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Abstract

The objective of this project was to study the effects on pregnancy rates of inseminating estrus-synchronize d heifers either at observed estrus or at a fixed time. In April, 1994, 574 yearling crossbred heifers, located on six Kansas ranches, were inseminated to achieve this objective. Her d size ranged from 38 to 293 head. The heifers were synchronized with the MGA-prostaglandin (PGF) system. Heifers were either inseminated 12 hr after the onset of estrus or, if not showing estrus, 72 hr after PGF. Pregnancy rates of 491 heifers bred on estrus averaged 56.6% (39.2 to 80.4%). Pregnancy rates for the 83 fixed-time-inseminated heifers average d 39.8% (15.6 to 56.5%) . Heifers that responded to the MGA-PGF synchronization system with a standing heat had higher pregnancy rates than those that were inseminate d at a fixed time. However, fixed-time inseminations used in conjunction with inseminations made at estrus increased the total number of heifers bred to proven AI sires.

Keywords

Cattlemen's Day, 1995; Kansas Agricultural Experiment Station contribution; no. 95-357-S; Report of progress (Kansas State University. Agricultural Experiment Station and Cooperative Extension Service); 727; Beef; Heifer; Synchronization of estrus; Fixed-time insemination

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PREGNANCY RATES IN MGA-PROSTAGLANDIN-SYNCHRONIZED HEIFERS BRED AT ESTRUS OR INSEMINATED AT FIXED TIMES

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Summary

The objective of this project was to study the effects on pregnancy rates of inseminating estrus-synchronized heifers either at observed estrus or at a fixed time. In April, 1994, 574 yearling crossbred heifers, located on six Kansas ranches, were inseminated to achieve this objective. Herdsize ranged from 38 to 293 head. The heifers were synchronized with the MGA-prostaglandin (PGF) system. Heifers were either inseminated 12 hr after the onset of estrus or, if not showing estrus, 72 hr after PGF. Pregnancy rates of 491 heifers bred on estrus averaged 56.6% (39.2 to 80.4%). Pregnancy rates for the 83 fixed-time-inseminated heifers averaged 39.8% (15.6 to 56.5%). Heifers that responded to the MGA-PGF synchronization system with a standing heat had higher pregnancy rates than those that were inseminated at a fixed time. However, fixed-time inseminations used in conjunction with inseminations made at estrus increased the total number of heifers bred to proven AI sires.

(Key Words: Heifer, Synchronization of Estrus, Fixed-Time Insemination.)

Introduction

Proper management of replacement heifers is essential, because they represent the future profitability of the herd. Utilizing estrus synchronization and artificial insemination (AI) can increase the proportion of heifers bred early in their first breeding season and, consequently, increase their lifetime productivity. Although several synchronization programs and insemination regimens are available, a common practice utilizes estrus detection, with inseminations based on the AM-PM rule (i.e., a female first showing estrus in the morning is inseminated that evening). However, fixed-time inseminations also can be used, when all females are inseminated at a specific time in a synchronization program, whether or not estrus has been detected. This method reduces labor, but pregnancy rates are often variable. Our objective was to evaluate the effects of inseminating estrus-synchronized heifers at observed estrus plus a fixed-time insemination for those not detected in estrus, in order to maximize the total number of pregnancies achieved with AI.

Experimental Procedures

In April, 1994, yearling crossbred heifers on six Kansas ranches were used in an estrous synchronization and artificial insemination program. Herd size ranged from 38 to 293 head and averaged 96 head. Each herd was assigned two or three experienced AI technicians before the breeding season. Heifers were synchronized with an MGA-prostaglandin (PGF) system in which animals were fed MGA at .5 mg/head/day for 14 days, then given a PGF injection 17 days after MGA withdrawal. Heifers were observed for signs of estrus and were inseminated artificially 12 hr after the first detected standing heat. Animals showing no signs of estrus were inseminated 72 hr after PGF. All females were pregnancy tested 30 days after insemination by real-time ultrasonography, with a 7.5 MHz intrarectal probe.

At location A (Table 1), 293 heifers were assigned randomly to receive the prostaglandin injection on either day 16 (PM) or day 17 (AM) after MGA withdrawal. Heifers then were evaluated for response to synchronization, onset of estrus, first-service pregnancy rate, and total pregnancy rate.

