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Different hormonal stimulation protocols can affect the number of ovulations, volume of corpora lutea and progesterone production in sows?

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The use of fixed-time artificial insemination (FTAI) in swine aims to minimize errors and labor associated with estrus detection, to reduce the variation of estrus and ovulation interval (KNOX, Theriogenology, v.75, p.308-19, 2011), possibly decreasing the number of doses of semen used per female in heat, consequently reducing production costs. However, there are evidences that ovarian stimulation with exogenous hormones can be detrimental to reproductive function in sows. As an example of that, concentration of progesterone (P4) is lower in the uterus of gilts stimulated with gonadotropins on day 12 of pregnancy (BLITEK, Dom. Anim. Endocrinol., vol.38, p.222-34, 2010) may be due to low capacity of the corpus luteum (CL) to produce P4 in treated animals. Most of the FTAI protocols (with the interval 72-80 hours between the eCG and GnRH) has insufficient success to synchronize estrus in order to use frozen semen (HÜHN, Theriogenology, v.46, p.911-24, 1996). Therefore, reducing the interval to 56 hours is an alternative to stimulate lower amplitudes of ovulations (CANDINI, Braz. J. Vet. Res. Anim. Sci., v.41, p.124-30, 2004). The aim of this study was to evaluate the effect of different FTAI protocols regarding the number of ovulations, volume of CL and P4 production. Thirty-eight sows were randomly assigned into groups: control, eCG (eCG im 600IU at weaning), GnRH56h (600IU eCG IM at weaning, 50 µg GnRH IM 56h after eCG) and GnRH80h (600IU eCG IM at weaning, 50 µg GnRH IM 80h after eCG). At day 7.5 after the beginning of heat or application of GnRH, animals were euthanised and blood and ovaries samples were collected. Serum progesterone levels were measured using radioimmunoassay. The number of ovulations were counted and two CLs from each ovary were collected and their volume were estimated (calculated by $V = 4/3\ \pi\ radius^3$). The obtained value were multiplied by the total number of CLs present in each female. Data were analyzed by One-way ANOVA and Tukey test. No significant differences were observed between experimental groups. The results are shown as mean ± SE. The number of ovulations were 23.9 ± 1.3 (control); 22.2 ± 1.1 (eCG); 25.8 ± 1.4 (GnRH56h) and 23.9 ± 1.0 (GnRH80h) (P = 0.25). The total volume of CL were 12.1 ± 1.7 cm^3 (control); 12.0 ± 0.8 cm^3 (eCG); 13.1 ± 1.6 cm^3 (GnRH56h) and 14.8 ± 1.7 cm^3 (GnRH80h) (P = 0.52). The P4 concentrations were 25.1 ± 2.2 ng/mL (control); 26.9 ± 2.5 ng/mL (eCG); 25.2 ± 2.8 ng/mL (GnRH56h) and 24.5 ± 2.8 ng/mL (GnRH80h) (P = 0.93). The P4 production per cm^3 of Cl was 2.3 ± 0.2 ng/mL (control); 2.3 ± 0.2 ng/mL (eCG); 2.1 ± 0.3 ng/mL (GnRH56h) and 1.9 ± 0.3 ng/mL (GnRH80h) (P = 0.63). These data show that hormonal stimulation has no effect on ovulation rate, volume of CL and P4 production. Moreover, the reduction in the interval between the application of eCG and GnRH from 80 to 56 hours does not affect the number of ovulations neither the functionality of CL.