

Finishing time and weights of grass-fed beef animals

NCR-SARE Project #FNC12-860

Final Report Summary, April 2015

Acknowledgements

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Abstract

Environmental impact of grass-fed beef was greater than feedlot-finished beef in a 2010 life cycle analysis (LCA) of beef production systems.¹ The LCA assumed 1100 lbs. live weight and 22 months of age at slaughter for grass-fed beef; compared to 1400 lbs. and 17 months for feedlot beef. The grass-fed beef figures came from data sets that may have included heritage cattle breeds and/or use of poor-quality forage. This project tracked grass-fed beef steers with modern British genetics, born in 2011 and 2012 on four Minnesota farms. Calculation of an age-weight index allowed comparison between steers in this study and the model grass-fed and feedlot steers from the LCA study. One farm using dairy infrastructure and feeding high-quality forage had many steers that approached and one that exceeded the performance of feedlot steers, indicating potential for an all-forage system to produce beef efficiently while gaining the environmental benefits of perennial forage. One farm with both a modern British breed herd and a heritage breed herd under the same management showed a marked difference in age-weight index between the two herds, confirming the possibility of confounding effects of cattle breed in studies of grass-fed systems.

¹ Nathan Pelletier, Rich Pirog, and Rebecca Rasmussen. 2010. Comparative life cycle environmental impacts of three beef production strategies in the Upper Midwestern United States. *Agricultural Systems*. 103(6):380-389. <http://www.sciencedirect.com/science/article/pii/S0308521X10000399>

<p>Table 1. Description of the four farms in the “Finishing time and weights of grass-fed beef animals” NCR-SARE Project #FNC12-860.</p>	
<p>Grass Meadows Farm Pine City, MN Jake and Lindsay Grass have a joint operation with relatives located farther north in Iron, MN. Calves are born at the Iron location, a 210-acre farm. Beef steers are intensively rotationally grazed for their finishing on 70 acres at the Pine City location. Pastures include cool-season grass and legume species: red and white clover, alfalfa, birdsfoot trefoil, tall fescue, orchardgrass, timothy. Two paddocks are in warm-season annuals; sorghum-sudangrass or grazing corn. Winter feed is produced on about 120 acres of rented land. Winter feed protocol includes three separate streams of feed types offered to cattle. Finished beef cattle are sold to Thousand Hills Cattle Company.</p>	<p>Bill McMillin Plainview, MN During the course of this project Bill had a cow/calf herd of 30 and grass-fed beef finishing operation. All cattle are rotationally grazed in summer on 40 acres of cool-season grasses and legumes. Bill uses his former dairy infrastructure to produce alfalfa hay and haylage for his winter feed on about 35 acres. Cows get a combination hay and haylage ration with lower-quality hay, and steers get a similar ration with higher-quality hay. Finished beef animals are sold to Hidden Stream Farm, a regional distributor of grass-fed beef, pastured pork and chicken and organic produce.</p>
<p>Jane Jewett Palisade, MN Jane has a cow/calf herd of 12 and finishes animals on 71 acres of rotationally grazed pastures. Pastures include birdsfoot trefoil, quackgrass, timothy, red and alsike clovers, orchardgrass, tall fescue, reed canarygrass, and Canadian bluejoint. Hay is purchased from her brother, who uses about 50 acres of rented land to produce it. Cows have continual access to bales in bale rings in the winter. Nearly all of her beef is direct-marketed through the Grand Rapids Farmers’ Market or by sales of quarters and halves.</p>	<p>Edgar Brown Willow River, MN Edgar has a cow/calf herd of 19 and finishes animals on 60 acres of rotationally grazed pastures. Pastures are cool-season grasses, alfalfa and clover. He makes hay on about 100 acres rented from neighboring farms. Cows have free access to bales without bale rings in winter, and sort for their preferred fraction of the hay. Some of Edgar’s beef is direct-marketed locally, and the remaining animals are sold to Thousand Hills Cattle Company.</p>

Figure 1. Average Age-Weight Index for four farms, compared to standard figures for feedlot and grass-fed beef.†

† LCA-Feedlot and LCA-Grass-fed figures come from Pelletier et al., 2010

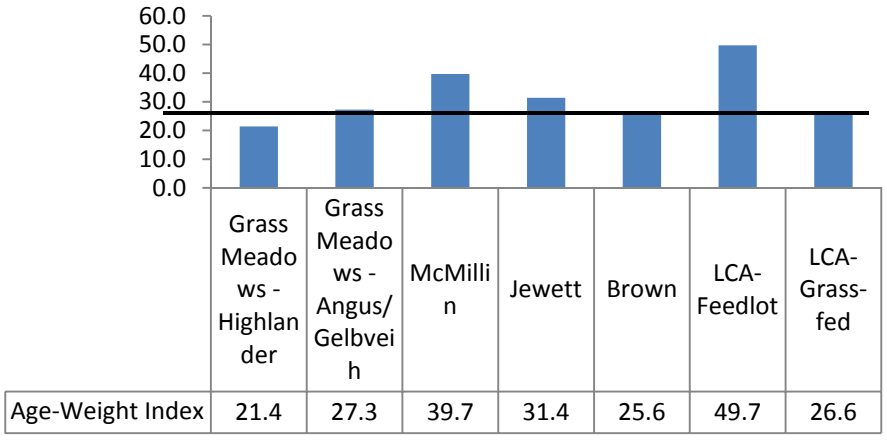


Figure 2. Age-Weight Index of grass-fed steers from four Minnesota farms, compared to figures calculated from Pelletier, et al. (2010) life cycle analysis (LCA) for feedlot beef and grass-fed beef.

