

# Alfalfa vs Cottonseed Hulls for Starting Cattle on High Concentrate Rations

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## Story in Brief

Rations for starting feedlot steers were diluted with cottonseed hulls or a mixture of cottonseed hulls plus alfalfa meal and fed for the first 24 days of a 119-day feeding period for 140 steers weighing 678 lb at the start of the trial. Compared with steers receiving cottonseed hulls in their starting rations, steers fed alfalfa meal consumed 1.4 percent more feed and gained about 2.5 percent more rapidly for a slight improvement (1.7 percent) in feed efficiency. Results suggest that with these starting rations, a protein content as low as 11 percent for 700-lb feedlot cattle had no marked adverse effect on subsequent feedlot performance. Though dehydrated alfalfa meal produced no significant performance or carcass benefit, economics in this trial justified including a low level of alfalfa meal in the starting ration.

## Introduction

Rations for starting feedlot cattle on feed generally contain moderate amounts of roughage to prevent overeating and acidosis. Intake of many essential nutrients, such as protein and potassium, may be considerably below animal requirements because intake of newly received cattle is often low, and chemical composition of roughages differ markedly. Dehydrated alfalfa meal (62 percent TDN, 19 percent protein) and cottonseed hulls (41 percent TDN, 4.3 percent protein) are two roughages which are used to start cattle on feed. Unidentified growth factors also have been ascribed to alfalfa meal, and it is included in many rations designed for starting cattle on feed. The objective of this trial was to compare performance of feedlot steers fed starting rations with roughage provided 1) by cottonseed hulls alone or 2) by a mixture of alfalfa meal and cottonseed hulls to maintain protein content.

## Material and Methods

Ration composition is presented in Table 1. From 40 to 70 percent of the roughage was provided from dehydrated alfalfa meal in the starting rations to maintain protein content near 13 percent (Table 1) compared with 10.3 to 11.9 percent protein for the cottonseed hull rations. Potassium levels for the two roughages and thereby for the rations were similar, but phosphorus and calcium were lower with the cottonseed hull rations. Steers had access to feed at all times in self-feeders. Steers received approximately 80 lb of each ration consecutively so that all steers were on each ration for 4 to 7 days and reached the top ration by day 24 of the experiment. During this period, each alfalfa-fed steer received a mean of 40 lb of dehydrated alfalfa. Other procedures were as described in "Lasalocid for Feedlot Steers" found elsewhere in this publication.

**Table 1. Ration composition (dry matter basis)<sup>a</sup>**

Ingredient	Ration roughage level (%)				
	40	30	20	12.5	5 <sup>b</sup>
Whole shelled corn	53.87	63.87	73.87	81.37	88.87
Cottonseed hulls	25	15	10	5	5
Alfalfa meal or					
cottonseed hulls	15	15	10	7.5	0
Pelleted supplement <sup>c</sup>	6.13	6.13	6.13	6.13	6.13

<sup>a</sup> Protein content of the starting rations with alfalfa meal present were 12.5, 13.1, 12.9 and 13.0% of dry matter compared with 10.3, 10.9, 11.4 and 11.9% with cottonseed hulls as the only roughage present.

<sup>b</sup> Calculated composition (dry matter basis) is 3.15 mcal ME/kg; 12.08% protein; .65% K; .47% Ca; .37% phosphorus. Analyzed between 89 and 91% dry matter.

<sup>c</sup> Contained, as a percent of the total ration, soybean meal, 3.4; limestone, 1.03; urea, .50; KCl, .40; salt, .30; dehy, .27; dicalcium phosphate, .23. Vitamin A at 30,000 IU/g, .01; and monensin (60 g/lb) at 0, 0.16 or .025 or lasalocid (20%) at .011 or 0.16.

