A comparison of two approaches for the use of GnRH to synchronize follicle wave emergence for superovulation

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Although estradiol has been used successfully to synchronize follicle wave emergence for superovulation, it cannot be used in many countries. Attention has turned to alternatives, including the use of GnRH to induce ovulation of a dominant follicle which will be followed by emergence of a new follicular wave in 1 to 2 days. However, GnRH synchronizes follicular wave emergence only when it induces ovulation and administration of GnRH at random stages of the estrous cycle results in ovulation in less than 60% of animals. The objective of the study was to compare superovulatory response and ova/embryo production following synchronization of follicle wave emergence for superovulation with GnRH administered 2 days after insertion of a progestin device with a protocol in which GnRH is administered 7 days after administration of PGF and a progestin device. Beef donors of various breeds were placed at random into one of two groups and superstimulated by replicate so that one cow in each group had ova/embryos collected on the same day. Sixty-six superstimulations were performed in this study; 26 were performed in 13 donors that were superstimulated twice in a cross-over design, and 40 donors were superstimulated once. Cows in Group 1 (GnRH-2 d) received a CIDR (Zoetis Animal Health, USA) on Day 0 and 100 µg of GnRH (Cystorrelin, Merial USA) on Day 2; FSH treatments were initiated on Day 4 with Folltropin-V (380 mg in cows and 208 mg in heifers; Vetoquinol, Canada) given in twice daily decreasing doses for 4 days. Prostaglandin was given with the last two injections of Folltropin-V and CIDRs were removed with the last Folltropin-V administration (i.e. Day 8). Donors received a second GnRH at the onset of estrus and were AI 12 and 24 h later. Ova/embryo collections were performed on Day 16 and classified according to the IETS Manual. Cows in Group 2 (GnRH-7 d) received an injection of PGF and a CIDR on Day -5 and 100 µg of GnRH on Day 2; FSH treatments were initiated on Day 4 and the remainder of the treatment protocol was as in Group 1, with ova/embryo collections on Day 16. Data (total ova/embryos collected and transferable embryos) were analyzed by ANOVA for mixed models, using treatment as a fixed variable and cow (i.d.) as a random variable. All donors had very high levels of embryo production. The Control (GnRH-2 d) cows produced a mean (± SEM) of 18.6±1.9 total ova/embryos of which 12.7±1.5 were of transferable quality (7.2±1.3 Grade 1). Cows in Group 2 (GnRH-7 d) produced a mean (± SEM) of 19.5±1.7 total ova/embryos, of which 14.8±1.5 were of transferable quality (8.9±1.2 Grade 1). Although two more transferable embryos were obtained in the GnRH-7 d group, differences were not significant (P>0.3). At the same time as this experiment was done, 214 other cows were superstimulated in this practice yielding an average of 7.9 transferable embryos per donor. Clearly, GnRH effectively synchronized follicle wave emergence for superstimulation in this experiment and results suggest that both approaches are efficacious for the superstimulation of beef cows.

KEYWORDS
superstimulation
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