

HIGH QUALITY ALFALFA HAY
WHAT IS IT WORTH TO THE BEEF MAN?

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Introduction

High quality alfalfa hay may offer the traditional cow-calf beef producer needed alternatives in feeding and marketing. With rapidly escalating production costs and a severely depressed market, optimum use of resources to produce more pounds of feeder beef or an acceptable carcass for slaughter is essential if producers are to survive the inevitable boom-or-bust cattle economy.

When fed to weaner calves in growing or warm-up rations, high quality alfalfa hay produces satisfactory weight gains with excellent conversion. Also, it has been shown that yearling cattle can be finished to an acceptable slaughter grade on high quality alfalfa hay or on pasture with an alfalfa hay supplement. Expanded use of high quality alfalfa to produce consumer beef would reduce the present dependence on grain in the production of animal protein.

Effect of Hay Quality on Predicted Performance

Research and rancher experience has shown that good quality calves can gain two pounds or more per day on eight to ten pounds of hay alone under good management conditions. The following table shows estimated performance on various quality hays when fed to calves from weaning to approximately 600 pounds live weight.

TABLE I

The Effect of Alfalfa Hay Quality on Performance of
400 - 600 Pound Steer Calves

	<u>Quality Rating</u>			
	<u>Superior</u>	<u>Good</u>	<u>Average</u>	<u>Poor</u>
Crude Protein (%)	23	20	17	14
Crude Fiber (%)	18	21	27	33
TDN (%)	70	63	57	50
	<u>Estimated Performance</u>			
Consumption (% of Avg Body Wt.)	3.5	3.0	2.5	2.0
Conversion (lbs feed:lbs gain)	7:1	9:1	12:1	15:1
Avg. Daily Gain (lbs)	2.2	1.9	1.2	0.8

High dry matter intake is essential for good performance and hay quality is the key to intake. On early cut high quality hay, fed as long hay, calves will consume three percent or more of their body weight daily. By contrast, voluntary consumption on poor to average quality hay, 50 to 60% TDN, will often drop to between 2 and 2½ percent body weight. Because maintenance requirements remain relatively constant, this difference in intake will result in less gain and poorer conversions.

The gains shown in Table I are estimated potential gains based on the energy value of the hay and the intake shown. It should be emphasized that satisfactory performance can be realized only if optimum management can be applied to better than average quality calves. It has been shown that adverse effects of weather, sickness, poor facilities and poor feeding management can reduce this potential gain by 20 to 30 percent.

Research Results

Considerable data are available on the effects of feeding high quality hay on performance of growing calves and on the use of all-forage diets for finishing beef cattle. In general,

this research has shown that alfalfa hay is an excellent source of energy for growing and finishing calves, that quality has a significant effect on performance and that cattle can be finished to an acceptable market grade on all forage diets.

A study conducted at the University of Nevada (1,2) compared the effects of high and low quality hay with and without supplement on intake and gain during the growing and finishing phases and on carcass acceptability at slaughter. The high quality hay used contained over 16 percent less crude fiber and 20 percent less lignin than the low quality hay. Although greater differences would have been desirable, the results were striking.

Performance during the growing phase of this study is shown in Table II

TABLE II

Performance of Steer Calves Fed High and Low Quality Alfalfa Hay With and Without Supplement
440 - 600 Pounds Body Weight

<u>Ration</u>	<u>Total Days</u>	<u>A.D.G.</u>	<u>Feed/ lb gain</u>
<u>High</u> Quality Hay Only	80	2.02	7.9
+ Barley Pellets	70	2.27	7.1
+ Alfalfa Pellets	70	2.08	7.7
Average		2.12	
<u>Low</u> Quality Hay Only	98	1.44	9.9
+ Barley Pellets	77	2.00	7.6
+ Alfalfa Pellets	91	1.89	7.5
Average		1.78	

Supplements were fed in an amount equal to one percent of body weight (approximately 1/3 of the total ration). Note that during this growing phase calves on straight high quality hay only gained 0.58 pounds per day more than those on low quality hay only (2.02 vs 1.44). High quality hay required two pounds less feed per pound of gain than low quality hay (7.9 vs 9.9). Barley pellets improved performance on both hays with the greatest improvement on the low quality (low 0.56 vs high 0.25). Gains on high quality hay alone were equal to those on low quality hay plus one percent barley. With either hay, performance on one percent third cutting alfalfa hay pellet supplement was intermediate to hay alone and hay plus barley.

In total daily feed, calves on high quality hay consumed approximately two pounds per day more than those on low quality.

These steers were continued on the same treatments from the end of the growing phase at 600 pounds body weight to a slaughter weight of 900 pounds. The results of this period are shown in Table III.

