

# Benchmarking and Standardization of Swine Production Systems

B. Predicala, A. Alvarado and L. Whittington



Swine Innovation Porc



Bernardo Predicala



Alvin Alvarado

## SUMMARY

Previous work have shown that even though the ultimate goal of a swine production operation is to raise hogs in the best possible manner, there is a wide variation in the different operational systems in place in swine facilities across the industry, leading to variability in performance, efficiencies, production costs, and overall productivity. The overall goal of the project was to evaluate the current performance of various operational systems in swine production to determine whether standardization and optimization can improve efficiencies and overall productivity. From the work conducted in this project, 14 key areas of swine barn design and management were identified by pork producers and other stakeholders as areas that could potentially benefit from standardization and optimization efforts.

## INTRODUCTION

During the investigation of past projects involving characterization of various swine production systems, it became apparent that inefficiencies and added costs in many hog barns can be traced to a number of areas: wide variations in building design, construction, barn equipment, management, and other operational systems.

Results also indicate, for the most part with no clear reason for the variability except for the lack of applicable standards to guide the producers. Ultimately, this wide variability makes it difficult to develop improvement measures that can be easily applied from barn to barn, or at least to the majority of hog barns currently in operation.

The lack of standards or optimization is evident in a number of examples pertaining to swine production. A Prairie Swine Centre study showed a four-fold difference in total energy usage between barns employing energy-efficient practices compared to other barns of the same type but has not put emphasis on efficient use

of energy in their operations. Within barns, various issues related to animal welfare such as lameness and stress could be avoided if appropriate standards are available for loading ramps, floor surface roughness, floor slat designs, pen walls, and alleyways. Anecdotally, there are other various examples that can be found across the industry that illustrate the wide variations in the manner by which 'common' production practices are implemented from barn to barn.

The overall goal of this project was to benchmark the existing operational systems in a modern swine production operation in order to develop recommendations for optimization and standardization of these various systems.

*“14 key areas of swine barn design and management were identified by pork producers as areas that could potentially benefit from standardization and optimization efforts”*

## RESULTS AND DISCUSSION

An initial survey of pork producers and related industry stakeholders to assess the awareness and application of existing standards and guidelines in current pig production systems showed: **a.** heavy reliance on “**rules of thumb**” for most of the decisions on design, construction and operation of pig barn systems (e.g., manure storage, flooring, ceiling height, pen size, stocking density), and **b.** most of the operational issues commonly encountered in the surveyed production barns seemed to be related to these areas. In contrast, for areas where there are numerous existing regulations and standards covering product specifications, installation, and performance, producers did not report many associated problems (e.g., 96% of pork producers reported no problem with their electrical system, which is a system governed by several existing codes and standards).



From the survey and interviews, the 14 key problem areas identified by pork producers include:

- a. dry sow stall
- b. farrowing crate
- c. ceiling height
- d. alley and/or hallway width
- e. space requirements for pigs
- f. load out
- g. flooring type
- h. slatted floor
- i. manure handling inside the barn
- j. manure storage external to barn
- k. manure handling activities
- l. feeders and drinkers
- m. commissioning and calibration of equipment
- n. emergency power and water systems.

A second survey focusing on the above areas was conducted with invited respondents from among pork producers across Canada. Out of all respondents, only 18% reported no problems with any of the 14 areas identified. Among those who reported encountering issues, the areas most frequently cited are feeders and waterers (40.9%), space requirements and crowding (39.4%), loadout (34.8%) and farrowing crates (31.8%). The specific problems reported include over-crowding, caused by increased prolificacy of breeding herd surpassing the original barn design specifications and changing market conditions resulting to higher or lower market weights of finished animals. Other physical system commonalities among producers include over 90% of complaints on barn load out designs implicating ramp angle and width as the primary problem, as well as 15-17% of all respondents having identified flooring type and slatted floor designs as problem areas associated with sow lameness and longevity.

## CONCLUSIONS

The project determined the main gaps regarding the building, equipment and manure storage/handling proved to be the most common problem areas for pork producers. By identifying widespread problem areas, we can develop priorities for swine barn research to fill the gaps determined in this project and focus efforts on improving these areas to the benefit of producers and pigs.

## ACKNOWLEDGEMENTS

Strategic funding provided by the Saskatchewan Pork Development Board, Alberta Pork, Manitoba Pork Council and the Saskatchewan Ministry of Agriculture. The authors would like to acknowledge the Saskatchewan Agriculture Development Fund and the Canadian Swine Research and Development Cluster (CSRDC) for the financial support to this research project.

