

POSTPARTUM PROSTAGLANDIN ADMINISTRATION BEFORE ESTRUS SYNCHRONIZATION AND ARTIFICIAL INSEMINATION

John R. Jaeger, Kenneth Fite and Tim Delcurto

SUMMARY

Ability to reduce the number of open cows culled from the herd would significantly improve financial returns. The sale of the open cow may replace the value of the calf she did not produce, but the producer incurs the costs of producing a replacement heifer. Those costs include the actual expense of producing a bred heifer, about \$800 to \$900, and also the interruption of cash flow due to the delay in production of a weaned calf from the heifer versus a cow. Additionally, the economic impact of shortening the postpartum-anestrous interval with no effect on pregnancy rate would also be significant. The USDA estimates that a 6-day decrease in the postpartum-anestrous interval would reduce cow maintenance costs nationally by \$112 million, and the increased calf-weaning weight would be worth \$96 million to the cow-calf industry.

Previous research has demonstrated the ability of prostaglandin F_2 (PGF), commercially available as Lutalyse® or Bovilene®, to increase fertility in postpartum cattle. However, results in previous studies following early postpartum administration of PGF have been variable. In a previously reported study, cows receiving PGF 25 and 40 days after calving had higher pregnancy rates compared to untreated controls, even though PGF treatment had no effect on the proportion of cows cycling at the beginning of the breeding season or on calving interval. The objective of the current experiment was to determine if the reproductive performance of cows receiving PGF before estrus synchronization and artificial insemination (AI) was greater than cows exposed to only synchronization and AI.

METHODS

Following calving, 134 spring-calving cows in year 1 and 65 spring-calving cows in year 2, were assigned by calving date to 1 of 2 treatment groups. Between days 25 and 33 postpartum (averaging 28 days), control cows (n=100) received no treatment, the second group of cows (n=99) were treated with PGF (25 mg, IM Lutalyse®). All cows were maintained as a single group throughout the experiment.

Blood samples were collected from all cows 10 days before, and on the day estrus synchronization was initiated. Serum progesterone concentrations were used to determine the number of cows cycling at the beginning of the breeding season.

All cows received Syncro-Mate-B (SMB) to synchronize estrus and were mass-mated to a single sire, by no more than 3 technicians, 48 hours after SMB implants were removed. Cows were later exposed to 4 fertile bulls for the remaining 42 days of the 45-day breeding season.

First-service conception rate (FSCR) to AI was determined by subsequent calving date, and pregnancy rate was determined by rectal palpation 120 days after completion of the breeding season.

RESULTS AND DISCUSSION

Data from both years were pooled and analysis revealed significant effects due to year for some of the variables measured, but there was no treatment-by-year interaction for any variable. Weight and body condition score at the time of PGF treatment differed significantly between years, but not between treatment groups and averaged 1124 lb. and 4.1 (1 to 9 scale), respectively. Days postpartum at breeding did not differ between treatment groups, averaging 71 days for all cows.

The proportion of cows cycling (had reestablished estrual behavior) at the time of estrus synchronization did not differ between treatment groups, but was greater for year 2 compared to year 1 (62.9 percent vs. 42.3 percent, respectively). Year had no effect on FSCR to AI; however, cows receiving PGF displayed a significantly higher conception rate to timed AI compared to control cows (39.2 percent vs. 26.0 percent, respectively). Final pregnancy rate did not differ between years or treatments and averaged 83.8 percent for all cows.

The number of cows calving in the first 21 days of the subsequent calving season tended to be greater for the PGF treated group, but was not significantly different between treatment groups or years and averaged 53.4 percent for all cows. Calving interval averaged 358 days for all cows and was shorter in year 2 than in year 1, but not different between treatment groups.

All differences observed between years was primarily due to cows being heavier and in better body condition year 2 compared to year 1. In addition, breeding date was one week earlier year 2 than in year 1. However, these factors had no effect on response to PGF treatment.

Although postpartum PGF treatment did not increase the number of cows cycling at the time estrus synchronization, FSCR to AI after estrus synchronization was improved. If cows had been in better body condition before estrus synchronization, it is likely that the improvement in FSCR would have been more dramatic and differences in pregnancy rate may have become apparent. These data suggest that further research to evaluate the efficacy and economic feasibility of early-postpartum PGF therapy should be conducted with cows in good body condition (minimum body condition score of 5). Significant factors are the economic return from an investment of \$2.50 for a Lutalyse[®] injection to insure conception to AI, the resulting early birth of a calf sired by a superior sire, and an improved pregnancy rate.