Economic Comparison of Finishing Steers on Grass with Self-Fed By-Products to Finishing Cattle in a Conventional Feedlot

A.S. Leaflet R2420

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Summary and Implications

Two hundred forty one steers were finished utilizing a self-feeder on grass or a conventional feedlot facility. The 80 head finished on grass were self-fed either a soyhulls-DDGS-supplement or a corn-DDGS-supplement ration with access to grass from May 7 to harvest on August 26 while the 161 head conventional group was finished in a total confinement deep bedded system with the ration consisting of corn-modified DDGS-supplement-limestone-ground hay. Steers were weighed and individually identified by one of three source groups. April feeder cattle prices during the past 5 years (2004-08) for 700 to 750 lb steers was used to establish an individual value for each steer. Based on previous work, the decision was made to assign the heavier steers to the self-fed on grass group. The self-fed on grass group's average purchase weight and price was 906 lb and $95.66/cwt ($865.84/hd), respectively, compared to the conventional group's average weight and price of 824 lb and $101.48/cwt ($833.62/hd), respectively.

The self-fed on grass group was harvested after 131 days on feed with an adjusted final weight of 1,330 lb and average daily gain of 3.24. Conventional group cattle were harvested after 138 days on feed with an adjusted final weight of 1,310 lb and average daily gain of 3.52. Differences in average daily gain were significant. The self-fed on grass group had 12 lb heavier carcasses, but this was not significantly different. Fat cover and yield grades were similar between the two management groups. The self-fed on grass had significantly lower marbling scores than the conventional group; resulting in 47% less Choice carcasses. Feed cost for the self-fed on grass group included feed delivered to the self-feeders, warm up feed charge and pasture charge of $50/acre or $23.13/hd. Feed cost for the conventional group included total ration delivered to the feed bunk and the warm up feed charge. Total feed cost for the self-fed on grass group was $331.82/hd compared to $359.12/hd for the conventional group. The conventional fed group had a higher average daily gain which offset the total feed cost/hd resulting in the conventional fed group having a lower feed cost/cwt of gain, $74.28/cwt compared to $78.89/cwt for the self-fed on grass group. Total cost for the self-fed on grass group was $378.78/hd compared to $430.57/hd for the conventional group resulting in total cost of gains of $89.25/cwt and $90.25/cwt, respectively. The conventional groups profit was -$32.57/head compared to -$12.02/head for the self-fed on grass group. The total cost differences were not significantly different.

Introduction

There has been increasing interest among consumers in beef from cattle that are finished or fattened "on grass" rather than in a conventional feedlot. In addition, Iowa has recently had a proliferation of plants that produce ethanol from corn. One by-product of this process is distillers dried grains with solubles (DDGS). The results of the previous work self feeding by-products to grazing steers as reported in A.S. Leaflet R2277 (Morrical, et al. 2008) have demonstrated the biological feasibility of the concept but producers raise questions about the economic feasibility of self feeding on grass compared to finishing in a conventional feedlot. The objective of this study was to compare the economics of cattle from similar sources, time on feed and harvest dates that were finished on grass with self-fed by-products to cattle finished in a conventional feedlot.

Materials and Methods

The steers fed on grass with self-feeders were at the Neely-Kinyon Farm, Greenfield, IA, and the steers finished in a conventional feedlot were at the Armstrong Research Farm, Lewis, IA during 2008. Steers were obtained from 3 sources on April 15, April 17 and May 2, 2008. All steers were individually identified and weighed by source group on May 5. Within source groups individual weights were adjusted so the total of the individual weights was equal to the total pay weight for each source of steers. To individually price each animal 1- an index was created by dividing each price by the average of the 600-650 weight range price; 2 – a linear regression was developed for this index; 3- the estimated price of each steer in the data is calculated by multiplying the expected value of the index by the last 5 years (2004-2008) average price of the 700-750 steers. The equation for estimating the feeder cattle price, $/cwt. is ((Wt/100)^2*0.0060972+Wt/100*-0.16907+1.9107)*108.68065 where Wt is the adjusted purchase weight and 108.68065 is the average April price of steers weighing between 700 – 750 lb for the last 5 years.

Total feed fed during the warm up phase was divided by the total head days from purchase to on test weigh day (May 7). Feed cost during the warm up period was $1.85

per head per day. Heavier cattle with calmer dispositions were allotted to the self-fed on grass group. The groups assigned to the Neely-Kinyon farm were self-fed in one of two groups; one ration contained soyhulls-DDGS and the other corn-DDGS (Table 1). Within each grass fed group half of the cattle were implanted with Synovex-S and half were not implanted. The lighter steers were allocated by weight into 4 groups to evaluate pen density in a total confinement system. One third of each pen was implanted 56, 82 and 112 days prior to harvest with Synovex-Choice. Steers in the total confinement system were bedded with corn stover as needed. Eighty three bales of stover were used at a cost of $25/bale and bedding was charged on a per head basis to the conventional finished steers. Vaccination and implants charges were $5.62/head for the conventional finished. The implanted grass finished group had a vaccination and implant charge of $3.74/head and the vaccination charge for the non-implanted steers was $.88/head. Yardage for the conventional finished group was $.35/head/day. For the grass finished steers self feeder rental was $2/self feeder/day for a total of $8/day for self feeders or $.10/head/day for self feeder rental. Labor for the grass finished cattle was one hour per day at $15/hour for the 80 head or $.19/head/day. Five percent interest on the ownership of the cattle for both groups was charged. The pasture at the Neely-Kinyon Farm was a mixture of fescue, smooth bromegrass, and bluegrass. The pasture rental charge was $50/acre for 37 total acres or $23.13/head.

