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McKay R. Erickson

Kenneth C. Ramsay

R. Funston

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Efficacy of a Second Injection of Prostaglandin F_{2α} in Yearling Beef Heifers Following Previous Estrus Synchronization

McKay R. Erickson
Kenneth C. Ramsay
Rick N. Funston

Summary with Implications

Angus-based, yearling beef heifers were utilized to determine the effects of administering a second prostaglandin F_{2α} (PGF; Lutalyse, Zoetis Animal Health, Parsippany, NJ) injection to heifers who did not previously respond to estrus synchronization. All heifers were exposed to a melengestrol-acetate (MGA)-PGF protocol. Following PGF injection, heifers were observed for estrus (estrus detection patches rubbed) for 3 d and inseminated. Heifers who did not show signs of estrus were placed with fertile bulls. After 3 d with bulls, heifers with greater than 50% of the rub-off coating removed from estrus detection aids were considered to have been bred. One-half of the heifers not showing estrus received a second PGF injection; the other half were the controls and received no further treatment. Heifers remained with bulls for 4 d. Percentage expressing estrus was greater for heifers receiving a second PGF injection. However, pregnancy rate was similar between treatments.

Introduction

Estrus synchronization can shorten the subsequent calving season by increasing the females coming into estrus to begin breeding season and subsequently increase the number of calves in the first 21 d of calving. This will produce a more uniform calf crop with greater weaning weights. Prostaglandin F_{2α} (PGF) induces estrus and is used to synchronize cattle for breeding either by natural service or artificial insemination (2009 Nebraska Beef Cattle Report, pp. 9–10). Females that don't exhibit estrus after the first round of AI would benefit from a quick return to estrus to become pregnant.

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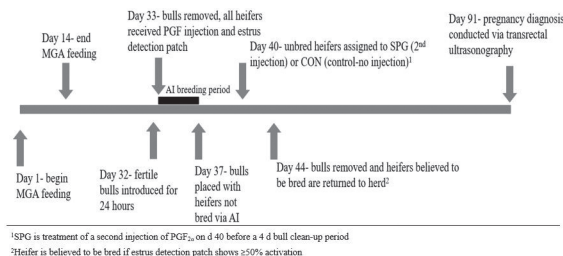


Figure 1. Timeline of 14 d MGA-PG protocol with treatment of PGF on d 40 for yearling heifers.

A second injection of PGF 7 days after the initial dose could make that a possibility.

Procedure

The objective of this study was to determine the effectiveness of a second injection of prostaglandin F_{2α} to young beef females failing to display estrus following an initial melengestrol-acetate (MGA)-PGF estrus synchronization protocol.

Angus-based, yearling beef heifers (n = 1,858, 709 lb, Ashby, NE) were exposed to a melengestrol-acetate (MGA)-PGF estrus synchronization protocol. Heifers were fed 0.5 mg/d MGA for 14 days. On day 32, fertile bulls were placed with heifers for 24 hours (Figure 1). On day 33, bulls were removed, and all heifers received an injection of PGF and an estrus detection patch (Estrotect; Rockway Inc., Spring Valley, WI) was applied. Following PGF injection, heifers were observed for estrus for 3 days and inseminated 12 h after detection of estrus. Heifers were considered in estrus when greater than 50% of the rub-off coating was removed from the patch. Heifers who did not show signs of estrus (day 37, n = 331) were placed in a separate pasture with fertile bulls at a 1:33 bull to heifer ratio. After 3 days with bulls, heifers (n = 151) with patches activated over 50% were considered to have been bred and were removed and placed with the previously bred heifers. The remaining heifers, who did not show estrus (day 40), were randomly assigned

to receive either a second PGF injection of equal dosage to the initial injection (n = 90, SPG) or no injection (n = 90, CON) and remained with bulls for 4 days. Following bull removal, SPG and CON heifers considered in estrus and assumed bred, (based upon activated patches) returned to the herd of AI and bull-bred heifers. Pregnancy diagnosis was conducted 47 days later via transrectal ultrasonography.

Results

Percentage of heifers expressing estrus was greater ($P < 0.01$) for SPG treatment (60% vs. 23% ± 13%, SPG [n = 53] vs. CON [n = 21]). Of the heifers expressing estrus in both treatments, pregnancy rate was similar ($P = 0.38$) between treatments (34% vs. 52% ± 11%, SPG [n = 18] vs. CON [n = 11]). The differences observed in estrus expression, yet no difference in pregnancy rates may be due in part to an insufficient number of females for detecting statistical differences. This was difficult to control since only females not responsive to the initial PGF injection could be included in this experiment.

Conclusion

In summary, a second PGF injection to yearling beef heifers that did not respond to an MGA-PGF protocol did increase the number of females that came into estrus, but did not improve pregnancy rates.

Overall, the number of pregnant females was increased as a result of increased estrus expression from a second injection of PGF compared to the control. This may be a viable method to increase the number of pregnancies and shorten the breeding season with a follow-up breeding without extending out 45–60 d in a typical bull breeding season.

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McKay R. Erickson, graduate student

Kenneth C. Ramsay, Rex Ranches, Ashby,
NE

Rick N. Funston, professor Animal Science,
University of Nebraska–Lincoln West
Central Research and Extension Center,
North Platte, NE