

## Are Sows Motivated for Movement?

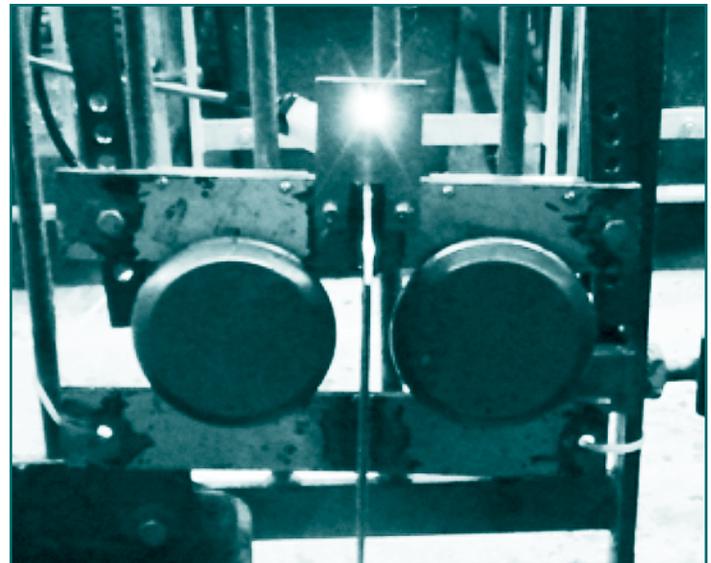
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The Canadian Code of Practice for the Care and Handling of Pigs requires that as of July 1, 2024, all mated gilts and sows must be housed in groups, or individual pens. Mated gilts and sows may also be housed in existing stall barns if they are provided with the opportunity to turn around or exercise periodically, or other means that allow

a greater freedom of movement. What constitutes 'greater freedom of movement' and the suitable options to meet this Code requirement must be clarified, by July 2019, as informed by scientific evidence, however at present there is minimal scientific evidence to address this question. The objective of study is to provide scientific information to be used as a basis for this recommendation.

A total of 24 animals (12 gilts, 12 sows) were studied for their motivation to exit the gestation stall and gain access to the alleyway between stalls for a three minute period. An operant panel was constructed that contained two identical buttons (Figure 1) that were programmed to count the number of presses made to each button. One button is designated as the active button (AB), as push counts to this button can result in a reward for the sow. The other is designated as the dummy



**Figure 1:** The operant panel containing two identical buttons, a central divider, and a light to indicate when the panel is active. Image shows the operant panel hung inside a stall gate.

button (DB), acting as a control measure;press counts made to this button have no effect and do not contribute to the sow obtaining a reward.

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**Training and testing procedure**

Sows were trained and tested in two phases, in one phase, the reward was the gate opening and the sow being allowed to roam the alley. In another phase, the reward was 0.2kg of feed. The order of training and testing for stall exit or extra feed was balanced, with half of the sows trained to exit first, and half trained to receive extra feed first. When training and testing animals to exit the stall, sows were rewarded for pressing the active button (Figure 2) with three minutes of time to freely move around within the alleyway between stalls (Figure 3). When sows were trained to press the active button for access to more feed, they were fed only 70% of their standard gestation ration in the morning in order to facilitate training. Thereafter, a handful of gestation feed (30% of feed ration) was the reward. The position of the AB and DB was switched between training and testing for feed and access to time out of the stall.



Figure 2: Sow pressing the active button. Figure 3: Sow walking in alley between stalls.

Once trained, sows were tested on an ascending schedule, where the number of AB button presses required by the sow was increased by 50% each day, starting at FR of 9, and increasing daily to a maximum FR. This produced a testing schedule of FR 9, 14, 21, 32, 48, 72, 108, 162, 243, 365 and 548.

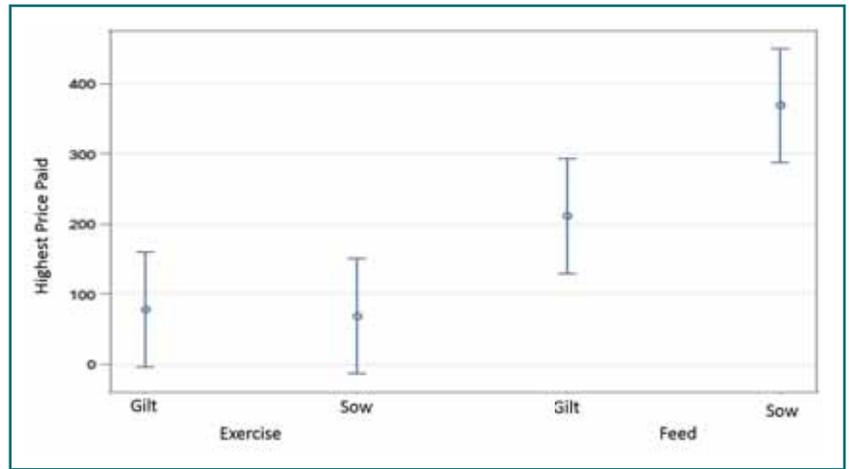


Figure 4: The Highest Price Paid for sows (n = 12 and gilts (n = 12) to access time out of the stall (exercise) or a feed reward (feed), (least square mean and 95% confidence limits).

In each 30 minute testing session, the animal was given a maximum of three consecutive opportunities to reach the required FR and obtain their reward. If an animal failed to reach the required FR within the 30 minute period, no reward was given. The animal was given a second opportunity to reach the required FR the following day, if the animal reached the required FR, testing continued along the schedule. If the animal failed to reach the required FR for a second day, testing ended. The total number of AB presses the animal achieved was regarded as a measure of the sows motivation.

