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A novel and safe strategy for resynchronization using estradiol 14 days after timed-AI in beef heifers

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We aimed to evaluate the use of estradiol benzoate (BE) or 17 β -estradiol (E2) associated with progesterone (P4) for resynchronization at 14 days post-TAI and its effect on the maintenance of pregnancy in beef heifers. In Exp1, Nelore heifers of 16-18 months were synchronized for TAI (D0). On D14, the animals received an intravaginal device of P4 (1g, Sincrogest, Ourofino Saúde Animal, Cravinhos, SP) and were split in three groups: control (C) (no treatment; n=17), BE (1mg BE, Sincrodiol, Ourofino; n=17), and E2+P4 (1mg E2 + 9mg P4, Betaproginn, Boehringer-Ingelheim, Campinas, SP, n=18). Ultrasonography evaluations (B/Doppler modes) were performed daily from D14 to D22 for measurement of follicles, area and blood perfusion of corpus luteum. On D22, devices were removed and pregnancy diagnosis (DG) was made by luteolysis detection, as reported by Pugliesi et al. (Biol Reprod, 4: 1-12, 2014). Non-pregnant (NP) heifers received 1mg of estradiol cypionate (SincroCP, Ourofino), 500 μ g of sodium cloprostenol (Sincrocio, Ourofino) and 200 UI of eCG (SincroeCG, Ourofino) on D22, and a second TAI was performed on D24. In Exp2, 919 Nelore and NeloreXAngus heifers were submitted to TAI and resynchronized as done in Exp1. Presence of a viable embryo was evaluated on D28 (Exp1) and D37-67 (Exp2) after first TAI, and 43-47 days after second TAI (Exp2). Data were evaluated by ANOVA (PROC MIXED), Fisher's exact test or logistic regression (PROC GLIMMIX) of SAS. In Exp1, follicular emergence in the BE group occurred only on days 3 to 5 after treatment, while in the others it was spread. However, follicular emergence (days) and dominant follicle diameter (mm) on D22 in NP heifers did not differ ($P>0.1$) between the C (2.8 ± 0.6 and 11.9 ± 0.9), BE (4 ± 0.5 and 10.9 ± 0.6) and E2+P4 (2.4 ± 0.6 and 12.3 ± 0.5). Luteolysis (days) occurred earlier ($P=0.03$) in the BE (18.6 ± 0.5) and E2+P4 (19.1 ± 0.5) groups than in C group (20.6 ± 0.4). In Exp1, pregnancy rate (PR) was similar ($P>0.1$) between the C, BE and E2 + P4 groups in DG22, (67.3%) and D28 (63.4%). In Exp 2, FD diameter (mm) on D22 did not differ ($P>0.1$) among groups: C (11.9 ± 1.8), BE (11.2 ± 1.8) and E2+P4 (11.5 ± 1.8). PR did not differ ($P>0.1$) among the C, BE and E2+P4 groups at DG22 (53.2% [165/310], 53.6% [163/304] and 48.8% [149/305],) and D37-67 post-TAI (44.3% [98/221], 43.2% [96/222], and 44.9% [97/216], respectively). Pregnancy loss was similar ($P>0.1$) among C (18.3% [22/120]), BE (17.2% [20/116]), and E2+P4 (16.4% [19/116]). The PR for resynchronized heifers was 39.8% (49/123) for C, 47.8% (55/115) for BE and 44.5% (57/128) for E2+P4 group ($P>0.1$). We conclude that administration of 1 mg of BE or 1mg of E2+9mg of P4 at 14 days post-TAI does not compromise pregnancy maintenance and anticipates luteolysis in non-pregnant heifers. This strategy is a novel and safe option for super-early resynchronization in heifers.

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