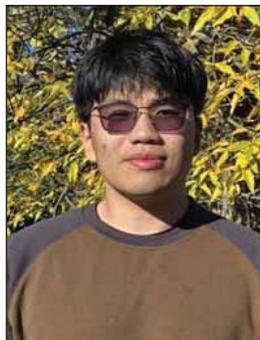


Improving Sow Management and Performance Using Precision Feeding Records

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INSIGHT FOR PRODUCERS

Understanding how housing style influences reproductive performance is important as we approach the mandatory switch to group sow housing. By comparing the two housing styles, we can identify risk factors and best practices.

SUMMARY

In 2029, Canadian pork producers will need to make the transition to group sow housing, following the updates to the Code of Practice for the Care and Handling of Pigs. This project addresses the timely issue of assisting producers in making the transition to group housing, improving sow welfare and maintaining productivity at the same time. The first study focuses on utilizing retrospective and longitudinal data comparing sow and gilt productivity in group and stall-housed herds, under the same management, identifying production benefits and risks associated with each housing system. The second study will focus on the analysis of data collected from electronic sow feeders alongside observations recorded on dam parity, productivity, social status, and feeder behavior. In this way, we can identify sows/gilts requiring attention and design intervention strategies to improve sow welfare and productivity. The goal of the project is to identify management practices that can benefit sow health and production in Canadian sow herds. The results will ease the transition and promote success in the adoption of group housing in Canada and Saskatchewan.

INTRODUCTION

Canadian pork producers are in the process of converting to group sow housing. Group housing can provide benefits including improved sow welfare, bone strength and litter health. The transition to group housing also poses management challenges. Sows will fight at mixing as they establish their social hierarchy, in addition to potential negative effects on reproduction, which is dependent on feed system, group size, and pen design. A survey of 104 Canadian sow herds found that barns with group gestation had higher sow mortality (Prade Ramos, 2022). A review of commercial farm records indicate that first and second parity sows are at greater risk of removal in group housing due to reproductive problems; generally, sows must remain in the herd at least three parities to cover their replacement cost (Ketchem et al., 2020, and J. Brown, pers. comm.). With Canadian producers transitioning to group housing, it is important to conduct research on best practices in group housing.

Electronic sow feeding (ESF) systems record sow feed intake on daily basis, helping to guide staff by providing a daily list of animals that have not been fed. However, ESF data is largely underutilized and only a small portion of the information is used on a regular basis.

Social status within the herd influences physiological stress, reproductive performance, and access to resources within the pen. Furthermore, it has been proposed that a consistent feeding order is indicative of greater group stability. This observation could be used to predict how well the system is working or identify changes in stress levels or aggression.

Acclimation of new animals into group housing with ESF feeding can be a challenge, potentially explaining negative issues associated with group gestation. Gilts that have not been exposed to ESF systems require training on using the system. Ideally training should be completed before breeding, as missing feed around ovulation and after breeding can lower conception rates. Studies indicate that increasing the acclimation period has a positive impact, reducing the incidence of prolapse (Ross, 2019).

Based on a dataset collected from 12 individual barns managed by the same company, a retrospective analysis is being completed. With the same genetics, feed, breeding management and recording system being used, this situation provides a unique research opportunity to compare sow and gilt performance under parallel systems. Comparison of

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reproductive performance within these systems will be done using Metafarms production records. This analysis will provide clear insights into the production benefits and risks associated with each system, and aid in development of interventions to improve sow health and productivity in groups.

In the final phase of this project, three practical interventions designed to reduce stress and improve gilt acclimation will be implemented on commercial farms. The goal is to identify management practices that can benefit sow health and production in Canadian sow herds. The results will ease the transition and promote success in the adoption of group housing in Canada and Saskatchewan's swine industry.

EXPERIMENTAL METHODS

We acquired data from 12 barns, spanning 2021 to 2023. Six barns were using gestation stalls, and six barns were using group housing with electronic sow feeders. All barns use common genetics, diets, productivity measurement protocols, and general management practices. Consistent management factors provide greater experimental control and data quality than would be the case in a random sampling of sow farms. The initial dataset included sixty-nine metrics as recorded by the software Metafarms (Table 1).

Data is currently being analyzed, using sample size criteria to ensure data validity. Next steps involve using principal component analysis to explore the correlation between metrics and develop core metrics that explain variations between housing types, barns and parities. Analysis of a short survey given to the barn managers will also be completed, for identification of any micromanagement practices that may influence metrics of interest.

The results of this project will identify the relative strengths and weaknesses of each housing system in terms of breeding success, productivity, litter performance, removals, and replacements. The analysis will focus on identifying areas where performance differs between housing systems, and opportunities for improvement in group housed herds.

RESULTS

Statistical analysis of collected data and analysis of results is ongoing. Overall, more data is available from barns utilizing group housing systems. Based on the preliminary data analysis, group-housed sows tend to deliver fewer stillborn piglets, especially considering older sows. Percentage of repeat breedings tend to be higher in group-housed barns.

IMPLICATIONS

While the promise of better animal welfare is great, the transition to group sow housing can pose challenges during and after the conversion. Analysis of metrics collected from a single management system with barns using either stalls or ESF housing while maintaining similar management protocols will provide insight into the influence of housing system on productivity and help identify production risks in both systems. Understanding these factors will allow for effective development of best management practices and ease the transition to group sow housing.

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Table 1. Some metrics collected from the barn management systems.

No.	Definition
2	The percentage of total services in which multiple matings occurred.
4	The percentage of sows that remain pregnant at 105 days.
6	The percentage of sows confirmed pregnant at 35 days post-service.
8	The average number of piglets weaned per sow.
9	The average number of dead piglets per litter.
11	The average number of live-born piglets per litter.
12	The average number of stillborn piglets per litter.
13	The average number of piglets (both live and dead) born per litter across the data set.
15	The overall mortality rate calculated as the percentage of farrowed sows that either died or were destroyed.
17	The average number of mummified piglets per litter.
19	The piglet death rate expressed as a percentage of live-born piglets.
20	The average age (in days) at which piglets are weaned.
22	The total number of piglets weaned in a sow's lifetime
26	The percentage of farrowed sows that were removed
28	The average number of days between weaning and the first breeding service.
30	The average total weight of a litter at weaning.
31	The average weaning weight per piglet.
32	The average weight per individual piglet at birth.
39	The percentage of services performed more than seven days after weaning.
42	The number of sows that are in a mated or breeding state at the end of the period.
44	A conversion metric showing how many services leads to a farrowing.
45	The total number of sows removed from the herd, which include culling, deaths, transfers, or transferred.
46	The number of unplanned sow deaths during the period.
47	The number of sows removed from the herd due to low performance, health issues, or age.
49	The number of sows moved from one barn or production unit to another during the period.
55	The net number of piglets fostered (moved from one sow to another) to balance litter sizes and ensure optimal survival and growth.
56	The total number of piglet deaths recorded during lactation or before weaning.
57	The number of sows that successfully weaned their litters.
58	The count of sows that weaned at least one piglet.
68	The number of sows that experienced an abortion during the gestation period.