubber mats had neither an effect on the number and on the weight of born piglets nor on sow's body mass or body mass gain.

Limb and claw health, growth of claws

Between the sows kept on slatted rubber mats and those kept on slatted concrete floor there was no difference in limb health (abrasions, swellings, injuries and claw mutilations) at the beginning and no difference at the end of housing period in the pens for pregnant sows. At the beginning, frequency of swellings was 60.4 %, of abrasions 52.9 %, of injuries 10.4 % and of claw mutilations 12.7 %. At the end of the housing period frequency of swellings was 27.3 %, of abrasions 38.7 %, of injuries 20.3 % and of claw mutilations 33.9 %. In sows kept on rubber mats in the ten year old building frequency of swellings and abrasions was significantly lower at the end than at the beginning of the housing period in group housing pens (swellings - 34 %, abrasions - 18 %). In the same building during pregnancy frequency of injuries rose significantly on both floor types (+ 13 %). During pregnancy frequency of injuries rose in sows kept on worn out concrete slatted floor (+ 10 %), while it was reduced in sows kept on rubber mats (-3%), the difference being almost significant ($p = 0.07$).

At the end of pregnancy sows kept on rubber mats had slightly (2.7 mm), but significantly, longer claws than sows kept on concrete floor. During pregnancy claw length of sows kept on rubber mats increased by 1.55 mm and those of sows kept on concrete slatted floor increased by 0.03 mm.

The study included sows of different age, the range being from sows in the second pregnancy to more than ten pregnancies. As limb and claw health of older sows may have been already irreversibly damaged, this may be a reason for the lack of significant differences in limb health between sows kept on the two floor types.

Hygienic conditions

In pens fitted out with smooth slatted rubber mats slatted floor, lying area and sows were significantly dirtier (average assessment of floor 2.4, average assessment of sows 2.6) than in pens with slatted concrete floor (average assessment of floor 2.0, average assessment of sows 2.2). Though pens with rubber mats being dirtier, there was no incidence of rising bacteria concentration on rubber mats.

Conclusions

Further studies should be carried out including only young sows and studies should last over several consequent years, so that the effect of rubber mats on limb and claw health as well as on claw length, hygienic conditions and on production criteria can be reliably estimated.

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