
Sponsors

University of Minnesota

College of Veterinary Medicine

College of Food, Agricultural and Natural Resource Sciences

Extension Service

Swine Center

Thank you to **IDEXX Laboratories** for their financial support to reproduce the conference proceeding book.

Production Leader

Steven Claas

Production Assistant

Steven Claas

Janice Storebo

Sarah Summerbell

Layout and CD-ROM

David Brown

Tina Smith

Logo Design

Ruth Cronje, and Jan Swanson;

based on the original design by Dr. Robert Dunlop

The University of Minnesota is committed to the policy that all persons shall have equal access to its programs, facilities, and employment without regard to race, color, creed, religion, national origin, sex, age, marital status, disability, public assistance status, or sexual orientation.

Sow and herd factors associated with sow mortality in commercial herds

Y. Koketsu and Y. Sasaki

Meiji University, Kawasaki, Japan

Introduction and Objectives

High sow mortality increases economic loss and negatively affects employees' morale (Deen and Xue, 1999). Death in sows mostly occurs within one week after farrowing (23%) and during late gestation (38%), and mean death interval from farrowing is 72 days (Stein et al., 1990). High risk of herd mortality is related to shorter lactation length and larger herd size (Koketsu, 2000). The objectives are to investigate sow and herd (multilevel) factors that are associated with a mortality risk in female pigs (females), and to determine the relationship between a hazard of mortality and possible factors using survival analysis.

Material and Methods

Of approximately 140 herds using a recording software system (PigCHAMP[®]) in Japan, 122 mailed their data files to the University in 2006. Of the 122 herds, 19 were excluded because they had no or inaccurate records with birth dates. The data included herd data with mean measurements of five years from 2000 to 2004 in 103 herds, and lifetime records of 60,846 females born between 1999 and 2002 in the 103 herds. Herds were categorized into three groups on the basis of 25 and 75 percentile of death rate (DR): low, intermediate, and high DR. Female DR was calculated as the number of dead females divided by sum of removal interval in all females multiplied by 100 days. All statistical analyses were performed in SAS (SAS Inst., Inc., Cary, NC). Multilevel logistic regression analyses were used to assess the risk of a female dying in a herd. A Cox proportional hazards model was used to investigate the association between death intervals and possible female factors. Culled and euthanized females were treated as censored subjects.

Results and Discussion

Of the 60,846 females, the proportions of dead, euthanized, and culled females were 10.4, 0.4, and 89.2%, respectively. The proportion of dead females

by the birth years ranged from 10.1% to 10.7%. Death interval was longer than culling interval in sows removed without being mated (14 vs. 33 days; $P < 0.05$).

Table 1. Mean death intervals and death rate (DR).

Subgroups	%	Last event to death	DI, d (Mean \pm SEM)	DR / 100 d
Gilts				
Not mated	5.4	Birth	215 \pm 2.7	0.037
Mated	9.2	Mating	79 \pm 1.9	0.159
Sows				
		Farrowing	55 \pm 1.8	0.173
Not mated	50.2	Farrowing	14 \pm 0.4	0.302
Mated	35.2	Farrowing	114 \pm 1.0	0.108

Death intervals (DI) were calculated as the number of days from last event to death in died parity.

In sows died without being mated, approximately 50% death occurred within one week after farrowing. The proportions of death on day 0, 1, and 2 after farrowing were 10.9, 12.8, and 8.3%, respectively.

In mated gilts and sows, approximately 50% death occurred between 15 to 18 weeks after last mating.

In multilevel analyses, high DR herds were associated with a higher mortality risk in all females ($P < 0.05$). Parity 1–5 and dead piglets ≥ 1 were also related to a higher mortality risk in sows ($P < 0.05$). A mortality risk was not associated with herd-level factors: pigs weaned per mated female per year, lactation length, and herd size.

In survival analyses, a higher hazard of mortality was associated with age at first mating ≤ 269 days in gilts, and gestation length ≤ 113 and ≥ 117 days, dead piglets ≥ 1 , and parity 2–5 in sows ($P < 0.05$).

In conclusion, mid-parity and more dead piglets were associated with a higher risk of females dying and a higher hazard of mortality.

References

- Deen and Xue. 1999. Proc AD Lemman Conf: 91–94.
- Koketsu. 2000. Prev. Vet. Med. 46: 249–256.
- Stein et al. 1990. Prev. Vet. Med. 9: 85–94.