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Robert L. Larson

L.R. Corah

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Synchronization of estrus in yearling beef heifers with the MGA®/prostaglandin F2 α system: III. timed insemination after 72 hours of estrous detection

Abstract

The percentage of heifers conceiving to artificial insemination (AI) following melengestrol acetate/prostaglandin F2 α (MGA®/PG) estrous synchronization can be increased by mass insemination of all heifers not showing estrus by 72 h after PG. Inseminating at 12 h after estrus detection all heifers showing estrus within 72 h after PG; then inseminating those not detected in estrus by 72 h after PG as a group increased the proportion of heifers conceiving to AI by 10.8%.

Keywords

Cattlemen's Day, 1992; Kansas Agricultural Experiment Station contribution; no. 92-407-S; Report of progress (Kansas State University. Agricultural Experiment Station and Cooperative Extension Service); 651; Beef; MGA/PG; Heifers; Timed mating; Conception rate

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**SYNCHRONIZATION OF ESTRUS IN YEARLING BEEF
HEIFERS WITH THE MGA®/PROSTAGLANDIN F₂α
SYSTEM: III. TIMED INSEMINATION AFTER
72 HOURS OF ESTROUS DETECTION^{1,2}**

R. L. Larson and L. R. Corah

Summary

The percentage of heifers conceiving to artificial insemination (AI) following melengestrol acetate/prostaglandin F₂α(MGA®/PG) estrous synchronization can be increased by mass insemination of all heifers not showing estrus by 72 h after PG. Inseminating at 12 h after estrus detection all heifers showing estrus within 72 h after PG; then inseminating those not detected in estrus by 72 h after PG as a group increased the proportion of heifers conceiving to AI by 10.8%.

(Key Words: MGA/PG, Heifers, Timed Mating, Conception Rate.)

Introduction

Earlier experiments conducted by KSU scientists have shown that mass insemination following MGA/PG estrous synchronization is an effective method of increasing the number of heifers conceiving to AI. These earlier trials also indicated that timed insemination was most effective in heifers that displayed estrus beyond 48 h after PG. By combining estrous observation and insemination 12 h after first detected estrus with timed insemination 72 h after PG, we hoped to maximize the number of heifers settling to AI in a 3 d breeding period. Also of interest was the association of serum progesterone concentration at the

time of PG injection with subsequent estrous behavior and AI conception rate.

Experimental Procedures

A total of 251 heifers at two commercial ranches received melengestrol acetate (MGA) (.5 mg/head/d) for 14 d with prostaglandin F₂α (Lutalyse®) injected 17 d after the end of MGA feeding. At the time of PG injection, serum was collected and later analyzed for progesterone concentration. Heifers were observed for estrous activity and inseminated 12 h after first being detected in estrus during the first 72 h following PG. At 72 h, all heifers that had not exhibited estrus were mass inseminated. Bulls were turned with the heifers 7 to 14 days after mass mating for 45 to 75 days. First service conception rate was determined by rectal palpation 50 to 100 days after AI.

Results and Discussion

Table 1 shows the benefits of combining estrous detection for 72 h with mass insemination of the heifers failing to show estrus by that time. By adding mass insemination to conventional estrous detection, we were able to get an additional 10.8% of the heifers to settle to AI. Conception rates to AI were higher (P < .05) in heifers that were detected in estrus in both ranches, (72.5% versus 50.0%). This was expected, because the non-

¹Appreciation is expressed to Select Sires, Inc., Plain City, Ohio for partial financial assistance and to the Upjohn Co., Kalamazoo, Michigan for providing prostaglandin.

²Appreciation is expressed to the two cooperating ranches: Gary Johnson, Dwight, Kansas, and Jack and Alan Grothusen, Ellsworth, Kansas.

responding group also included non-puberal heifers and those not responding to synchronization. But the group of heifers that were not detected in estrus also must have included individuals that were puberal and ovulated in a time period coinciding with the synchronization period, because 50.0% of these heifers settled to the AI breeding.

Only 82.9% of the heifers were puberal at the start of the breeding season (Table 1), when we used > .9 ng/ml serum progesterone as a cut-off point. In those heifers not detected in estrus, more became pregnant to

AI if they had serum progesterone concentrations greater than .75 ng/ml at PG administration ($P < .05$). In heifers that displayed estrus, serum progesterone was not related to conception. Possibly the most surprising finding is that 37.5% of heifers not detected in estrus and also having < .75 ng/ml progesterone conceived to AI.

In conclusion, we found acceptable conception rates for heifers not detected in estrus but mass inseminated at 72 h following PG.

Table 1. AI Pregnancy Rate of All Heifers

	Ranch A	Ranch B	Overall
No. of heifers	178	73	
Total AI conception rate	69.1%	64.4%	67.7%
Overall pregnancy rate	96.6%	90.5%	95.2%
Puberal (> .9 ng/ml progesterone)	86.5%	73.9%	82.9%
AI conception rate for heifers showing estrus	72.3%	73.1%	72.5%
AI conception rate for heifers not showing estrus	58.3%	31.3%	50.0%
No. of heifers not detected in estrus that settled to AI	22 (12.4%)	5 (6.8%)	10.8%
AI conception rate for heifers detected in estrus with P concentration:			
< .75 ng/ml	100.0% (4/4)	77.8% (7/9)	84.6%
.75 - 1.5 ng/ml	63.6% (14/22)	71.4% (10/14)	66.7%
> 1.5 ng/ml	72.0% (85/118)	69.2% (18/26)	71.5%
AI conception rate for heifers not detected in estrus with P ¹ concentration:			
< .75 ng/ml	50.0% (8/16)	12.5% (1/8)	37.5%
> .75 ng/ml	65.0% (13/20)	50.0% (4/8)	60.7%

¹P = progesterone.