On-farm demonstration of parity-segregated phase feeding in group-housed sows

This demonstration was part of the Canadian-wide project entitled "From Innovation to Adoption: On-Farm demonstrations of swine research," led by Swine Innovation Porc. It aimed to increase the pace of adoption of new technologies and management strategies. To achieve this goal, we have partnered with several hog producers and organizations operating in the sector across Canada. These producers and organizations have agreed to implement new technologies and management strategies, and thus become demonstration sites for these innovations. We regularly collect information to better understand the process and challenges of adopting and using new technologies and strategies on these demonstration sites," says Geneviève Berthiaume, Senior manager in Economics and Management at the Centre de développement du porc du Québec (CDPQ).

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By 2024, hog producers will have to renovate or build new barns to accommodate group sow housing.[1] Making these improvements presents a real opportunity for producers to evaluate which equipment and technology can be implemented that will have a positive economic impact on their operations and ensure long-term sustainability. For example, can a phase feeding program be considered for your gestating sows? To learn more about phase feeding, read below about the results of a recent on-farm demonstration project that evaluated the concept of parity-segregated phase feeding in group-housed sows.

Based on research conducted by Dr. Ron Ball (retired researcher at the University of Alberta), parity-segregated phase feeding would more precisely meet the amino acids and energy requirements of the gestating sow.[2] Possible benefits include: reduced feed costs, improved sow body condition at farrowing, better rebreeding success and prolonged productive life of sows. The savings in feed costs depend on price relationships, but in general, are greater for older sows when wide price gaps between corn and soybean meal exist.

What is parity-segregated phase feeding in group-housed sows?

Typically, gestating sows are fed a single diet, where the nutritional composition is constant for the entire gestation period. Parity-segregated phase feeding involves the use of two

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different diets to meet the needs of sows at different stages of gestation and parity. The objective of this on-farm demonstration project was to evaluate the effect of parity-segregated phase feeding in gestating sows on feed costs.

More specifically, the following feeding strategies were compared:

Conventional feeding which involved the use of a single diet (Diet A) for the entire gestation period, for all sows;

Parity-segregated phase feeding which consisted of using two diets for parity three sows and above. From Day 0 to 85 (day 0 being the first day of gestation), a diet with lower SID lysine content (standardized ileal digestibility) was given to sows (Diet B). Then, from day 86 to the end of gestation, sows were fed Diet A (same as conventional feed). Meanwhile parity one and two sows were fed Diet A throughout their entire gestation period.

In short, it was the diet of parity three sows and above during their first 85 days of gestation that differed from the conventional feeding strategy. Parities one and two received the same diet in both strategies. This demonstration is therefore a simplified application of parity-segregated phase feeding.

Table 1: Cost reductions of using parity-segregated phase feeding when compared to conventional feeding for the gestation period.

Criteria on a yearly basis		Conventional	Phase feeding	Difference
Average feed price (2017)	$/mt	302.70	293.60	-9.10
Feeding cost	$/sow	188.73	183.04	-5.69

Using phase feeding for gestating sows housed in groups typically involves the use of an ESF (Electronic Sow feeder) or a Free-access ESF system with two feed lines, allowing for two diets to be fed simultaneously. The period of application of this feeding strategy covers the gestation period, from day zero, when the sows are inseminated, to the transfer of the sows to the farrowing unit (around the 115th day of gestation).

Impact on feeding costs

Combining both diets (A and B) for parity three sows and above allows the parity segregated phase feeding strategy to achieve a lower feed cost than a conventional feeding strategy (see Table 1). Using 2017 average (Quebec) feed prices, utilizing a parity segregated phase-feeding strategy would result in a savings of $5.69 /sow /year compared to a conventional feeding program.

Price Fluctuations?

As feed prices fluctuate over time, a sensitivity analysis was conducted to assess the variation related to corn and soybean meal prices. Considering the minimum and maximum (Quebec) prices ($/ton) observed between January 2013 and December 2017, the parity-segregated phase feeding strategy has an economic advantage over conventional feeding, with annual savings ranging from $ 1.66 to $ 10.06 per sow (Table 2).

Producers' comments

This project was demonstrated with the assistance of Hog Tied Farms (Thedford, Ontario) owned and operated by John

Table 2. Difference ($) between the feeding cost of the parity-segregated phase feeding strategy and conventional feeding under different combinations of corn and soybean meal prices

		Soybean meal prices ($/ton)							
		350	400	450	500	550	600	650	700
Corn prices ($/ton)	175	-$3,53	-$4,46	-$5,40	-$6,33	-$7,26	-$8,20	-$9,13	**-$10,06**
	200	-$3,30	-$4,23	-$5,16	-$6,10	-$7,03	-$7,96	-$8,90	-$9,83
	225	-$3,06	-$4,00	-$4,93	-$5,86	-$6,80	-$7,73	-$8,66	-$9,60
	250	-$2,83	-$3,76	-$4,70	-$5,63	-$6,56	-$7,50	-$8,43	-$9,36
	275	-$2,60	-$3,53	-$4,46	-$5,40	-$6,33	-$7,26	-$8,20	-$9,13
	300	-$2,36	-$3,30	-$4,23	-$5,16	-$6,10	-$7,03	-$7,96	-$8,90
	325	-$2,13	-$3,06	-$4,00	-$4,93	-$5,86	-$6,80	-$7,73	-$8,66
	350	-$1,90	-$2,83	-$3,76	-$4,70	-$5,63	-$6,56	-$7,50	-$8,43
	375	**-$1,66**	-$2,60	-$3,53	-$4,46	-$5,40	-$6,33	-$7,26	-$8,20

**Using 2017 grain prices, parity-segregated phase feeding would result in annual savings of $ 5.69/sow compared to conventional feeding programs. Savings could vary from $ 1.66 to $ 10.06/sow depending on the feed price scenario (2013-2017). **

Van Engelen. "I already had the intention of installing a second feeding line further down the road, but this project has made that happen faster than expected. I did not observe any nutritional deficiencies in my sows while applying the parity-segregated phase feeding strategy. However, the demonstration only took place over a short period of time (10 months). I do not think the test was long enough to observe changes in sow body condition and performance," John commented.

In addition, the producer also mentioned wanting to learn more about phase feeding strategies and even precision feeding to decide on the best program for his herd. Overall, Mr. Van Engelen had a positive experience and reduced his diet cost.

Two feeding lines allowing the use of two different feeds simultaneously, installed in Hog Tied Farms.

Conclusion

Parity-segregated phase feeding in gestating sows would minimize overfeeding while adequately meeting sow requirements. This reduction in the excess nutrients results in a reduction in feed cost of around $ 5/sow per year.

Partners

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For Further Reading

[1]Code of Practice for the Care and Handling of Pigs
http://www.nfacc.ca/pdfs/codes/pig_code_of_practice.pdf

[2]Feeding Sows More Efficiently
http://www.prairieswine.com/wp-content/uploads/2012/11/Volume-1-Issue-4-Gestation-Nutrition.pdf