# Summary: Improving sow welfare and outcomes in the farrowing house by identifying early indicators from pre-farrowing assessment

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**Main Points:**

- Factors in identifying sows with compromised health or welfare included feed refusal, crate fit, locomotion score, and respiration rate.
- Fit in the crate was significant for farrowing and lactation outcomes and was more informative than parity.
- It is recommended to include records of the identified risk factors as a part of standard farm procedures.

## Introduction

The time around farrowing and lactation are the periods with the highest risk of poor outcomes in a sow's productive life, including low performance, premature sow removals, and sow or piglet death. Since the period around farrowing has the highest risk for sow health issues, monitoring of sows in that time-period will improve both welfare and productivity. Decreased risks of poor outcomes can be achieved by assessing sows' pre-farrowing for health status (Vargovic, 2020). The objective of this study was to identify the most informative variables observed in the farrowing house for predicting poor farrowing or lactation outcomes. The hypothesis was that informative predictors can be identified, which implies that at-risk sows can be identified and potentially managed to reduce incidences of poor outcomes.

## Materials and Methods

The data from 1,103 sows were collected from two nucleus farms, operated by independent companies within the periods of October to December 2017 (Farm A) and March to June 2018 (Farm B). All sows were bred using artificial insemination and after weaning were either re-bred or culled according to the farm protocol. During the gestation period, sows from Farm A were kept in static groups of about 10 sows per pen and manually fed, and sows from Farm B were kept in large dynamic groups of about 250 sows per pen and fed using electronic sow feeders. Sows were moved to the farrowing house (hereafter termed "entry") at an average gestation length of 110 d (Farm A: entry once per week; farm B: entry twice per week). The target lactation lengths were four (Farm A) and three (Farm B) weeks. Ease of locomotion was assessed while sows were walking from the gestation housing to the farrowing house (Scores: 0-good mobility (easy movement); 1-restricted mobility (stiffness, slow movement); 2-poor mobility (limping, reluctance, uneven slow movement); 3-very limited mobility (inability to bear weight on one or more limbs). Crate fit was assessed when sows were recumbent (Scores: 1-represented plenty of room and crate not filled; 2-moderate room and overall crate filled; and 3-represented limited room, crate filled and movements likely to be restricted). Feed refusals were scored 3-4 h after the first morning feed was delivered (Scores: 0-majority eaten and 1-more than half of the meal remained). Respiration rate comprised the number of expirations per minute when sows were recumbent.

A range of variables were investigated as potential predictors of poor outcomes in the farrowing house. Poor outcomes (scored as binary traits) reflected three categories in a sow's lifecycle: farrowing, lactation, and removals. Examples of outcome traits analyzed were farrowing failure (excessive number of stillborn piglets relative to litter size, presence of late stillborn piglets, or sows that experienced a caesarean or prolapse), lactation failure (weaned piglets <7, lactation length <15 d or removal reasons that included lactation issues), and sows removals (removed pre-weaning, un-successfully re-mated, and re-mated but subsequently culled before the next farrowing event). Univariate logistic regression was used to identify predictors in the first instance. Predictors from univariate analyses were subsequently considered together in multi-variate models.

## Results and Discussion

Several predictors were significant across the two farms and for all three categories. These predictors included feed refusal (lack of appetite), crate fit, locomotion score, and respiration rate. Normal appetite compared to feed refusals reduced the risk of farrowing failure (13.5 vs. 22.2%) and removals (10.4 vs. 20.4%). Fit in the crate was significant for farrowing and lactation outcomes, and was more informative than parity. Sows with sufficient space had two to three times reduced risk of poor outcomes compared to restrictive crates relative to sow dimensions. Sows with good locomotion score pre-farrowing had two to three times less risk of farrowing failure and reduced piglet mortality, weaned two piglets more relative to affected sows, and were less likely to be removed before weaning (3.24 vs. 12.3%). Sows with higher respiration rates had a significantly reduced risk of poor farrowing outcomes. However, although the respiration rate was significant for both farms, this predictor requires additional investigation across seasons, to exclude potential bias due to seasonal effects. This study demonstrated that it is possible to predict poor outcomes for sows prior to farrowing, suggesting there are opportunities to decrease the risk of poor outcomes and increase overall sow welfare.

## Conclusions

This study identified multiple variables that could be considered as predictors of sows at-risk of reproduction failure or premature removal. The most consistent predictors were feed refusals observed from entry to the farrowing house until farrowing, the relative suitability of farrowing crate for individual sows, respiration rate at the entry to the farrowing house, and locomotion issues. Most of these predictors are observed but are not routinely recorded, thus it is recommended to include the recording of these variables as a part of standard farm procedures.

## References

Vargovic, L. 2020. Pre-farrowing health and welfare of sows. Armidale, NSW, Australia: University of New England.

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