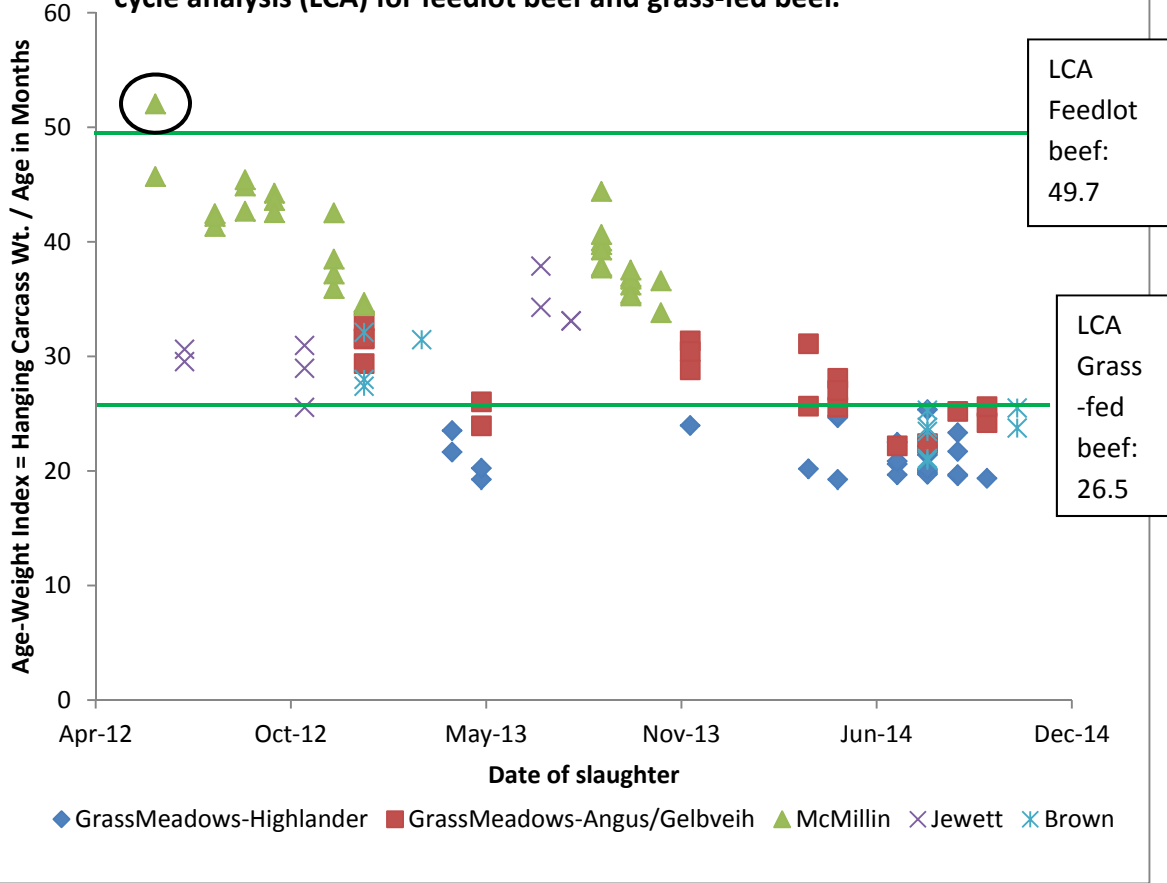


Table 2. Hay and haylage average RFV and winter feeding system on the four farms during this study.			
Brown	Grass Meadows	Jewett	McMillin
RFV = 90	RFV = 105	RFV = 108	RFV = 138
Round bales; cattle sort for preferred portion of hay	Multiple forage types; cattle fed 3 types at a time and allowed to choose	Round bales; bale rings used to minimize waste and sorting	Hay and haylage; bunk feeding; some bale ring use

Table 3. Comparative economics of the four farms in this study.				
	Brown	Grass Meadows	Jewett	McMillin
Feed \$/steer	\$ 947	\$ 1,135	\$ 968	\$ 1,346
Avg. lbs. carcass wt.	617	571	528	675
\$/steer gross	\$ 1,990	\$ 1,841	\$ 1,703	\$ 2,177
\$/steer net	\$ 1,043	\$ 707	\$ 735	\$ 831
\$/acre net	\$ 124	\$ 212	\$ 73	\$ 332
Feed \$/steer includes feed for the cow during the pre-weaning phase. Stored feed costs were calculated based on RFV and hay auction prices from Sauk Centre, MN in November 2014: http://www.midamericanauctioninc.com/hay-sale-results . Cost of pasture and cropland rental were from U of MN: http://www.cffm.umn.edu/publications/pubs/farmmgtopics/rentalrates.pdf ; and from Vance Haugen (personal communication). Grass-fed beef prices were based on carcass weight and were the midpoint of the range reported by the USDA-AMS: http://www.ams.usda.gov/mnreports/nw_ls110.txt . \$/acre includes acres used for pasture and for production of winter stored forage.				

Based on the spread of animal performance seen within and among these four farms, there is clearly potential here for grass-fed beef production efficiency to improve. The right combination of genetics, feed quality, and management system can generate grass-fed beef carcass weights and finishing times that are at least more competitive with feedlot beef than is often acknowledged. More systems work is needed to optimize grass-fed beef production systems.

In terms of economics, widely varying grass-fed beef production systems can be profitable. All of the production systems used returned an acceptable net \$/acre based on the land values in their area. The highest net \$/steer, surprisingly, was the Brown farm with the lowest RFV for winter feed.

The complete report can be viewed on the SARE website:

<http://mysare.sare.org/mySARE/ProjectReport.aspx?do=viewProj&pn=FNC12-860>