

Finding Effective Enrichments for Group Housed Sows

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The Code of Practice for the Care and Handling of Pigs indicates that all pigs must be provided with multiple forms of enrichment to, “improve the welfare of the animals through the enhancement of their physical and social environments”. This research was intended to provide pig producers evidence-based information on enrichment options which they can implement immediately. In two trials, using free-access stalls and electronic sow feeding (ESF) housing systems, the study demonstrated that wood suspended from a chain, cotton rope and straw can all be used as enrichment materials. Straw tended to be preferred by sows; straw is malleable and consumable which are known to be positive characteristics for enrichment. The straw was also provided as a diffuse enrichment on the floor, not as a single point source like the object enrichments, which allowed for more interaction. Rotating the different enrichments increased sow interactions with enrichment. This confirms that novelty and the type of material provided play a role in increasing attractiveness and sustaining sows’ interest in enrichment. When free-access stalls were used, dominant sows spent more time near enrichments, while subordinate sows spent more time in the free-access stalls. In ESF housing subordinate sows interacted with enrichments more than dominants, and sows had higher skin injury scores indicating higher levels of aggression in this system compared to free-access stalls. It is possible that these differences were influenced by genetics. Further research on the effects of genetics and housing and feeding systems on enrichment use is recommended.

INTRODUCTION

Group housing for gestation sows has been adopted by approximately 25% of pork producers in Canada. Although group housing is considered a socially enriched environment, there is also an inherent risk of aggression as pigs compete for resources such as food and territory. Studies have shown that providing occupational enrichment in group housing has been associated with reduction in aggression and reductions in stereotypic behaviour. The Canadian Code of Practice for the Care and Handling of Pigs requires that all pigs be provided multiple forms of enrichment. However, what type of enrichments to provide and how enrichment should be provided is not well understood, particularly in slatted flooring systems which are widely used in North America. To address this issue, two set of studies (Phase 1 and Phase 2) were performed to examine how different types of enrichment and its presentation affects the use of enrichments by gestating sows. Both phase 1 and 2 also looked at the effect of enrichments on aggression using skin injury scores.



“Rotating enrichments increases sow interactions with the enrichment”

MATERIALS & METHODS

Phase 1

Phase 1 trials were designed to investigate suitable enrichments for sows housed on fully or partially slatted flooring systems. Studies with similar methodology were conducted at Prairie Swine Centre (PSC) and at the University of Manitoba (U of M) under different housing systems and genetics. Each treatment was studied over a 12 day period and sow groups received all four treatments in random order. Treatments consisted of:

1. Constant: constant provision of four wooden enrichments per pen;
2. Rotate: rotation of three items (rope, straw, and wood block) every three days;
3. Stimulus: rotation of the same three items, with an associated stimulus (bell);
4. Control: no enrichment provided.

Phase 2

Phase 2 compared the effects of fibre-based enrichments and object enrichments on sow behaviour. The ratio of enrichments provided per sow (one or three enrichments per group of 28 sows) was also studied. Five groups of ~ 28 sows housed in free access stalls were randomly allocated to three treatments per group, including:

1. One fibre feeder per pen (Figure 1);
2. Three fibre feeders per pen;
3. One wood enrichment per pen;
4. Three wood enrichments per pen, or
5. No enrichment (control).

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RESULTS & DISCUSSION

Enrichment Use

All types of enrichment used (straw, hanging wood, hanging rope and fibre provided in a feed hopper) elicited a response (contact with enrichment) 20 percent of sows. Enrichment contacts were three times higher in the ESF feeding system than free-access stalls. Sows preferred straw, rope and wood in decreasing order of preference. The Rotate and Stimulus treatments had a higher percentage of sows contacting enrichment compared to Constant provision of one enrichment in both study locations. Sows in the Rotate and Stimulus treatments interacted with enrichments more and spent more time in proximity to enrichment on day 10, when straw was provided in both studies. Sow activity (time standing), was greater when enrichment was provided compared to Control, indicating a higher activity level with enrichment.