TABLE III

Performance Data of Finishing Steers Fed High and Low Quality Alfalfa Hay Alone and With Supplement
600 - 900 Pounds Slaughter Weight

<u>Ration</u>	<u>Total Days</u>	<u>A.D.G.</u>	<u>Feed/ lb gain</u>
<u>High</u> Quality Hay Only	143	2.09	9.8
+ Barley Pellets	87	2.47	9.2
+ Alfalfa Pellets	129	2.07	11.2
<u>Low</u> Quality Hay Only	185	1.65	11.9
+ Barley Pellets	108	2.49	9.0
+ Alfalfa Pellets	150	1.98	10.4

Note that the average daily gain on high quality hay only was 2.09 pounds compared to 1.65 pounds on low quality hay. Note also that high quality hay required over two pounds less feed per pound of gain than low quality hay (9.8 vs 11.9). Barley supplement significantly increased average daily gain on both high and low quality hay. The alfalfa pellet supplement increased gain on low quality hay only.

Steers on straight high quality hay required over 40 days less time to reach 900 pounds slaughter weight than those on low quality hay (143 vs 185). Both supplements decreased time required with the greatest decrease from barley.

The longer feeding period on low quality hay also had an effect on carcass quality as shown in Table IV.

TABLE IV

Carcass Data of Steers Finished on High and Low Quality
Alfalfa Hay Alone and With Supplement

<u>Ration</u>	<u>Quality Grade (%)</u>			<u>Average Cutability (%)</u>	<u>Average Back Fat, cm</u>
	<u>Choice</u>	<u>Good</u>	<u>Standard</u>		
<u>High Quality Hay Only</u>	12.5	25.	62.5	52.49	0.30
+ Barley Pellets		75.	25.	51.54	0.63
+ Alfalfa Pellets		87.5	12.5	51.89	0.50
<u>Low Quality Hay Only</u>		25.	75.	51.14	0.63
+ Barley Pellets		87.5	12.5	51.96	0.74
+ Alfalfa Pellets	12.5	50.	37.5	52.28	0.46

Back fat thickness was altered by both hay quality and supplements. Steers receiving low quality hay deposited more back fat which was probably a result of their longer feeding period. Those supplemented with barley had more back fat in spite of a shorter time on feed than those supplemented with alfalfa pellets, which was probably a reflection of greater energy intake.

Percent cutability of carcasses was not significantly influenced by hay quality or supplement treatment. However, supplements did improve cutability on poor quality hay. While hay quality did not influence grade significantly, both supplement sources improved average quality grade over the unsupplemented controls.

Grass fat cattle, or cattle finished on pasture with a minimum of supplemental energy, have been the object of considerable research and discussion during recent years. A trial just completed in Modoc County compared a high quality alfalfa cube vs barley as supplements for heifers on irrigated clover-grass pasture (3).

The trial started on May 16 with supplement beginning on May 24. Supplement was hand fed twice daily. Heifers were slaughtered as they reached what appeared to be choice grade weights, feed consumption and gains are shown in Table V.

TABLE V

Effect Of Supplement on Performance of Heifers
On Irrigated Pasture

<u>Item</u>	<u>Barley Supplement</u>	<u>Alfalfa Cube Supplement</u>
Avg. Wt. on (lbs)	646.	615.
Avg. Wt off (lbs)	868.	835.
Avg No days	136.7	136.7
A.D.G. (lbs)	1.62	1.62
Avg. Sup/day (lbs)	4.41	5.32
Total Gain/acre (lbs)	776.	769.

An attempt was made to equalize supplemental energy on the basis of TDN intake. The actual amount of average supplement fed per day (4.41 lbs - barley : 5.32 lbs cubes) appears to be low and certainly additional supplement would have increased average gain. However, the quality of carcasses produced suggests that additional supplement would have been wasted.

Table VI shows the effect of supplement source on carcass quality

TABLE VI

Effect of Supplement on Carcasses of Heifers Finished
On Irrigated Pasture

<u>Item</u>	<u>Barley Supplement</u>		<u>Alfalfa Cube Supplement</u>	
	6-choice	1-good	5-choice	1-good
Quality Grade				
Average Grade (1)		12.86		12.28
Average Back Fat (inch)		0.31		0.22
Average Dressing Percent		58.05		56.85
Color (2)		4.3		4.7
(1) Numerical range of values appropriate for grades	Standard, 6-7-8			
	Good, 9-10-11; Choice, 12-13-14.			
(2) Numerical conversion	1= White, 10=Yellow			

Although barley supplement appeared to improve quality grade this is probably not significant. The greater amount of back fat and the higher dressing percentage on the barley heifers would suggest a greater energy intake in spite of the fact that average daily gains were equal. Outside fat cover was not as yellow as might be expected with a slight advantage for the barley group.

Summary

Beef cattle producers can use high quality alfalfa hay in both growing and finishing rations, in either the feedlot or on irrigated pasture. Such a program will allow more flexibility in marketing, help provide year-round labor for employees and make better use of available ranch resources. The economics of such a program will depend on the relative value of hay and cattle.

In either winter warm-up operations or summer pasture programs, success will depend largely on the quality of cattle used and the type of management employed.

References

- Pierce, Cecil, et al. Proceedings, Western Section, American Society Animal Science, Volume 22, 1972.
- Pierce, Cecil, et al. Proceedings, Western Section, American Society of Animal Science, Volume 23, 1972.
- Pierce, Cecil and John Robison, Farm Advisors Modoc County, unpublished data