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

A field study of relationships between salivary progesterone concentrations, backfat thickness, and reproductive performance in sows weaned one litter and nursed sows

Y. Takai, Y. Tanaka, and Y. Koketsu
Meiji University, Kawasaki, Japan

Introduction and Objectives

Circulating progesterone (PRG) was low in the period from farrowing to mating. However, approximately 10% of the 191 weaned sows had high concentrations (>3 ng/mL) of serum PRG, and the high PRG concentrations were associated with an increased occurrence of reproductive failure after insemination (Elbers et al., 1994). High PRG concentrations imply active corpora lutea in lactation. Nutritional status in lactation was associated with backfat thickness (BF) and ovulation rate (Koketsu et al., 1998; Van den Brand et al., 2000). BF decreased in lactation to produce milk for piglets. In a few sows, BF increased in lactation (Langendijk et al., 2007). The objectives were to measure salivary PRG concentrations in sows weaned one litter and sows used for nursing piglets after weaning their own piglets (nursed sows), and to determine associations between PRG concentrations at weaning, BF, and reproductive performances.

Materials and Methods

This study was conducted on a commercial farm that had approximately 300 female pigs (females) and used a recording system (PigCHAMP®). The farm was visited 13 times from 2005 to 2006 to collect saliva samples at weaning from 138 sows weaned one litter and 42 nursed sows. Reference samples were collected from randomly selected 15 gestating females. PRG concentrations were measured by using ELISA kit for salivary PRG (DRG, Germany). BF was determined approximately 6 cm off the midline of the 10th rib by using Renco Lean-meater® (Renco Corp, MN). All weaned sows were categorized into two groups on the basis of upper 25 percentiles of PRG concentrations: $\geq$ 3.1 (HIGH) and $\leq$ 3.0 ng/mL (OTHER). Loss of BF in lactation was categorized into two groups: $\leq$ –1 (increased BF) and $\geq$ 0 mm (decreased BF). All statistical analyses were done with SAS (SAS Inst. Inc, NC). Statistical power was calculated. All statistical models included visited month as a random effect.

Results

Gestating females and nursed sows had higher PRG concentrations than sows weaned one litter (4.1 and 3.0 vs. 2.1 ng/mL; $P < 0.01$). Of 180 weaned sows, 11.1% had higher PRG concentrations than the mean PRG concentration of gestating females. No differences were found in reproductive performances between sows weaned one litter and nursed sows. HIGH groups had fewer subsequent pigs born alive (11.4 vs. 12.1 pigs) and thinner prefarrowing BF (20.8 vs. 21.6 mm) than OTHER groups ($P < 0.05$). No differences between the two groups were found in weaning-to-first-mating interval, farrowing percentages, weaning BF, and loss of BF in lactation. Meanwhile, sows with increased BF in lactation tended to have higher percentages of sows having high PRG concentrations (41.2 vs. 34.1%; $P = 0.068$; Power = 0.373) and had longer weaning-to-first-mating interval (6.1 vs. 5.3 days; $P < 0.05$) than those with decreased BF.

In conclusion, high PRG concentrations at weaning related to increased BF in lactation may be associated with fewer subsequent pigs born alive.

References

Elbers et al. 1994. Vet. Quart. 2:162–166.
Koketsu et al. 1998. Anim. Reprod. Sci. 52:153–163.
Langendijk et al. 2007. Theriogenology. 67:1076–1086.
Van den Brand et al. 2000. J. Anim. Sci. 78:396–404.