

Finishing Beef Cattle on Grass Supplemented with Self-fed By-Products

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Summary and Implications

The objective of this study was to feed beef cattle to market weight (or as near as possible) by grazing cool-season grass supplemented with self-fed by-product pellets. The study took place at two locations in southwest Iowa. Yearling cattle were used at the Armstrong Farm and fall born calves were used at the Neely-Kinyon Farm. At each location, the cattle were allotted by weight to treatments of: 1) grazing with immediate access to by-product pellets in a self-feeder (early) and 2) grazing with later access (mid-June) to the same pellets (late). The trial started April 21, 2005. The by-product pellets were a blend of DDGS, soy hulls, and wheat midds.

Overall, the calves supplemented the by-product feed early grew faster than the calves supplemented later. The early supplemented calves consumed 15.5 lb/day of by-product feed and gained 2.50 lb/day. The later supplemented calves consumed 17.4 lb/day of feed and gained 2.17 lb/day overall and 2.37 lb/day while supplemented.

Overall, the yearling steers supplemented the by-product feed early grew faster (ADG=2.61) than the steers supplemented later (ADG=1.80). The early supplemented steers consumed an average of 19.9 lb/day for 180 days. The late supplemented steers during the first period (without supplementation) gained only 0.53 lb/day, which was the result of a shortage of forage and the forage that was available was fescue. Once supplementation occurred, the late supplemented steers partially compensated by consuming 20.1 lb/day of supplemental feed and gaining 2.32 lb/day. Some of the cattle reached market weight by the end of grazing season on October 12, 2005. Five calves were harvested with an average live weight of 1,009 lb, an average carcass weight of 598 lb, and 59.3% yield. Nineteen yearling steers were harvested with average live weight of 1,225 lb, an average carcass weight of 744 lbs, and 60.7% dressing percentage. Average daily feed cost for the by-product feed including feeder rent ranged from \$1.19/day to \$1.48/day.

Some lessons can be derived from this study. The by-product feed was a ration that the cattle consumed readily from self-feeders with minimal problems. The by-product feed should be offered as soon as the cattle are put in

pasture for maximal gains. With good grass, yearling steers can be expected to gain 400 to 500 lb over six months of grazing with by-product feed supplementation. Achieving choice grade may be challenging with this system.

Introduction

There has been increasing interest by some consumers for beef from cattle that are finished or fattened "on grass" rather than in a conventional feedlot. Also recently, Iowa has had a proliferation of plants that produce ethanol from corn. The by-product of this process is distillers dried grains with solubles (DDGS). The objective of this study was to feed beef cattle to market weight (or as near as possible) by grazing cool-season grass supplemented with self-fed by-product pellets.

Materials and Methods

The study took place at two locations in southwest Iowa – the ISU Armstrong Farm, Lewis, IA and the Neely-Kinyon Farm, Greenfield, IA, during 2005. Yearling cattle were used at the Armstrong Farm and fall born calves were used at the Neely-Kinyon Farm. At each location, the cattle were allotted by weight to treatments of: 1) grazing with immediate access to by-product pellets in a self-feeder (early) and 2) grazing with later access (mid-June) to the same pellets (late). The trial started April 21, 2005.

The by-product pellets were a blend of DDGS, soy hulls, and wheat midds (Table 1). The by-product feed was chosen because of its low starch content and high digestible fiber content, which compliments the forage and minimizes negative associative effects. It is also easy and safe to feed in a self-feeder with minimal risk of acidosis and over eating digestive problems.

The pasture at the Armstrong Farm was primarily tall fescue. It had not been grazed the prior year. The pasture at the Neely-Kinyon Farm was a mix of bromegrass and bluegrass with 15 to 20 percent legumes, primarily birdsfoot trefoil. The cattle at each site continuously grazed their assigned pasture. The cattle were weighed when they were placed on grass, when the self-feeders were added to the second treatment and in October when the cattle were removed from grass. Prior to the self-feeders, the cattle were hand-fed the by-product pellets for approximately 2 weeks for adjustment. At the end of the study, the cattle near market weight were harvested. The yearling cattle were scanned by a certified ultrasound technician for backfat, ribeye area, and marbling. The calves were not scanned. The cattle that were not ready for market were placed in a conventional feedlot for finishing. By-product feed usage was recorded.

Results and Discussion

Calves. Overall, the calves supplemented the by-product feed early grew faster than the calves supplemented later. The Neely-Kinyon Farm pasture had a lower stocking rate (calves) and higher quality forage (minimal fescue) than the Armstrong Farm pasture, and thus offered better grazing. The early supplemented calves consumed 15.5 lb/day of by-product feed and gained 2.50 lb/day. The later supplemented calves consumed 17.4 lb/day of feed and gained 2.17 lb/day overall and 2.37 lb/day while supplemented. The calves had an average body condition score of 3.19 at the beginning of the trial in April and an average body condition score of 5.6 (late) and 6.0 (early) in October. The calves body condition score increased by 2.34 (late) and 2.88 (early).

