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Finishing Beef Cattle - Corn & Alfalfa or Pelleted Supplement

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Alfalfa is widely utilized as a source of protein and other nutrients in dairy operations. Beef producers, and especially feedlot operators, tend not to use alfalfa forage to the same degree. Part of the reason, no doubt, has to do with the value of the crop relative to beef prices; it also may be due to the fact that in beef finishing rations, alfalfa hay is somewhat difficult to handle and to feed at controlled levels.

Beef producers raising alfalfa have the option to market this forage of farm or utilize the crop with beef cattle. The decision must be based upon value of the crop when sold vs. being fed.

The objective in this study was to compare alfalfa hay to a commercial protein supplement in a rather simplified, low labor feeding situation that could be readily adopted by smaller producers. Self-feeders were used for feeding whole corn or a whole corn supplement mix. Third-cutting alfalfa hay and first-cutting tall fescue hay were harvested and fed free-choice as large bales (800-1100 lbs.). The hays were fed to serve as a roughage source and in the case of the alfalfa, as the only source of supplemental crude protein. Composition of the hays is shown in [Table 1](#).

Forty head of Angus, Polled Hereford and Simmental crossbred steer calves were used. These calves were spring born, weaned October 10, 1995 and fed hay, corn silage, corn and soybean meal for approximately 7 weeks prior to starting on feed November 30. At weaning, calves were vaccinated with Cattlemaster 4+SL and Presponse and dewormed with Ivomec. When calves were started on feed, they were implanted with Implus-S and a second implant was administered 113 days later.

Steers were fed in groups of 10 head each in four outside pens with access to a pole barn for shelter. Average weight when started on feed was 666 lbs.

During the initial three week period, corn silage was reduced and whole corn increased. Calves fed grass hay also received 1 lb. of 41% commercial protein

supplement pellets daily per head. Those fed alfalfa did not receive any form of additional protein. Both groups had free-choice access to commercial mineral mixtures. The mineral mixture offered to the alfalfa-fed calves was fortified with Rumensin, whereas, that offered to supplemented calves did not since the supplement was fortified with Rumensin.

Once calves were on a full-feed of corn, self-feeders were used. Alfalfa-fed calves received only shelled corn, whereas, calves fed grass hay received a mixture of 95% corn and 5% supplement pellets. The goal was to maintain daily supplement intake at near 1 lb. per head. Once calves were consuming in excess of 20 lbs., the mix was changed to 96% corn and 4% supplement.

Calves were fed these diets until they appeared to have attained sufficient finish to grade choice. One pen of 10 head from each of the alfalfa and commercial supplement group was slaughtered after 179 days and the other pen from each group slaughtered after 193 days for an average of 186 days on feed. Carcass weights and quality grades were obtained.

Results

[Figure 1](#); illustrates the body weight change throughout the feeding period. There was little difference in weight change of calves fed either alfalfa hay or commercial supplement as the source of protein, especially, during the first 113 days. During the remaining 73 days, calves receiving supplement, tended to gain at a faster rate.

[Table 2](#) shows daily gains, feed consumption, cost and carcass data. Daily gain is computed from the final weight with a 4% shrink. This was also the final payweight. Calves fed the commercial supplement gained approximately .13 lb. more per day than those fed alfalfa hay as the protein source. As was shown in figure 1, this difference occurred during the final 73 days of the feeding period.

Alfalfa-fed calves consumed less grain, more hay, mineral and total feed than calves fed the commercial supplement. Alfalfa consumption was nearly 25% of the total diet and was in excess of that needed to meet protein requirements, especially late in the feeding period. The high alfalfa hay consumption during later stages of the feeding period likely contributed to the lower performance as cattle approached finish weight.

Carcass dressing percent was similar, but cattle fed alfalfa hay tended to grade lower, again possibly due to higher consumption of hay in the final phase of the feeding period. With alfalfa hay valued at \$80.00 per ton, feed cost/cwt. gain was similar between the two feeding programs.

Conclusion and Implications

A rather simple, low labor system was utilized to finish steer calves. High quality alfalfa hay was effectively utilized as a source of supplemental protein and roughage for cattle self-fed whole shelled corn. Excess hay consumption especially during the last 60 to 90 days on feed may have reduced gain and carcass quality slightly.

Pricing corn at near \$4.00 per bu. and commercial supplement at \$360.00 per ton, resulted in similar feed cost of gain when alfalfa hay was valued at \$80.00 per ton. Thus, if alfalfa can be sold off-farm for greater than \$80.00 per ton, using a commercial protein supplement rather than alfalfa would have been more profitable in this situation.

When using high quality alfalfa hay as a source of protein and roughage, limiting hay consumption to 2 to 4 lbs. daily per head during the last 60 to 90 days will likely enhance cattle performance and feed utilization. Using a lower quality alfalfa would likely reduce hay consumption. However, this may also reduce animal performance if protein needs are not provided.

