

# Comparing groups and stalls. What does the data say?



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Shuang Luo is a M.Sc. student, supervised by Dr. Jen-Yun Chou. After earning a B.Sc. in Animal Science from the University of Alberta, he spent time working at a commercial swine farm and gained a solid understanding of swine management practices. Currently, Shuang is studying retrospective data from sow barns to assess approaches to the upcoming deadline to switch to group sow housing.

## Introduction

Following updates made to the Code of Practice for the Care and Handling of Pigs, Canadian producers will need to make the transition to group sow housing by July 1st, 2029. With the shocking cost associated with the barn renovations that will be needed for this change, there is great concern about the productivity challenges that sows in group housing may face. Reports of abortions and early pregnancy losses are rightfully worrisome, as well as concerns about learning and implementing practices for actually managing group housed animals over multiple parities.

To ease this transition, it is important that the industry begins to assess data that we have from farms that have already implemented group housing and developed their own management strategies. With management programs and computer based record keeping, the data exists, it just needs to be processed and analyzed.

This project aims to gather knowledge and develop methods to assist producers in making the transition to group housing, while also improving sow welfare and maintaining productivity. This study focuses on utilizing retrospective and longitudinal data, comparing sow and gilt productivity in group and stall-housed herds under the same management practices. By identifying production benefits and risks associated with each

housing system, we can better understand how to approach the transition to group housing. Our findings will help develop communication materials to assist producers and their staff with the changes made.

## What we did

Using data from 12 farms run by a pork producer in Saskatchewan, we started our assessment. Within the group of 12 farms, 6 use group housing and 6 use stall housing, with all farms using the same genetics, feed, and general management strategies. This producer shared their electronic management data (Metafarms) with us, and we began to assess what was there.

“There is no “best” housing system. Management is the key to success of any system.”

To begin, we visualized the data using box plots based on the categories provided to us. Initially, we were working off of 68 initial metrics tracked by the management program, some of which are included in Table 1. From these 68 initial metrics, we identified 27 key performance indicators. Since many of these indicators overlapped or were closely related, we ended up developing 8 principal components to be considered as performance themes (Table 1.).

## What we found

Regarding farrowing mortality (PC1), significant differences were found related to parity ( $P < 0.001$ ), housing style ( $P = 0.042$ ), and the interaction between parity and housing style ( $P = 0.003$ , Figure 1). Sows and gilts in group housing had lower farrowing

Table 1. Eight principal components to be considered as performance themes

Principal component	Included metrics
Farrowing mortality (PC1)	Average born dead, birth loss rate, stillborn rate
Sow fertility (PC2)	Wean to first service, conception rate, number of repeat services,
Mummification (PC3)	Average number of mummified fetuses per litter
Sow herd turnover (PC4)	Number of females remaining at the end of a period, total number of females removed, unplanned sow deaths
Litter size potential (PC5)	Average number of live-born piglets, average total litter size
Late gestation success (PC6)	The percentage of sows confirmed pregnant at 72 days, the percentage of sows that remain pregnant at 105 days
Mid gestation success (PC7)	The percentage of sows confirmed pregnant at 35 days post-service
Problem litter management (PC8)	The net number of piglets cross-fostered, piglet death rate, total number of piglets that died before weaning

mortality scores, indicating that they had more piglets born alive than their stall-housed counterparts.

Regarding sow fertility (PC2), mixed results were seen (Figure 2). Housing style alone did not have a significant impact on sow fertility aspects ( $P=0.497$ ). Parity had a significant impact on PC2 score ( $P<0.001$ ); as sows aged, the average PC2 score increased. There was a significant interaction between housing style and parity ( $P<0.001$ ). Gilts in group housing seemed to struggle with aspects related to fertility, though sows parity 3 and beyond displayed a higher PC score than their stall-housed counterparts. The higher PC score indicates that any issues with fertility seen in group housed gilts are overcome by older sows.

