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L. B. Butler

South Dakota State University

H. L. Miller

South Dakota State University

M. B. Long

South Dakota State University

D. D. Zalesky

South Dakota State University

D.M. Marshall

South Dakota State University

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Effects of MGA on Prepubertal Crossbred Beef Heifers

L.B. Butler,¹ H.L. Miller,² M.B. Long,³ D.D. Zalesky,⁴
and D.M. Marshall⁵
Department of Animal and Range Sciences

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Summary

A study was conducted using 55 prepubertal replacement crossbred beef heifers to determine the effect of feeding MGA to prepubertal heifers on age at puberty. No difference ($P = .65$) was detected between MGA treated heifers versus control heifers for age at puberty. There was no difference ($P = .80$) in age at conception to AI for the two groups.

Key Words: MGA, Beef Heifers, Puberty, Fertility

Introduction

It is beneficial for producers to breed heifers early in the breeding season. If bred early in the breeding season, they are allowed a longer postpartum interval. This is needed so heifers can be bred with the cow herd after they calve. Breeding heifers early increases the economic value of the heifer, because she has the opportunity to wean a heavier calf. Many heifers cannot be bred early because they have not obtained sexual maturity prior to the breeding season. Progesterone like compounds can be used to induce puberty in heifers. Melengesterol acetate (MGA) is a progestin which is used in cycling feedlot heifers to suppress estrus. Once MGA feeding is stopped, these animals will exhibit estrus. It has also been shown that MGA can be used to induce puberty in beef heifers.

The purpose of this study was to determine the effects of MGA on induction of puberty in prepubertal crossbred beef heifers.

Materials and Methods

This study utilized 55 crossbred beef heifers (Angus, Hereford, Simmental, and Tarentaise) housed in dry lot at the Beef Breeding Unit at SDSU. Heifers were allotted to a control group ($n=28$) and a treatment group ($n=27$). All heifers received a cracked corn-alfalfa pellet concentrate. They had access to grass hay free choice. During the treatment period, the treatment heifers received .4 mg MGA per head per day for 14 days. The treatment period was started late January 1995 approximately 102 days before the breeding season. The average age and weights of the control and MGA heifers are shown in Table 1.

Table 1. Age and weight at start of treatment

Treatment	Age (days)	Weight (lb)
Control	302	622
Treatment	302	634

Cyclicity was determined by the collection of weekly blood samples. Samples were collected by jugular venipuncture. Upon centrifugation, blood sera was assayed for progesterone by a one step radioimmunoassay method. Samples containing 1 ng/ml or greater

¹Graduate Assistant.

²Associate Professor.

³Former Chemist.

⁴Assistant Professor.

⁵Professor.

of progesterone were used to indicate the presence of a functional corpus luteum.

The breeding season was initiated in early May. The artificial insemination (AI) period lasted for 10 days. On day 7, the heifers received an injection of Lutalyse to synchronize estrus. Heifers were placed in a grass pasture with a clean-up bull for 53 days. Blood samples were collected for four weeks post-AI to determine if heifers conceived to AI. Indications of conception were three or more consecutive elevated progesterone levels. Pregnancies will be determined in August, approximately 35 days after the clean-up bull is removed using B-mode real time ultrasound.

Age and weights were analyzed using GLM procedure of SAS. Pregnancy data will be analyzed by Chi-square.

Results and Discussion

At the start of the study, the heifers were of similar age and weight (Table 1). None of the heifers showed signs of estrus. Based on progesterone levels in the blood, at the start of the breeding season 19 heifers had not displayed elevated levels of progesterone indicative of cyclic activity. At the end of blood collection period only 2 heifers had not displayed elevated progesterone levels and were not used in the analysis of days of age to first estrous.

No difference was detected between treatment groups for condition score ($P=.88$). The condition score of the treatment and control groups were 3.4. Condition scores are lower than what is preferred at the start of the breeding season. This may be due to the unusually wet weather experienced in the spring of 1995. The lot the heifers were housed in

was extremely muddy. This could explain the low gains present from the start of the study to the beginning of the breeding season.

Weight at the start of the breeding season was not significantly different ($P=.57$). The mean weight for the control group was 709 lb and for the treatment group it was 721 lb. It would appear that the heifers were near 65% of the mature body weight at the beginning of breeding season.

Conception age to AI was not different ($P=.80$) between the control and treatment group (Table 2). The mean age at conception was 419 days for the control group and 418 days for the treatment group. Progesterone levels indicate 17 of 29 heifers inseminated had 3 or more consecutive elevated progesterone levels. Of the 17, 10 were treatment heifers and 7 were control heifers. The response to the Lutalyse appeared low (29 of 55). This may have been due to lower body condition scores and poor lot conditions.

Table 2. Condition score, weight at breeding, and age at AI

Treatment	Condition score	Weight (lb)	Age (days)
Control	3.4	709	419
Treatment	3.4	721	418

Under the conditions of this study the results are inconclusive as to whether MGA induced puberty in heifers. Further research is needed to give a better indication of whether MGA will be an effective tool to induce puberty in beef heifers.