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Reproduction

Relationship between ovulation rate and litter characteristics at birth

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Introduction: The genetic selection for increased litter size has resulted in a disproportionate increase in ovulation rate (OR). A higher OR was linearly related with decreased placental length at day 35 of pregnancy, which could inhibit foetal growth during further pregnancy (Da Silva et al., 2016). As increased litter size has resulted in a decreased piglet birth weight and increased within litter birth weight variation, we investigated the relationship between OR and litter characteristics at term.

Materials and Methods: Multiparous (parities 2-9) crossbred sows (Yorkshire x Landrace, n=109) were submitted to transrectal real time B-mode ultrasonography using an Aquila MyVet30 LAB with a convex transducer at 7.5 MHz (Pie Medical/Esaote, Maastricht, The Netherlands). Sows were scanned at day 24 ± 2.6 of pregnancy, and left and right ovaries were assessed for number of corpora lutea (CL), defined as OR, and the diameter (mm) of the five largest CL. At farrowing, the total number of piglets born (TNB, liveborn + stillborn), number of mummies and average piglet birth weight (BW) were assessed, and the standard deviation of piglet birth weight (SDBW) within the litter was calculated. The relationships of OR and CL diameter with litter characteristics were assessed in two different models with PROC MIXED in SAS 9.3 (SAS Inst. Inc. Cary, NC), and OR or CL diameter included as continuous fixed effect, and parity as fixed class effect.

Results: OR was 25.2 ± 3.8 (mean ± SD), ranging from 16 to 33 and the CL diameter 8.4 ± 0.8 mm. The number of mummies was 0.4 ± 0.9, TNB was 17.7 ± 3.1, BW was 1293 ± 188g and SDBW was 306 ± 76g. There was no relationship between OR and TNB (p=0.99), number of mummies (p=0.20), BW (p=0.30) or SDBW (p=0.66). However, a higher CL diameter was related with a higher BW (β =48.3 ± 22.9g/ovulation, p=0.04) and higher SDBW (β =25.0 ± 10.5g/ovulation, p=0.02).

Conclusion: The results show that OR did not affect litter characteristics at birth, despite previous reported effects on placental development at day 35 of pregnancy. Further, CL diameter is related with piglet BW and uniformity. Because CL diameter is related with the follicle diameter at ovulation, this could indicate that piglet development is already partly established during follicle and oocyte development. However, this needs further investigation.

Disclosure of Interest: None Declared

Keywords: Corpora lutea, ovulation rate, piglets birth weight