

Serum AMH 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). AMH is secreted by the granulosa cells of small antral follicles and serum concentrations are independent of the stage of the estrous 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 estrous 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 X g for 30 min for serum separation which was frozen at -20°C until AMH analysis. Serum AMH was evaluated using an enzyme-linked immunosorbent assay (AnshLabs, Webster, TX, USA). The sensitivity of the AMH assay was 0.011 ng/mL 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 LSD test when ANOVA revealed statistically significant differences. Regression analysis and Pearson's correlation were used to determine the relationship between the number of viable oocytes aspirated and the number of embryos produced. The mean (\pm SEM) number of viable oocytes collected was higher ($P < 0.05$) in Brangus (23.3 ± 4.3) and Braford (22.5 ± 3.6) than in 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.

KEYWORDS AMH, in vitro embryo production, beef cattle.

