

## Environmental enrichment for growing pigs: Could novelty be the key?

*Discusses the effects of environmental enrichment and the important role played by novelty when enrichment is provided on commercial pig farms.*

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### Introduction

Freedom to express normal behaviour is often neglected in intensively farmed animals (de Greef *et al.*, 2011). Failure to provide domestic pigs (*Sus scrofa*) with suitable substrates to encourage exploratory behaviour, such as rooting, has led to the development of harmful social behaviours towards pen mates (Statham *et al.*, 2011). Tail-biting (TB) is one behavioural manifestation that compromises productivity, profitability and welfare of these animals (Sutherland & Tucker, 2011). Producers are moving away from traditional low-cost/low-benefit practices, such as tail-docking, as they do not account for what is inciting the redirected TB behaviour. Understanding the multifactorial causes of TB may have a higher likelihood of eliminating the behaviour (Turner, 2011). This paper explores recent reports on how providing environmental enrichment in commercial settings encourages natural pig behaviours and minimises damaging social behaviours.

### Discussion

Providing substrates, such as straw and compost, is an effective form of enrichment as it encourages natural rooting behaviour (Beattie *et al.*, 1995). However, these materials are impractical in commercial piggeries with slatted flooring, as substrates easily pass through the slats and block sewage systems (Van de Weerd *et al.*, 2006). A study by Statham *et al.* (2011) found that providing straw bi-weekly on solid floors did not significantly decrease TB outbreaks. A total of 706 pigs were followed from birth to slaughter and split among four treatments: straw throughout life (ST), straw from weaning (SW), straw in finishing (SF) and no straw (NS). Due to pen design, groups ST and SW had less straw provided at finishing with a concurrent increase seen in TB. The incidence of TB in the SF group was reduced. These results concur with the suggestion by Day *et al.* (2002) that it is the change in straw provision, the novelty factor, rather than the straw itself that alters social behaviours. If straw is offered commercially, the level of straw should remain constant or be augmented to avoid increasing TB behaviours.

Statham *et al.* (2011) found that providing straw prior to weaning did not offer a protective effect against TB after weaning. Interestingly, Oostindjer *et al.* (2011) have shown that piglets moving from barren housing pre-weaning to enriched housing post-weaning display increased levels of interaction with enrichment and lower TB behaviours. However, piglets moving from enriched housing pre-weaning to barren housing post-weaning display decreased levels of play and increased TB behaviours. This suggests that the best period to offer enrichment is post-weaning. If a production system is unable to incorporate enrichment post-weaning, it should not be presented in the farrowing crates as this may increase the incidence of TB post-weaning (Oostindjer *et al.*, 2011).

The need to account for novelty in enrichment devices was also established by a study by Van de Perre *et al.* (2011). Their paper compared the use of a single chain for enrichment to seven point-source objects (objects restricted to a single location): rubber bars and balls, yellow and purple ribbons, yellow and grey garden hoses, and orange ropes. The point-source objects were offered in sequence, with a new object provided each week to 108 pigs split among 12 pens. This was found to decrease incidences of TB compared to providing a single object. However, repeating the sequence of objects a second or third time had less effect on reducing TB behaviour. Habituation to point-source objects has previously been shown to occur very rapidly in pigs, perhaps due to their long-term presence in the pen (Van de Weerd *et al.* 2003).

Van de Perre *et al.* (2011) demonstrated that popular objects actually encouraged TB behaviours by inducing competition for them. In comparison, Manciocco *et al.* (2011) showed that by offering an increased variety and quantity of enrichment, competition for individual objects was reduced. Four

types of enrichment were used (rubber hose, hemp rope, steel chain in rubber hose, and balls) with a density of 19 items per 50 pigs. Offering a large quantity of objects made individual interaction with these items easier and safer and lower levels of TB were seen in the enriched pens (5%) compared with control pens (27%). The study also found a decrease in daily interaction with enrichment objects from 35% after two weeks to 13% during the sixth week. This is in accordance with the findings of Van de Perre *et al.* (2011) and Statham *et al.* (2011) and further emphasises that novelty plays a crucial role when providing enrichment. The larger quantity and variety of objects may explain why it took six weeks in the current paper for the “novelty factor” to diminish compared with one week in the Van de Perre *et al.* (2011) study. If enrichment objects are offered in commercial piggeries, a larger variety and number should be provided per pen to reduce competition for them.

Enrichment devices must have certain characteristics to be suitable for growing pigs (Van de Perre *et al.*, 2011). The best have a mix of complexity, ingestibility, odour, chewability, flexibility and destructibility (Van de Weerd *et al.*, 2003). Manciooco *et al.* (2011) observed changes in object preference with age. Younger animals preferred rubber hoses lying on the ground while older pigs preferred ropes hung from the ceiling. This may be a facet of increasing body size and reduced space, making hung articles more accessible. Steel chains inserted in rubber hoses remained attractive throughout the study, potentially owing to the complexity of the device and the novel sensation of biting steel (Manciooco *et al.*, 2011). Van de Perre *et al.* (2011) found a similar preference in pigs for hanging objects, with orange rope and ribbons being the most attractive to pigs of all ages. This implies that hanging complex objects are most suitable for finishing pigs in commercial premises.

## Conclusions

Novelty is an important aspect of any enrichment scheme, especially in preventing habituation. Offering a greater variety and number of objects combined with rotation seems to result in the lowest level of competition and lowest number of TB outbreaks. However, further work is required to identify robust solutions to eliminate TB behaviours from intensively farmed pigs.

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