Case control study on environmental, nutritional and management-based risk factors for tail-biting in long-tailed pigs

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Abstract

A case control study with a questionnaire was carried out to compare feeding practices, diet composition, housing and management in 78 herds with or without a history of tail-biting in undocked pigs (Sus scrofa) in Finland. Tail-biting was measured as the mean annual prevalence score of tail-biting damage (TBD) for a farm. Logistic regression parameters were calculated separately for risk factors present in piglet (lactation), weaner, and finishing units. Risk factors found in piglet units for TBD were slatted floors and area of slats. In the weaner units, slatted floors, area of slats, use of whey or wheat in the diet, and use of purchased compound feeds were associated with a risk of TBD. In the finishing units, slatted floors, area of slats, increasing number of finisher pigs at the farm, absence of bedding, liquid feeding, several meals per day, specialised production type and a group size greater than nine pigs were found as risk factors for TBD. Increased farm size was connected to risk for TBD in the overall dataset. The nutritional risk factors seem to operate together with other risk factors, but with relatively lower odds. The risk factors of undocked herds in this study seem to be similar to the risk factors from earlier studies of docked pigs. This study provides information which can be used to refine decision-support tools for management of the potentially higher risk for tail-biting among long-tailed pigs, thus aiding compliance with EU law and enhancing pig welfare.

Keywords: animal welfare, environment, feeding, pig, risk factor, tail-biting

Introduction

Tail-biting is a behaviour that gives rise to serious animal welfare and economic problems in modern pig (Sus scrofa) production. Many environmental, feed-related or animal-based risk factors increase the likelihood of onset of tail-biting (for a review, see Taylor et al. 2010). From an ethological point of view, tail-biting has been associated with a redirection of normal foraging or exploratory behaviour linked to other pigs’ tails (e.g. Schröder-Petersen & Simonsen 2001). The absence of suitable foraging material — feed, bedding or enrichment — is shown to make pigs redirect their exploratory behaviour from the ground to other pen items and pen-mates (Aversos et al. 2010), behaviours that appear in conjunction with an increased level of tail-biting behaviour (Day et al. 2002). Solutions that satisfy pigs’ needs for exploration, rooting and foraging are preferred in order to decrease the risk of tail-biting, but are not always practical from a farmers’ point of view (D’Eath et al. 2014).

Whilst there are many anecdotal reports of nutritional risk factors for tail-biting, both quantitative and qualitative in nature, there has been little research carried out on this subject using an epidemiological approach. Results which associate tail wounds or tail-biting behaviour with limited feeding space (Botermans & Svendsen 2000; Hunter et al. 2001; Moinard et al. 2003; Smulders et al. 2008; Taylor et al. 2012), feeding frequency (Botermans & Svendsen 2000; Hessel et al. 2006; Taylor et al. 2012; Temple et al. 2012), deficits in diet quality or quantity (Fraser 1987; McIntyre & Edwards 2002; Beattie et al. 2005; Temple et al. 2012), form of the feed (Hunter et al. 2001; Moinard et al. 2003; Holmgren & Lundeheim 2004; Smulders et al. 2008; Taylor et al. 2012) or dysfunction of the feeder system (Paul et al. 2007; Taylor et al. 2012) do exist. In many cases these come from experimental studies, and there is limited evidence of their importance under practical farming conditions, where multiple risk factors are present simultaneously (Smulders et al. 2008). The combined effect of environmental and nutritional limitations at farm level requires special attention for the risk of tail-biting to be comprehensively measured.

Most of the epidemiological investigations originate from short-tailed pigs, as tail-docking is widely carried out in the majority of European countries. A few epidemiological studies explore the relationship between tail-biting...