

The Value of Adding Graded Levels of Gelatinized Sorghum Grain to a Fattening Ration (Project 623)

C. L. Drake, B. E. Brent, C. W. Deyce¹ and H. B. Post¹

Reports from several experiment stations have aroused much interest in the value of "steam processing" or "flaking" grain for beef cattle. During the process, some gelatinization or cooking of the grain occurs. This trial studied the addition of various amounts of completely gelatinized sorghum grain to fattening steer rations.

Experimental Procedure

The sorghum grain was ground in a hammer mill through a $\frac{1}{16}$ inch screen, then processed through an X-50 extruder cooker. The ground grain was steam heated to 300°F and approximately two tons per hour were processed through the cooker. The extruded grain, containing 18 to 20 percent moisture, was dried and placed in metal storage bins until used. Since the extruded grain left the processing machinery in rather large, hard lumps, it was run through a roller mill and crumbled before being incorporated into the ration. Protein supplement was mixed with the concentrate portion of the ration, which was fed twice daily. Hay was offered daily. Ration composition is shown in table 7.

Fifty-seven Hereford steers were randomly allotted to 12 individual pens and four group pens. Before the trial each steer was implanted with 24 milligrams of diethylstilbestrol. Three steers fed individually and one group-fed lot received one of the experimental rations. Weight gain, feed efficiency and carcass information were collected on the feedlot cattle. Four fistulated steers were used to determine digestibility, rumen volatile fatty acid concentration, ammonia and pH. Rumen fluid was obtained twice a week, 10 minutes before feeding and 1, 2, 3, 4 and 6 hours post-prandial. These data are currently being analyzed. Information concerning feed intake and steer performance is shown in table 8, chemical composition of concentrate and supplement mixtures are presented in table 9.

Results and Discussion

Feed intake was good throughout the trial in spite of the bulkiness of the gelatinized grain. Little variation was noted in feed consumption among lots. Differences in performance between individually and group fed steers receiving the same ration were not consistent. Carcasses of steers receiving high levels (50 and 75%) of gelatinized grain graded slightly higher than controls.

1. Department of Grain Science and Industry
2. The cooperation and help of the Wenger Mix Manufacturing Company, Sabetha, Kansas, in processing the grain is appreciated.

Table 7
Ration Composition

Treatment	1	2	3	4
<u>Ration composition, lbs.</u>	<u>% Concentrate as gelatinized sorghum grain</u>			
	0	25	50	75
Rolled sorghum grain	1400	1050	700	350
Gelatinized sorghum grain		350	700	1050
Supplement ¹	200	200	200	200
Prairie hay	400	400	400	400

¹Five lbs. urea (45% N) 1 lb. trace mineral premix (% element in premix: manganese 4.4, iron 6.6, copper 1.3, cobalt .2, iodine .3, zinc 12, magnesium 20, sulfur 2.7) 10 lb. dry molasses, 10 lb. dicalcium phosphate, 0.44 lb. vitamin A (10,000 IU per gm), 163.56 lb. dehydrated alfalfa meal (17% protein).

Table 8
Weight Gains, Feed Efficiency and Carcass Data of Steers Fed Graded Levels of Gelatinized Sorghum Grain 125 days (June 22 to October 25, 1966).

Treatment	1		2		3		4	
	% Concentrate as gelatinized sorghum grain							
	0		25		50		75	
Individually or lot fed	Ind	Lot	Ind	Lot	Ind	Lot	Ind	Lot
No. of animals	3	11	3	11	3	11	3	12
Starting wt., lbs.	707	720	687	718	687	720	692	732
Final wt., lbs.	1040	1074	1030	1057	1025	1065	1043	1072
Average daily gain, lbs.	2.66	2.83	2.73	2.71	2.69	2.76	2.82	2.72
17 Feed per lb. gain								
Sorghum grain ¹	7.72	7.14	8.57	7.61	6.68	7.22	6.27	6.90
Prairie hay	1.90	1.73	2.11	1.85	1.65	1.76	1.51	1.67
Total	9.62	8.87	10.68	9.46	8.33	8.98	7.78	8.57
Av. Carcass grade ²	19	18.5	18.7	18.5	17	19.2	18.0	19.3

1. Includes 10% supplement.

2. Av. good = 17; high good = 18; low choice = 19.

Table 9
Chemical Composition of the Concentrate and Supplement Mixture

Treatment	1	2	3	4
	% Concentrate as gelatinized sorghum grain			
	0	25	50	75
Moisture	11.03	10.54	10.38	9.32
Protein	11.71	11.69	12.31	11.50
Ash	2.75	2.59	2.92	2.44
Ether extract	2.68	2.72	2.10	1.73
Crude fiber	3.95	3.98	4.20	4.11
N.F.E.	67.89	69.00	68.10	71.91