Figure 1. Alfalfa Hay vs. Supplement for Finishing Steer Calves on Whole Shelled Corn

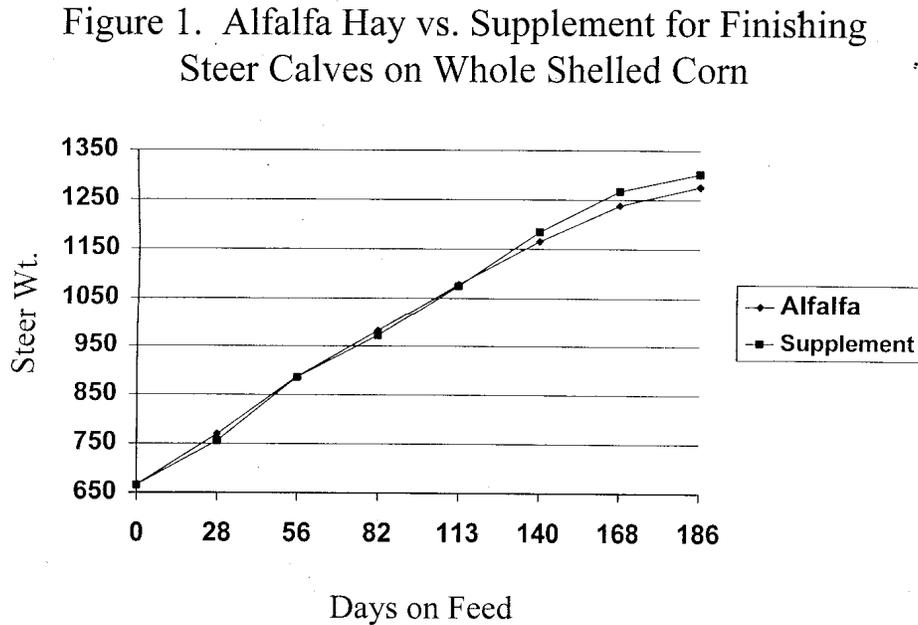


Table 1. Nutrient Composition of Hays Fed to Finishing Steer Calves ¹ .		
Forage Quality Variable	3rd Cutting Alfalfa ²	1st Cutting Fescue/ Clover ³
Dry Matter, %	85.8	87.9
Below Vales on DM Basis		

Crude Protein, %	20.7	8.5
Acid Detergent Fiber, %	32.5	41.2
Neutral Detergent Fiber, %	45.1	62.9
Estimated TDN, %	65.5	55.6
Relative Feed Value	131	84

¹Both hays harvested as large round bales

²Grown at Feldun-Purdue Agricultural Center, Bedford, IN, net wrapped, stored and fed under roof.

³Grown at Southern-Indiana Purdue Agricultural Center, Dubois, IN, twine wrapped, stored outside but fed under roof.

Table 2. Performance of Steer Calves Fed Whole Shelled Corn with Alfalfa Hay or Commercial Supplement as the Source of Supplemental Protein (Southern Indiana-Purdue Agricultural Center, Dubois, IN.).

Variable	Protein Source	
	Alfalfa Hay	Commercial Supplement
No. Steers	20	20
Start Wt., Lbs. (11-30-95)	666	666
Finish Wt. (4% Shrink)	1225	1249
Daily Gain (186 days)	3.01	3.14
Feed Consumed (Lbs. as-fed)	Avg. daily per hd ¹ ., Lbs.	
Corn Grain ²	19.53	20.75
Supplement ³	--	1.02
Alfalfa Hay	6.15	--
Fescue/Clover Hay	--	2.77
Mineral Mix ⁴	.22	.11
Total as-fed	25.68	25.54
Total Dry Matter	22.27	21.30
Feed/CWT. Gain (dry matter)	7.40	6.78

Feed Cost/CWT. Gain ⁵ , \$	56.33	55.88
Carcass Dressing, %	62.33	62.21
% Grading Choice or Higher	75.0	90.0

¹Hay fed free-choice from large bales

²Whole corn and corn-supplement mix fed in self-feeders. Initial mix of corn and supplement was 95:5 and later changed to 96:4 as intake increased.

³Supplement was a commercial brand, containing 41% protein, fortified with minerals, vitamins, Rumensin, and Tylan.

⁴Two commercial mixtures were used. For alfalfa cattle the mixture contained Rumensin, but did not for the supplemental cattle.

⁵Alfalfa hay, \$80.00/ton, fescue hay, \$50.00/ton, corn grain \$3.92/bu., 41% supplement \$360/ton, mineral mix with and without Rumensin, \$30.00 and \$25.00/cwt. respectively. A small amount of corn silage was fed initially and priced at \$30.00/ton.