Variability of ovulation in pig farms; associated factors and consequences on reproductive performances

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Adequate timing of insemination close to ovulation is a key determinant of reproduction performances (Kemp and Soede, 1996). At farm level, liberal insemination strategies (>2 semen doses) are often recommended to compensate for variable and unknown ovulation time. Efficient prediction or control of ovulation could improve labor costs (Soede et al. 2002). The objective of this work was to investigate factors associated with variability of ovulation in different herds and possible impacts on reproduction.

The study was performed in 4 conventional farms: 300 to 1000 sows, weaning at 3 weeks, insemination (2–4 / sow), herd fertility >85%. Measurements were performed on several batches on a total of 314 gilts and weaned sows. They included daily recordings of estrus and ovarian status using transcutaneous ultrasound technique (3.5–5 Mhz probe, Exago®, ECM). We collected information about number and timing of inseminations (AI), backfat (BF) at AI, weaning-to-estrus or last altrenogest-to-estrus intervals (gilts), parities, previous litter size or lactation duration, health status, treatments, and subsequent performances. Results were analysed using GLM or LOGISTIQ procedures (SAS 9.2) for quantitative or qualitative data, respectively.

Within 8 days after weaning, 97.5% females exhibited estrus and ovulated, 2.5 % remained anestrus and one ovulated silently. Ovulation occurred at 76 ± 8 % of estrus duration, 44.1 ± 18.7 h after the onset of estrus, with large individual variations (-3 h to +105 h). Gilts had shorter estrus and ovulated earlier ($p<0.01$). Late weaning-to-estrus interval was associated to earlier ovulation, and shorter estrus. Weaning to estrus or last altrenogest-to-estrus intervals where the best predictors of estrus duration and ovulation time ($p<0.01$) in 3 of 4 farms. Previous litter size was unrelated to ovulation criteria but lactation length impacted weaning to-ovulation interval. BF at AI had no effect on sows but was related to last altrenogest-to-ovulation interval ($p<0.05$) in gilts. Fertility was high (83.6 to 96 % according to farms) and poorly related to ovulation criteria. However, it increased ($p<0.05$) with the number of AI falling into the interval of [-24; +12 h] around ovulation. Low BF at AI (≤13 mm) was associated with lower fertility in gilts.

Results confirmed variability of ovulation and the importance of good estrus detection procedures to adapt AI protocols. Impact of parity, BF and previous lactation should deserve further attention.