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## Effect of magnesium-mica during grazing and/or feedlot phases on performance of steers

### Abstract

Seventy-two mixed breed steers (679 lb avg BW) grazing smooth bromegrass pastures for 112 days were fed 2.2 lb/day of either a control supplement (PC) or one containing .075 lb/day of magnesium-mica (PMM). Following the grazing period, steers were placed in a feedlot with pasture groups split such that two of the groups fed each pasture supplement were fed a control supplement (FC) and two groups were fed a supplement containing 10% magnesium-mica (FMM). Steers fed PMM tended to gain faster than those fed PC during the pasture phase (2.41 vs. 2.32 lb/day). Steers fed PMM had higher dressing percentage ( $P<.05$ ) and net carcass values ( $P<.06$ ). Percent grading Choice was 41.7 for PMM vs. 27.8 for PC, and that difference also was reflected in marbling scores. No differential effect of feedlot supplement was detected for carcass measurements. Magnesium-mica fed during a pasture phase may affect subsequent marbling scores.

### Keywords

Cattlemen's Day, 1996; Kansas Agricultural Experiment Station contribution; no. 96-334-S; Report of progress (Kansas State University. Agricultural Experiment Station and Cooperative Extension Service); 756; Beef; Magnesium-mica; Smooth bromegrass; Feedlot; Marbling score

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**EFFECT OF MAGNESIUM-MICA DURING  
GRAZING AND/OR FEEDLOT PHASES  
ON PERFORMANCE OF STEERS <sup>1</sup>**

*K. P. Coffey<sup>2</sup>, F. K. Brazle<sup>3</sup>, and L. W. Lomas<sup>2</sup>*

**Summary**

Seventy-two mixed breed steers (679 lb avg BW) grazing smooth bromegrass pastures for 112 days were fed 2.2 lb/day of either a control supplement (PC) or one containing .075 lb/day of magnesium-mica (PMM). Following the grazing period, steers were placed in a feedlot with pasture groups split such that two of the groups fed each pasture supplement were fed a control supplement (FC) and two groups were fed a supplement containing 10% magnesium-mica (FMM). Steers fed PMM tended to gain faster than those fed PC during the pasture phase (2.41 vs. 2.32 lb/day). Steers fed PMM had higher dressing percentage ( $P < .05$ ) and net carcass values ( $P < .06$ ). Percent grading Choice was 41.7 for PMM vs. 27.8 for PC, and that difference also was reflected in marbling scores. No differential effect of feedlot supplement was detected for carcass measurements. Magnesium-mica fed during a pasture phase may affect subsequent marbling scores.

(Key Words: Magnesium-Mica, Smooth Bromegrass, Feedlot, Marbling Score.)

**Introduction**

Previous work at KSU-SEARC has shown a tendency for increased digestibility and increased rumen fermentation products from cattle fed magnesium-mica (MM). Carcass

marbling scores and the percentage of steers grading Choice were higher from feedlot steers fed MM compared with steers fed our typical feedlot diet in another study. Our objective was to measure grazing and subsequent feedlot performance and carcass characteristics of cattle fed magnesium-mica in the grazing and(or) feedlot phases.

**Experimental Procedures**

Seventy-two mixed-breed steers were weighed on April 6 and 7, allotted into eight groups of nine head each, and assigned randomly to one of eight 10-acre smooth bromegrass pastures. Half of the steers were fed 2.2 lb/day of a grain sorghum-based control supplement (PC), whereas half were fed 2.2 lb/day of a supplement containing MM to provide .075 lb of MM/head daily.

Following a 112-day grazing period, steers were transported to the SEARC feedlot facility at Mound Valley, KS, blocked by previous pasture treatment, and assigned randomly to one of two finishing diets (80% ground grain sorghum, 15% corn silage, and 5% protein supplement on a dry matter basis). One group was fed the control supplement (FC), and the other group was fed a supplement with 10% of the wheat middlings replaced by MM (FMM; Table 1); both contained 50% CP. At the end of a 120-day finishing period, steers were

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slaughtered at a commercial packing plant, and carcass data were collected following a 24-hour chill.

