Abstracts

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Intrinsic direct role of dopamine in the regulation of rabbit (Oryctolagus cuniculus) corpora lutea: in vitro study

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Dopamine (DA) is a catecholamine neurotransmitter that is distributed in the brain and also in different peripheral organs. In particular, DA receptors (DR) are expressed in luteal cells of various species, but the intrinsic role of the DA/DRs system on corpora lutea (CL) function is still unclear. The main objectives of the present study were to examine in rabbit CL the gene expression of DRs and DA and their immunolocalization, as well as the in vitro effects of DA on the production of progesterone, PGE_2, and PGF_2α during early, mid, and late luteal stages. The results showed that there was a significant increase in DA expression, PGE_2, and PGF_2α, but the final effect on luteal cell function was still unclear. DA receptors were expressed only in the luteal cells of the rat, whereas DA and D1 receptor expression was not detected in the rat. These results provide evidence that the DA/DR system exerts a dual modulatory function in controlling the lifespan of CL: the DA/D1 receptor is luteotrophic, while the DA/D3 receptor is luteolytic. The present study sheds new light on the physiological mechanisms regulating luteal activity that might improve our ability to optimize reproductive efficiency in mammalian species, including humans.

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Effect of systematic preventive treatment using uroteronics on the occurrence of clinical endometritis in dairy cows – preliminary results

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The effect of repeated administration of oxytocin (day 1 and day 2 post partum) in combination with a single administration of ergometrin or dinoprost (day 7 p.p.) on the occurrence of clinical metritis in dairy cows was evaluated in this field trial. Cows without retained foetal membranes were divided into 3 groups. No treatment was performed in the control group (Group C, n = 156), repeated intramuscular administration of oxytocin (Oxytocin inj., Bioceta, 30 IU pro toto) in combination with dinoprost ( Dinoytic inj., Pfizer, 10 mg pro toto; Group D, n = 76) or in combination with ergometrin (Ergometrin, Bioceta, 15 mg pro toto; Group E, n = 87) were performed in experimental groups. The vaginal discharge (score 1–5) and uterine content (score 1–3) were evaluated on D14–21 post partum. In addition, the number of interventions necessary for clinical endometritis treatments in groups C, D and E were evaluated. The average discharge score was 2.0, 2.31 and 2.03, the average content score was 1.52, 1.64 and 1.60. The average number of interventions was 0.68, 0.86 and 0.78; the proportion of cows without treatment was 59.4%; 54.2% and 54.7% among groups C, D and E, respectively. There were no significant differences in all evaluated variables among the groups. The preliminary results did not show any favourable effect of post partum administration of oxytocin in combination with dinoprost or ergometrin on the occurrence of clinical metritis in dairy cows. (Supported by the grant IGA VPUT Brno No. 68/2013/FVU).

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Maturation and culture in the Corral® dish: effect on bovine embryo development

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Corral® dishes have been designed for group culture of human in vitro fertilization (IVF). Its quadrant design allows passage of medium and embryotoxic factors amongst the quadrants, but allows grouping of embryos per donor. We have tested its feasibility for culturing embryos in a model system for bovine ovum pick-up/IVF. Oocytes (n = 10) of individual cows (n = 64, 4 replicates) were matured in a quadrant of the Corral® dish in TCM-199 supplemented with 20 ng/ml EGF. After fertilization, 8 yoyotes of each donor were cultured in a Corral® dish quadrant (corral) or in a single drop (drop) of SOF medium with 0.4% BSA and insulin-transferrin-seleum. Classical group culture in a 50 μl droplet, consisting of 25 embryos resulting from oocytes derived from different cows served as a control (embryo density 1:2). Cleavage rate was assessed at 45 h post insemination (pit) and was significantly lower in both test groups compared to the control (CTRL: 85.0 ± 2.52%; corral: 77.6 ± 2.66%; drop: 72.9 ± 2.78% (p < 0.05). Blastocyst development was also significantly lower in the test groups compared to the control, both at day 7 pit (CTRL: 32.5 ± 3.31%; corral: 22.8 ± 2.67%; drop: 12.9 ± 2.10%) and day 8 pit (CTRL: 40.0 ± 3.46%; corral: 30.1 ± 2.92%; drop: 26.7 ± 2.77%). However, at day 7 pit, a significantly higher blastocyst rate was noticed in the control than the drop (after Bonferroni correction). In conclusion, culturing oocytes or embryos in the Corral® dish per cow did not match the benefits of group culture, probably due to the large distance between the quadrants and the lower embryo density (1:2).}

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Reducing glycerol concentration with trehalose increases survival of bull spermatozoa

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Although glycerol has a known cytotoxic effects on bovine spermatozoa, it is used as a common cryoprotectant in TRIS based extenders. This study was conducted to analyse the effects of trehalose in semen extenders supplemented with low (3.5%) glycerol. Semen samples from 3 mature Sahiwal bulls were pooled, ejaculates were divided into 4 aliquots: I-Control (TRIS extender with 7% glycerol), II-Reduced glycerol (RG) 3.5%, trehalose 0 mm (TU), III-RGT100 mm, IV-RGT200 mm. Post thaw sperm motility, plasma membrane integrity (PMI) and functionality (HOST), normal acrosomal ratio (NAR) and DNA integrity (via acridine orange) were analysed. The post thaw motility (55 ± 1.58% vs. 42 ± 1.22%), viability (63 ± 0.89% vs. 51 ± 1.3%), HO (54.2 ± 0.37% vs. 41.4 ± 0.67%) and DNA integrity (97.62 ± 0.48% vs. 96.51 ± 0.37%) were significantly (p < 0.05) higher in RGT200 compared to Control. NAR % was significantly (p < 0.05) higher in RGT100 compared to Control (57.2 ± 0.88 vs. 40 ± 0.71). In conclusion, extenders with low fraction of glycerol (3.5%) supplemented with gradual increase in trehalose concentration (up to 200 mm) resulted in better sperm survival.