

Optimizing flooring and social management of group housed gestating sows

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This study demonstrated that, for sows housed in groups:

- Flooring with narrower gaps and slats seems to reduce feet lesions and increase the standing comfort of the sows while not significantly impacting the ease of manure removal.
- Three strategies for the timing of mixing sows can result in similar reproductive performance and well-being: 1) early mixing (at weaning), 2) mixing after insemination, or 3) late mixing.
- Enrichment has a beneficial impact on sow behaviour by providing manipulable objects to positively occupy their time and promote exercise.
- Rotating enrichment devices increases their use by sows.

Why was this study done?

Canadian pig producers have been transitioning to group housing over the past few years. The strategies used for managing group-housed sows can have an impact on the cost and type of barn renovation needed and on sow welfare. This project addressed three specific knowledge gaps related to the management of gestating sows in groups, as recommended in the *Code of Practice for the Care and Handling of Pigs* (2014).

What was done and what was the outcome?

Research question: What are the most effective concrete floor slat and gap width ratios for comfort and well-being of sows as well as ease of manure management?

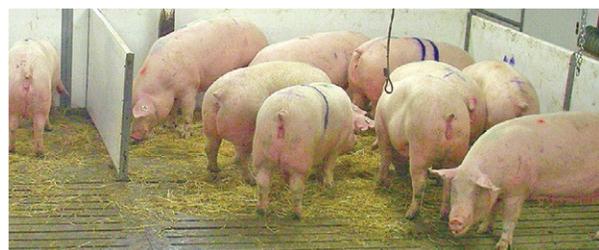
Based on detailed evaluations of different slatted floor configurations, two flooring types were evaluated in group pens holding sows over two gestation periods:

- Test floor: slats at 105 mm (4") with a gap of 19 mm (0.75") (slightly narrower than commonly used)
- Control floor: Slats at 125 mm (5") with a gap of 25 mm (1") (typical in commercial barns)

Overall, when measuring sow lameness, behaviour, reproductive performance and culling rates, there were minimal differences seen between sows evaluated on the test floor versus the control floor. However, sows on the test floor had fewer feet lesions and showed less hind-limb discomfort than those on the control floor.

Evaluation of air quality, sow cleanliness and floor friction demonstrated that manure removal was not compromised by the narrower gaps and slats of the test floor.

In addition, researchers evaluated the physical properties of rubberized and synthetic concrete overlay materials. The rubber overlays tested were softer than concrete which would increase sow comfort, and had greater surface friction which would reduce slippage. Additionally, the overlay materials had similar bacteria counts as concrete after pressure washing. While the material showed good resistance against pressure washing, more study would need to be done to assess its durability and longevity.



Straw used as enrichment. Source: University of Manitoba

Research question: What sow mixing strategies after weaning provide the best results for reproductive performance, low economic risk and sow well-being?

Three different timings for mixing sows were examined:

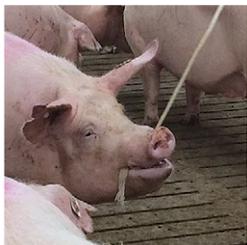
- Early mixing (at weaning)
- Post-insemination mixing (within seven to eight days of weaning)
- Late mixing (at four weeks post-breeding, after confirmation of pregnancy)

Assessing sow foot health.
Source: University of Manitoba



Wrapping an accelerometer onto the rear leg of a sow on a force plate scale.
Source: University of Manitoba

Sow using rope enrichment.
Source: University of Manitoba



Colour coded pigs for behaviour observations.
Source: University of Manitoba

Swine Cluster 2 | Animal Welfare



Saliva sampling for measuring cortisol.
Lindsey Lippens.
Source: University of Manitoba

Overall there were no differences in reproductive performance between sow mixing strategies. These results demonstrate that, with good management, individual feeding and adequate floor space, sows can be successfully grouped at weaning, after insemination or after the confirmation of pregnancy without compromising reproductive performance. Also, the type of group housing system used (with walk-in-lock-in stalls or electronic sow feeders) did not seem to have any impact on the outcomes of the mixing strategy. This knowledge will provide options for those wanting to maximize group housing of gestating sows, and thereby reduce stall usage.

Researchers also updated a model to determine the economic risks related to management modifications. Based on the number of piglets born alive, the economic risk was similar between the three tested sow mixing strategies.

Research question: What environmental enrichment strategies can be incorporated into slatted-floor pen systems for sow groups?

Researchers screened several different enrichment devices, such as hanging wooden blocks, three items hung together (chain, rope and wood block) and straw. They also studied different enrichment strategies, including the constant provision of one enrichment device, the rotation of three enrichment devices and no enrichment.

Results showed that enrichment had a positive impact on sow behavior and that all tested enrichment devices can be used with sows. Sows tended to interact more with the devices when they were changed regularly (rotation).

Sows tended to prefer chopped straw over the other devices. Straw provides the advantage of being both malleable and consumable, but can be challenging to use due to concerns over manure management and biosecurity.

A follow-up study with fibre enrichments noted that dominant sows had greater access to enrichment, suggesting the more valued enrichment resulted in greater competition. Further investigation is needed to better understand the importance of social status and different forms of enrichment.

Collaborators

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