

# Advances in Environmental Enrichment for the Welfare of Grower Pigs

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## Introduction

There is an inherent motivation for pigs to exhibit exploratory behaviours, even in intensive husbandry systems where food is readily available (Scott *et al.*, 2007). This biologically important behaviour is recognised by current EU legislation, which states that “Pigs must have permanent access to a sufficient quantity of material to enable proper investigation and manipulation activities”. However, as Bracke (2007) points out, this leaves some room for interpretation of what “proper investigation and manipulation activities” are. Recent studies have analysed the effectiveness of varying forms of enrichment in improving welfare by measuring stress levels and the incidence of unwanted aggressive behaviours.

## Discussion

Pigs typically express nosing, rooting and chewing behaviours as a reflection of both exploratory and feeding motivation. If pigs are housed in barren environments where these behaviours cannot be fully expressed, they may instead redirect the behaviours towards pen-mates, resulting in antisocial activities such as nosing, tail-biting, and massaging (Day *et al.*, 2008). Providing straw improves pig welfare due to its threefold advantage as a recreational stimulus, a nutritional stimulus and as bedding (Scott *et al.*, 2007). This is supported by the findings of Day *et al.* (2008), that groups of pigs provided with straw nosed other pigs approximately 40% less throughout their total behavioural activity than pigs in barren environments.

However, Day *et al.* (2008) highlight that 90% of EU pig producers use fully or partly slatted floors and this design is incompatible with straw, which commonly blocks the liquid-slurry handling facilities. In an attempt to overcome this problem, their study aimed to determine whether providing chopped straw gave equivalent improvements in pig welfare as those of full-length straw. The analysis involved comparing the levels of activity and aggressive behaviours among 24 groups of 10 growing pigs housed on either no straw, chopped straw, half-length straw or full-length straw. Intriguingly, while chopped straw increased overall activity and expression of manipulative oral behaviours such as licking, it conversely resulted in some apparent frustration because these behaviours were restricted by the shorter lengths of straw. The frustration was redirected towards pen-mates in the form of aggressive behaviours. Day *et al.* (2008) concluded that although providing chopped straw is definitely better than no enrichment in slatted housing, its propensity to increase agonistic behaviours provides significant drawbacks and other avenues to enrichment should be explored.

In a similar endeavour to identify alternatives to full-length straw, Bench and Gonyou (2007) focused their study on providing novel objects to simulate components of the sow’s udder in the hope of decreasing the occurrence of belly nosing in early-weaned pigs. For this experiment, 291 seven-day-old piglets were divided into three groups, receiving either eight rubber nipples in the feed trough, an air-filled black rubber inner-tube or neither. Observations were taken at 5-minute intervals for two consecutive days to determine the percentage of time piglets spent belly nosing as well as other nosing activities. In terms of reducing belly nosing, the nipple treatment was the most effective. However, as a method of reducing nosing behaviours directed away from the belly, the tube treatment was the more effective. Bench and Gonyou (2007) suggest that providing novel objects acted as a large surface suitable for redirecting nosing behaviour away from pen-mates. Interestingly, the differing frequencies of antisocial behaviour support the findings of Day *et al.* (2008), that provision of enrichment is most important at a young age when the potential for pig-directed manipulatory behaviours is greatest.

The possibility for an animal to control its environment and to cope successfully with challenges may be a source of positive emotions and contribute to a decrease in stress and redirected oral behaviours (Puppe *et al.*, 2007). In contrast to the previous two studies, an

experiment carried out by Puppe *et al.* (2007) provided enrichment in the form of sustained cognitive challenges based on a combination of classical and operant conditioning. Seven replicated trials were conducted with an experimental and a control group. A “food-rewarded learning system” was implemented using acoustic cues in the experimental group. The experimental group of eight growing pigs was fed by four “call-feeding-stations” (CFS) in three consecutive phases – an associative phase, a discriminative phase and a working phase. The associative phase involved classical conditioning, where whenever a pig entered a certain CFS, an individual tone was played before the pig was rewarded with food. The discriminative phase then employed operant conditioning, in that the individual tone was used as a summons to enter the CFS that was calling and receive food. Finally, the working phase involved requiring the pigs to push a button after entering the correct CFS in order to receive the food reward.

Combining these three phases, the experiment resulted in the growing pigs having a permanently increased locomotor activity, as a direct consequence of fulfilling their motivational requirements to obtain the food portions. Additionally, incidences of belly-nosing were reduced in the experimental animals, most likely due to their being frequently occupied in obtaining numerous small food portions. This was a similar result to those of full-length straw in the study conducted by Day *et al.* (2008) in reducing nosing activities and appears to be a practicable enrichment method, especially in slatted flooring systems where there is little or no access to suitable straw. Furthermore, levels of excitement and fear reactions on exposure to unfamiliar situations and novel objects were significantly lower in the experimental piglets, which Puppe *et al.* (2008) suggest may reflect their greater ability to adapt emotionally. They emphasise the important role of adaptive ability for animal welfare.

## Conclusion

Providing environmental enrichment to intensively managed pigs improves welfare by increasing locomotion, decreasing stress and reducing misdirected aggressive behaviours. Given that these positive behaviours also result in improved meat quality (Chaloupkova *et al.*, 2007; Puppe *et al.*, 2007), there is justification on the grounds of both welfare and productivity to provide pigs and piglets with enrichment, in the form of cognitive challenges, novel objects and straw, wherever possible.

## References

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