

The Use of an Oral Progestogen, Melengestrol Acetate (MGA), in Controlling the Estrous Cycle of Beef Heifers

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Story in Brief

Melengestrol acetate (MGA) is a potent oral progestogen, that is highly effective in suppressing estrus in heifers during the time it is included as part of the ration. This is a report of a study of the effectiveness of MGA in synchronizing estrus. Twenty six Angus and 27 Angus X Hereford crossbred heifers were wintered at a moderate level (0.5 lb. per day gain) on native grass pastures at Ft. Reno. They were divided into two comparable groups: one group (26 heifers) served as untreated controls; the other group (27 heifers) were individually fed 0.5 mg. MGA per head per day for 18 days, April 16, 1966 to May 3, 1966.

Estrus was effectively suppressed during the 18 days of MGA feeding, only 1 MGA fed heifer was observed in estrus compared to 7 control heifers during the same period. Estrus was synchronized: 81.5 percent of the treated heifers were in estrus within 7 days, and 74.1 percent were in estrus within 5 days after the last feeding of MGA. In the same 5 day period, 34.6 percent of the controls were in heat. Conception rate at the first post-MGA estrus was only fair, 59.1 percent, but no other undesirable effects were noted on fertility: only 1 MGA treated, as well as 1 control, heifer were open at the end of a 90 day breeding season; 80 percent of the MGA treated and 53 percent of the control heifers calved in the first 30 days of the 1967 calving season; and the average date of calving of the MGA group was 8 days earlier than the controls. No detrimental side effects of any sort were noted.

The results obtained in this study indicate that MGA is a safe and effective means of synchronizing estrus in non-lactating beef heifers.

Introduction

Precise control of the estrous cycle of beef heifers would offer many possibilities for improvement of efficiency in cattle production. A very important possibility associated with estrus control in beef cow herds would be facilitating the use of artificial insemination. One of the big factors limiting the use of AI in beef herds, particularly commercial

herds, is the labor involved in heat detection. If the estrus cycle is synchronized a high percentage of a group of heifers come into heat within two or three predictable days and heat detection becomes less of a problem.

Practical techniques for estrus synchronization became possible following the development of the oral progestogens—compounds with the same physiological activity as naturally occurring progesterone but, unlike progesterone, effective when fed. Today several pharmaceutical houses either now have, or soon will have, on the market, oral progestogens for use in synchronizing estrus in beef cows.

The 1967 Feeders' Day report (Okla. Agr. Exp. Sta. Misc. Publ. MP-79, page 37) summarized estrus synchronization studies conducted over a three year period at the Ft. Reno Research Station. These studies utilized an oral progestogen, medroxyprogesterone acetate (MAP)¹, fed for 18 days at a level of 180 mg. per head per day. The response obtained in post-partum lactating cows was variable and unpredictable. However, excellent synchronization was obtained in non-lactating cycling heifers, with estrus occurring within 6 days after the last feeding of MAP in 90 percent of the heifers.

There are a number of other compounds that are similar to MAP in their effect but are much more potent, and their characteristic effect can be obtained with a much lower dose than 180 mg. per day. One of these compounds is melengestrol acetate (MGA)², which is reported to be 300 to 900 times more potent than MAP in estrus suppression. It is effective when fed and has also been extensively studied as a feed additive which will suppress estrus in feedlot heifers as well as stimulate rate of gain and feed utilization.

The purpose of this study was to determine the effectiveness of melengestrol acetate in synchronizing estrus in non-lactating cycling heifers.

Materials and Methods

The data used in this report were obtained from 26 Angus and 27 Angus X Hereford crossbred yearling heifers. The heifers were maintained at the Ft. Reno Research Station during the 1965-66 wintering season at a moderate level of feeding on native grass pasture. They were

¹ Repromix is the trademark for a premix containing medroxyprogesterone acetate, the Upjohn Company, Kalamazoo, Michigan.

² MGA is the trademark for melengestrol acetate, The Upjohn Company, Kalamazoo, Michigan.

fed 1½ lb. cottonseed meal per head per day starting November 15, plus ground milo as needed to obtain approximately 0.5 lb. per day gain.

The heifers were divided into two groups as equally as possible on the basis of age, weight, breeding and whether or not they had attained puberty. One group served as an untreated control and the other group was fed 0.5 mg. MGA per head per day for 18 days with the first feeding on April 16 and the last feeding on May 3. The MGA was thoroughly mixed with cottonseed meal so that 1½ lb. of cottonseed meal contained the daily dose of 0.5 mg. MGA, and the heifers were individually fed to insure that each heifer received the allotted dosage. The control heifers were group fed the same amount of cottonseed meal but minus the MGA. Vasectomized bulls ran with the heifers at all times to detect the occurrence of estrus.