Results and Discussion

Table 1 shows the rates of detected estrus and first-service pregnancy rates at each location. Based upon detection of estrus, 85.5% of the 491 heifers responded to synchronization. The first-service pregnancy rates of those heifers ranged from 39.2 to 80.4%, with an average of 56.6%. The remaining 83 heifers, either not responding to the estrous synchronization program or not detected in heat, were inseminated at 72 hr after PGF. Pregnancy rates ranged from 15.6 to 56.5%, with an average of 39.8%. These data suggest that heifers responding to the MGA-PGF synchronization system with a standing heat have higher pregnancy rates than those that are inseminated at a fixed-time. However, fixed-time AI used in conjunction with inseminations made after detection of estrus can increase overall pregnancy rates. A primary goal of a synchronization-AI program for replacement heifers is to maximize the number of pregnancies to proven AI sires in the first 21 days of the breeding season. This allows heifers to calve earlier in the calving season, breedback earlier in the following breeding season, and wean heavier calves in the fall.

Figure 1 illustrates the percentage of heifers detected in estrus at location A after receiving injections of PGF on either day 16 or 17 after MGA withdrawal. Of the 131 heifers receiving a day-16 injection, 81.7% were detected in heat before 72 hr, and first-service pregnancy rate was 62.6%, whereas that of the 24 remaining time-inseminated heifers was 12.5%. Of the 137 heifers receiving a day-17 injection, 95.6% were detected in heat by 72 hr, and first-service pregnancy rate was 56.5%, whereas that of the 6 time-inseminated heifers was 33%. At the completion of a 60-day breeding season with clean-up bulls, overall pregnancy rates were 96.2 and 94.2% for day-16 and -17 prostaglandin injections, respectively. These data suggest that heifers may respond better to estrous synchronization when injected with PGF 17 days following MGA withdrawal. However, overall first-service pregnancy rate (estrus and time-inseminated heifers) and total pregnancy rate were similar between injection times.

Table 1. Variability among Ranches in Detected Estrus and First-Service Conception of Beef Heifers Synchronized with MGA and Prostaglandin (PGF)

	Ranches					
Item	A	B	C	D	E	F
No. of heifers	293	38	51	56	90	73
No. and % detected in estrus						
by 72 hr after PGF	261 (89.1)	35 (92.1)	51 (100)	33 (58.9)	65 (72.2)	46 (63.0)
No. and % pregnant						
AI at estrus	157 (60.2)	15 (42.9)	20 (39.2)	18 (54.5)	31 (47.7)	37 (80.4)
AI at 72 h	5 (15.6)	1 (33.3)	—	13 (56.5)	14 (56.0)	—
Total first-service pregnancy rate (%)	55.3	42.1	39.2	55.4	50.0	80.4

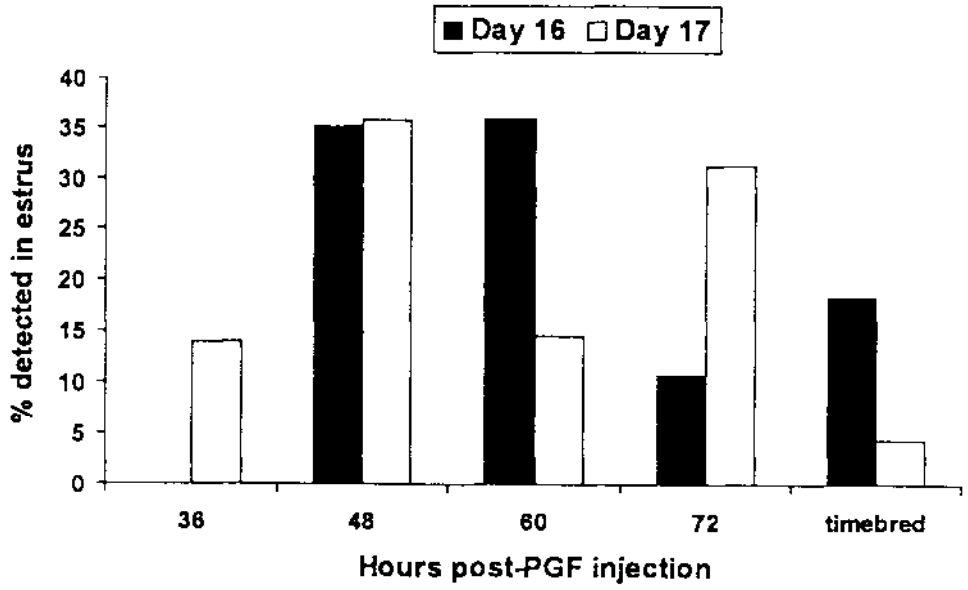

Figure 1. Onset of Estrus in Heifers Given Prostaglandin $F_{2\alpha}$ on Either Day 16 or 17 Post-MGA Withdrawal