Comparison of Long-Term Progestin-Based Estrous Synchronization Protocols in Beef Cows and Heifers

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Introduction

Synchronization protocols utilizing a 14-day pretreatment with exogenous progestins prior to gonadotropin releasing hormone (GnRH), and prostaglandin (PG) treatments have been shown to be effective for estrous synchronization in beef cows and heifers. However, beef producers are reluctant to incorporate estrous synchronization and artificial insemination (AI) into their operations. This may be due to the time and labor required for these procedures. Although effective, the progestin-select synch protocol described above can require 33 days to complete. Previous studies in our lab indicate that reducing the time between progestin (CIDR) removal and GnRH dosing from 12 to two days shortens the protocol by 10 days without loss of effectiveness. The objective of our current experiment was to compare the effectiveness of melengestrol acetate (MGA) with CIDR progesterone inserts in an estrous synchronization protocol, where the interval from progestin removal to GnRH dosing was two days.

Materials and Methods

Angus-cross beef cows (n = 74) and heifers (n = 64) utilized for this study were managed and maintained separately throughout the study. The estrous synchronization protocol consisted of 14 days of progestin treatment followed by GnRH on day 16 and PG on day 23. Half of the cows (n = 37) and heifers (n = 32) received an EAZI-Breed CIDR as the progestin source and were fed a carrier for 14 days, whereas the remaining 37 cows and 32 heifers were fed carrier containing MGA to deliver 0.5 mg per head per day. At the time of PG dosing, each cow or heifer was equipped with a heat detection patch to improve determination of the onset of standing estrus. During a 96-hour period following PG treatment, all cows and heifers were observed at least twice daily for onset of standing estrus. Time of onset of standing estrus and time of AI were recorded for each cow or heifer. Artificial insemination was performed by one experienced technician at ~12 hours after onset of observed standing estrus. Eleven days following the end of the 96-hour estrus detection period, all animals were exposed to fertile bulls for 56 days. All cows were evaluated for pregnancy status by transrectal ultrasonography ~ 60 days after AI and again 45 days later. Fetal crown-to-rump length was used to differentiate between pregnancies resulting from AI versus clean-up bulls. Data for interval from PG to onset of estrus were analyzed using general linear model of SAS. Percentage data were evaluated using the chi-square analysis.

Results

Heifers receiving a CIDR versus MGA as the progestin source exhibited similar estrous response (75.0 vs 78.1%; P=0.768), mean interval to estrus following PG (48.3 vs 49.6 h; P=0.684), AI conception rate (62.5 vs 76.0%; P=0.305), and final pregnancy rate (90.6 vs 87.5%; P=0.689), respectively. Cows receiving a CIDR versus MGA as the progestin source also had a similar interval from PG to estrus (53.1 vs 50.0 h; P=0.547), but exhibited increased estrous response (91.8 vs 72.2%; P=0.028) and increased AI pregnancy rate (76.5 vs 50.0%; P=0.033). Final pregnancy rate was also higher (94.6 vs 77.8%; P=0.037) for cows receiving CIDR as compared with those receiving MGA.

Significance

This study suggests that an estrous synchronization protocol consisting of 14 days progestin treatment with either CIDR inserts or MGA, followed by GnRH two days after progestin withdrawal and PG seven days later, results in acceptable estrous response and AI pregnancy rates in beef cows and heifers. Results indicate that CIDR inserts may be preferable to MGA as a progestin source for synchronizing estrus in cows. The estrous synchronization protocol required 10 days less than those previously reported, which could increase convenience and may improve overall utilization by producers.