Following the last feeding of MGA on May 3, the heifers were held in drylot for 10 days to facilitate heat detection and hand mating. When detected in heat the heifers were removed from the drylot and hand mated to fertile Angus bulls. All heifers were hand mated at the first estrus only if it occurred during the 10 day detection period, after which all heifers ran in pastures with fertile Angus bulls until August 1. Pastures were checked twice daily in an effort to record all mating. The heifers were checked for pregnancy on October 11. The crossbred heifers remained at the Ft. Reno Station to calve in 1967. Five of the Angus heifers, although pregnant, were culled and the remainder were moved to the Lake Carl Blackwell range area near Stillwater to calve in the Spring of 1967.

Results and Discussion

The response of the Angus and crossbred heifers to MGA is presented in Table 1. Average daily gains during the wintering period (November 15, 1965 to April 15, 1966) were: Angus heifers, 0.41 lb. per day; and crossbred heifers, 0.51 lb. per day.

While not one of the items under study, it is apparent that MGA was effective in suppressing estrus during the period of feeding. Only 1 MGA treated heifer was observed in estrus during feeding, compared to 7 control heifers during the same period of time.

Estrus was synchronized in the heifers used in this trial. Twenty two of 27 MGA fed heifers (81.5 percent) were observed in estrus within 7 days after the last feeding of MGA, with 20 (74.1 percent) in estrus within a 5 day period from day-1 to day-5 post-MGA. In comparison,

Table 1. Reproductive Performance of Angus and Angus X Hereford Crossbred Yearling Heifers Fed 0.5 mg. MGA per Head per Day for 18 Days (April 16-May 3, 1966), and Bred by Natural Service at the First Post-Treatment Estrus.

Item	Treatment Group	
	MGA	Control
Number of heifers.	27	26
Avg. age on 4-16-66 (days).	419	407
Avg. weight on 4-16-66 (lb.)	510	512
Number observed in estrus:		
Prior to start of MGA feeding.	9	8
During period of MGA feeding.	1	7
Number in estrus, days 1-7 post-MGA:		
Number on day-1.	4	5
Number on day-2.	6	0
Number on day-3.	5	2
Number on day-4.	3	2
Number on day-5.	1	0
Number on day-6.	1	0
Number on day-7.	1	0
Number settling at first post-MGA estrus.	13	-
Number open after 3 months breeding season.	1	1
Number retained to calve in 1967.	26	20
1967 calving data:		
Total number of heifers calving.	25	19
Number calving in first 30 days.	20	10
Avg. calving date.	2-25	3-5

during the same 5 and 7 day periods there were 9 control heifers (34.6 percent) in estrus.

The conception rate at the first post-MGA estrus was only fair, 13 of 22 (59.1 percent) conceived to service at this estrus. Unfortunately, complete conception data was not obtained on the controls in this study for a comparison. However, one would expect to obtain a conception rate of at least 65 percent with natural service. The conception rate obtained is not greatly depressed below this level, and is better than has been obtained with Hereford heifers fed MAP at Ft. Reno in previous years.

Other than the possibility that the conception rate was slightly depressed, there was no other detrimental effect on fertility associated with MGA feeding. Only 1 MGA treated, as well as 1 control, heifer failed to conceive during the 90 day breeding season. Eighty percent of the MGA treated heifers, compared to 53 percent of the control heifers, calved in the first 30 days of the calving season. However, the remainder of the controls were not far behind since there was only 1 week difference, in favor of the MGA treated group, in average date of calving in 1967.

Only 33 percent of the heifers had reached puberty by the time MGA feeding was started. However, 81.5 percent responded with a synchronized estrus. This suggests that if heifers are at an age and weight at which puberty should occur, its onset can be stimulated by the oral progestogen, MGA. Similar observations have been made in Hereford heifers fed medroxyprogesterone acetate (MAP).

No undesirable side effects of any sort were noted to be associated with the feeding of MGA. Therefore, the results obtained in this study indicates that melengestrol acetate is a safe and effective means of synchronizing estrus.

The Association Between Beef Carcass Conformation and Carcass Composition

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Story in Brief

Muscle development in slaughter cattle has become increasingly more important during recent years as the result of increased emphasis on high ratios of lean to fat and of lean to bone in retail cuts of beef by the consumer. These studies suggest that superior carcass conformation, as generally interpreted, is not closely related to percentage yields of the thick, high value muscle in the carcass. With one exception, lower conformation carcasses were found to be comparable to the higher conformation carcasses in the percentage yield of high value muscle.

The most striking differences between the carcass conformation grades were found to be in fat and bone percentages. Standard and Low Good conformation carcasses were observed to have more bone and less fat than Choice conformation carcasses. Since differences in muscle content (on a carcass basis) were quite small, the sum of percentage fat and percentage bone was observed to make up a rather constant percentage of the carcass weight among conformation groups.