Social Status

The phase 1 study was conducted in an ESF system (University of Manitoba) and in free-access stalls (Prairie Swine Centre). Social status had a greater effect in the ESF system, with subordinate sows using the enrichment more than dominant sows. The fact that subordinate sows used the enrichments more suggests that the sows did not value the enrichments highly. This result may be due to dominant sows protecting the ESF feeder. Sows at the two sites also showed differences in stress physiology. At PSC, social status did not have a significant effect on cortisol levels, whereas at the U of MB subordinate sows had higher cortisol levels than dominant sows. There were no effects of social status and parity on sow skin lesions at either site.

When fibre enrichment was provided in the free-access stall system (Phase 2), dominant sows had greater access to enrichment than subordinates, and the prevalence of skin lesions increased, especially when only one fibre feeder was present. This indicates that sows valued the fibre enrichment, and that limiting sows to only one access point resulted in increased aggression among sows.

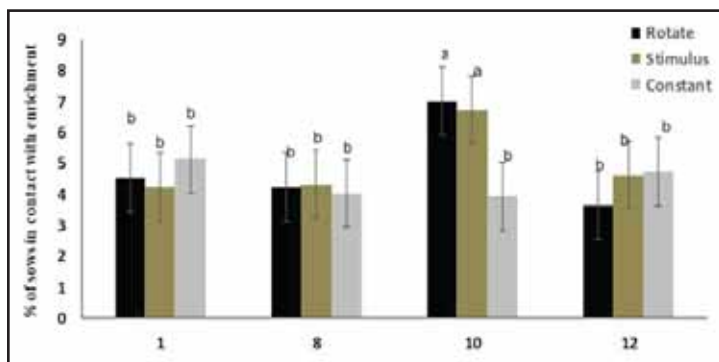


Figure 2. The percentage of sows in contact with enrichment in observations on days 1, 8, 10 and 12 in the free-access stall system. Sows were scan sampled at 15 minute intervals over 8-hours per day using time lapse digital cameras.



Small amounts of organic material drop out of the rotor when a pig uses its snout to turn the wheel at the bottom.



Figure 1. The fibre dispenser used in this study was supplied by Big Dutchman. The original dispenser had five holes in the bottom designed to dispense pelleted feed. As finely chopped hay was used in this study, the opening in the bottom was enlarged to improve flow.

Aggression and Stress

In the fibre enrichment study, higher lesion scores were observed when fibre enrichment was provided than when wood enrichment was given. This result suggests that aggression may be increased when enrichments are of greater value to sows and there is limited access.

Average injury scores were higher in the ESF system than in the free-access stall system, and subordinate sows tended to have higher injury scores than dominant sows. As previously discussed, the subordinate sows in ESF also had higher cortisol levels indicating that social competition may be higher in ESF feeding system. Alternatively, these behavioural differences may be related to differences in genetics or management between the two study sites.

CONCLUSION

Under conditions of adequate space allowance and individual feeding, wood suspended from a chain, rope and straw can all be used as enrichment materials. Straw enrichment provided on the pen floor produced the greatest response to enrichment. The rotation of enrichments tended to increase sow interaction with enrichment, indicating that maintaining novelty is an important factor to maintain sow interest. The behaviour of sows in the two barns studied was significantly different. Sows in the ESF barn contacted the enrichments three times more frequently than those in the free-access stall barn. Social status influenced fibre enrichment use but not use of other enrichments, with dominant sows having greater access. This suggests that when the enrichment provided is of greater perceived value and access is limited, then competition for the resource is increased.

ACKNOWLEDGEMENTS

The authors gratefully acknowledge specific funding for this study provided by Swine Innovation Porc (SIP). The authors would also like to acknowledge the strategic program funding provided by Sask Pork, Alberta Pork, Ontario Pork, the Manitoba Pork Council and the Saskatchewan Agriculture Development Fund. In addition, we also wish to acknowledge the support of the production and research technicians at Prairie Swine Centre that make it possible to conduct this research.