Animal Reproduction

THEMATIC SECTION: 38TH ANNUAL MEETING OF THE BRAZILIAN EMBRYO TECHNOLOGY SOCIETY (SBTE)

FTAI AND AI

Estradiol esters pharmacokinetics in a bovine waveless model

Túlio Vinicius Arruda Silva[1], Aline Silva Mendes Teixeira[1], Sara Adna Santos de Oliveira[2], Luiz Gustavo Bruno Siqueira[3], Ricardo Alamino Figueiredo[4], João Henrique Moreira Viana[4]

[1]Universidade de Brasília, [2]Universidade Federal de Uberlândia, [3]Empresa Brasileira de Pesquisa Agropecuária, [4]Empresa Brasileira de Pesquisa Agropecuária Recursos genéticos e Biotecnologia

Estradiol esters can be used in timed artificial insemination (TAI) and embryo transfer (TET) protocols. Most studies on exogenous estradiol pharmacokinetics, however, used a standard dose, regardless of body weight and did not take into account the potential interference of endogenous estradiol on circulating concentrations. The aim of this study was to compare serum estradiol concentrations after the injection of estradiol benzoate or cypionate using a waveless bovine model. Sound, pluriparous, non-lactating and nonpregnant Nelore cows (n=24) had their follicular waves suppressed by immunization against GnRH using two 1 mL SC doses of an anti-GnRH vaccine (Bopriva, Zoetis, Brazil), given 20-days apart, as previously described (Viana et al. Theriogenology;172:133-141, 2021), and were allocated using a randomized block-design according to body weight into three groups, which received either 2 mL saline (control group, CG), 5 mcg/Kg im estradiol benzoate (Syncrogen, GlobalGen, Brazil, EB group), or 5 mcg/Kg im estradiol cypionate (Cipion, GlobalGen, EC group). Blood samples were collected immediately before (0h) and 6h, 12h, 24h, 48h, 72h, 96h, and 120h after treatment. Plasma estradiol concentrations were analyzed by electrochemiluminescence (ECL) using a commercial kit (Elecsys Estradiol III, Roche Diagnostics GmBH, Germany). Data were analysed using the GLIMMIX procedure of SAS with a repeated statement to account for measurements over time. Results are shown as mean±SEM. There was no difference in the average body weight among groups (622.5±25.3, 623.1±27.1 and 625.9±25.1 kg in CG, EB and EC groups, respectively, $p>0.05$). The average E2 concentration was greater in groups EB and EC compared with CG ($p<0.0001$), but did not differ between EB and EC ($p=0.4558$). We observed time and time x treatment effects ($p<0.0001$) for groups EB and EC. In the EB group, there was a peak in E2 concentrations (154.9±16.1 pg/mL) at 6 h, when it was greater ($p<0.0001$) than those observed in EC group, followed by a progressive decline up to 120 h, moment when it became lower ($p=0.0003$) than in EC group. Conversely, in the EC group, E2 concentrations increased ($p=0.01$) up to 24 h after treatment reaching a plateau thereafter, with the maximum average value (38.0±2.5 pg/mL) occurring at 96 h. Most of the samples (75%) collected from the CG had E2 concentrations below the detection limit of the ECL kit used (5 pg/mL). In summary, the use of EB results in an earlier (6h vs. 24h) and 4-fold greater peak estradiol concentration, followed by lower values after 96 h, compared with EC.

Acknowledgments: Projects FAPDF 00193-00001711/2022-69 and CNPq INCT 406866/2022-8.