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Pregnancy Rates to Artificial Insemination in Yearling Beef Heifers Is Not Influenced by Injectable Trace Mineral

Abstract

Heifers that conceive early in their first breeding season have a long-term advantage in future reproductive success and production. Reproductive performance is more likely to be maximized if nutritional requirements are met, including those for trace minerals. Reproductive response to supplementation of trace minerals has been variable. Bioavailability of source, mineral antagonisms, intake, and long-term animal nutrient status may all contribute to that variability. A recent study found pre- and post-partum bolus injections of trace mineral increased pregnancy rate to AI in mature beef cows. The objective of this study was to determine the impact of an injectable trace mineral supplement on pregnancy rates to AI in developing replacement heifers.

Keywords

Beef Cattle Research

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Pregnancy Rates to Artificial Insemination in Yearling Beef Heifers Is Not Influenced by Injectable Trace Mineral

S.K. Johnson and M. Warner Holman¹

Introduction

Heifers that conceive early in their first breeding season have a long-term advantage in future reproductive success and production. Reproductive performance is more likely to be maximized if nutritional requirements are met, including those for trace minerals. Reproductive response to supplementation of trace minerals has been variable. Bioavailability of source, mineral antagonisms, intake, and long-term animal nutrient status may all contribute to that variability. A recent study found pre- and post-partum bolus injections of trace mineral increased pregnancy rate to AI in mature beef cows. The objective of this study was to determine the impact of an injectable trace mineral supplement on pregnancy rates to AI in developing replacement heifers.

Experimental Procedures

Yearling Angus heifers (n = 72, year 1; n = 81, year 2; n = 105, year 3) from a single operation were targeted to gain 0.5 lbs/day from weaning until mid-February. In mid-February, heifers were gradually increased to a higher energy diet to gain approximately 2 lbs/hd/day through breeding. Trace mineral supplementation was provided as a free choice supplement post-weaning and then as part of the mixed ration prebreeding and contained both organic and inorganic sources of Cu and Zn.

At 30 to 33 days prior to the start of the breeding season, heifers were assigned randomly to receive either an injectable trace mineral solution (1 mL/150 lbs, MultiMin, Fort Collins, CO) or remained untreated. Body weight and condition score (1 = thin to 9 = obese) was recorded at this time, except no body condition score was recorded in year 1. Estrus was synchronized and insemination occurred after observed estrus for the first three days of the breeding season. Heifers not observed in estrus were mass inseminated and received 2 mL of Cysterolin (100 µg GnRH, Merial, Duluth, GA, year 2) or Factrel (100 µg, GnRH, Fort Dodge Animal Health, Fort Dodge, IA; year 1 and 3). Estrus detection and AI continued for 22-24 days before heifers were exposed to natural service sires. Pregnancy rate to AI was determined 47-56 days after AI.

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Results and Discussion

Characteristics of heifers by year are shown in Table 1. Prebreeding body weight differed between years ($P < 0.01$) and was lighter in year 1 than in years 2 or 3. Body condition score was higher ($P < 0.01$) in year 2 than in year 3. Pregnancy rate to AI did not differ ($P > 0.1$) with treatment or year or for the interaction of treatment and year.

An injectable trace mineral administered 30 to 33 days before breeding to yearling beef heifers did not influence AI pregnancy rate. This was not unexpected because heifers had received adequate trace mineral supplementation program during development.

Table 1. Characteristics of yearling beef heifers

Year	n	Prebreeding weight	Prebreeding BCS	AI pregnancy, %
1	72	753 ± 7	-	68
2	81	859 ± 7	6.0 ± 0.6	53
3	106	869 ± 6	5.1 ± 0.5	56