**Table 1. Composition of Feedlot Supplements Fed to Finishing Steers <sup>a</sup>**

Ingredient	Magnesium-	
	Control	Mica
Soybean meal	50.0	53.0
Wheat middlings	13.0	-
Ground limestone	14.0	14.0
Urea	8.9	8.9
TM salt	5.0	5.0
Cane molasses	2.85	2.85
Potassium chloride	4.0	4.0
Vitamin A,D,E premix	2.0	2.0
Rumensin 80 premix	.25	.25
Magnesium-mica	-	10.0

<sup>a</sup>Supplement was fed at 5% of the ration dry matter.

### Results and Discussion

Although steers fed PMM gained faster during the pasture period (2.41 vs. 2.32 lb per day), the difference was not statistically significant. No significant pasture treatment feedlot treatment interactions were detected ( $P > .05$ ) for any of the performance or

carcass measurements. Therefore, feedlot data were pooled across the main effects of pasture treatment and feedlot treatment. Neither pasture nor feedlot treatment affected feedlot gain, efficiency, or cost of gain (Table 3). These data are in agreement with those from a previous SEARC study.

Feedlot supplements had no effect on any of the carcass measurements evaluated in this study. However, steers fed PMM had heavier ( $P = .11$ ) hot carcass weights and higher ( $P < .06$ ) dressing percentages than those fed PC. Fifty percent more steers graded USD A Choice in the groups fed PMM compared with those fed PC. These factors combined to produce a \$19.92 higher ( $P < .06$ ) net carcass value.

Considering these data with previous data, we conclude that MM fed at a level of 9-10 lb/ton of dry matter should have minimal effects on gain and efficiency of feedlot steers, but feeding MM during the grazing or feedlot period may have a significant impact on carcass marbling score and, therefore, value of the cattle.

**Table 2. Performance by Steers Grazing Smooth Bromegrass Pastures and Fed Magnesium-Mica (.075 lb/day) in a Grain Supplement <sup>a</sup>**

Item	Magnesium-	
	Control	Mica
Initial wt, lb	677.5	680.0
Gain, lb	260.4	270.4
Gain, lb/day	2.32	2.41

<sup>a</sup>No significant differences ( $P < .10$ ) were detected.

**Table 3. Performance and Carcass Characteristics of Finishing Steers Fed Magnesium-Mica<sup>a</sup> in a Pasture or Feedlot Supplement**

Item	Pasture Treatment <sup>b</sup>		Feedlot Treatment	
	PC	PMM	FC	FMM
Initial wt, lb	938	950	945	943
Final wt, lb	1335	1336	1334	1336
Gain, lb	396	385	389	392
Daily gain, lb	3.4	3.3	3.3	3.3
Daily DM intake, lb	24.2	24.1	24.2	24.2
Gain/feed, lb/lb	.136	.133	.134	.135
Feed cost, \$/cwt gain	37.13	38.03	37.85	37.30
Hot carcass wt, lb <sup>c</sup>	784	796	791	790
Dressing % <sup>de</sup>	58.8	59.7	59.3	59.1
Fat thickness, in	.28	.32	.29	.31
Longissimus eye area, in <sup>2</sup>	14.1	13.9	14.0	13.9
Marbling score <sup>f</sup>	418	441	439	420
% USDA Choice	27.8	41.7	33.3	36.1
USDA yield grade	1.9	1.9	1.8	1.9
Net carcass value, \$ <sup>eg</sup>	852.28	872.20	861.73	862.75

<sup>a</sup>Magnesium-mica levels were .075 lb/day in the pasture supplement and 10 lb/ton DM in the feedlot ration.

<sup>b</sup>PC and PMM = control and magnesium-mica supplements during the pasture phase; FC and FMM = control and magnesium-mica supplements during the feedlot phase.

<sup>c</sup>Differences between pasture supplements were detected (P=.11).

<sup>d</sup>Calculated using actual unshrunk live weight.

<sup>e</sup>Differences between pasture supplements were detected (P<.06).

<sup>f</sup>400 = Select<sup>0</sup>; 500 = Select<sup>+</sup>.

<sup>g</sup>Net carcass value is based on a base price of \$113/cwt hot carcass weight with discounts of \$6/cwt for Select grade and \$16/cwt for yield grade 4 or carcasses heavier than 950 lb.