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Relationship among circulating anti-Müllerian hormone, insulin like growth factor 1, cadmium and superovulatory response of dairy cows

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The objectives of this study were 1. to determine the associations among circulating anti-Mullerian hormone (AMH), insulin like growth factor 1 (IGF1) and Cadmium (Cd) concentrations of lactating Holstein cows at the time of superovulation and 2. to determine the effect of circulating AMH, IGF1 concentrations on the superovulatory response in Holstein dairy cows. Holstein cows (n = 30) were synchronized for superovulation and flushed. Blood samples for AMH, IGF1 and Cd analysis were collected prior to superovulation, at estrus and at the time of embryo collection. The concentrations of blood markers prior to superovulation were highly correlated to superovulatory response. Circulating concentrations of AMH, IGF1 prior to superovulation were negatively correlated to Cd concentrations ($P < 0.05$). There was no correlation between circulating concentrations of AMH and IGF1. The number of corpus luteum ($r = 0.71$), total embryo ($r = 0.67$), total transferable embryo ($r = 0.51$) and total grade 1 embryo ($r = 0.5$) were positively correlated to AMH concentrations ($P < 0.05$). There was a trend for negative correlation found between circulating Cd and grade 1 embryo yield ($r = P < 0.1$). When cows were classified into quartiles of circulating AMH concentration, the superovulatory response parameters evaluated were increased with increased AMH concentrations; particularly we observed a >2-fold difference between first and fourth AMH quartiles in total transferable embryo yield and total Grade 1 embryo yield. In conclusion, circulating AMH concentration was robustly associated with superovulatory response. Measuring AMH before enrolling cows in superovulation programs will likely allow practitioners to improve numbers of embryos produced and, thereby, reduce costs per embryo produced.

Biography

Rabie Lotfy Abdel Aziz is an Associate Professor at Faculty of Veterinary Medicine, Beni-Suef University. He received his Ph.D. degree in Theriogenology and Biotechnology from Beni-Suef University, April 2013. Currently, he is a visiting scholar in the College of Veterinary Medicine, at Washington State University, USA. He published more than 11 papers in reputed journals. His scientific interests focus on application of modern reproductive biotechnologies for genetic improvement in imported dairy breeds of cattle.