

Assessing Enrichment for Sows



Victora Kyeiwaa, B.Sc., Jennifer Brown, Ph.D.



While many different forms of enrichment materials have been studied, most of the research has been done on piglets and growing pigs. Examples are straw, chains, wood, rope, mushroom compost, wood shavings, garden hose, peat moss and rubber balls. These studies have shown that, when growing pigs are given appropriate enrichments, they can benefit from reduced aggression, fewer behavioural vices (such as tail-biting), reduced fear, and improved growth. While similar benefits can be expected for sows, older animals are different and generally prefer manipulable and destructible enrichments over simple objects.

The farm-level interest in sow enrichment has been driven by the revised Canadian Code of Practice for the Care and Handling of Pigs, which includes a requirement that all pigs should be provided with “multiple forms of enrichment that aim to improve the welfare of the animals”. This code requirement and the increasing trend towards group gestation housing have created a need for research in this area.

Funded by Agriculture and Agri-Food Canada (AAFC) and is part of a larger Swine Innovation Porc project (led by Dr. Laurie Connor at the University of Manitoba, with the research being carried at Prairie Swine Centre and the University of Manitoba), this project examines different methods of developing effective environmental enrichment for group-housed sows which would

be economically viable to the pig industry and could serve to guide producers in decision making.

European research has identified straw and other malleable and consumable materials as being optimal for pigs. However, in North America there is a greater reluctance to provide such materials. Straw has been shown to be effective in grower-finisher pigs, but many producers feel there may be an increased risk to biosecurity by bringing straw into their facilities. Small amounts of high fibre materials (e.g. chopped or pelletized straw) can be provided, in a rack or hopper, for example, and will increase satiety (feeding satisfaction) in sows as well as providing enrichment.

Providing enrichment can help to reduce aggression and stress and improve physiological function for all ages of animals, providing a direct benefit to pork producers, along with addressing public concerns regarding barren conditions in housing facilities.

Sows in stalls show stereotypies or abnormal behaviours such as bar biting, continuous drinking and vacuum/sham chewing. Stereotypies are defined as behaviours with no clear function, and

are seen as indicators of frustration, boredom, fear and stress. Sows in group housing also show some of these abnormal behaviours, especially ear/tail-biting, bar biting, as well as overt aggression, which can increase the chance of abortions.

What Types of Enrichment Do Sows Prefer?

Four treatments are being provided to sows, including; rope, small amounts of straw, wood on chains and a control treatment where there is no provision of enrichment materials. Because pigs are social animals and their social status can influence enrichment use, the effects of social status will also be examined. Social status is determined in a feed competition trial whereby six focal sows; three dominants and three subordinates are selected for additional data collection. Mostly, in a social environment, subordinate animals are being bullied and driven away from available resources by dominant ones. Dominates and subordinates sows are selected in this study to determine if all sows, irrespective of social status, will benefit from enrichment use.

Older animals generally prefer manipulable and destructible enrichments

A common problem with enrichments is that animals lose interest over time. This project will also examine if regular rotation of enrichments can increase their interest and value to sows, compared to constant provision.

Cameras are mounted over the pens and time lapse photos taken on selected days to determine the level of enrichment use, and the activities and postures of sows. Stereotypic behaviours are recorded by live observation of sows, and levels of aggression are determined using skin lesion scores, ranging from 0 (no injury) to 3 (severe injury) on both sides of the body.

Accelerometers are used as automated measuring tools to record the mobility of animals, similar to pedometers used to record fitness activities in people. Accelerometers are being used in this research to compare the activity levels of dominant and subordinate sows. Saliva samples are also taken in early, mid- and end of each trial to determine cortisol levels as a measure of stress.

While the benefits of enrichment are well known, determining exactly what enrichments are suitable at each stage of production, as well as the best methods for presenting them are still unclear. This research will help to fill these gaps related to sows, and will form the basis for practical recommendations to benefit sows and help producers meet the code of practice requirement. Enrichment is a new area for Canadian pig producers, and time is needed to clarify what is meant by enrichment and to implement these measures.

This research project will be completed in December 2017, with results available in 2018. This project is funded by Swine Innovation Porc within the Swine Cluster 2: Driving Results Through Innovation research program. Funding is provided by Agriculture and Agri-Food Canada through the AgriInnovation Program, provincial producer organizations and industry partners.



(Improving biosecurity...Cont'd from page 5)

Features to improve animal handling and pig welfare:

- Decrease the number of ramps, and floor levels
- Reduce the amount of loose equipment (chains, pins, etc)
- Reduce sharp edges or protrusions and areas where body parts may be trapped or pinched
- Increase door width
- Decrease the slope of ramps and minimize step ups
- Handle pigs using behavioural principles (approach and retreat, use of flight zone) in a low stress manner (use prods only when needed)
- Have adequate ceiling heights during handling
- Forced ventilation in summer, and bedding/insulation in winter
- Use sprinklers at loading and unloading (temperatures $\geq 24^{\circ}\text{C}$)

"Due to multiple trailer types and configurations retrofitting trailers to increase ease of cleaning and animal welfare need to be considered on a trailer by trailer basis."

Summary

Although many livestock trailers may look very similar at first glance, there are in fact a wide variety of designs in use. Individual manufacturers offer a variety of options on trailers, and transporters often do aftermarket custom work, making it difficult to define the exact features present on an average livestock trailer. These include variations in trailer siding, ramp length and angle, step design, light housing, gating, latches, sprinklers or misters as well as other features.

In terms of ease of cleaning, the general rule is that trailers with more decks take longer to clean, and that flat deck trailers are easier to clean than pot trailers. The new hydraulic deck trailers fit between these categories, as while the decks themselves are relatively easy to clean, the chain drive, locks and controls are all complex components and difficult to clean thoroughly.

Animal handling is clearly improved on straight deck trailers as the use of ramps is minimized. Handling of pigs on hydraulic deck trailers is even better as there are no ramps involved. However, pot belly trailers (either dual purpose or dedicated for pig transport) remain the most commonly used trailer design in Canada. These trailers (especially dual purpose ones) are highly versatile, have high load capacity and are relatively low weight. However, these trailers are also the most difficult to clean and have poorest animal handling characteristics. Alternative designs are being used which are easier to clean and allow better ease of handling for animals, but these designs are less versatile, have reduced load capacity and/or are significantly heavier.

The trucking industry recognizes the need for innovation in this area, especially due to increased biosecurity concerns and the cost of cleaning trailers, however this change will come at a cost due to reduced capacity, less versatility, higher trailer weight and higher purchase cost. Regardless of these issues, improved technologies to aid in the cleaning process will assist the industry regardless of trailer design and are sorely needed.

This project is funded by Swine Innovation Porc within the Swine Cluster 2: Driving Results Through Innovation research program. Funding is provided by Agriculture and Agri-Food Canada through the AgriInnovation Program, provincial producer organizations and industry partners.