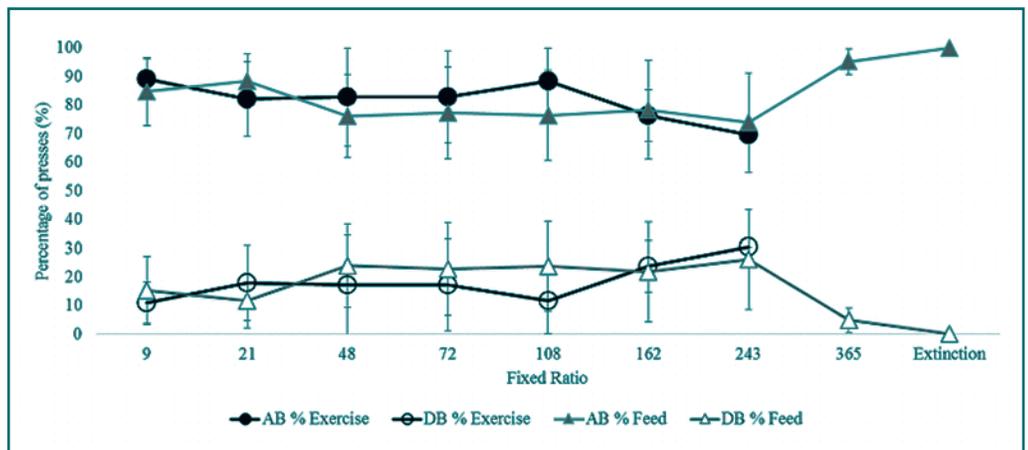


Figure 5. The mean percentage of total button presses in which the active button (AB) and dummy button (DB) was pressed when tested for access to time out of the stall (Exercise) and access to additional feed (Feed). Data from sows and gilts combined (n = 8).

All sows were fitted with accelerometers to record step counts as a measure of activity when out of the stall. Additionally, a camera positioned at one end of the alleyway recorded the behaviour of sows once out of the stall. During testing for motivation to exit the stall, the frequency and duration of sows seeking social contact, or seeking food was recorded.

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lower than required will increase water wastage. Finally, ensure you regularly check water flow rates, as this will determine time spent at the nipple, water intake and water wastage. Too little is just as costly as too much when it comes to flow rates.

### For Further Reading

- 1 Water Usage and Wastage from Nipple Drinkers  
(English) <http://www.prairieswine.com/water-usage-and-wastage-from-nipple-drinkers/>
- 2 Pork Production Reference Guide  
(English) [http://www.prairieswine.com/wp-content/uploads/2010/07/2000\\_Prairie\\_Swine\\_Reference\\_Guide.pdf](http://www.prairieswine.com/wp-content/uploads/2010/07/2000_Prairie_Swine_Reference_Guide.pdf)
- 3 Effects of nipple drinker height and flow rate on water wastage in grower and finisher pigs  
(English) <http://www.prairieswine.com/reducing-water-wastage-from-nipple-drinkers-by-grower-finisher-pigs/>
- 4 Recommended Flow Rate & Height of Nipple Drinkers  
(English) <http://www.prairieswine.com/recommended-flow-rate-height-of-nipple-drinkers/>
- 5 A Checklist for Water Use  
(English) <http://www.prairieswine.com/a-checklist-for-water-use/>

**Table 2. Measured Water Flow Rates – 24 audited farms**

	Low (<0.5L/min)	Target (0.5 – 1.5 L/min)	High (1.5 – 2.5 L/min)	Very High (>2.5L/min)
Gilt Pen	5.1%	33.3%	56.4%	5.1%
Gestation	0.0%	59.4%	21.9%	18.8%
Farrowing	15.3%	38.9%	29.3%	16.6%
Nursery	15.2%	56.8%	19.0%	8.9%
Finishing	5.4%	29.3%	54.3%	10.9% > 2.5

**Table 3. Hypothetical water disappearance measurements**

	Low	Target	High	Very High
Measured Values**	5.4%	29.3%	54.3%	10.9%
Water Flow Rate (L/min)	0.5	1.0	2.0	2.75
Number of Pigs	324	1,758	3,258	654
Daily Water Disappearance /Pig (L/pig)	3.5	7	14	19.25
Total Daily Water Disappearance/Day (L)	1,134	12,306	45,612	12,590

\*\* Refers to the percentage of nipple drinkers that were measured in each respective category. A total of 24 farms were measured across Canada.

L/Day	
Calculated Water Disappearance	71,642
Target Water Disappearance	42,000
Water Wastage	29,642
Additional Manure Disposal Cost/Day	\$114.12

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### Results and Discussion

Sows showed a greater highest price paid for feed, than movement, but for gilts the highest price paid for each reward did not differ. Sows also showed a greater highest price paid to access feed than gilts. However, the highest price paid for movement did not differ between sows and gilts.

Additional control sows were presented with the operant panel for 30 minutes for seven consecutive days, with no rewards. Initially they interacted with the panel, generating total push counts on day 1 within the range of the HPP by sows and gilts for access to time out of the stall. However, over the course of six days repeated presentation, total interaction with the panel reduced. In contrast, sows trained to associate interaction with the panel with generating a reward maintained levels of interaction with the panel over consecutive days, and as the FR increased (Figure 5).

### Conclusions

Results suggest that stall-housed sows and gilts are motivated to access time out of their stall. The levels of motivation for both rewards are equal in gilts, but in sows the motivation

for movement is moderate when compared to their greater motivation for feed. The greater motivation to receive a feed reward in sows may be because they were recovering from lactation during the testing period. To provide more substantial evidence on which to base Code recommendations, further studies will be done to examine sows' motivation to exit the stall at different feeding levels, and a comparison of the impact of weekly exercise compared to group housing and stall housing on sow behaviour and production when fed at different feeding levels.

### Acknowledgements

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