SHORT-TERM FEEDING OF MGA TO POSTPARTUM COWS PRIOR TO THE BREEDING SEASON

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Summary

A protocol to make anestrous cows more likely to cycle prior to estrous synchronization would greatly enhance reproductive efficiency. Ease of application, availability, and low cost make feeding melengestrol acetate (MGA) a good choice in such a protocol. MGA, used as a progestin "primer," has no detrimental effects on cows that are already cycling and reduces the number of cows expressing short cycles.

(Key Words: MGA, Postpartum Interval, Pregnancy Rate, Short Cycle.)

Introduction

Fifteen to twenty percent of the nation's cows fail to wean a calf annually, primarily because they do not become pregnant within the relatively short breeding season. The purpose of our experiments was to test a protocol that would "progestin-prime" multiparous beef cows so that all would be cycling at the start of the breeding season. Such a procedure would be useful in many operations that are unable to justify labor-intensive synchronization systems.

Experimental Procedures

Experiment 1

Thirty-nine multiparous, crossbred cows were exposed to progestin (MGA) treatment beginning 30 days postpartum (Spring, 1999). Cows were blocked according to calving date and assigned randomly to treatment. Treatments consisted of feeding MGA for 8, 4, 2, or 0 (controls) days at 0.5 mg/head daily.

Blood was collected before and after MGA supplementation and analyzed for progesterone concentration (>1 ng/ml was evidence for luteal activity).

Cows were synchronized with prostaglandin $F_{2\alpha}$ (Lutalyse®, Pharmacia & Upjohn) at the beginning of the breeding season, inseminated upon standing heat, and exposed to bulls 6 days following the second Lutalyse injection. Pregnancy and conception dates were determined by uterine palpation and actual calving dates.

Only cows anestrus before treatment were included in the statistical analysis of initial rise in blood progesterone, days to conception, incidence of short cycles, and response to prostaglandin $F_{2\alpha}$. However, both cycling and noncycling cows at 30 days postpartum were included in determination of pregnancy rates and conception rates to AI.

Experiment 2

Ninety-three multiparous, black baldy, fall-calving cows were used in 1999. Cows were assigned randomly to receive MGA (0.5 mg per head daily for 4 days) (n=44) or no MGA (n=49). Suckled cows grazed fescue pastures and were group-fed the supplement. Treatment began 35 days prior to the breeding season. Bull exposure was for 60 days.

Experiment 3

Thirty-six multiparous Angus and Angus × Hereford cows were used in April 2000. Cows were blocked by calving date and assigned randomly to MGA (0.5 mg per head daily for 4 days) or no MGA. Suckled cows were individually fed the MGA supplement starting 30 days prior to the breeding season, while grazing native grass pasture. Bull exposure was for 60 days.

Results and Discussion

Experiment 1

Blood samples revealed 20.5% of cows were cycling 30 days prior to the beginning of the breeding season. Cycling percentages for each treatment group were: 33% (8 days), 20% (4 days), 18% (2 days), and 11% (0 days).

Treatment with MGA influenced (P<.05) days to the first postpartum luteal activity (progesterone>1 ng/ml) (Table 1). The 0- and 2-day treatments produced earlier (P<0.05) postpartum rises in serum progesterone than either 4- or 8-day treatments. A trend was also noted in days from MGA withdrawal to progesterone rise. The 2-day treatment increased blood progesterone 3.6 days following withdrawal. The 4- and 8-day treatments delayed first luteal activity to 11.7 and 13.5 days, respectively. Treatment had no effect on days to conception following calving.

The incidence of short cycles tended to decrease (P=0.28) with increased days of MGA treatment. Ninety-one percent of the controls exhibited short cycles, versus none for 8-day MGA-treated cows.

A decrease in calving interval was noted with MGA treatment. The 2-day cows averaged 355 ± 7 days between calves, whereas controls averaged 377 ± 8 days (P<0.10). The other treatments (4 day and 8 day) were intermediate; 366 ± 8 days and 371 ± 8 days, respectively.

An overall pregnancy rate of 92% was achieved for all cows. The percentages of cows artificially inseminated were greater in MGA-treated cows than controls. More (P<0.05) 2-day MGA-treated cows (86%) were inseminated during the AI period than controls (33%).

Experiment 2

Pregnancy rates were similar for control (95%) and MGA-treated (97%) cows (Table 2). Fetal ages (by palpation) were similar between treatments.

Experiment 3

An overall pregnancy rate of 88% was achieved for all cows. Pregnancy rates were greater (P<0.05) for MGA-treated cows (100%) than for controls (76%). Neither days pregnant (fetal age) nor calendar date of conception was influenced by MGA treatment.

It is clear that progestin is necessary for the induction of normal estrous cycles in postpartum beef cows. Whether the progestin is from an endogenous source or exogenous treatment (MGA), progestin is necessary to prepare the female reproductive tract for the subsequent pregnancy. It is thought that progesterone acts as a "primer" to enable gonadotropins to regulate reproductive function. The decrease in short, non-fertile cycles achieved by feeding MGA is of interest, because decreasing short cycles tightens the calving season. Progestin may also elicit more distinct estrus response from hormonal challenge, and possibly improve conception rates to AI at the beginning of the breeding season.

Table 1. Effects of Temporal Feeding MGA to Postpartum Cows (Experiment 1)

	Days MGA Fed			
Item	0	2	4	8
Calving to 1st luteal activity, days	38.8[a]	34.8[a]	45.0[b]	48.5[b]
1st Luteal activity following the end of MGA feeding, days	--	3.6	11.7	13.5
Cows exhibiting a short cycle, %	91	53	32	0
AI pregnancy rates, %	33	86	57	63
Subsequent calving interval, days	377	355	366	371

[a,b]Means with uncommon superscript letters differ ($P<0.05$).

Table 2. Effects of Feeding MGA Prior to the Breeding Season

	Days MGA Fed	
	0	4
Experiment 2, Fall-calving Cows		
Pregnancy rate, %	95	97
Fetal age, days	85	82
Days postpartum conceived	84	88
Experiment 3, Spring-calving Cows		
Pregnancy rate, %	76	100
Fetal age, day	68	70