

The welfare implications of tail biting in pigs

Discusses the welfare and economic benefits of controlling tail biting in pigs housed in intensive systems.

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Introduction

Tail biting is a multifactorial behavioural problem of pigs that can be indicative of underlying welfare issues. Risk factors include a lack of stimuli, limited expression of natural behaviours, overcrowding, and particular feeding plans (Scollo *et al.*, 2013). Although rarely seen in semi-natural conditions, tail biting is frequently observed in intensive systems (Scollo *et al.*, 2013). Tail docking of piglets is a routine management practice performed throughout intensive piggeries in order to reduce the incidence of tail mutilations caused by this behaviour. Without analgesics, up to one third of the tail is removed surgically with a knife or by using a heated docking iron (Sutherland *et al.*, 2008). Shortening the tail length and removing the tuft of hair is thought to decrease attraction and sensitise the tip to induce avoidance behaviours (Moinard *et al.*, 2003). While some may consider the welfare risks associated with tail docking to be less than those associated with the tail mutilations that can occur otherwise, the underlying causes are not addressed when docking is used as a preventive measure.

Discussion

Acute stress can be characterised by an increase in cortisol concentration. However, chronic stress has been shown to lead ultimately to a reduction in daily cortisol secretion and a reduced cortisol response to stressors (De Groot *et al.*, 2000; Valros *et al.*, 2013). At a cellular level, the stress response includes synthesis of heat-shock proteins as a protective mechanism (David *et al.*, 2002). A study by Valros *et al.* (2013) examined pre- and post-mortem physiological indicators of stress and meat and carcass characteristics in tail-bitten pigs at slaughter. Pigs (n=12) with clearly visible tail wounds and 13 control pigs from pens where no tail biting occurred were selected for examination. Saliva cortisol concentrations before and after transport to the abattoir were measured. After stunning, samples of serum cortisol concentrations, blood lactate concentrations and intestinal heat-shock protein 70 (HSP70) were taken and carcass weight and lean meat percentage were calculated. In tail-bitten pigs, the increase in cortisol due to transport was found to be lower than in control pigs. This may be indicative of a less reactive HPA-axis due to chronic stress in their home environment. Tail-bitten pigs showed a higher level of carcass condemnations due to abscesses, also suggesting chronic damage. However, the difference in cortisol secretion between control pigs and tail-bitten pigs may have been due to infection.

The interaction between the immune system and stress is complex. Studies have shown both an increase and a decrease in cortisol response following disease (Balaji *et al.*, 2000; Valros *et al.*, 2013). An elevation in HSP70 was seen in tail-bitten pigs, indicating stress prior to transport as increases in intestinal levels are seen approximately 6 hours after the stressful event (David *et al.*, 2002). Tail-bitten pigs also had a considerably lower carcass weight, producing a lower amount of lean meat than control pigs thereby indicating economic losses for producers. Prevention of tail mutilations would be a significant benefit to both producers and animals.

A study by Wallenbeck and Keeling (2013) investigated early indicators of tail-biting outbreaks feasible for application in commercial piggeries by using data from electronic feeders. Non-castrated boars (n=460) with undocked tails were separated into tail biting (TB) and matched control pens where no tail biting was registered. Over a period of 10 weeks prior and 10 weeks after the first tail injury in the pen, daily frequency of feeder visits (DFV) and daily feed consumption (DFC) were recorded. On an individual level, tail-biting victims were found to have an increased DFV 2-5 weeks prior to an outbreak. Because of time constraints, Wallenbeck and Keeling (2013) were unable to identify pigs performing tail biting. Further research into the feeding habits of tail-biting pigs may allow early identification and prevention. A lower-than-average DFV was recorded in TB pens than in control pens 6-9 weeks prior to a tail-biting outbreak, so it was concluded that low feeding frequencies of groups of pigs can be used to predict tail biting as early as 9 weeks before tail injury occurs. Using this method of prediction, farmers could improve welfare by implementing preventive strategies and ameliorating husbandry conditions, thereby alleviating the need for tail docking.

An experiment by Scollo *et al.* (2013) examined the role of tail presence, gender and straw availability

in control of tail-biting outbreaks in heavy pigs. The study was performed in a commercial environment with a 30-week growing cycle on sows and castrated boars (n=672). Half of the animals had docked tails and were sorted into 24 pens based on gender and tail docking. Environmental enrichment was provided in all pens in the form of hanging chains and sawdust. Pigs were fed manually twice daily in accordance with heavy-pig-rearing nutritional requirements. Long straw was provided at all times in 12 randomly selected pens. Few interactions between factors were identified. However, the presence of straw produced an increased motivation for exploring and reduced the risk of tail biting. Although the provision of straw has been shown to be an effective means of environmental enrichment for the prevention of tail biting, the impracticality of blocking slurry-based sanitation systems means that it has not been widely adopted (Scollo *et al.*, 2013). With the ability to predict tail biting as much as 9 weeks before an outbreak, straw could be provided at high-risk times as a form of tail-mutilation prevention.

Conclusions

Tail biting causes a significant reduction in welfare for pigs through pain and chronic stress. While docking may reduce the incidence, it does not address the underlying welfare issues. Repercussions for farmers are seen as economic losses due to decreased carcass weights at slaughter as well as carcass condemnations. Providing straw seems to decrease the need to dock and so enhances pig welfare.

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