SUMMARY

In general, problems such as lameness, claw injuries and claw infections very commonly occur in sow housing, and are a primary cause of culling, especially among young animals. The culling of young animals is a large economic burden in pig production, and therefore it is of great importance to try to reduce problems related to claw health. In addition, claw injuries also lead to a significant amount of suffering for the animals, which is not in accordance with good animal welfare.

Previous studies have shown an increased prevalence of claw health problems in housing systems where limited amounts of straw are given, and where there are slatted floors in the dung area of the pens. These conditions must be taken into consideration, since these pen types will soon be the most prevalent in modern Swedish pig production.

In this study, the importance of straw for the occurrence of claw injuries, sow activity, pen hygiene, and animal well-being was studied in the pen system described above.

All studies were carried out on gestating sows housed in dry sow pens of the type "2 rooms" (Figure 1), with liquid feed, trough feeding with trough dividers, and without being locked in during feeding times. A total of 24 pens were studied in three trials. In half of the studied dry sow pens (12 control pens, or 4 pens per trial), a small amount of straw was given (approx 200 g per sow per day), whereas the other half of the pens (12 study pens, or 4 pens per trial) received a larger amount of straw (approx 1000 g per sow per day). The straw was given after the morning feeding.

The claw health of the animals was documented using claw studies carried out when they first entered the pen, and when they left the gestation unit. A total of 99 sows were examined in this study. For these studies, the sow was placed in a sow cradle (Figure 2) where the legs could be lifted individually, cleaned with a brush, water, and claw knife, and the claws examined. The observations were carried out using the same method and according to the same protocol as previously described.

At the same time as the claw studies, observations were made of scratches/injuries and bites on the examined sows. In addition, the eating order of the sows was noted at three different times during their stay in the gestation unit. The sow that first left the trough at feeding times was given
an eating order point of 1 (short time at the trough), while the sow that stayed the longest at the trough was given an eating order point of 3 (long time at the trough). The sows were also videotaped for 24 h to determine their activity and location in the pen. In addition, 2 h manual behaviour studies were carried out at times during their stay in these pens. In these studies, the presence of stereotypies in the group was especially noted (“chewing/biting the bars”, “chewing saliva”, “rolling the tongue”, and “licking the floor”). Hygiene level and cleanliness of the pens were evaluated using hygiene studies. Each pen was divided into 8 areas (Figure 3), and an evaluation of the amount of moisture and dirtiness were carried out using two parallel 3-point scales.

The results of the claw studies (combining all the claw injuries), bites and scratches, and the 24-h studies of animal activity, were analysed statistically using the GLM procedure in SAS. The occurrence of claw injuries was analysed using a statistical model containing the following factors: amount of straw bedding, litter number, trial number, injuries, and eating order points at feeding. In the statistical model for the analysis of the sow activity/location during the entire day, the factors amount of straw and litter number were used. The amount of straw was the factor in the model for bites and scratches. For the other observations (occurrence of stereotypies, and the pen cleanliness studies, only the frequency and the mean were calculated.

The claw studies showed the occurrence of 6 types of injuries: cracks in the claw wall, overgrown heel, white line injuries, injury to the border of the heel/toe, or toe injuries. Certain injury types occurred more often together with other types of injuries than others did. In Table 1, the significant correlations between the different injuries at entering the gestation unit are shown, and in Table 2 the significant correlations when leaving the unit. Cracks in the claw wall and white line injuries, and heel injuries and overgrown heels, respectively, appeared to occur at the same time.

The statistical analyses were carried out on both the total material (that is, all sows) and on a portion of the material, consisting of those sows missing or which had minor wounds upon entering the gestation unit. The analyses of the total material (Table 3, Figure 5) showed that the older sows (litter number >4) incurred significantly fewer claw injuries during gestation than the young animals did. In general, no other factor in the model was significant. However, it was noted that the sows having serious
claw injuries already upon entering the unit did not tend to show an increase in these injuries as much as sows having no or light injuries upon entering did (Table 3, Figure 6). In pens with the larger straw ration, a nominally lower increase in the number of injuries on the sows was found in comparison to those occurring on sows housed in pens with the lower straw ration. This was true for all types of injuries (Figure 4). The results of the statistical analyses for sows with no or light injuries are presented in Table 4. When the animals with the more serious injuries were not included in the analyses, the effect of the amount of straw present was greatly increased, although not enough to reach significance, whereas the p-value for litter number increased somewhat.

The incidence of bites and scratches generally decreased to some extent during the stay in the gestation unit (Table 5). This decrease was greatest on animals in the pens with the larger straw ration, but the difference in comparison with animals in the lower straw ration was not significant.

The presence of a larger straw ration also appeared to have reduced the occurrence of stereotypies (Table 8) among the sows. The sows given the larger straw ration were observed to be lying down somewhat more in the dung area (Table 6), especially the older animals (Table 7). An interpretation of this result could be that the floor heated lying area with the larger amounts of straw at times was “too warm” for the sows. Generally, no differences in activity between the two groups of animals could be detected (Tables 6, 7).

The effect of the amount of straw on pen moisture and cleanliness is given in Figures 7 and 8. The lying area was observed to be somewhat less damp and cleaner in pens given the larger straw ration. On the other hand, the larger amounts of straw were more difficult to press down through the slatted flooring, and as a result the pens were wetter and less clean in the dung area.

In summary, the studies showed that the size of the straw bedding ration clearly had a positive effect on the prevalence of claw injuries, and that the use of plenty of straw bedding was also of importance for the welfare of the sows. The results of the studies are interpreted so that it should be possible to reduce the problem with claw injuries, which is often seen in pens with slatted floors and relatively small areas for the animal, by increasing the amount of the straw bedding. This method is also considered to be a better way of preventing problems with claw injuries than by replacing the slatted flooring in those types of pens (that is, in gestation pens for well-established
sow groups) with solid flooring. In previous studies, changing the slatted floors to solid floors in gestation pens for dry sows did not show any large effect on claw health.

The comparison and evaluation of housing systems is often difficult to carry out, because various factors must be considered at the same time to obtain an evaluation of the entire system. In this type of evaluation, it is common that the different parameters considered have different “weights” or importance. For example, often building costs are more important for the producer’s choice of housing system than what the system can mean for animal health and welfare, for animal handling, the working environment, the effect on the environment, etc. Different producers also have different considerations depending upon economics, their interests, and their viewpoints with respect to production and the future. Irrespective of what weight is put on the parameter animal health and welfare, it can, however, be proven that in the long-term viewpoint these factors are of great importance for production economy. A low incidence of disease and durable animals are important ingredients for a strongly competitive and enduring production.

This study has shown that an abundant straw ration, as a specific factor, appears to be of great importance in ameliorating some of the animal health and welfare problems which can occur in some types of intensive housing systems. In general, the study also showed that perhaps it is not sufficient to indicate that the animal should have access to straw as a bedding material. The amount of straw available is also important and must therefore be more precisely defined.