Animal Reproduction

Abstracts - 35th Annual Meeting of the Brazilian Embryo Technology Society (SBTE)

FTAI/FTET/AI

Effect of the follicular stage and progesterone concentrations at the beginning of an estradiol/progesterone-based timed-AI protocol on emergence and development of a new follicular wave in Bos indicus heifers

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Resumo

The study evaluated the effect of the follicular stage (pre- or post-deviation) at the onset of a synchronization protocol and the effect of higher or lower circulating progesterone (P4) from intravaginal devices on emergence and development of a new follicular wave (NFW) in Bos indicus heifers. Cycling Nelore heifers (n = 42; 24.0 ± 2.7 months old; BCS = 3.3 ± 0.1) were submitted to a presync protocol starting with 1.5 mg estradiol benzoate (EB), a P4 device and 2 doses of PGF (0.5 mg), 24 h apart. In half of heifers, the presync started on D-10, to result in a post-deviation 7-d old dominant follicle (DF) on D0. In the other half, the presync started on D-5, to result in a pre-deviation 2-d old follicle on D0. On D0, heifers received 1.5 mg EB and were randomized into a 2×2 factorial arrangement, composed by the follicular stage (pre- vs. post-deviation) at the onset of the protocol, and the P4 treatment with a new intravaginal device with 2 g (High P4) vs. a 1 g device previously used for 14 d (Low P4). Ultrasound evaluations were performed on D-10, -5, -2, and daily from D0 to 7, to evaluate follicular dynamics. Blood samples were taken daily from D0 to 7. On D7, the P4 devices were removed and heifers were reassigned to the presync, in a cross-over model. Statistical analyses were done by the PROC GLIMMIX of SAS 9.4 ($P \leq 0.05$). Only data from heifers that had emergence of a NFW after D0 were analyzed (n = 58). On D0, before treatments, circulating P4 was similar between groups (0.4 ng/mL). As expected, on D0, the diameter of follicle was greater (11.2 ± 0.3 vs. 7.1 ± 0.2 mm), the number of follicles ≥ 5 mm was smaller (2.7 ± 0.3 vs. 5.2 ± 0.2) and the circulating estradiol was greater (5.6 ± 0.9 vs. 2.5 ± 0.4 pg/mL) in post-deviation than in pre-deviation group. Circulating P4 over time was greater in High P4 than in Low P4 group, especially during the first 3 d (3.3 ± 0.2 vs. 1.9 ± 0.1 ng/mL). Neither follicular stage nor P4 treatments affected day of emergence (2.6 ± 0.1 d), day of deviation (5.0 ± 0.1 d), or follicular diameter at deviation (6.6 ± 0.1 mm). The number of follicles ≥ 5 mm at deviation was not affected by follicular stage but was lower in High P4 than in Low P4 group (6.9 ± 0.5 vs. 8.6 ± 0.6). Follicular stage did not affect the NFW development until D7. However, follicular growth rate from emergence to D7 was greater in Low P4 than in High P4 group (1.12 ± 0.06 vs. 0.98 ± 0.04 mm/d), resulting in a greater DF on D7 (9.3 ± 0.3 vs. 8.5 ± 0.2 mm). Notwithstanding, P4 treatments did not affect the growth rate from emergence to deviation. In conclusion, neither the follicular stage at the onset of an E2/P4 protocol, nor treatment with distinct P4 devices affected the DF development during the common growth phase. However, lower circulating P4 resulted in more subordinate follicles at deviation and greater follicular growth after deviation.

Acknowledgments

FAPESP #2018/03798-7 #2021/09924-7; CAPES; CNPq; Morro do Brumado Farm.