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TIMED ARTIFICIAL INSEMINATION IN YEARLING BEEF HEIFERS: 7-11 COSYNCH VS. COSYNCH

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Summary

Previous research demonstrated that an estrus-synchronization program using a short period of melengestrol acetate (MGA) feeding in conjunction with a Cosynch protocol was effective in synchronizing estrus in postpartum beef cows. The objective of our study was to test this synchronization protocol (7-11 Cosynch) in yearling beef heifers in comparison to a Cosynch protocol. Fifty-eight commercial beef replacement heifers were assigned randomly to two protocols: Cosynch (n=29) and 7-11 Cosynch (n=29). Beginning on day 1, heifers in the 7-11 Cosynch protocol were fed MGA (0.5 mg/heifer daily) for 7 days. On day 7, the last day of MGA feeding, the heifers on the 7-11 Cosynch protocol received an injection of $PGF_{2\alpha}$. On day 11 all 58 heifers received an injection of GnRH (100 μg). On day 18, all 58 heifers were injected with $PGF_{2\alpha}$. On day 20, all of the heifers received a 100 μg dose of GnRH by injection and were artificially inseminated. Ultrasonography was used to determine pregnancy status 29 days after breeding. A greater percentage ($P<0.01$) of heifers were pregnant after the 7-11 Cosynch treatment (67%) than after the Cosynch treatment (31%). This study demonstrates the potential of achieving acceptable pregnancy rates using timed artificial insemination in yearling beef heifers.

Introduction

The use of artificial insemination (AI) is limited in the beef industry due to the added costs, labor, time, and the additional skills required. Application of estrus-synchronization protocols has reduced the time required for using AI, making it a feasible option for some producers. Most protocols require estrus detection, but in recent years timed AI protocols for cows have yielded acceptable results, further reducing the time requirement for AI. However, the timed AI protocols designed for cows do not always provide satisfactory results when applied to heifers.

A common protocol for synchronizing estrus in heifers is to feed melengestrol acetate (MGA) for 14 days at a rate of 0.5 mg/heifer daily. Heifers then receive an injection of $PGF_{2\alpha}$ 17 to 19 days after MGA feeding and are inseminated according to observed estrus. This synchronization system is effective but requires 31 to 33 days from the initiation of MGA feeding to the beginning of AI.

Recently, another protocol (7-11 Synch) for heifers was tested with a shorter, 7-day, MGA feeding period combined with the Select-Synch protocol. Although this protocol yielded good synchrony and conception rates in heifers, this synchronization system still requires labor for detection of estrus.

The present study was designed to determine whether the 7-11 Synch system could be modified for timed AI of heifers.

Experimental Procedures

A group of 58 yearling heifers (Angus x Hereford) from the Kansas State University Cow-Calf Unit were used in this study. Blood

was collected 11 days before the experiment as well as on days 1 and 18 and subsequently analyzed for concentrations of progesterone to determine whether each heifer had achieved puberty. Heifers were blocked by weight and pubertal status and assigned to one of two protocols. One group (7-11 Cosynch; n=29) were fed MGA (0.5 mg/heifer daily; Pharmacia Animal Health, Kalamazoo, MI) in combination with a Cosynch protocol (Figure 1). The control group (Cosynch) received the traditional Cosynch protocol (Figure 1).

Heifers in the 7-11 Cosynch group were individually fed a grain sorghum carrier containing MGA for 7 days starting on day 1. On the last day of MGA feeding, the heifers were injected with 25 mg (i.m.) of $PGF_{2\alpha}$ (Estrumate, Schering-Plough Animal Health, Kenilworth, NJ). The Cosynch group was fed the carrier without MGA for the first 7 days. Thereafter, all of the heifers were fed only the carrier throughout the end of the trial. On day 11, all heifers received 100 μg (i.m.) of gonadotrophin-releasing hormone (GnRH; Cystorelin, Merial, Iselin, NJ). Then, on day 18, all heifers received an injection of $PGF_{2\alpha}$. All heifers were injected with GnRH (100 μg) and artificially inseminated on day 20. Semen from two sires was distributed equally between the two treatments.

Results and Discussion

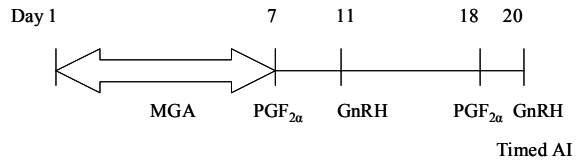
Ultrasonography was used to determine pregnancy status at 29 days after timed AI. In total, 28 of 58 (48%) heifers were pregnant. In the 7-11 Cosynch group 19 of 29 (67%) heifers were confirmed pregnant. In contrast, only 9 of 29 (31%) heifers in the Cosynch group conceived. Even with this small number of heifers, pregnancy rates differed ($P<0.01$) between the two treatments.

No difference in pregnancy rates was detected between sires. Seven heifers were nonpubertal at the beginning of the trial. At day 18, four heifers still were not cycling. Two of the three heifers that began cycling during the treatment were confirmed pregnant.

A great opportunity exists to use AI in the beef industry, but this advantage requires a greater input of time and labor. The present study indicates that short-term MGA feeding combined with the Cosynch protocol may yield acceptable pregnancy rates with timed AI in yearling beef heifers.

Acceptable pregnancy rates obtained from timed AI protocols may allow more producers to use AI and thereby benefit from superior genetics at costs comparable to purchasing bulls.

7-11 Cosynch



Cosynch