

TABLE 9. GRAIN TYPE AND PROCESSING METHOD^a

Item	Corn		Flaked
	Dry Roll	Flake	Milo
No. Steers	47	47	46
Initial Wt., Lb.	507	514	509
Gain, Lb.	3.07	2.98	3.00
Feed, lb.	19.2 ^b	17.2 ^c	17.2 ^c
Feed/Gain	626 ^b	577 ^c	574 ^c
Improvement, %	---	8	8

^aThree trials; avg. 180 days. Feed intake based on 88% dry matter; gains based on unshrunk weight. All diets contained 10% alfalfa hay.

PERFORMANCE OF GROWING CALVES FED KENAF HAY

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Summary

Research was initiated at this station in 1976 to evaluate kenaf as a forage crop in Arizona. Kenaf traditionally has been grown to maturity and used in making twine, cloth or paper. However, limited data from other stations suggested kenaf might be useful under immature harvesting systems as a forage crop.

Our initial studies, presented in the 1977 and 1978 Arizona Cattle Feeders Day Reports, showed that kenaf forage planted in April and harvested as sun-cured hay after 130 days growth was readily consumed by lambs and steers but was less digestible than alfalfa hay. Results of a small-plot study conducted to obtain information on the relationship between stage of maturity and nutritive value of kenaf forage were reported in 1979. Kenaf planted at Yuma in late June and harvested within 60 days appeared to be competitive with alfalfa hay in terms of crude protein content and in vitro digestibility. In comparison with conventional annual forages, kenaf had higher protein content at all stages of growth and, through 45 days, higher in vitro digestibility. However, from 60 to 105 days post-planting the quality of kenaf forage declined rapidly which is consistent with its history as a fiber crop. Estimated dry matter yields of kenaf were consistently lower than those of the conventional forages.

These data suggested that if kenaf were properly managed it might have potential as a forage crop in Arizona. Since there was no information on the levels of animal performance which might be attained on diets containing kenaf hay, this study was conducted to compare the performance of calves fed growing diets based on kenaf or alfalfa hay.

PROCEDURE

Kenaf hay used in this study was produced on the Yuma Experimental Farm. It was planted on July 9, 1979 and harvested 67 days later on September 13. The hay was cut and baled with conventional equipment but when compared with alfalfa hay harvested at the same time required an additional day of drying in the windrow before baling. Yield of baled hay was approximately two tons per acre. This hay appeared to be similar in quality to that harvested after 60 days growth in the earlier small plot study, although the crude protein content was slightly lower (10.8 vs 12.2%). As a point of reference, the in vitro digestibility of the 60-day samples from the small plot study was approximately the same as for alfalfa hay.

Thirty-seven "oakie" steer calves with a mean initial weight of 369 lb were used in the feeding trial. They were among 200 calves purchased through Producers Livestock Marketing Association and shipped to Yuma in mid-July 1980. Upon arrival calves were individually weighed, ear-tagged and injected with one million units of vitamin A. For approximately three weeks after arrival, all calves were fed sliced alfalfa hay ad libitum. During this period calves were branded, castrated and dehorned as needed, treated for grubs and implanted with 36 mg of Ralgro. Calves were allotted by weight and type to pens of 8-10 steers each. Two pens (18 steers) were assigned to the kenaf treatment and two pens (19 steers) to the alfalfa hay control.

The roughages were fed ad libitum and, in addition, each steer received 4 lb of dry rolled wheat daily. Alfalfa and kenaf hays were sliced with addition of 5% molasses and 5% water prior to feeding. Individual animal weights were taken on two consecutive days at the initiation and conclusion of the experiment and one-day weights were recorded at 28-day intervals.

RESULTS

Performance data for this 119-day growing trial are in table 1. Steers fed the control diet with alfalfa hay gained over .5 lb/day more (2.35 vs 1.78 lb/day) than those fed the kenaf hay. The major reason for this was that steers fed kenaf consumed nearly 40% less roughage (8.6 vs 13.8 lb/day) and 30% less total feed (12.6 vs 17.8 lb/day) than those fed alfalfa hay. Feed conversions were similar for the two diets.

The lower intakes were probably due to the physical nature of the kenaf hay. The kenaf plant has a woody central stem which by 60 days growth was up to one-half inch in diameter. Even when sliced the hay was quite coarse. This physical property problem appears to be most serious obstacle to using kenaf in practical feeding situations. The problem could probably be alleviated by grinding the hay to a finer particle size, pelleting the forage or perhaps by harvesting it as silage. The effect would also be minimized by including the roughage in complete mixed diets.

OBSERVATIONS

1. Calves fed sliced kenaf hay plus 4 lb of grain/day consumed 40% less roughage and gained 25% slower than those fed sliced alfalfa hay plus grain.
2. The major factor in the reduced intake of kenaf hay appeared to be its coarse physical nature.
3. If the agronomic characteristics of kenaf are sufficient to warrant its production as an annual forage crop, it could be used in practical diets for beef cattle. However, additional research would be needed to determine the optimum physical form for feeding.

TABLE 1. PERFORMANCE DATA FOR STEERS FED KENAF OR ALFALFA
(119 days)

Item	Source of Roughage ^a	
	Kenaf	Alfalfa
Number of steers	18	19
Mean initial weight, lb	371	367
Mean final weight, lb	583	647
Av. Daily Gain, lb.	1.78	2.35
Av. Daily Feed, ^b lb	12.6	17.8
Feed/100 lb gain, lb	708	757

^a roughages were sliced with addition of 5% water and 5% molasses prior to feeding.

^b daily feed includes 4 lb of dry rolled wheat per steer.