Yearlings. Overall, the yearling steers supplemented the by-product feed early grew faster (ADG=2.61) than the steers supplemented later (ADG=1.80). The early supplemented steers consumed an average of 19.9 lb/day for 180 days. The late supplemented steers during the first period (without supplementation) gained only 0.53 lb/day, which was the result of several problems in the pasture. First the pasture was grazed prior to the start of trial during March and April for approximately 30 days. Stocking rate was probably too high, 1.5 to 1.6 steers/acre for this pasture's productivity. And, the pasture was primarily tall fescue, which contributed to fescue toxicity and high body temperatures in some steers. Two steers died and two had to be removed from the late supplemented group. Once supplementation occurred, the late supplemented partially compensated by consuming 20.1 lb/day of supplemental feed and gaining 2.32 lb/day. Overall the late steers gained 1.80 lb/day as compared with 2.61 lb/day for the early group.

Carcass data. Some of the cattle reached market weight by the end of grazing season on October 12, 2005. Five calves were harvested with an average live weight of 1,009 lb, an average carcass weight of 598 lb, 59.3% yield, average backfat of .36 in., and average ribeye area of 11.7 sq. in. Four calves graded choice and one graded select with four head at yield grade #2 and one at yield grade #1 (Table 2).

Nineteen yearling steers were harvested with average live weight of 1,225 lb, an average carcass weight of 744 lbs, 60.7% dressing percentage, average backfat of .32 in., and average ribeye area of 12.8 sq. in. Quality grades for the

yearling cattle were disappointing with only four grading choice and fifteen grading select. Yield grades indicated that cattle were still relatively lean with five steers at yield grade #1, ten head at yield grade #2, and four head at yield grade #3 (Table 2). All of the yearlings were scanned at the end of the trial by a certified ultrasound technician and had an average backfat of 0.28 in. and an average ribeye area of 12.5 sq. in. Only one calf and four yearlings harvested were from the late supplemental groups.

Costs. The cost assumptions were that the by-product feed cost 7¢/lb delivered plus \$2/day for a self-feeder for each group (these were the actual costs) and \$40/acre for pasture stocked with 1.5 cattle per acre. The costs for each group are shown in Table 2. Average daily feed cost for the by-product feed including feeder rent ranged from \$1.19/day to \$1.48/day. Costs were higher for the yearlings because they ate more feed. Feed cost of gain was from 46¢ to 82¢ per pound of gain. When the pasture cost was included the cost of gain was \$53 to \$96 per cwt of gain. The late supplemented yearlings were the highest cost because of their low gain. Death loss was not included in cost of gain calculations.

Conclusions

Some lessons can be derived from this study.

- The by-product feed was a ration that the cattle consumed readily from self-feeders with minimal problems.
- The by-product feed should be offered as soon as the cattle are put in pasture for maximal gains.
- Yearlings can reach market weight on grass with supplementation of a by-product feed.
- With good grass, yearling steers can be expected to gain 400 to 500 lb over six months of grazing with by-product feed supplementation.
- Daily gains of about 2.5 lb/day can be expected with this system.
- Achieving choice grade may be challenging with this system.
- Cattle could meet "natural" or "grass-finished" criteria, but not "organic" using this system.
- Pasture quality is a factor in this system.

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Table 1. Composition and calculated analysis of a by-product feed mix.

Composition	%
DDGS	50.0
Soy hulls	25.0
Wheat midds	20.9
Molasses	2.5
Calcium carbonate	<u>1.6</u>
Total	100.0
Calculated Analysis	
Dry matter, %	90.1
Crude protein, %	21.8
Calcium, %	.94
Phosphorus, %	.67
NE _m	.91
NE _g	.61
TDN, %	85.9

Table 2. Performance of grazing beef cattle supplemented with by-product feed.

	Calves		Yearlings	
	Early suppl.	Late suppl.	Early suppl.	Late suppl.
Number, head	26	27	21	32 ¹
Stocking rate, hd/A	1.34	1.48	1.49	1.56
Live weight				
Avg lb ² (4/21/05)	433	435	735	734
Avg lb ³ (6/10/05)	582	519	856	760
Avg lb ⁴ (10/12/05)	868	813	1,189	1,048
Body condition score ⁵				
Avg (4/21/05)	3.12	3.26	3.98	3.93
Avg (6/10/05)	4.16	3.44	4.67	3.86
Avg (10/12/05)	6.00	5.60	6.55	5.69
Average daily gain				
First period, lb/day	2.98	1.68	2.42	0.53
Second period, lb/day	2.31	2.37	2.68	2.32
Overall, lb/day	2.50	2.17	2.61	1.80
Avg feed consumed, lb/day	15.5	17.4	19.9	20.1
Choice or better %	25	0	20	25
YG 1 and 2, %	100	100	73	100
Avg daily feed cost ⁶ , \$/day/hd	1.16	1.29	1.46	1.48
Feed cost of gain ⁶ , \$/cwt of gain	46	59	56	82
Total cost of gain ⁷ , \$/cwt of gain	53	67	64	96
Marketed off-grass, hd	4	1	15	4
Marketed off-grass, %	15.4	3.7	71.4	14.3

¹During the study, 2 steers died and 2 steers were removed. The effective number was 30.5 head.

²In date was April 21, 2005. Early supplement started this date.

³Mid date was June 10, 2005. Late supplement started this date.

⁴Out date was October 12, 2005.

⁵Body condition score: 1=extremely thin, 9=extremely fat.

⁶Includes \$2/day self-feeder rent for 30 cattle or 7¢/hd/day.

⁷Includes 17¢/day pasture rent or \$40/acre for 1.5 head of cattle/acre. Death loss not included.