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# Identifying factors that could influence sow viability

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## Introduction

During the last six years, sow mortality has increased from an average of 7% to over 15% in some of the large production systems in the USA, Canada, and Mexico. In some European countries, sow mortality has also increased. The main reasons are not clear, but multiple factors seem to be involved. These factors are not necessarily the same in all the sow farms and/or production systems, but together they are clearly interfering with the longevity of the sows.

Sow farms or production systems with unacceptably high sow mortality (defined as all gilts and sows lost, including ones destroyed or euthanized) have identified the following causal factors:

- Minimal husbandry
- High sow to staff ratio
- High room temperature and/or poor ventilation
- Evidence of stress and sow discomfort
- Feeding management; heavy restriction 4-5 days prior to farrowing
- Sow flow issues; limited space, mixing
- Genetic make-up for very lean animals
- PRRS-positive status
- Lack of control on parity distribution
- Lack of control of sow body condition
- Limited gilt developers, acclimatization
- Lack of communication among farm staff members
- Lack of attention and individual care to sows
- Pressure to achieve mating target and lack of gilts

How much each one of the factors negatively impact varies from farm to farm and from one production system to another. Usually several factors are involved, and each needs to be considered to effectively attack the sow mortality problem.

The majority of the mortality is observed during the pre-farrowing to post-weaning period. Also, poor leg scoring, severe feed restriction, and lack of water intake a few days prior to and after farrowing seem to have a direct impact on the number of sow-losses at a young age (parity one to three).

## Study design

### Study sites

This study was done in four different production systems in North America, each with high sow mortality rates associated with low sow retention between parity one to parity two. The first step was to understand the issues and the similarities and differences between the four production systems. In general the similarities included the following:

- The management protocol
- The pressure to achieve breeding target
- Limited supply of gilts for replacements due to limited multiplication base
- The genetic make-up of the sows and the health status of the farm regarding PRRS and mycoplasma
- The parity distribution of the sow inventory
- The main feed ingredients and the feeding management, which included intensive restriction 4-5 days prior to and 3-4 days after farrowing
- The type of crate, feeder, water supply, and flooring at farrowing
- The record-keeping system
- Post-culling management
- The period when the majority of the sows die, i.e., around farrowing

### Pre-treatment sow mortality observations

- In all the production systems, sow mortality was higher during summer than other seasons of the year.
- On average, sows euthanized represented over 40% the total dead.
- Over 60% of the deaths occurred from farrowing to the next potential service.

- Sows after six parities had a much higher mortality/ euthanasia rate than younger sows.
- Warm water, nipples with high pressure and poor water flow, poor quality floor, pellet feed, and low particle size seemed to have a negative impact on the longevity of a female.
- Pressure to achieve breeding target, associated with lack of selected gilts and weaned sows available to breed, lead to increased sow mortality.
- Sows with poor leg and low back-fat reserve (< 12 mm) were more likely to die.
- Building usage pressure, continuous movement of sows, and sow mixing without controlling size of the group were predisposing factors to sow deaths.
- High sow mortality had a negative effect on the morale of the workforce.
- Estimated financial impact of each percentage point of sow mortality was $0.28 per slaughter pig. However, this could vary from one production system to another.

Treatment action plan

- Increase replacement pool of gilts to remove all older parity sows plus those animals with obvious additional physical problems or low performance.
- Improve selection criteria impacting the quality of gilts available to breed.
- Implement a favorable gilt developer program which considers age, back-fat, number of cycles, and weight for all gilts prior to breeding.
- Do not breed any sows with more than seven parities.
- Be more generous with the amount of feed offered to each sow prior to and after farrowing (with the aim of reducing sow constipation and gastric ulcers).
- Be more proactive in identifying and treating sows correctly.
- Provide early individual care to sows with evidence of physical problems or other abnormalities.
- Give attention to environmental conditions that facilitate sow comfort, especially farrowing room temperature.
- Review the current maternal boar inventory for better feet and leg standards.

## Results

Implementation of management procedures to decrease sow mortality has resulted in the reduction of the mortality levels within a year of implementing the established action plans. Although the target of less than 8% originally set in all 29 sow farms has not been reached, the mortality trend is favorable. In some farms, decreases in the mortality levels were seen as early as four to five months after the changes were implemented. In an overall production system, results may be seen at different times after implementing measures. In some farms, mortality levels are reduced very early after implementing intervention strategies, while in others results may be seen after a longer period of time.

## Conclusion

In summary, sow mortality is a problem that affects the North American swine industry. Sow mortality can be attributed to multiple causes. Among others, nutrition, feeding regime, genetics, environment, herd structure, and management are considered important factors affecting sow mortality. In addition, variation between systems was also observed even when similar genotypes and procedures were followed. Action plans to address sow mortality need to be designed specifically for each production system and need to be implemented across all disciplines.