Grazing Corn For Finishing Beef and Growing Dairy Heifers

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Typically corn is ensiled, harvested for grain and the aftermath grazed, but there is growing interest to graze whole standing plants. Grazing mature corn in the upper Midwest has the potential to extend the grazing season, help spread manure on cropland, and reduce or eliminate the need for a feedlot when finishing animals. Pasturing corn eliminates the day-to-day feeding chores associated with confined systems. However, basic animal performance and economic information for grazing mature corn is limited. Research in the upper Midwest has shown that gestating beef cows gained 2.2 lbs/d while grazing unsupplemented corn in October and November. Current North Dakota research suggests that non-lactating cows can be wintered on whole-corn plant forage plus a protein supplement and minerals from November to January.

Swath grazing is an alternative strategy to utilizing corn in livestock systems. Winter swath grazing involves swathing a crop in fall around the time of a killing frost and leaving the windrows in the field to be grazed in November or later. It reduces requirements for baled hay for winter feeding, reducing costs. Seeding in May results in higher yields, but the crop is over mature when swathed in late fall. May seeded crops could perhaps be swathed in August to provide summer grazing during a drought period. Mid-late June plantings are at the proper maturity (soft dough) in September, but are lower yielding. Certain breeds of cattle may find it difficult to graze on snow covered corn in the swath.

This article reports on corn grazing studies conducted in west central Minnesota to address producer interest in grazing standing corn. One trial conducted at the West Central Research and Outreach Center (WCROC), near Morris, MN evaluated grazing corn vs. feedlot performance for growing heifers. Three additional trials evaluated finishing beef steers. One beef trial was conducted at the WCROC; the other two beef finishing trials were conducted on area farms.

Dairy Heifer Trial

Animal performance of dairy heifers grazing standing corn vs. feedlots are compared in Table 1. Dairy heifers grazing mature corn gained 2.3 lb/d and 497 lb/ac. Feedlot heifers gained 3.4 lb/d over the 70 day period that the heifers were grazing corn.

Table 1. Summary Statistics for Dairy Heifers

	Corn Grazing Heifers	Feedlot Finished Heifers
Avg. Starting Weight	930	995
Avg. Ending Weight	1100	1230
Avg. Daily Gain	2.3	3.4

Economic evaluation of grazing corn included: seed, fertilizer, machinery, fencing and supplementation (labor not included). Table 2 summarizes field time and machinery costs. Machinery costs, both operating and overhead, are based on the MN Farm Machinery Economic Cost Estimates for 1999.

Table 2. Field Operations for Planting Corn

	Time (hours)	$/hour	Total Cost	Cost per Acre
Moldboard Plow	**1.2**	42.89	51.47	8.58
Cultivate	**0.6**	31.83	19.10	3.18
Plant	**0.5**	57.91	28.96	4.83
Fertilizer Application	**0.3**	49.57	14.87	2.48
Chemical Application	**0.3**	21.33	6.40	1.07
Total Cost			**$120.80**	**$20.14**

Heifers were supplemented while grazing corn. Supplement was fed at 5 lbs per head per day. Fencing costs were amortized over 20 years, resulting in an annual per acre cost of $7.24. A one inch water line watering system was amortized over 10 years, resulting in an annual per acre cost of $19.97. Costs calculated on a pound of gain basis are summarized in Table 3. There is no land charge in this analysis.

Feedlot heifers were fed a ration of corn silage, alfalfa silage, corn grain, soybean meal, salt and dical. It was fed at a rate of 45.3 lbs per head per day on an as-fed basis. The cost of the ration was $0.018/pound. Total feed cost over 70 days was $1,027 or $0.24 per lb of gain. A fixed cost of $500 for the facilities was charged. Total cost per pound of gain for the feedlot heifers was $0.36, well below the $0.56 per pound of gain for corn grazing heifers. High supplementation cost ($0.26) was the primary factor accounting for the higher cost per pound of gain for animals grazing corn. Supplementation costs per pound of gain for corn grazing heifers were greater than total feed costs per pound of gain in the feedlot.

Another way to evaluate the economics of grazing mature corn is to compare it to the value of harvesting it for grain. Estimated grain yield of the grazed corn was 165 bu/ac. At a price of $2.25/bu for the corn grain, gross return per acre would be $371.25. Gross per acre returns from grazing corn, assuming a value of $70/cwt would be $347.85.

Table 3. Cost per pound of gain

Input	Cost per pound of gain
Seed	$0.09
Fertilizer	$0.03
Chemicals	$0.09
Supplementation	$0.26
Machinery	$0.04
Fencing and watering (Amortized Cost)	$0.05
Total	**$0.56**

Beef Trials

In the beef finishing trial at the WCROC, cattle grazing corn achieved lower final weights (1142 vs. 1227 lb., respectively); had lower backfat measurements (0.24 vs. 0.29 in., respectively); and lower average daily gains (2.7 vs. 3.5 lb/d, respectively) when compared to the feedlot cattle (Table 4).

In the two on farm trials, economic as well as animal performance information was collected (Table 4). At one farm (A), 28 beef steers gained on average 2.3 lb/d, which translated into 380 lb/ac. At the second farm (B) steers gained 2.8 lb/d and 395 lb/ac. Economic evaluation of grazing corn input costs included: seed, fertilizer, machinery, fencing and supplementation (labor not included). This resulted in a cost per pound of gain of $0.39 for corn grazed steers at farm A and $0.67 at farm B. The striking difference between the two operations is due in large part to fertilizer and machinery costs. Farm B had more tillage operations in planting corn, but the major expense at farm B was $73.33/ac in fertilizer costs.

Table 4. Comparative animal performance data across corn grazing trials and compared to conventional feedlot values.

Location	Initial Weight (lb)	Final Weight (lb)	Average. Daily Gain (lb/d)	Gain per Acre (lb/ac)	Cost per Pound of Gain ($)
Conventional Feedlot (WCROC)	964	1227	3.5	-	-
Corn Grazing (WCROC)	951	1142	2.7	459	-
Farm A	740	800	2.3	380	0.39
Farm B	940	810	2.8	395	0.67

Finishing animals by grazing standing corn will require different strategies and skills than typical pasture grazing or finishing in a feedlot. Because of slower rates of gain, this data suggests a longer period to finish animals when grazing is compared to a feedlot.

In these studies the costs and returns for grazing corn were highly variable and more expensive than the cost of a feedlot system. Economics of grazing corn will, of course, vary with cost of gain and value of corn. In some situations there may be manure or environmental issues that make grazing mature corn an attractive alternative to a feedlot system. In other situations it may be facility or philosophical considerations that may make grazing mature corn an option for producers. However, input costs (in this study, supplement and fertility) must be carefully managed if grazing mature corn is going to be an economically attractive alternative to producers.