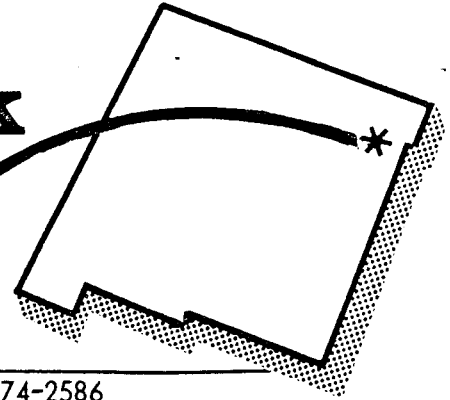




# Clayton Livestock Research Center

## PROGRESS REPORT



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### VALUE OF KOCHIA HAY IN GROWING RATIONS FOR YEARLING CATTLE

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Studies on the use of Kochia (*Kochia scoparia*) have shown this plant to have potential as a cattle feed. However, toxicity problems have been encountered which limit its usefulness. In grazing trials kochia was best utilized in combination with other forages such as native grass. The purpose of the trial reported herein was to determine the value of kochia hay when fed to growing cattle prior to finishing.

One hundred and twenty steers weighing an average of 640 lb. were assigned to eight pens of 15 head each. During a 56-day period one pen was fed only alfalfa hay and one pen was fed kochia hay. Three pens were fed a 50% concentrate ration containing 50% ground alfalfa hay and three pens were fed the same growing ration with alfalfa replaced by kochia hay. The alfalfa contained 16.4% crude protein and 11.4% ash while kochia contained 19.1% crude protein and 21.5% ash on a dry matter basis. Following the growing period all cattle were fed a finishing ration containing 85% concentrates. Alfalfa and cottonseed hulls supplied the roughage. After 98 days on this ration all cattle were slaughtered and carcass data obtained.

Results are shown in the accompanying table. During the first 56 days cattle fed kochia rations ate less feed and gained less weight than those fed alfalfa. However, cattle fed kochia rations made

compensatory gains in the next 98 days. Despite the compensatory gain made by cattle fed kochia hay alone, the overall gain was less than that of cattle fed alfalfa only. The two groups fed 50% concentrates during the first 56 days made the same total gain whether the growing ration contained alfalfa or kochia. There were no differences in carcass characteristics due to feeding alfalfa or kochia during the growing period.

In order to produce a daily gain of 1.74 lb alfalfa hay would have to contain 54 Mcal of NEM and 28 Mcal of NEg/100 lb of feed. Kochia hay would have to contain 45 Mcal NEM and 16 Mcal NEg/100 lb to produce a gain of .28 lb/day. Therefore, for maintenance kochia hay was worth 83% of alfalfa and for gain it was worth only 57% of alfalfa. If cattle used 35% of their feed for maintenance and 65% for gain (as they did on the 50% concentrate feed for the first 56 days) kochia would be worth 66% of the value of alfalfa.

Using the above NEM and NEg values for alfalfa and kochia and published values for other ingredients, the predicted rates of gain shown in the table were calculated. The agreement between observed and predicted gain is excellent. These comparisons show that the compensatory gain achieved in the finishing period by cattle grown on kochia rations is due entirely to increased feed intake since the increased gain was predictable.

<sup>1</sup> Appreciation is expressed to Dr. Ted Montgomery of West Texas State University and to Iowa Beef Processor, Inc. for collection of carcass data.

Item	Growing Ration			
	Alfalfa	Kochia	50% Alfalfa	50% Kochia
<u>Growing period (56 days)</u>				
Initial weight, lb.	621	677	641	637
Daily feed intake, lb.	20.48 <sup>b</sup>	14.53 <sup>a</sup>	24.71 <sup>c</sup>	22.29 <sup>b</sup>
Daily weight gain, lb.	1.74 <sup>e</sup>	.28 <sup>d</sup>	3.12 <sup>g</sup>	2.39 <sup>f</sup>
Predicted daily gain, lb.	-	-	3.19 <sup>a</sup>	2.48 <sup>ab</sup>
Feed per pound gain, lb.	11.77 <sup>b</sup>	51.89 <sup>c</sup>	7.92 <sup>a</sup>	9.33 <sup>ab</sup>
<u>Finishing period (98 day)</u>				
Initial weight, lb.	718	693	816	756
Daily feed intake, lb.	21.58 <sup>a</sup>	23.76 <sup>b</sup>	21.63 <sup>a</sup>	22.85 <sup>ab</sup>
Daily weight gain, lb.	2.74 <sup>ab</sup>	3.11 <sup>c</sup>	2.46 <sup>a</sup>	2.88 <sup>b</sup>
Predicted daily gain, lb.	2.73	3.14	2.47	2.82
Feed per pound gain, lb.	7.88	7.64	8.79	7.93
<u>Entire 154 days</u>				
Daily feed intake, lb.	21.18 <sup>a</sup>	20.40 <sup>a</sup>	22.75 <sup>b</sup>	22.65 <sup>b</sup>
Daily weight gain, lb.	2.38 <sup>b</sup>	2.08 <sup>a</sup>	2.70 <sup>c</sup>	2.70 <sup>c</sup>
Predicted daily gain, lb.	2.37	2.10	2.73	2.70
Feed per pound gain, lb.	8.90	9.81	8.43	8.39
<u>Carcass data</u>				
Hot carcass weight, lb.	628 <sup>a</sup>	631 <sup>a</sup>	683 <sup>b</sup>	673 <sup>b</sup>
Dressing percent	63.6 <sup>ab</sup>	63.3 <sup>a</sup>	64.6 <sup>b</sup>	63.9 <sup>ab</sup>
Fat cover over rib, in.	.44	.44	.52	.50
Kidney, heart and pelvic fat, %	1.9	1.9	2.1	2.0
Marbling score <sup>1</sup>	5.3	5.3	5.5	5.4
Quality grade <sup>2</sup>	11.6	11.9	12.1 <sup>b</sup>	11.6 <sup>ab</sup>
Yield grade <sup>3</sup>	2.8 <sup>a</sup>	2.8 <sup>a</sup>	3.2 <sup>b</sup>	3.1 <sup>ab</sup>
Rib eye area, sq. in.	11.3	11.1	11.2	11.2

<sup>1</sup> Marbling key: 3 = traces, 4 = slight, 5 = small, 6 = modest.

<sup>2</sup> Quality grade key: 10 = good, 11 = high good, 12 = low choice, 13 = choice.

<sup>3</sup> Yield grade is scored from 1 through 5 with 1 being the highest yield.

a-g Values within the same criterion of response and feeding period having different superscripts differ (a,b,c = P<.05 and d,e,f,g = P<.01).

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