The efficacy of novel rope flavours as environmental enrichment for stalled gilts

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Abstract

The objective of this study was to evaluate the use of flavoured ropes as environmental enrichment for individually housed pigs (Sus scrofa). A 4 × 4 Latin square experimental design was utilised to evaluate the effects of four rope flavour treatments on 24 individually penned gilts: i) water; ii) salt water solution; iii) sugar water solution; and iv) apple juice. Cotton rope was soaked in the assigned treatment solution for 30 min on day 1 of each treatment. The rope was tied to an overhead bar at 1000h on day 1 and removed at 1900h on day 2. The following day, gilts received a different treatment using the same methodology. Gilts were video-recorded one day before treatments were given (baseline) and throughout the study. The video was analysed for enrichment interaction, eating behaviour, and posture using a 2-min scan sample interval between 0700 and 1900h. The addition of sugar flavour increased enrichment interaction compared to apple and salt flavours but did not differ compared to water treatment. Furthermore, gilts interacted with enrichment 61% more the first day the enrichment flavour treatment was provided compared to the second. Gilts given rope enrichment spent less time lying and more time sitting compared to when no enrichment was provided. The results of this study suggest that while the addition of flavours to cotton ropes caused minor changes in enrichment interaction and behaviour, provision of rope enrichment was beneficial for increasing activity in stalled gilts.

Keywords: animal welfare, behaviour, environmental enrichment, feed intake, flavour, pig

Introduction

Biologically relevant environmental enrichment devices can improve pig (Sus scrofa) welfare by providing an outlet for exploratory (van de Weerd et al 2003) and play behaviours (Dudink et al 2006), decreasing aggression (Dudink et al 2006), and inducing positive cognitive bias (Douglas et al 2012). Pigs are highly oral-nasal focused and environmental enrichment devices that encourage foraging and chewing are likely valued by pigs (van de Weerd et al 2003). Pigs can quickly habituate to environmental enrichment devices (Apple & Craig 1992); therefore, the addition of novel qualities may be beneficial for maintaining interest (van de Weerd et al 2003).

In a survey sent to pig welfare scientists, 28% of respondents identified chewable, 14% identified novelty, and 11% identified olfactory/smell as important environmental enrichment properties (Bracke 2008). Cotton ropes can be beneficial for their chewable, changeable, and manipulable properties. However, cotton ropes rank low in smell and novelty qualities compared to other rootable environmental enrichment materials, such as straw, compost and earth (Bracke 2008). While these rootable materials are beneficial for many enriching qualities for the pig (Bracke 2008), they are often not practical for biosecure facility or laboratory settings as they can reduce swine hygiene and health (Scott et al 2006) and interfere with manure pits in systems with slatted floors (van de Weerd & Day 2009). Therefore, by adding a novel taste and smell to cotton ropes, the value of this environmental enrichment device to the pig may increase.

Recently, interest in pig flavour preference has grown with research evaluating weaned pig feed intake (Oostindjer et al 2010), the use of ropes for oral fluid collection (Kittawornrat et al 2010), and wild boar baits (Campbell & Long 2009). However, it is unclear if flavours can be an effective addition to environmental enrichment for maintaining pig interest. While regular rotation of environmental enrichment devices can be time consuming and expensive, the addition of novel flavours to environmental enrichment devices could potentially decrease labour associated with maintaining device novelty.

The objective of this study was to evaluate flavoured ropes as environmental enrichment for individually housed gilts. It was hypothesised that gilts would interact with flavour-enhanced ropes more than ropes soaked in water. Additionally, we hypothesised that gilts with access to flavoured ropes would be more active than when ropes were soaked in water or there was no rope access.