

176 SERUM ANTIMULLERIAN HORMONE CONCENTRATIONS AND *IN VITRO* EMBRYO PRODUCTION IN BEEF CATTLE

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The collection of high numbers of oocytes for *in vitro* embryo production in the cow depends on the number of antral follicles available for aspirations. The number of antral follicles varies significantly among cows and can be estimated by ovarian ultrasonography or measurement of serum concentrations of antimullerian hormone (AMH). The AMH is secreted by the granulosa cells of small antral follicles and serum concentrations are independent of the stage of the oestrous cycle. Therefore, it may be useful as a tool to select oocyte donors for *in vitro* embryo production. An experiment was designed to evaluate the effect of breed of cattle and the correlation of serum AMH concentrations on the number of viable oocytes and embryos produced *in vitro*. Cumulus-oocyte complex were collected during 44 ultrasound-guided follicle aspiration sessions performed at random stages of the oestrous cycle without superstimulation in 14 Bonsmara, 11 Braford, and 19 Brangus cows that were used for commercial *in vitro* embryo production using frozen-thawed semen from bulls of the same breed. Blood samples were collected by jugular venipuncture at the time of OPU, centrifuged at 3000 × g for 30 min for serum separation which was frozen at -20°C until AMH analysis. Serum AMH was evaluated using an ELISA (AnshLabs, Webster, TX, USA). The sensitivity of the AMH assay was 0.011 ng mL⁻¹ and intra-assay CV were <5%. The number of viable oocytes collected and embryos produced in each breed were compared by ANOVA and means were compared by the protected l.s.d. test when ANOVA revealed statistically significant differences. Regression analysis and Pearson correlation were used to determine the relationship between the number of viable oocytes aspirated and the number of embryos produced. The mean (± SEM) number of viable oocytes collected was greater ($P < 0.05$) from Brangus (23.3 ± 4.3) and Braford (22.5 ± 3.6) than from Bonsmara donors (12.2 ± 2.5). Although not statistically different, the numbers of embryos produced followed the same pattern (Brangus, 4.4 ± 0.9; Braford, 3.4 ± 0.6; Bonsmara, 2.9 ± 0.5). Serum AMH concentration was positively correlated with the number of viable oocytes collected in all breeds ($R^2 = 0.63$ for Bonsmara, 0.50 for Braford, 0.32 for Brangus; $P < 0.01$). Serum AMH concentrations were also correlated with the number of embryos produced in all breeds ($R^2 = 0.32$ for Bonsmara, 0.16 for Braford, 0.39 for Brangus). However, AMH concentrations were not significantly correlated with the proportion of viable oocytes collected and embryos produced. Results demonstrate a breed effect on the number of oocytes collected per session and that circulating AMH concentrations are correlated with the number of viable oocytes collected per session in commercial *in vitro* embryo production programs.

177 PERFORMANCE OF Gyr PREPUBERTAL HEIFERS IN *IN VITRO* EMBRYO PRODUCTION

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Bovine *in vitro* embryo production is highly relevant for dairy systems in Brazil, and Gyr dams are commonly used as oocyte donors. The aim of this study was to evaluate the use of prepubertal Gyr heifers as oocyte donors, an alternative to anticipate reproduction of those animals. For that, 11 Gyr [4 prepubertal (PP) donors and 7 adult cows (C) donors] were used in ovum pickup (OPU) sessions. The PP cows presented an average of 282.5 kg and 26.75 months, and had never displayed oestrous. Non-lactating cows presenting an average of 492 kg and 136 months were selected for C. Five replicates were performed, totaling 27 OPU sessions (C-17, PP-10) and 2-3 sessions per animal. Follicular wave was synchronised by aspiration of follicles larger than 8 mm 96 h before OPU. Cumulus-oocyte complexes (COC) were classified accordingly to their quality in viable (G1, G2, and G3) or non-viable (G4). Viable oocytes were matured and fertilized, and the presumptive zygotes were cultured in SOF medium at 38.5°C and 5% CO₂ in air. Cleavage rate was assessed 48 to 72 h post-insemination (hpi) and blastocyst rate at 168 hpi. Mean number of structures was analysed by *t*-test, and percentage of viable, G1, G2, G3, G4, cleavage, and blastocyst rates were compared among groups by Fisher's exact test (GraphPadInstat, La Jolla, CA, USA; $P = 0.05$). Results are followed by standard error values. All procedures were approved by a local ethics committee. We found that despite higher ($P < 0.05$) numbers for both viable oocytes (PP: 15 ± 2.6; C: 6.11 ± 0.76) and total oocytes (PP: 23.70 ± 2.83; C: 8.82 ± 1.19) in the PP group, the rate of viable oocytes was similar ($P > 0.05$) among PP and C groups (PP: 61.5 ± 6.51%, C: 66.79 ± 3.79%). Mean numbers of G1, G2, G3, and G4 oocytes were higher ($P < 0.05$) in the PP group (G1 = 7.1 ± 1.18; G2 = 4.9 ± 1.74; G3 = 3.9 ± 1.09; G4 = 7.8 ± 1.38) than in the C group (G1 = 2.70 ± 0.740; G2 = 2.47 ± 0.44; G3 = 1.11 ± 0.31; G4 = 2.52 ± 0.39). However, the proportion was similar ($P > 0.05$) among PP and C groups (PP: G1 = 29.5 ± 4.21%; G2 = 19.5 ± 2.85%; G3 = 15.9 ± 13.5%; G4 = 35.1 ± 6.33%; and C: G1 = 27.24 ± 4.44%; G2 = 29.60 ± 5.08%; G3 = 12.34 ± 3.01%, G4 = 30.79 ± 4.93%). Cleavage rate (PP: 91.3 ± 17.94%; C: 74.09 ± 4.65%), mean blastocyst number per OPU session (PP: 3.3 ± 1.29; C: 1.76 ± 0.28), and blastocyst rate (PP: 19.74 ± 7.40%; C: 27.03% ± 4.07%) were similar ($P > 0.05$) among groups. We conclude that prepubertal heifers presented increased numbers of viable oocytes per OPU session, but blastocyst yield was similar to adult cows. This data suggests that prepubertal Gyr heifers can be used as oocyte donors.

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