

The effect of environmental enrichment on behavioural expression of intensively housed pigs

Discusses the welfare implications for piglets of providing them with environmental enrichment to help promote the expression of a range of normal forage-related behaviours.

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Introduction

The desire for commercial efficacy in modern pig-production systems is reflected in the prevalence of simple, barren, indoor housing (Vanheukelom *et al.*, 2012). Pigs' inability to perform a normal range of behaviours in this environment results in decreased activity and the expression of maladaptive behaviours, such as tail- and ear-biting (Oostindjer *et al.*, 2011). Environmental enrichment (EE) has been investigated as a way to improve the welfare of pigs in intensive production systems. Allowing additional space and providing substrate enables pigs to express social and foraging-related behaviours (Van de Weerd & Day, 2009). This paper will investigate the effect of providing substrates on the behavioural expression of pigs at various life stages.

Discussion

Oostindjer *et al.* (2011) examined the effects of sow housing and EE on the behavioural development of piglets. Initially, 32 sows and their litters were randomly assigned to four treatment groups involving a combination of sow confined / loose and lactation pen barren / enriched. Post-weaning, groups of four piglets (n=256) were randomly allocated to either an enriched or barren pen. EE was provided through increased space allowance and the provision of straw, peat, wood shavings and branches. Observations were made periodically throughout the day, focusing on important social and foraging-related behaviours such as belly-nosing and exploration of the environment. The study revealed lower levels of manipulative behaviours and higher levels of foraging-related behaviours in piglets housed in enriched pens. Reduced levels of play and overall activity were observed in pens lacking enrichment. Decreased activity is considered an indicator of reduced welfare (Van de Weerd & Day, 2009; Vanheukelom *et al.*, 2012).

The transition of weaners from an enriched pre-weaning environment to a barren pen led to a significant increase in maladaptive behaviours and decreased play. Weaning is regarded as a time of considerable stress in intensive production due to the rapid transition from milk to solid food. In this context, stress can be defined as "the sum of behavioural and physiological responses to environmental change" (Barnett, 2003). Production implications of this information include the requirement to maintain EE throughout life to prevent reappearance of maladaptive behaviours. Free sow housing coupled with an enriched environment pre-weaning was shown to positively affect how piglets adapted to their post-weaning environment and thus greatly affected weaner welfare.

Statham *et al.* (2011) assessed the effects of providing straw at different life stages at a commercial piggery. The aim of the study was to investigate the prevalence of tail-biting and other maladaptive behaviours with and without regular straw provision. The four treatment groups included pigs (n=706) provided with straw: throughout life, from weaning, in finishing, and not at all. The sample size of this study was significantly larger than that of Oostindjer *et al.* (2011), so behavioural observations were performed at a litter rather than an individual level.

The study was largely inconclusive, with the timing of straw provision having no significant effect on pig behaviour. The data collected were influenced by restrictions encountered by researchers working at the commercial farm. Straw could not be distributed daily and more straw was provided to weaner than to finisher pens. The effects of EE removal in this study mirrored those of Oostindjer *et al.* (2011), suggesting that the removal of enrichment may be more detrimental to welfare than if it were never introduced. The incorporation of EE into intensive systems requires practical planning and economic consideration.

A study undertaken by Vanheukelom *et al.* (2011) sought to examine whether providing peat to piglets would influence behavioural development and weight gain. Peat is soft, absorptive and has been shown to encourage growth and assist in preventing gastrointestinal diseases (Trckova *et al.*, 2005). As in the previous studies, the behaviour of pigs was analysed throughout each housing transition prior to slaughter. However, peat was not provided to growers or finishers, even though behavioural observations continued.

Peat was provided in a tray to 9 of the 18 litters. The presentation of the substrate in a tray aimed to minimise the blockage problems associated with straw in fully-slatted pens used in conjunction with liquid effluent systems (Statham *et al.*, 2011). Piglets had access to solid feed to allow for comparison of foraging-related behaviours. At weaning, piglets (n=180) were divided into groups of 10, half receiving peat while the other half did not. Each pen was observed for 4 x 1-minute periods in the morning and afternoon with the behaviour of each piglet recorded continuously.

Piglets with access to peat exhibited foraging-related behaviour significantly more often than piglets without. Piglets provided with peat post-weaning and piglets with exposure to peat throughout life showed less inactivity and less manipulation of pen mates, reflecting enhanced welfare. At the end of the weaning phase, piglets provided with peat throughout life had a higher weight than piglets that had not received enrichment. However, this result does not account for inherent individual variability in bodyweight.

This study and that of Oostindjer *et al.* (2011) suggest that beneficial effects of EE can be established in the lactation pen. The expression of exploratory and foraging behaviours allows piglets to gain information about the environment, thus reducing social conflict and fear of new substances. As illustrated in the two previous studies, feed in isolation can be considered as having enriching potential when provided to piglets. It is arguable that feed consumption is higher in environmentally enriched pigs as there is no need to redirect foraging behaviours.

The study concluded that it was not sufficient to provide enrichment only to sucker and weaner pigs since the removal of peat led to more inactive behaviour with increased occurrences of aggression in later life. This supports the findings of Oostinjer *et al.* (2011) and Statham *et al.* (2011).

Conclusions

Various factors must be considered when providing EE to intensively housed pigs. Regular provision of substrate throughout life has been shown to enhance welfare by promoting the expression of a range of normal behaviours. Avoiding sudden discontinuation of EE is important in maintaining enhanced welfare.

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