

# Sow mortality in Canadian Swine Herds

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## SUMMARY

Sow mortality is an area of increasing concern as production records indicate a significant increase in spontaneous death losses over the past 10-20 years. This project gathered information on sow mortality through a literature review, a producer survey, visits to 13 Canadian farms for live sow measurements, and will analyze historical sow culling and mortality records from 34 Canadian farms.

Survey results from 104 herds across Canada found that the average sow replacement rate was 44% of the herd per year, with average sow mortality (sudden deaths) of 5.7%, and average parity of the sow herd was 3.5. The most common reasons for early sow removal (i.e. excluding old age) were poor reproductive performance and lameness.

Both the survey and on-farm visits showed that larger herds had a higher average sow mortality (sudden deaths) per year, higher annual sow replacement, and lower average parity. Reasons for these effects are unclear; one theory is that larger farms experience greater staff shortages, with limited time for identification and follow-up treatment of compromised sows. Farms using group housing in gestation also showed a higher average sow mortality per year when compared to farms with stall-housing, and may be associated with the increased number of aggressive interactions that result in injury and increased incidence of lameness, leading to higher removal rates.

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## INTRODUCTION

Sow mortality is an important economic and animal welfare concern for pork producers. The average productive life of sows is decreasing. Culling and mortality numbers are often combined or not recorded consistently, making it difficult to accurately determine these numbers. Recent reports from US herds indicate average sow mortality rates of 9%, with higher levels in larger herds and more productive herds. Furthermore, almost 50% of the reported death losses occurred in young animals (gilts to parity 2), indicating a significant cost to producers, considering the revenue from young sows' piglets sold does not surpass the costs of raising replacement females until parity 3. Having comparable data for Canadian pig herds and getting an understanding of the underlying causes of sow removal will benefit sow welfare and Canadian pork producers.

## EXPERIMENTAL PROCEDURES

A literature review was done to determine sow mortality rates based on recent research and to examine risk factors for sow mortality. A simplified sow necropsy procedure was also developed to use on-farm for assessment of causes of death.

The next phase of this study collected information regarding sow culling and mortality in Canadian swine herds from producers through an online survey. One hundred and four producers provided complete responses to 49 questions about sow management, culling and mortality factors.

Next, 13 farms were visited for sow observations on a total of 1,389 live sows and a necropsy demonstration was done on 8 sows using a developed necropsy decision tree. Live sows were evaluated based on animal-based measures (body condition score [BCS], lameness, and injury scores), and each farm's annual sow mortality (sudden deaths) and average parity of the sow herd were also recorded.

Of the surveyed farms that were not visited in-person, historical sow culling and mortality records in swine management software were obtained from 34 Canadian farms providing data on 72,700 removed sows.

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## RESULTS AND DISCUSSION

No recent data has been published on the risk factors and causes of sow death in the Canadian sow herd. Previous studies have suggested that the increase in sow removal including sudden death, sow culling and involuntary removal is associated with a combination of factors, including inadequate nutrition, housing, management, genetics, environmental factors, and susceptibility to pathogens.

The survey results found that the average sow replacement per year was 44%, average sow mortality per year was 5.7%, and average parity of the herd was 3.5. The most common reason for sow removal (i.e., sum of culling, euthanasia, and death) was 'old age' (72%). The most common reasons for early sow removal were poor reproductive performance (60.6%) and lameness (28%). It was found that 65% of the survey participants did not perform necropsies on dead sows.

Average sow mortality (sudden deaths; %) per year showed a significant positive correlation with herd size and number of barn staff, with the latter accounting for 17% of the variation in average sow mortality per year ( $P < 0.001$ ). Farms with group housing in gestation also showed a higher average sow mortality per year when compared to farms with stall-housing, and farms with mixed housing (both stalls and groups) were intermediate.

During the barn visits, the most commonly observed BCS was 3 (ideal condition). Of the 1,389 sows observed, 1,205 (88.8%) sows had no signs of lameness, and 1,003 showed no signs of injury (72.2%). Smaller herds had a higher proportion of old sows (parity  $>5$ ) than large herds ( $>1,000$  sows) and larger herds had a higher proportion of 'high' mortality levels than mid-size herds. Group gestation systems were associated with more lameness than stall gestation, however, the highest incidence of lameness was found in breeding, not in gestation. Larger farms were associated with higher average sow mortality, and sows in stall gestation showed the highest incidence of mild injury (score 1). Thus, in each type of farm different factors related to sow health and welfare were observed, and it is evident that larger farms are challenged by higher levels of injury and mortality, while farms with group gestation had higher lameness than stall gestation.

Of the eight sows necropsied, three sows were found dead, and five were euthanized. Four sows presented external and internal gross findings related to the locomotor system, and were removed from the herd by euthanasia.

The historical sow culling and mortality data have been sorted to categorize removal reasons across farms and will be analyzed along with farm information/management factors to determine risk factors related to sow death and removal. A number of recommendations will be identified related to sow longevity.

## IMPLICATIONS

The average mortality rate of the Canadian herds included in the survey was moderate at 5.7%. Larger herds had a higher average sow mortality per year, higher annual sow replacement, and lower average herd parity. The association between farm size and mortality rate is a common finding but the causes are unclear. One theory is that larger farms experience greater staff shortages, with limited time for identification and treatment of compromised sows. The higher average sow mortality per year in gestating sows housed in groups may be associated with the increased number of aggressive interactions that result in injury, leading to the removal of the sow. It is anticipated that as the transition towards group gestation progresses, producer experience, management and genetics will adapt, resulting in reductions in sow death loss over time.

## ACKNOWLEDGEMENTS

Funding for this project was provided by Swine Innovation Porc through the Canadian Agricultural Partnership. The authors would also like to acknowledge the strategic program funding provided by Sask Pork, Alberta Pork, Ontario Pork, the Manitoba Pork Council and the Saskatchewan Agriculture Development Fund. We are grateful for support from staff at CCSI and CDPQ who conducted farm visits in QC. In addition, we also wish to acknowledge the support of the production and research technicians at Prairie Swine Centre that made it possible to conduct this research.