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 Hertfordshire AL4 8AN, UK
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Stress measures in tail biters and bitten pigs in a matched case-control study

C Munsterhjelm^{†‡}, E Brunberg[‡], M Heinonen[§], L Keeling[‡] and A Valros[§]*

[†] PB 57, FIN-00014 University of Helsinki, Finland

[‡] Department of Animal Environment and Health, Swedish University of Agricultural Sciences, Uppsala, Sweden

[§] University of Helsinki, Faculty of Veterinary Medicine, Department of Production Animal Medicine, Helsinki, Finland

* Contact for correspondence and requests for reprints: camilla.munsterhjelm@helsinki.fi

Abstract

*This study aimed to identify differences in stress measures in pigs (*Sus scrofa*) with different roles during a tail-biting outbreak. Quartets ($n = 16$) of age- and gender-matched fattening pigs including a tail biter (TB; $n = 16$), a victim (V; $n = 16$), a control in the same pen (C_{tb} ; $n = 10$), and one in a pen without tail biting (C_{no} ; $n = 14$) were chosen by direct behavioural observation. Stress measures used were behaviour (dog-sitting, sniffing of pen-mates and aggression), thyroid hormone concentration, morphology of adrenal and thyroid glands and salivary cortisol concentration sampled at 0700, 1000, 1600 and 1900h. Category (TB, V, C_{tb} , C_{no}) effects were investigated using a mixed model with replicate as subject and category as repeated effect. Category had a significant effect on adrenal total (cortex + medulla) and cortical area, salivary cortisol at 1900h, serum triiodothyronine (T_3) and the behaviours performing and receiving sniffing. Victims suffered from a triad of chronic stress, pathology and suppressed T_3 secretion. Evidence for stress in tail biters, a possible cause of the behaviour, consisted of a slightly flattened day-time cortisol pattern and more performed sniffing than all other categories. Differences in evening cortisol concentration and T_3 levels between the categories in the pen with ongoing tail biting emphasise the qualities of the control animal. It supports the view that neutral pigs represent a phenotype that adopts a coping strategy leading to lower stress levels than in tail biters and victims, despite being housed in the same pen.*

Keywords: adrenal, animal welfare, injurious behaviour, physiology, swine, thyroid