

of the two groups. Approximately 86 percent of the carcasses from the 50 percent corn silage group graded choice while only about 64 percent of those from the 80 percent corn silage group graded choice. This would tend to indicate that 50 percent corn silage steers were fatter. The 80 percent silage steers undoubtedly needed a longer feeding period. It is interesting to note that the 50 percent silage steers graded as well as the 20 percent silage group and made slightly cheaper gains. The gains of the 80 percent silage group were very economical, but the cattle obviously were not finished.

The net energy values of feeds compared in this trial will be reported later.

Whole Corn vs. Ground Corn vs. Rolled Corn For Finishing Cattle¹

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Story In Brief

Whole corn, ground corn, and rolled corn were compared in feedlot rations for steers using sorghum silage as the roughage source and a conventional supplement. During a 140-day feeding trial, differences in rate of gain and feed efficiency were small. Steers fed either the ground or rolled corn consumed one pound more air-dry feed daily than those fed whole corn but were no more efficient in their feed utilization.

The feed cost of grain was lowest for the steers receiving the whole corn due primarily to no processing cost charges against whole corn. The lower cost of gain for the whole corn resulted in a cost advantage of \$6.80 and \$3.60 compared to rolled and ground corn, respectively.

Introduction

The cost of grain processing for finishing cattle is always of major concern to the cattle feeder, since a small reduction in feed processing

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cost can significantly increase net returns, particularly for the larger feeder. Some feedlots in the Texas-Oklahoma Panhandle and Southwest Kansas area have utilized whole corn with varying degrees of success. In most cases, the use of whole corn has been in high concentrate rations using a special supplement.

The purpose of this trial was to compare whole corn with ground and rolled corn when used with sorghum silage and a conventional protein-mineral supplement.

Materials and Methods

Eighty-four yearling steers were grouped according to weight into 12 groups of seven steers each. These groups were then divided into four replications of three groups each and the groups within replications allotted randomly to the following ration treatments.

- (1) Ground yellow corn + sorghum silage + supplement.
- (2) Rolled yellow corn + sorghum silage + supplement.
- (3) Whole yellow corn + sorghum silage + supplement.

There were four lots of seven steers per lot on each treatment, a total of 28 steers per treatment.

The initial and final weights of the steers were taken after a 16-hour shrink off feed and water. At the end of the 140 day feeding period, the steers were slaughtered and carcass data collected.

The grain used in the study was purchased from a local grain elevator in ten-ton lots with portions of each lot being ground and rolled for the respective corn preparation treatments. The sorghum silage was purchased from a area farmer. Samples of the grain and silage were collected periodically during the study for the purpose of dry matter determinations, particle size measurements, and density measurements.

The sorghum silage was fed at a level to constitute approximately 20 percent of the daily dry matter intake of the steers. The steers were fed twice daily to appetite.

All steers were implanted with two 15 mg. stilbestrol implants at the beginning of the feeding period.

Results and Discussion

The protein-mineral-vitamin supplement used in this study is shown in Table 1. This supplement was fed at a level of 1.7 pounds per steer per day.

The results shown in Table 3 indicate very little difference in performance of cattle fed corn processed by the three methods. Both rate of gain and feed conversion values were very similar among treatment

Table 1. Ingredient Makeup of Supplement

Ingredient	Percent of Mix
Cottonseed meal (43%)	40.0
Dehydrated alfalfa meal (17%)	35.0
Urea (45% nitrogen)	10.0
Stock salt	5.0
Dicalcium phosphate	2.0
Calcium carbonate	6.0
Premix ¹	1.2
Aurofac 10	0.8
	100.0

¹ Source of Vitamin A, D, and E.

Table 2. Moisture, Particle Size, and Density of Processed Corn

Process	Screen Size				Moisture percent	Weight per bushel
	4.0mm	3.0mm	2.0mm	1.0mm		
	Percent passing through					lb.
Whole corn	0	0	0	0	14.16	55.6
Whole corn	17.24	0	0	0	13.90	46.5
Ground corn	99.06	75.11	52.70	17.24	13.86	44.9

groups and apparently were influenced very little by the methods or processing corn compared in this experiment.

A physical separation of the fecal material from steers fed whole corn showed many whole kernels of corn passed through the digestive tract. This was probably true with ground and rolled corn also as indicated by the feed efficiency values of these groups but the undigested corn in their fecal material was simply less obvious.

It was more difficult to keep the steers receiving whole corn on feed as compared to the other two groups. The steers on whole corn tended to select the roughage at each feeding and as indicated in Table 3 consumed one pound less air-dry feed, mostly corn, than the steers fed ground and rolled corn.

Using the indicated feed prices shown in Table 3 and a charge of \$0.15 per cwt. for grinding and rolling, the steers fed whole corn produced the most economical gains. This amounted to a cost reduction of \$6.80 and \$3.60 compared to rolled and ground corn, respectively, based on a feedlot gain of 400 pounds per steer.

Method of corn preparation had no effect on carcass merit (Table 4). There were no apparent differences in any of the carcass characteristics measured.

Table 3. Feedlot Performance Data (140 Days)

	Ground corn	Rolled corn	Whole corn
No. Steers	28	27	28
Initial wt., lb. ¹	651	649	649
140 day wt., lb. ²	1072	1056	1053
Daily gain, lb.	3.01	2.91	2.88
Daily feed intake, lb. ²			
Grain	17.2	17.2	16.4
Sorghum silage	4.6	4.6	4.4
Protein supplement	1.7	1.7	1.7
Total	23.5	23.5	22.5
Feed ² /lb. gain, lb.	7.80	8.08	7.78
Feed cost/cwt. gain, \$ ³	21.61	22.41	20.71

¹ Based on 14 hour shrink off feed and water.² Values expressed on 90% dry matter basis.³ Feed Prices

Whole corn	\$2.80/cwt.	Protein supplement	\$3.45/cwt.
Ground corn	2.95/cwt.		
Rolled corn	2.95/cwt.	Price of ground and rolled corn includes	
Sorghum silage	7.00/ton	\$.15/cwt. processing charge.	

Table 4. Carcass Data

	Ground corn	Rolled corn	Whole corn
No. Steers	28	27	28
Final live wt., lb.	1072	1056	1053
Hot carcass wt., lb.	697	693	687
Dressing percent ¹	65.0	65.6	65.2
Carcass grade ²	10.0	10.5	10.5
Ribeye area, sq. in. ³	11.7	11.6	11.3
Fat thickness, in. ⁴	.51	.59	.57
Cutability, % ⁵	48.9	48.5	48.4

¹ Calculated on basis of live shrunk weight and hot carcass weight.² U.S.D.A. grading standard: high choice-12, average choice-11, low choice-10, high good-9.³ Surface area of loin eye at 12th rib.⁴ Average of three measurements taken on ribeye tracing at 12th rib.⁵ Percent of boneless trimmed retail cuts on carcass basis = $51.34 - 5.78$ (fat thickness) - $.462$ (% kidney fat) + $.740$ (ribeye area) - $.0099$ (chilled carcass weight).