

The influence of environmental enrichment upon the welfare of intensively housed weaner, grower and finisher pigs.

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Introduction

The welfare of intensively housed weaner, grower and finisher pigs is a controversial issue. Intensive housing can restrict the behavioural repertoire that can be demonstrated by the pigs housed in such a situation. This restriction can be to the extent that it prevents behaviours such as rooting of the ground substrates and wandering being performed. These behaviours comprise a large proportion of the behavioural repertoire displayed by pigs in the free-ranging state however, due to the space restrictions and barren flooring of intensive housing, these behaviours cannot be performed. Pigs housed in this situation may also be injured due to space restrictions or flooring that is inherently unsuitable for the pigs to stand on for long periods.

Discussion

Environmental enrichment has been investigated as a means to improve the welfare of intensively housed pigs. It generally involves the addition of substrates to the housing and/or increasing the area available to each pig.

There will be an integrated discussion of the first two articles as both contain an investigation into the influence of environmental enrichment on agonistic behaviour. The third article investigates the influence of environmental enrichment on limb injuries and immune responses and as such will be discussed separately.

Beattie, O'Connell, Kilpatrick and Moss (2000) investigated the influence of environmental enrichment on welfare-related behavioural and physiological parameters in pigs.

The behaviour of the pigs was observed and it was found that the pigs in an enriched environment spent 29.3% of observation time exploring the substrates provided and only 5.6% of time exploring the fixtures of the pen. This is in contrast to the behaviour of the pigs in the barren environment, where exploration of the pen fixtures occupied 22.8% of the observation period.

Through this higher level of manipulation of the fixtures, the pigs in the barren environment had a higher chance of causing mechanical damage to the fixtures of the pen and/or injury to self. The welfare of the pigs in the enriched environment thus exceeded that of the pigs in the barren environment, as the probability of injury to self was reduced.

The pigs in the barren environment also displayed significantly more aggressive behaviour, such as biting, than did the pigs in the enriched environment. The pigs in the barren environment were thus more prone to injury from such interaction.

These findings are in accordance with the findings of the research of De Jong, Prella, van de Burgwal, Lambooi, Korte, Blockhuis and Koolhaas (2000) that investigated the effects of rearing conditions on behavioural and physiological responses of finisher pigs to pre-slaughter handling, mixing and transport.

An integral component of this research was the observation of the behaviour demonstrated by pigs reared in either a barren or an enriched environment during a one-hour journey to the abattoir and a 115-minute period in lairage.

In transport the pigs reared in the barren environment and those reared in the enriched environment remained separated and each pig was exposed to 8 new conspecifics of the

same treatment type. The aim was to determine the amount of aggressive behaviour demonstrated by each pig. It was found that the barren environment pigs engaged in significantly more inter-pig aggression than did the enriched environment pigs.

The pigs reared in the barren environment also spent a significantly longer period of time in transport standing or walking than did those reared in the enriched environment. This, combined with the higher incidence of aggressive behaviour, rendered the pigs reared in the barren environment more liable to receive injury in transit, whether it be from conspecifics or from the motion of the vehicle. Enriched housing thus improved welfare by removing such likelihood of injury.

Beattie et al. (2000) found that the enriched housed pigs showed a lower latency to contact a novel object and spent more time in contact with it. The authors interpreted this as indicating a lower fear response to novel stimuli in enriched-housed pigs compared to barren housed pigs. Thus enriched housing could improve the welfare of intensively housed pigs through reducing the fear of novel husbandry procedures.

Beattie et al. (2000) measured plasma cortisol concentrations to indicate the stress experienced by the pigs in response to novel stimuli. The cortisol concentration of the barren housed pigs did not change significantly in response to the novel stimulus. This combined with a higher adrenal gland mass in these pigs may indicate a chronic stress response and possible suppression of the Hypothalamo-Pituitary-Adrenal axis (Laedwig and Smidt, 1989). However, De Jong et al. (2000) found a significant increase in the cortisol concentrations of barren housed pigs in response to transport that was not evident in the enriched housed pigs. This suggested a greater activity of the H-P-A axis in barren housed pigs.

Thus, further research into the impact of increased behavioural activity on cortisol concentrations in pigs, and of the utility of cortisol concentrations in measuring stress, must be undertaken before using this concentration in determining welfare.

Attempts to increase hygiene in piggeries have resulted in the common usage of perforated metal floors that can cause injury to the hooves of the pigs housed on them. Kelly, Bruce, Edwards, English and Fowler (2000) investigated the limb injuries, immune responses and growth performance of early weaned pigs in different housing systems. The housing systems chosen to represent those in common usage were deep-straw and Straw-FlowR (Enriched) and small and large flatdeck (Barren).

Twenty pigs were weaned into each of the four systems and it was found that the pigs that had injuries prior to weaning healed most rapidly on the deep straw. After two weeks in the flatdeck pens the incidence of injuries increased significantly with 24.9% of the pigs on the small flatdeck injured and 6.6% of the pigs on the large flatdeck injured.

There was no significant difference in growth performance found between the four systems.

Immune responses were measured through intramuscular injection of ovalbumin and Keyhole-Limpet-Haemocyanin. There was no significant difference in the immune response between the four systems to ovalbumin. However, the immune response to KLH was greatest in those pigs housed on deep-straw.

The influence of chronic stress on immune response in intensively housed pigs warrants further investigation with antigens capable of eliciting a greater immune response so that differences in response between barren and enriched housed pigs are more marked.

Conclusions

It may be concluded, from the discussion presented in this assignment, that environmental enriched has the potential to significantly improve the welfare of intensively housed weaner, grower and finisher pigs. One of the main improvements to welfare that follows environmental

enrichment is that of the pigs having the ability to display more of their natural behaviour which includes the rooting of substrates. This will act to reduce stress and alleviate boredom. By alleviating boredom the incidence of agonistic behaviour and manipulation of the pen will be reduced, thereby reducing the chance of injury. Finally it can be seen that environmental enrichment need not be at the expense of maximum productivity; in fact productivity may be increased through a reduction in herd wastage due to injury.

References

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