

Reducing the Incidence of Tail-biting in Weaned Pigs

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Introduction

Tail-biting is an unpredictable and abnormal behaviour resulting from disharmony between the animal and its environment (Smulders *et al.*, 2008). It results from the pig's natural tendency to root and chew on objects in its environment and has been suggested to be a redirected exploration behaviour (Van Putten, 1980). Stress is defined as an environmental effect that over-taxes an individual's control systems and reduces its fitness. Both the tail-biting pigs and their victims have been shown to suffer reduced welfare due to living in a stressful environment (Schroder-Peterson & Simonsen, 2001). Recent research has investigated how the environment in which pigs are housed can be manipulated to reduce the incidence of tail-biting.

Discussion

Outdoor production systems are one suggested method for reducing tail-biting. Recent research demonstrates lower frequencies of tail manipulation (including touching and biting) among outdoor pigs compared with those housed indoors. A study by Presto *et al.* (2008) compared the activity behaviour and social interactions of pigs in indoor and outdoor systems, to identify whether different housing systems affected behaviour. The 96 pigs studied were born outdoors and at weaning were moved to either a pen indoors or a pasture outdoors. The indoor environment consisted of a part concrete part slatted floor with free access to straw and a space allowance of 1.1m² per pig. The outdoor pastures contained vegetation, a shaded area containing straw bedding and a mud wallow. The total space allowance was at least 375m² per pig.

Observation of pig activity and social interactions indicated more rooting by outdoor pigs than indoor pigs. Tail manipulation occurred less frequently in the outdoor pigs compared to the indoor pigs. The authors note that this may be due to a smaller available and more barren indoor area. Consequently, indoor pigs had limited possibilities to perform natural behaviours, such as rooting. In the search for an object to manipulate, indoor pen-mates may have been an alternative for restless pigs to interact with. Additionally, in the outdoor groups the pigs could increase the distance between one another and escape from another pig's attentions.

The authors conclude that an outdoor system seems to allow pigs to perform more natural behaviours, such as foraging and rooting, than an indoor system and that this resulted in a lower frequency of aggressive and harmful behaviours, including tail-biting. They suggest that aspects of the environment, including roughage, pasture, and a larger area may play an important role in reducing such behaviours. However, this study was unable to confirm the relative importance of these factors.

It is worth considering whether aspects of outdoor housing systems could be integrated into indoor systems while the viability of outdoor housing systems is further investigated. Several previous studies suggest that environmental enrichments have considerable impact on diminishing tail-biting behaviour (e.g., Bøe, 1993; Peterson *et al.*, 1995).

More recently, Zonderland *et al.* (2008) evaluated four preventative measure and two curative treatments for tail-biting in 960 weaned pigs. The four preventative measures were: a suspended metal chain; two rubber hose tubes tied crosswise and suspended; a straw rack with long straw (5g/pig/day); and twice-daily provision of long straw on the floor (2 x 10g/pig/day) (i.e., 20g straw/day). For tail-biting pigs one of the following two curative treatments was applied: straw twice daily (as in the fourth preventative measure), or removal of the biter. Groups of 10 pigs were housed in part-slatted pens measuring 2.95m x 1.42m (0.4m²/pig). Based on tail-damage scores, twice-daily provision of straw considerably reduced

the occurrence of bite marks and tail wounds compared with the provision of a chain, or rubber hose, while the straw rack had an intermediate effect. Both curative treatments eliminated the tail-biting outbreak temporarily but not permanently. The authors conclude that providing pigs with on average of 20g of straw per pig per day (in two portions) was effective in reducing tail-biting behaviour. They also note that since the straw rack was considerably less effective than twice-daily provision of straw, perhaps the frequency and provision method of straw were also important factors.

This study supports the suggested role of roughage in reducing the incidence of tail-biting in the outdoor system and provides a potential method of environmental enrichment for indoor production systems. Despite the evidence that providing straw may enhance pig welfare (Van Putten, 1969; BØe, 1993; Petersen *et al.*, 1995), the use of straw has not been widely adopted. This is mainly because of its incompatibility with housing systems containing perforated flooring, where full-length straw may block the slurry-based manure systems. It has been investigated whether chopped straw bedding (which does not block the slurry-handling facilities) would achieve similar welfare enhancements as those achieved by un-chopped full-length straw. In a recent study, Day *et al.* (2008) recorded the prevalence of pen-mate directed behaviours, such as tail-biting and straw-directed behaviours, among 240 growing pigs provided with no straw bedding, full-length straw, half-chopped straw, and fully chopped straw. The results indicate that reducing the length of straw diminishes the benefits (elicitation of natural behaviours and reduction of damaging behaviours such as tail-biting). The authors conclude that it may be inadvisable to provide chopped straw as enrichment in growing/finishing pig-housing systems. They suggest chopped straw may increase exploratory motivation but thwart the ensuing nosing, rooting and chewing behaviours because chopped straw does not readily accommodate these behaviours, with the ensuing activity being redirected towards pen-mates. As this is the first study to investigate the behavioural effects of chopped straw, further work is required to validate this hypothesis.

Conclusion

Recent research indicates that the incidence of tail-biting is reduced in outdoor systems, and that factors contributing to this reduced frequency of tail-biting, including providing environmental enrichment in the form of straw, have potential to be adapted to indoor systems. Further research into the behaviourally rewarding properties of roughage, such as straw, may be required to facilitate the construction of environmental enrichment devices that meet the behavioural needs of pigs, while also being compatible with slatted indoor housing systems.

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