

High Protein-Sorghum Grain as the Only Protein Source in an  
all Concentrate Steer Finishing Ration (Project 253-6) 1965

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The finishing ration for yearling steers should contain a minimum of about 10% protein. Sorghum grain frequently contains 10% protein; this test was to determine if such sorghum grain meets protein requirements.

The sorghum grain was obtained locally and had been tested for protein content at delivery during harvest. Sorghum grain testing 10.0% protein or higher was stored in one bin and that below 10% in another bin. The division was by protein testing the first load of grain delivered by a seller. Subsequent loads were similarly divided. A Udy analyzer (Udy Analyzer Co., Boulder, Colo.) was used to determine protein content of the grain. Only sorghum grain of higher protein content was used.

Three treatments were compared with two lots of steers per treatment and 10 steers per lot. The three treatments were:

Sorghum grain as the only protein source.

Sorghum grain with 1% urea added.

Sorghum grain with 0.75% urea and  
5% dehydrated alfalfa added.

Exception for the above variables all rations were as nutritionally adequate and as equal as possible.

A premix and other ration ingredients were mixed with the dry rolled sorghum grain and the complete ration fed in a self-feeder.

The premix supplied per pound of feed consumed: 3.5 mg. of chlorotetracycline (Aureomycin), 0.5 mg. of diethylstilbestrol and 750 I.U. of vitamin A. A trace mineral mixture supplied the following in mg. per pound of feed: manganese, 23; iron, 23; copper, 2.3; zinc, 11.4; iodine, 0.68; cobalt, 0.23. Ground limestone was added to all rations to meet the required calcium level.

No hay or other roughage was fed after the test started.

Prior to the test the steers were started on a self-feeder with a mixture of 45% bran, 5% dehydrated alfalfa and 50% dry rolled sorghum grain with prairie hay fed free-choice. The bran and prairie hay were gradually eliminated. The test being reported was initiated when the steers were receiving nearly an all sorghum grain diet.

The results are reported in table 1. Ration intake varied widely between lots within each treatment but differences between treatments were small.

Daily gain ranged from 2.81 to 3.15 pounds per steer and feed per pound of gain from 6.4 to 8.2 pounds with no apparent difference due to treatments. Variation between lots receiving the same treatment was more than between treatments.

The carcasses graded choice or high good and averaged low choice. No differences were noted in carcasses between treatments; however a complete record was not available because 13 of the 59 carcasses were shipped by the packer who bought the steers before all carcass data were collected.

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Table 1

High protein sorghum grain in an all-concentrate steer finishing ration as the only protein source July 2 - October 23, 1965 - 112 days

Protein source	Sorghum grain only	Sorghum grain & Urea	Sorghum grain, urea and dehydrated alfalfa				
Composition of self-fed concentrate mixture, percent:							
<i>Cattle</i> <i>impaired</i> <i>grains</i> <i>perform</i> <i>sharply</i> <i>as well</i> <i>as others</i>	<i>1980#</i>	<i>1960#</i>					
Dry rolled sorghum grain	99.00	98.00	93.50				
Urea	---	1.00	0.75				
Dehydrated alfalfa (17% protein)	---	---	5.00				
Ground limestone	0.75	0.75	0.50				
Premix <sup>1</sup> (supplied trace minerals, antibiotics, diethylstilbestrol, and vitamin A, for more details see footnote 1 under table)	0.25	0.25	0.25				
<i>look at</i> <i>ration</i>	Cost of concentrate mixture per ton <sup>2</sup>	\$41.10	\$42.04	\$42.37			
Percent protein in concentrate mixture (moisture free basis)	<u>12.88</u>	14.20	13.85				
<i>quite a</i> <i>departure</i> <i>from</i> <i>conventional</i> <i>rations</i>	Lot number	18	19	20	21	22	23
No of steers per lot	10	10	10	9 <sup>3</sup>	10	10	
Av initial weight, lb.	733	731	748	742	722	746	
Av daily gain, lb.	3.00	2.81	3.09	2.98	2.90	3.15	
Av daily feed intake, lb.	20.9	22.9	23.3	19.0	20.4	22.6	
Feed per lb. of gain	7.0	8.2	7.5	6.4	7.0	7.2	
Cost per cwt. of gain	\$14.30	\$16.75	\$15.85	\$13.41	\$14.89	\$15.25	

1. The premix supplied per pound of feed consumed: 3.5 mg. of chlorotetracycline (aureomycin), 0.5 mg. of diethylstilbestrol and 750 I.U. of vitamin A. One pound of a trace mineral premix (Calcium Carbonate Co., Z5) was added per ton of complete feed which supplied in mg. per pound of feed approximately: manganese, 23; iron, 23; copper, 2.3; zinc, 11.4; iodine, .68; and cobalt, 0.23.

2. Feed prices are on inside back cover.

3. One steer died September 7, 1965.