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Effects of species-relevant environmental enrichment on the behaviour and productivity of finishing pigs

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Abstract

Three different enrichment objects, which were designed according to pig-specific requirements, were provided to groups of growing pigs with undocked tails. The enrichment treatments were a substrate dispenser providing straw, a rootable feed dispenser providing flavoured feed and a liquid dispenser that provided flavoured water when chewable rods were manipulated. These objects were compared with a pen with a full bed of straw (positive control) and a commercial enrichment object, a Bite Rite (Ikadan System, Denmark, minimal enrichment). Video tape recordings from weeks 1, 3 and 7 were scanned using time-sampling to investigate general behaviour and enrichment use. Production parameters were measured, as well as occasions where tail biting (with fresh damage to a tail) occurred. The behavioural observations revealed that all of the enrichment provided was used by the pigs, but there were differences in the level and type of enrichment use by the pigs. The extent to which the straw and straw rack were used was significantly greater than for the other treatments (11.5 and 3.6% of the observations). Enrichment that was located on the floor could be manipulated from different postures, including whilst lying down; for example in 6.6% of the observations in which pigs on straw were lying down, they were manipulating the straw. This also applied, but to a lesser extent, to the straw rack and rootable feed dispenser. Groups provided with the liquid dispenser (which experienced technical problems) and Bite Rite had the highest prevalence of tail biting incidents

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(100 and 83% of pens, respectively). This study shows that a full bed of straw was the most successful way of occupying the pigs and, in addition, it prevented severe tail biting. Where it is not possible to supply a full bed of straw, point source enrichment objects such as substrate or feed dispensers appear to offer a good substitute. Such objects were well-used and did not affect production negatively; furthermore, severe outbreaks of tail biting were prevented.

Keywords: Enrichment; Behaviour; Production; Welfare; Pigs

1. Introduction

There is a large body of literature supporting the hypothesis that environmental enrichment improves animal welfare (see Young, 2003 for an overview). One of the main mechanisms by which enrichment improves animal welfare is the creation of behavioural opportunities to allow an animal to express control over its environment. It may well be that enrichment is also intrinsically rewarding. Environments with low levels of predictability and controllability will limit the regulatory capacity of organisms, which can lead to decreased welfare (Wiepkema and Koolhaas, 1993). Successful enrichment strategies for pigs have been associated with modifications to barren environments that allow individuals to express key elements of their behavioural repertoire, such as foraging and exploratory behaviour (Van de Weerd et al., 2003; Young, 2003).

Straw is generally regarded as a functional form of enrichment for pigs (Arey, 1993), as it occupies pigs for up to 25% of their active time (McKinnon et al., 1989; Beattie et al., 2000). It provides thermal and physical comfort, it can be ingested to provide gutfill, and it provides a substrate for chewing and rooting activities (Fraser, 1975). Mainly because of these last characteristics, straw reduces the risk of the development of harmful social behaviour (Ruiterkamp, 1987; Fraser et al., 1991; Lyons et al., 1995; De Jong et al., 1998; Van de Weerd et al., 2005). Among the harmful social behaviours of pigs, tail biting is one of the most serious due to its damaging nature and the associated risks of infection. In situations where a substrate cannot be provided enrichment objects should be offered instead (Defra Code of Recommendations for the Welfare of Livestock: Pigs, 2003). These types of enrichment objects will be referred to as point source enrichment objects as they are often restricted to a single location in a pen and they are limited in size, in that they generally do not allow all animals in a group simultaneous access. If an enrichment object is offered as an alternative to straw it should occupy animals to the same extent and divert them from performing adverse behaviour.

In a previous study, Van de Weerd et al. (2003) investigated which characteristics of enrichment objects played a major role in determining the extent of object directed exploratory behaviour in pigs. The characteristics of objects, which were found to maintain a pig's attention were ingestible, destructible, deformable, chewable and odorous, and these were in many cases associated with rootable substrates (Van de Weerd et al., 2003). However, other characteristics suggested by the analysis as important were 'not rootable' and 'not particulate', which although initially counterintuitive, related to hanging, ingestible objects, which proved very effective in maintaining a pig's interest. In the