Environmental enrichment for pigs

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Introduction

In intensive piggeries, pigs are generally housed in barren environments that compromise their expression of normal behaviour (Bolhuis et al., in press, 2005). The environment is an important source of stress, especially during weaning, which tends to induce aberrant behaviours among piglets that may compromise welfare. Such behaviours include manipulating littermates (belly-nosing, tail-biting, chewing, rooting and nibbling), manipulating pen fixtures, and aggression. Many studies claim that environmental enrichment with substrates or outdoor housing can help alleviate these problems (Petersen et al., 1995). By looking at three recent papers discussing the effects of providing straw bedding, a car tyre and outdoor housing, this review aims to determine the efficacy of environmental enrichment in improving pigs' welfare.

Discussion

Bolhuis et al. (in press, 2005) studied the behaviour of 60 piglets in barren housing (B) and housing enriched with straw bedding (E) to determine whether straw bedding would affect the behaviour of piglets and thus influence their welfare.

Before farrowing, 60 sows were randomly assigned to either B or E farrowing crates. After weaning, 30 piglets from B crates were placed in five B pens, and 30 piglets from E crates were placed in five E pens. E piglets were found to be more active, showing greater exploratory behaviour, possibly because straw was more attractive than pen fixtures and bare floor. However, B piglets spent more time manipulating littermates and pen fixtures than E piglets, with tailbiting only rarely observed and never in E pens. B pigs played less than E pigs, which may reflect compromised welfare because play is diminished by unpleasant conditions and negative emotions.

Thus, enrichment with straw bedding did seem to improve the welfare of pigs. This strongly supports the findings of Petersen et al. (1995), which showed that enriched pens containing straw, logs and branches were associated with a reduced incidence of aberrant behaviours, even though enrichment did not abolish them completely.

Ishiwata et al. (2004) conducted an experiment to assess the effect of fixing a rubber tyre to a pen wall on agonistic behaviour (aggression), and thus pig welfare. Three litters of eight weaned piglets were allocated to six pens of four littermates each. At first grouping (G1), two piglets from each pen were transferred to another pen containing non-littermates, and three pens were provided with a tyre (enriched). At second grouping (G2), the piglets transferred at G1 were transferred to another pen containing non-littermates, but no piglet was exposed to a tyre for the first time. At third grouping (G3), piglets in barren pens were transferred to enriched pens, and vice versa. Then, all pens were enriched. The study was limited by the rather narrow definitions of agonistic behaviour and "use" of a tyre.

Barren pens yielded a higher injury score than enriched pens in G1, whereas in G2, piglets in enriched pens were more frequently attacked than piglets in barren pens, possibly due to the attractiveness and ownership of the tyres. G1 and G2 also saw a greater number and longer duration of attacks toward unfamiliar piglets. In G3, piglets without experience in using a tyre had higher injury scores due to aggression resulting from "space ownership".

Hence, rather than reducing aggression, environmental enrichment with a rubber tyre changes the style of attacks. It should be noted, though, that such enrichment should be preceded by familiarizing piglets with the use of a tyre to reduce the risk of injury during agonistic interactions associated with it.

Previous studies have shown that the complexity of the nursing environment affects the cognitive abilities of pigs and their capacity to deal with stressors, thus influencing the way in which they react to future challenges. A study performed by Hötzel et al. (2004) investigated the effect of indoor and outdoor housing systems on the behaviour of pigs, and aimed to ascertain if outdoor systems could improve the welfare of pigs by providing more space and greater environmental complexity.

From each system, the behaviour of eight sows and their litters was observed. Indoor housing of sows consisted of individual farrowing crates with concrete floors; outdoor housing of sows consisted of individual paddocks separated by electric fences and furnished with a hut. Indoor piglets were confined in a pen with a concrete floor; outdoor piglets were placed in a paddock similar to that of the sows. This study was limited by direct visual observation and the use of focal animals rather than observing every piglet.

Indoor sows were found to have spent more time sitting, whereas outdoor sows spent more time standing, walking and exploring the environment. During lactation, indoor piglets showed greater manipulation of littermates, aggression and nursing, whereas outdoor piglets showed more feeding and exploratory behaviours. At weaning and post-weaning, indoor piglets demonstrated littermate manipulation and aggression more frequently than outdoor piglets, which performed more locomotion.

It was concluded that indoor piglets are generally less active than outdoor piglets, but instead participate in littermate manipulation and agonistic interactions. During lactation, indoor piglets were in close contact with the sow 100% of the time, whereas outdoor piglets had less contact with the sow. The allowance of the outdoor sow to control nursing frequency benefited both the sow and piglets, as extensive contact with piglets during lactation can be aversive to sows, and less contact with the sow also encouraged the foraging behaviour by piglets, thus better preparing them for weaning. Hence, the rearing system of pigs undeniably alters their behaviour, and outdoor housing systems seem to be effective alternatives for alleviating aberrant behaviours and improving welfare.

Conclusion

As demonstrated in the studies, environmental enrichment plays an important role in the improvement of pig welfare. Of the three abovementioned forms of enrichment, outdoor housing systems and straw bedding seem to be most effective in alleviating aberrant behaviours in pigs and hence in improving their welfare. Provision of rubber tyres may alter behaviour, but not necessarily reduce aggression. Further advances in environmental enrichment are required to offer additional alternatives. Such alternatives should aim to promote the expression of normal behaviour and assuage stress and frustration.

References

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