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Abstract

Growing rations containing forage sorghum silage (FSS) or equal amounts of FSS and alfalfa haylage were fed to crossbred steer calves for 112 days. Steers consumed more of the FSS + haylage but rate and efficiency of gain were best for steers fed the FSS. We calculated the value of alfalfa haylage at various prices for FSS and soybean meal.

Keywords

Cattlemen's Day, 1981; Report of progress (Kansas State University. Agricultural Experiment Station); 394; Beef; Rations; Sorghum silage; Alfalfa haylage

Growing Rations of Forage Sorghum Silage and Alfalfa Haylage

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Summary

Growing rations containing forage sorghum silage (FSS) or equal amounts of FSS and alfalfa haylage were fed to crossbred steer calves for 112 days. Steers consumed more of the FSS + haylage but rate and efficiency of gain were best for steers fed the FSS. We calculated the value of alfalfa haylage at various prices for FSS and soybean meal.

Introduction

Alfalfa is an important crop to Kansas livestock men and farmers. In 1979, Kansas produced 1.03 million acres of alfalfa yielding 3.50 tons of hay equivalent/acre. Although most alfalfa is harvested as hay, haylage or silage use is increasing.

This trial evaluated alfalfa haylage as a source of both energy and protein in a growing ration for steer calves.

Experimental Procedure

The forage sorghum was Dekalb FS 25a+ grown under dryland conditions and harvested October 21 to 23, 1979. It was direct-cut in the firm-dough stage (66 to 68% moisture) and ensiled in a 20 ft. x 60 ft. A. O. Smith Harvestore. The alfalfa haylage (ensiled at 42 to 48% moisture in a 14 ft. x 40 ft. A. O. Smith Harvestore) was made from 3rd and 4th cutting, 1/10 to 1/4 bloom, Kanza alfalfa harvested in August and September, 1979. Ration, forage, and supplement compositions are in Table 19.1. Ration 1 (forage sorghum silage) was formulated to provide 12% crude protein, and soybean meal supplied 43% of the total crude protein. For ration 2, alfalfa haylage replaced half of the forage sorghum silage (dry matter basis). Ration 2 contained 12% CP and the same amounts of rolled milo and supplement as ration 1, but its supplement contained no soybean meal and alfalfa haylage supplied 58% of the total crude protein. Both rations were mixed twice daily and full-fed to crossbred steer calves sired by 3/4 Simmental bulls. Two pens of five steers and one pen of six steers received each ration during the 112-day trial (November 28, 1979 to March 19, 1980).

All steers were weighed individually after 16 hrs without feed or water at the start and end of the feeding trial. Intermediate weights were taken before the a.m. feeding on days 28, 56, and 84.

Results

Steer performances are shown in Table 19.2. Steers fed forage sorghum gained faster and more efficiently (approaching significance, $P<.10$) than those fed FSS + alfalfa haylage. Feeding FSS and haylage together increased forage intake 16.8% (1.82 lbs. dry matter/steer/day) over FSS alone.

As indicated by chemical analyses and steer performance, the alfalfa haylage had less net energy than expected; the forage sorghum silage, more. If we assume the FSS and rolled milo had similar net energy values in both rations, then the alfalfa haylage contained approximately 53 to 55 megacalories of $NE_{maintenance}$ and 22 to 24 megacalories of NE_{gain}/lb. (DM basis).

The value of the alfalfa haylage fed in this trial depends primarily on the price of the forage sorghum silage and soybean meal---both being replaced with haylage. Shown in Table .3 are values of alfalfa haylage calculated from selected prices of FSS and soybean meal. Each price combination for haylage, FSS, and soybean meal gives the same feed cost/lb. of gain for rations 1 and 2.

Table 19.1. Composition of the two growing rations.

Ingredient	Ration 1 FSS	Ration 2 FSS + haylage
	lbs/steer/day	
Forage sorghum silage[1]	full fed	full fed[3]
Alfalfa haylage[2]	----	full fed[3]
Rolled milo	2.30	2.30
Supplement A*	2.00	----
Supplement B**	----	2.00

[1]Preliminary chemical analyses: 31.2% DM; 7.71% crude protein and 24.32% crude fiber (DM basis).

[2]Preliminary chemical analyses: 54.4% DM; 19.68% crude protein and 28.62% crude fiber (DM basis).

[3]Silage and haylage were fed in equal amounts on a DM basis.

*Contained 42.8% CP, 1.9% calcium, and 1.4% phosphorus, and supplied 200 mg of Rumensin per steer daily.

**Contained 8.9% CP, 1.9% calcium, and 1.4% phosphorus, and supplied 200 mg of Rumensin per steer daily.

Table 19.2. Performance by calves fed the forage sorghum silage and alfalfa haylage rations.[1]

Item	Ration 1 FSS	Ration 2 FSS + alfalfa haylage
No. of steers	16	16
Initial wt., lbs.	578	584
Final wt., lbs.	794	773
Avg. total gain, lbs.	216	189
Avg. daily gain, lbs	1.93	1.69
Avg. daily feed, lbs.[2]		
forage sorghum silage	10.82	6.35
alfalfa haylage	---	6.29
milo	2.07	2.07
supplement	1.80	1.80
Total	14.69	16.51
Feed/lb. of gain, lbs.[2]	7.63	9.77

[1]112-day feeding period (November 28, 1979 to March 29, 1980).

[2]100% dry matter basis.

Table 19.3. Relative values of alfalfa haylage based on steer performance results from Table 3 and indicated prices for forage sorghum silage and soybean meal.*

Forage sorghum silage price ($/ton)	Soybean meal price ($/ton)			
	200	250	300	350
16	34.67	44.33	59.67	72.33
19	39.00	51.66	64.00	77.00
22	43.00	55.67	68.00	80.67

*Value of haylage expressed as $/ton of alfalfa hay equivalent.