Grass finished steers were harvested on August 26, 2008 and conventional finished steers were harvested September 3, 2008. Full carcass data was collected and all groups were sold on the same pricing grid. Feed ingredients, prices and ration percentages on a dry matter basis are presented in Table 1. A SAS analysis was ran on growth and carcass data comparing grass finished and conventional finished steers. SAS General Linear Models was utilized to account for source, implant, pen density and feeding system.

Results and Discussion

Feed costs are reported in Table 1. Previous work finishing cattle self-fed on grass indicated heavier cattle gained faster and produced a higher quality carcass than lighter cattle (A.S. Leaflet R2067, 2006).

Based on the past 5 year April price for 700-750 lb steers, the steers self-fed on grass purchase price $/cwt was $95.66 compared to $101.48/cwt for the conventional feedlot group. Table 3 shows the purchase cost difference per head of $865.84 versus $833.62 or $32.22/hd. The 82 lb of additional weight for the group self fed on grass cost $32.22/head more than the conventional group meaning the additional weight was purchased at a cost of $39.20/cwt.

The self-fed on grass group averaged 20 lbs heavier adjusted final weight producing a 12 lb heavier carcass. Conventional fed cattle groups had a significantly higher average daily gain, pay- to-pay, 3.52 compared to 3.24 for groups self-fed on grass. The non-implanted steers gained .27 lb/day (P=.02) less than implanted steers. Average fat cover for both groups was .47 inches. No significant differences existed in yield grades between the two groups, however, there was a significant difference in marbling scores.

The average base price for USDA Choice, Yield Grade 3 carcasses was $156.73/ cwt. USDA Select, Yield Grade 3 price was $150.74/cwt. USDA Standard, Yield Grade 3 price was $144.51/cwt. Premiums for Yield Grade 1 and 2 were $ 4.00/cwt and $2.00/cwt, respectively, and a Yield Grade 4 discount of -$13.50/cwt was applied. Carcass price received for the two groups was not statistically different.

The total ration dry matter/head offered to the conventional group was 27.83 lb/day on test compared to 21.98 lb/day for the self-fed on grass group. Dry matter intake for the self-fed on grass group does not include an estimate of grass dry matter intake.

Total feed cost (Table 3), including ration offered, pasture and warm up feed, was significantly lower for the self-fed on grass group. However, the conventional fed group had a higher average daily gain which offset their higher total feed cost/hd resulting in them having a lower feed cost/cwt of gain, $74.28/cwt compared to $78.89/cwt for the self-fed grass group.

The yardage, bedding and implant cost resulted in a higher non-feed cost/head for the conventional group ($430.57/head) compared to the self-fed on grass group ($378.78/head). However, total cost of gain for the conventional group was lower at $89.25/cwt of gain compared to $90.25/cwt for the self-fed grass group. But the conventional groups profit was -$32.57/head compared to -$12.02/head for the self-fed on grass group. These negative group profits were not significantly different from one another.

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Table 1. Feed ingredients, prices and percent of ration dry matter.

Item	Price	Conventional Feedlot	Grass Corn-DDGS	Grass Soyhulls-DDGS
Corn	$5.50/bu	44.2%	45.6%	
Soyhulls	$170/Ton			47.6%
DDGS	$190/Ton		49.3%	47.6%
Modified DDGS	$92/Ton	38.5%		
Supplement	$380/Ton	3.0%	5.1%	4.9%
Limestone	$220/Ton	0.5%		
Ground hay	$100/Ton	13.8%		

Table 2. Performance and carcass traits.

Item	Conventional Feedlot	Self-fed on Grass
No of steers	161	80
Purchase weight	824	906
On test weight	863	952
Days on feed	138	131
Days on test	114	111
Adj. Final Weight	1310	1330
Average daily gain, pay to pay	3.52	3.24
Hot Carcass Wt, lb	805	817
Fat Cover, in.	.47	.47
Marbling Score	SM 07	SL 85
% Yield Grade 1 & 2's	39%	49%
% low Choice or Better	58%	31%
Total ration dry matter, lb during test *	3173	2440
Daily dry matter intake on test*	27.83	21.98

* Does not include an estimate of grass intake for steers self-fed on grass

Table 3. Economic values.

Item	Conventional Feedlot	Self-fed on Grass
No of steers	161	80
Purchase weight	824	906
Purchase price, $/cwt	$101.48	$95.66
Purchase price, $/head	$833.62	$865.84
Carcass price $/cwt.	$154.30	$152.48
Gross income, $/hd	$1,242.85	$1,246.29
Feed cost $/hd	$323.62	$272.10
Pasture cost $/hd	$ 0.00	$23.13
Warm up cost $/hd	$35.50	$36.39
Total feed cost $/hd	$359.12	$331.62
Feed cost/cwt of gain	$74.28	$78.89
Vaccine and Implant cost $/hd	$ 5.62	$ 2.31
Yardage cost $/hd	$39.90	$ 0.00
Self feeder rental $/hd	$ 0.00	$11.10
Labor cost $/hd	$ 0.00	$20.81
Bedding cost $/hd	$12.89	$ 0.00
Interest charge $/hd	$13.04	$12.94
Trucking checkoff and Insur. $/hd	$11.23	$13.69
Total cost $/hd	$430.57	$378.78
Total cost per cwt of gain	$89.25	$90.25
Profit $/hd	$-32.57	$-12.02