

ABSTRACTS: 34TH ANNUAL MEETING OF THE BRAZILIAN EMBRYO TECHNOLOGY SOCIETY (SBTE)

Embryology, developmental biology, and physiology of reproduction

Effects of estradiol on PGF2 α synthesis in beef heifers submitted to resynchronization at 14 days after TAI

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We aim to evaluate the effects of estradiol benzoate (EB) or 17 β -estradiol (E2) associated to P4 in the PGF2 α synthesis 14 days post-TAI in beef heifers. Nelore heifers were submitted to timed-AI (TAI; D0). On D14, heifers received an intravaginal P4 device (1g, Sincrogest, Ourofino Saúde Animal) and were randomly split: Control (C; no treatment; n=12); EB (1mg EB, Sincrodiol, Ourofino; n=10); or E2 (1mg E2 + 9mg P4, Betaproginn, Boehringer-Ingelheim; n=10). On D14, blood samples were collected hourly for 8 hours (H) after the treatments (H0 to 8) to measure plasma concentrations of PGF2 α metabolite (PGFM; pg/mL) by an in-house ELISA. Devices were removed on D22 and pregnancy was diagnosed on D28. Data were analyzed by ANOVA (PROC MIXED), LSD test or Fisher's exact test of SAS. Pregnancy was detected in 17 heifers: C (n=7), EB (n=5) and E2 (n=5) groups. Regardless of pregnancy status, a group by hour interaction ($P<0.05$) indicated increased PGFM concentrations between H4 and 6, and 7 and 8 for E2 and EB groups, respectively; whereas no difference was observed in C group. PGFM concentrations were greater ($P<0.05$) in E2 and EB groups than in C group, respectively, at H5 to 8 and at H8. A greater ($P<0.05$) number of heifers with a CV-identified prominent PGFM pulse (>100 pg/mL) was observed in E2 group (60% [6/10]) than in EB (10% [1/10]) and C (0% [0/12]) groups. The peak (pg/mL) and area under pulse curve (AUC; pg/mL/h) of PGFM pulses were greater ($P<0.05$) in E2 group (118 ± 20 and 162 ± 36) than in C group (31 ± 4 and 30 ± 4), but did not differ ($P>0.1$) from EB group (72 ± 30 and 90 ± 47). Amplitude (pg/mL) of PGFM pulse was greater ($P<0.05$) in E2 group (91 ± 19) than in EB and C groups (overall mean: 27 ± 15). Maximum PGFM concentration (pg/mL) did not differ ($P>0.1$) between E2 (120 ± 20) and EB (80 ± 18) groups and both were greater ($P<0.05$) than C (37 ± 4). For non-pregnant heifers, a group by hour interaction indicated increased ($P<0.05$) PGFM concentrations in E2 group from H4 to 8, and in EB group at H7 and 8. PGFM pulse concentrations at the peak, amplitude and AUC were greater ($P<0.05$) in E2 group (124 ± 23 , 93 ± 24 and 151 ± 48) than in C group (26 ± 3 , 10 ± 1 and 23 ± 2); whereas the EB group (88 ± 43 , 61 ± 39 and 115 ± 70) did not differ ($P>0.1$) from the other groups. Maximum PGFM concentration did not differ ($P>0.1$) between E2 (124 ± 23) and EB (110 ± 30), but was greater ($P<0.05$) in both groups than in C (32 ± 3). For pregnant heifers, no effects of group, hour or their interaction were detected, but maximum PGFM concentration was greater ($P<0.05$) in E2 (115 ± 34) than in EB (49 ± 10) and C (41 ± 5) groups. Prominent PGFM pulses were only detected in pregnant heifers from E2 group (3/5). In conclusion, PGF2 α synthesis is more stimulated and anticipated in heifers treated with E2 than EB; and 1mg of EB 14 days after TAI does not induce PGF2 α synthesis in pregnant beef heifers. Acknowledgments: FAPESP (2015/10606-9; 2017/18613-0).