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## Sorghum grain as the only protein source in all-concentrate heifer finishing rations: Two levels of year in an all-concentrate ration

### Abstract

Tests reporting on sorghum grain as the only protein source in a diet for finishing cattle are reported in Kansas Agr. Expt. Station Bulletins 493 and 507 and on page 24 in this bulletin. The three rations fed are show in table 10. The sorghum grain was obtained as needed at a local elevator, mixed with other ration ingredients at the Animal Husbandry elevator and delivered, usually in 2000 lb. loads to the self feeders when needed.

### Keywords

Cattlemen's Day, 1968; Report of progress (Kansas State University. Agricultural Experiment Station); 518; Beef; Sorghum grain; Protein; All-concentrate ration; Urea

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Sorghum Grain As the Only Protein Source  
In All-Concentrate Heifer Finishing Rations:  
Two Levels of Urea In An All-Concentrate  
Ration, (Project 253-6) 1968

E. F. Smith, D. Richardson, C. L. Drake and B. E. Brent.

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The three rations fed are shown in table 10. The sorghum grain was obtained as needed at a local elevator, mixed with other ration ingredients at the Animal Husbandry elevator and delivered, usually in 2000 lb. loads to the self feeders when needed.

The heifers were purchased by an order buyer through sale barns and were mostly Angus and Angus-Hereford crossbreds. They were started on feed with a mixture of 60% dehydrated alfalfa crumbles and 40% ground sorghum grain fed in a self-feeder with prairie hay free choice. During two weeks the alfalfa crumbles were gradually reduced. A premix was included when alfalfa crumbles were less than 25 percent of the ration. After the heifers were on all concentrate, the prairie hay was gradually removed from the ration during one week. At the end of three weeks the heifers were on all concentrate ration. Then the following three rations were compared:

1. All sorghum grain without added protein, 2. Sorghum grain plus one percent urea, and 3. Sorghum grain plus 2 percent urea.

### Results

The diet containing 2% urea reduced rate of gain and increased costs. It seemed to reduce feed intake in one of the two lots, table 11. Least feed per pound of gain was from the ration containing 1% urea. The heifers fed sorghum grain as the only protein source required about a half pound more feed to produce a pound of gain than those fed 1% urea.

No differences in carcasses could be explained by ration treatments. The reason for the low dressing percentage (58) for lot 1 is unknown. Carcass grades averaged low choice to choice for the different lots.

This test substantiates previous tests that excellent results may be obtained with all concentrate rations where the source of protein is sorghum grain with 1 percent urea added. Nearly as good results may be obtained by omitting the urea.

Table 10

## Composition of Rations, 1968

	Sorghum grain	Sorghum grain and 1% urea	Sorghum grain and 2% urea
<u>Ingredients per ton</u>			
Ground sorghum grain	1945	1925	1905
Premix	50	50	50
Salt	5	5	5
Urea (45% nitrogen)	0	20	40
Total, lb.:	2000	2000	2000
<u>Ingredients in 50 lbs. of premix</u>			
Ground limestone	20		
Trace mineral premix <sup>1</sup>	1.0		
Stilbestrol premix (2 grams stilbestrol per lb.)	0.5		
Vitamin A premix (10,000 IU per gram)	0.3 (140 gms.)		
Chlortetracycline premix (10 grams per lb.)	0.8 (380 gms.)		
Ground sorghum grain (enough to make the premix up to 50 lbs.)	27.4		
Total, lb.:	50.0		

<sup>1</sup> Percentages of indicated elements in trace mineral premix: Manganese, 4.4; iron, 6.6; copper, 1.32; cobalt, 0.23; iodine, 0.30; zinc, 5; Magnesium, 20; sulfur, 2.70.

Table 11

Sorghum Grain With No Added Protein In a Cattle Finishing Ration; Two Levels of Urea In An All Concentrate Ration, October 23, 1967, to January 25, 1968 - 94 days

	Sorghum grain		Sorghum grain and 1% urea		Sorghum grain and 2% urea	
	1	2	3	4	5	6
Lot number	1	2	3	4	5	6
No. of heifers per lot	11	11	11	11	11	11
Av. initial wt. lbs.	632	628	628	625	629	620
Av. daily gain lbs.	2.60	2.61	2.62	2.66	2.36	2.08
Av. daily feed intake, lbs.	21.0	20.4	19.6	19.6	19.6	17.6
Feed required per lb. of gain, lbs.	8.1	8.0	7.5	7.4	8.3	8.5
Feed cost per cwt. of gain, <sup>1</sup> \$	14.84	14.33	14.11	13.79	15.86	16.22
Carcass data:						
Av. Carcass wt.	508	518	524	519	507	503
Dressing Percent	58.0	59.3	59.9	59.3	59.5	59.7
Carcass grade <sup>2</sup>	19.5	19.6	19.6	19.6	20.0	19.5
Rib eye area, sq. in.	10.3	10.4	10.3	10.2	10.7	9.73
Fat thickness inches	.43	.45	.47	.49	.53	.48
Yield grade <sup>3</sup>	2.8	3.1	3.0	2.7	3.0	3.1
Percent protein in concentrate mixture (88% dry matter basis).	9.74	9.95	12.60	12.54	14.82	14.99
Cost of concentrate mixture/ton <sup>1</sup>	\$36.79	\$36.79	\$37.53	\$37.53	\$38.27	\$38.27

<sup>1</sup> Feed prices are on inside back cover.

<sup>2</sup> Carcass grade score: Low choice, 19; Average choice, 20.

<sup>3</sup> Yield grade: Ranges from 1 to 5, 1 is most desirable.