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Effect of Magnesium Mica on Live Weight Gain and Carcass Characteristics

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Story in Brief

Large frame, mixed breed steers (n=467) of similar initial weight (793 lb), frame size and muscle thickness were allotted to one of 24 pens for serial harvest (six pens per date) after 117, 131, 145, or 159 d on feed. Twenty-four pens were assigned randomly to treatment for feeding of 1 lb of a supplement comprised of ground milo with either 0, 4 or 8 oz of magnesium mica added. At 28-d intervals and 7 d prior to harvest, live weights were measured. Following a 36-h chill, quality and yield grade data were obtained. No differences in live performance or carcass characteristics were detected, although carcass quality and yield grade increased with days on feed.

(Key Words: Magnesium Mica, Steers, Carcass Characteristics, Serial Harvest.)

Introduction

Studies by Coffey and Brazle (1996) suggested that feeding magnesium mica increased marbling scores and the percent of carcasses grading U.S. Choice. If this observation is correct, the value of these cattle at harvest might be increased due to an increased percentage of U.S. Choice carcasses.

Cattle must be marketed at the correct stage of production to optimize profitability. When marketing on a carcass basis the percentage of cattle grading U.S. Choice is important to the value of a pen of cattle. During 1997, the price paid for Choice carcasses averaged \$7.67/cwt more than those that graded Select. As days fed increases, percentage Choice generally increases. However, if cattle are fed too long and the percent of carcasses that are U.S. yield graded 4 or 5 grows, carcasses will be discounted. During 1997, discounts averaged \$12/cwt and \$17/cwt for yield grade 4 and 5 carcasses, respectively. Therefore, if the percent of carcasses graded U.S. Choice could be increased, without affecting yield grade, profitability would be enhanced. Additional factors that influence the length of the feeding period are feed costs and cattle prices. This study was conducted to evaluate the effect of supplemental magnesium mica on carcass characteristics and feed efficiency. Days fed were varied in order to evaluate the effect of magnesium mica on marbling, because as days fed increases, marbling scores should increase; serial harvest allows one to determine effects on carcass quality more precisely.

Materials and Methods

Large frame, yearling, crossbred steers, primarily crosses of British and Continental cattle, that had grazed together during the summer in the high plains of Texas were obtained. Four hundred sixty-seven steers were trucked to Goodwell, OK on September 11, 1997. Of these steers, 233 were processed and sorted into 12 pens of 20 to 21 head each on September 11; the remaining 234 steers were processed and sorted the following day into an additional 12 pens. At processing, steers were eartagged and weighed and routine feedlot vaccinations (IBR, PI-3, 7-way clostridial vaccines) were administered. Steers were dewormed with Valbazen[®] on d 28 after worm populations in fecal samples were detected. All steers were implanted on d 0 with Ralgro[®] steers were reimplanted with Revalor[®] S[®] 90 d prior to the anticipated harvest date. The diets fed were prepared at Texas County Feeders in Guymon, OK and were trucked twice daily to Panhandle State University for feeding.

Pens were randomly sorted into four harvest dates (6 pens/harvest date) and also into three treatment groups (2 pens/treatment/harvest date) for supplementing with magnesium mica. Magnesium mica, containing 7.83% magnesium, was fed at levels of 0, 4, or 8 oz per head per d. This supplement was fed at 1 lb per head per d; the remainder comprised of ground milo.

This supplement was prepared and delivered by ACCO Feeds of Oklahoma City. The supplement was top-dressed on feed in each bunk.

Cattle weights taken on September 1 were not shrunk because, following transport, cattle should be shrunk. However, weights taken during the trial, on d 28, 56, and 84 were pencil shrunk 4% to account for digestive tract fill. All steers were also weighed 7 d prior to each harvest date. The final live weights were shrunk only 2% to account for fill and to calculate gain between weighing and harvest dates. These weights were used as harvest pay weights. On d 117, 131, 145, and 159, six pens of cattle, two from each treatment, were transported to Dodge City, KS where they were harvested at Excel. Incidence of tongue lesions, liver abscesses and lung lesions was recorded. At 36 h postmortem, carcass characteristics were measured.

Results and Discussion

Live weight average daily gains and feed to gain ratios were not significantly different among treatment groups (Table 1). Carcass weight, quality and yield grade increased as days fed increased (Table 2), but no differences were observed in carcass traits among treatments (Table 3). The effects of days fed on performance and carcass measurements are discussed in a subsequent article and will not be addressed at this time. Carcass weights, dressing percentage and kidney, heart and pelvic fat all increased as days fed increased, but no differences among treatments were detected.

As expected, with increased days fed, yield grade and marbling scores increased in a linear trend, but, again no differences were found among treatments and the percent of carcasses grading Choice also increased but effects of magnesium supplementation were not observed. Similar time trends in the percent of carcasses that graded premium choice were observed.

Marbling scores were not increased, as suggested by Coffey and Brazle (1996), with the supplementation of magnesium mica. The diet consumed in this trial was a corn based diet, while the Kansas State University study was performed using a grain sorghum based diet.

Literature Cited

Coffey, K.P. and F.K. Brazle. 1996. Proc. Kansas State University, Cattlemen's Day. pp 112-114.

Table 1. Effect of magnesium mica on live performance.			
	Level of magnesium mica, oz		
Performance trait	0	4	8
Number of steers	151	153	163
Number of pens	8	8	8
Weight, lb			
Initial	793	791	794
Final	1329	1280	1330
Daily gains, lb			
0-harvest	3.69	3.65	3.69
Feed/Gain	5.79	5.79	5.89

Table 2. Effect of days fed on carcass characteristics.		
	Days fed	Effect

Carcass trait	117	131	145	159	Linear	Quadratic
Hot carcass wt, lb	755	807	841	887	.01	.01
Dressing percent	62.3	63.4	63.6	64.9	.01	.01
KPH, %	1.92	2.16	2.22	2.34	.01	.01
Maturity score	154.2	161.2	165.1	170.1	.01	.01
Marbling score ^a	400	413	441	457	.01	.05
Percent low choice	39.47	46.90	53.41	61.79	.05	-
Percent premium choice	7.67	7.85	18.16	18.34	.01	-
Ribeye area, sq in	12.79	12.90	12.52	13.61	.01	.01
Yield grade	2.78	3.17	3.59	3.70	.01	-
Yield grade 1&2, %	61.55	42.58	22.07	15.02	.01	-
Yield grade >4.5, %	.83	2.63	6.95	17.49	.01	.01
Net return, \$/head						
Live wt basis	-5.74	-1.48	4.23	8.62	-	-
Grid	-23.38	-4.29	2.58	12.86	.01	-
Box beef	-11.58	-4.22	0.33	22.32	.01	.05

^a300-399, slight; 400-499, small.

Table 3. Effect of magnesium mica on carcass characteristics.			
Carcass trait	Level of magnesium mica, oz		
	0	4	8
Hot carcass weight, lb	826	816	824
Dressing percent	63.68	63.53	63.44
Maturity score	162.5	164.8	160.5
KPH, %	2.16	2.14	2.18
Marbling score ^a	424	428	432
Percent low choice	50.52	51.03	49.62
Percent premium choice	12.70	13.08	13.24
Ribeye arm sq in	13.07	12.84	12.96
Yield grade	3.26	3.36	3.31

^a300-399, slight; 400-499, small.