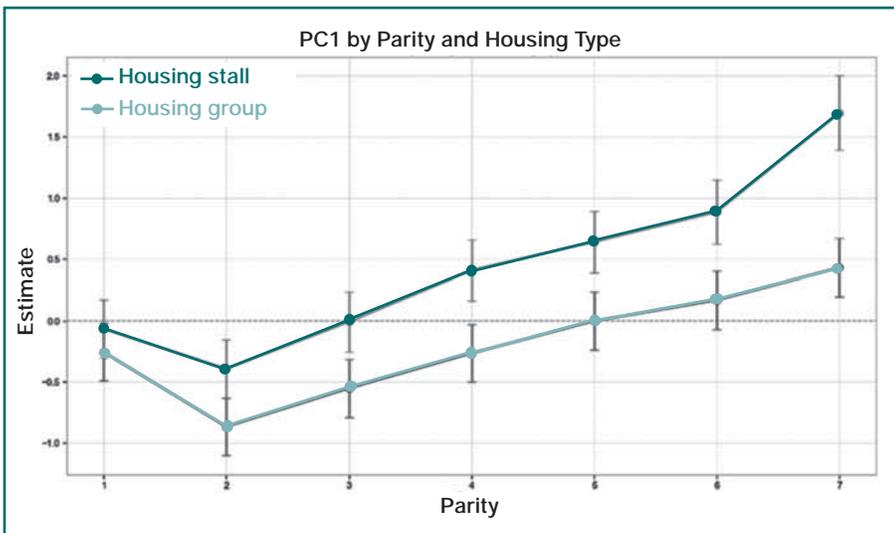


Figure 1. Average principal component (PC) score (estimate) for farrowing mortality (PC1).

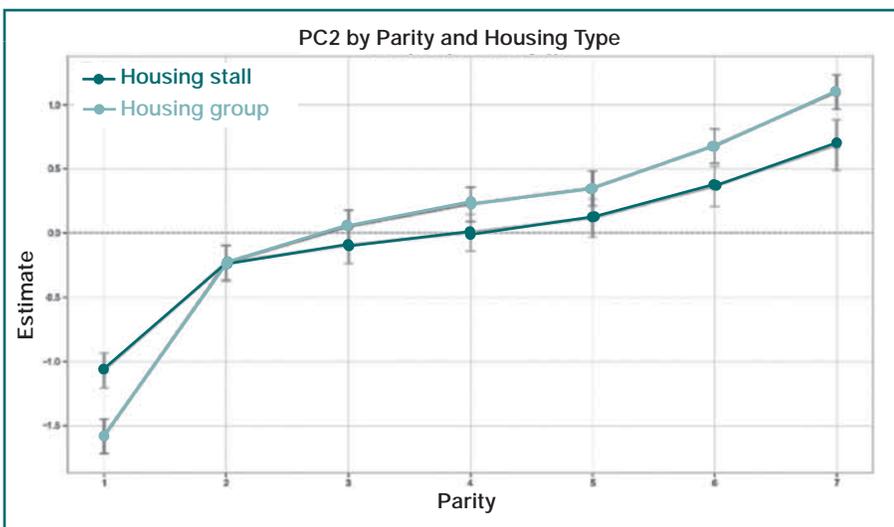


Figure 2. Average principal component (PC) score (estimate) for sow fertility (PC2).

### Implications

Based on these preliminary findings, we can see that there is no “best” housing system. The reality of working with animals is that we will face challenges no matter what we do, so we need to assess and adjust our practices as time goes on. The results presented here show that group housing is undoubtedly beneficial for higher parity sows, reducing farrowing mortality and increasing fertility. However, the major management challenge that the industry will face in transitioning to group housing is illustrated – gilt fertility suffers in group housing. Hopefully, through further investigation, we will be able to identify factors contributing to this struggle and develop different approaches to mitigate this issue.

### Next steps

This project is currently ongoing. We are working on the analysis for principal components 3-8, which will provide further insight into gestation success, litter characteristics, and herd turnover. Following completion of our analyses, we will work on developing realistic approaches to mitigate challenges associated with group sow housing. Identifying factors which reduce reproductive performance or sow welfare will allow us to further investigate critical point where careful management is necessary, especially for gilts entering the breeding herd. Participation in knowledge transfer activities and further publication in communication materials such as this will also be pursued, to ensure that producers and industry members are being updated on our progress as much as possible.