**Table 2. Steer performance and intake**

Item	Alfalfa	Hulls
Steers, number	70	70
Weights, lb		
Initial	677	679
55 days	924	919
119 days		
Live	1103	1095
Carcass	1090	1079
Daily gain, lb		
0-55	3.63	3.52
56-119	3.52	3.46
0-119 live	3.57	3.49
0-119 carcass	3.43	3.33
Daily feed, lb		
0-28	19.3	19.2
0-55	21.0	20.6
56-119	22.2	22.0
0-119	21.6	21.3
Feed/gain		
0-55	5.78	5.87
56-119	6.31	6.34
0-119 live	6.06	6.12
0-119 carcass	6.30	6.41
Metabolizable energy, <sup>a</sup> Mcal/kg	3.00	2.99

<sup>a</sup> Calculated from gain and feed intake.



## Results and Discussion

Performance information is presented in Table 2. No significant differences in performance were detected. Steers receiving alfalfa in their starting ration consumed an average of 1.4 percent more feed, which increased gain by 2 to 3 percent and improved feed efficiency by 1.7 percent. Energy availability of the ration was unchanged. Based on the averages, replacing 40 lb of cottonseed hulls with dehydrated alfalfa meal during the starting period saved 44 lb of feed over the 119-day trial.

Carcass characteristics (Table 3) were not significantly altered by composition of the starting ration though fat thickness, KHP, marbling score and cutability all indicate that carcasses were slightly fatter for steers which received dehydrated alfalfa meal.

**Table 3. Carcass characteristics**

Item	Starting roughage	
	Alfalfa	Hulls
Carcass weight	676	669
Dressing percent	61.3	61.1
Liver abscesses		
Incidence, %	45	36
Severity	1.78	1.84
Rib eye area		
Square inches		
In. <sup>2</sup> /cwt	12.1	12.1
In. <sup>2</sup> /cwt	1.79	1.82
Fat thickness, in.	.41	.37
KHP, %	2.33	2.24
Marbling score	12.9	12.6
Federal grade	12.5	12.5
Percent choice	55	51
Cutability, %	50.5	50.9
Carcass value, \$/cwt	61.34	61.50

**Table 4. Composition of feces**

Day of trial	Component	Starting ration	
		Alfalfa	CSH
20	pH	6.36	6.37
	Dry matter, %	21.8	22.4
	Starch, % of DM	17.7	16.5
	Samples with whole kernels, %	27	17
115	pH	5.63	5.60
	Dry matter, %	23.1	24.5
	Starch, % of DM	17.3	22.5
	Samples with whole kernels, %	23	57

Feces samples were obtained on day 20 when steers were fed receiving diets containing cottonseed hulls (12.5 percent) or a mixture of cottonseed hulls (5 percent) plus alfalfa meal (7.5 percent) as a source of roughage. No marked effect of roughage source at this time or later in the feeding period was apparent (Table 4). The dry matter, starch and whole kernel percentages were higher later in the feeding trial, and pH was lower. Whether this difference is due to a reduced digestibility with age and time on feed or a ration composition difference is under study.

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# Influence of Starting Weight and Breed on Performance of Feedlot Steers

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## Story in Brief

Steers were grouped by initial weight and fed high concentrate rations in two finishing trials. Feed intake was greater for heavier steers but, expressed as a fraction of body weight, declined from 2.5 to 2.2 percent per day as mean steer weight increased from 850 to 1137 lb. Efficiency of feed use has generally been lower for heavier cattle, but energetic efficiency, calculated from net energy equations, is consistently higher for heavier cattle. Fat cover and marbling have generally increased with starting weight and carcass weight. Comparison of breeds in these trials revealed lower rates of gain for Angus steers, especially late in the finishing period; lower dressing percentages for Hereford steers than other types; and high rates of gain and carcass cutability for exotic crossbred steers.

## Introduction

Effect of starting weight on feedlot performance has been studied previously with 500 and 600-lb steers (Gill et al., 1980). Intakes and gains were greater for heavier steers, but heavier steers had less desirable feed efficiencies. These effects need examination with heavier steers.

Feedlot performance and carcass characteristics among common cattle breeds have been reviewed (Owens et al., 1979; Gill et al., 1981). Total feedlot gain for Angus-Hereford crossbred steers has exceeded the mean of Angus and Hereford steers by 6 to 8 percent. Marbling score and percent of carcasses grading choice