

Final Report
**An Economic Comparison of Pasture Based Beef Breeding
Herds and Cash Crops in Southern Ontario**

A Report Prepared by:

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For

The Ontario Soil and Crop Improvement Association (OSCIA)
(with funding from the Great Lakes Agricultural Stewardship Initiative (GLASI))

March 31, 2016

Table of Contents

A. Summary	2
B. Introduction.....	2
C. The Study	4
i. Overview	4
ii. Economic analysis – Net revenue per acre.....	6
D. Conclusions.....	8
E. Acknowledgements	9
F. Appendices	10
1. Environmental benefits of forages.....	10
2. Survey Questionnaire.....	11
3. Summary of herd data by producer.....	17
4. Suggestions for future research in pasture beef production.....	18
5. How could more cow-calf production be encouraged in Ontario?.....	19

List of Figures

Figure 1. Ontario beef cow numbers (thousands of animals), 1990 to 2016.	3
Figure 2: The number of acres of pasture per cow for each herd, compared to the average of 1.54 acres	5
Figure 3: The number of days each herd spent grazing pasture per year, compared to the average of 171 days	5
Figure 4: Net revenue in dollars per acre, comparing beef survey responses to average cash crop prices for 2015	7
Figure 5: Cash crop and beef net revenue, 2005 to 2015	8

List of Tables

Table 1: Change in Ontario forage acres, 2001 to 2011	3
Table 2: Ontario beef cow numbers, 2001 to 2011.....	3
Table 3: Annual cost of establishing and maintaining pasture.....	6

A. Summary

This study was conducted in response to the sharp decline in Ontario forage and pasture acres between the 2006 and 2011 censuses, which is concerning as forage and pasture crops have many well-established environmental benefits (see Appendix 1). This study investigates the ability of pasture-raised beef to compete financially with cash-crop production in southwestern Ontario.

Fifteen cow-calf producers in southwestern Ontario participated in this study by completing an in-depth survey. Herd size ranged from 30 to 350 cattle, with an average of 152 cattle per herd. Acreages devoted to pasture ranged from 33 ac to 650 ac. The small number of producers included in this report makes it an excellent case study, focused on a group of skilled and engaged cattle producers. Caution should be taken against drawing general conclusions about the profitability of the beef sector from this case study sized effort.

During 2015, the net revenue for corn, soybeans and the grazing portion of these select beef enterprises was calculated. The estimated net revenue from grazing averaged \$366 per acre as compared to \$286 and \$226 per acre for corn and soybeans, respectively. This case study shows that in 2015, grazed beef production, via cow-calf style operations, was competitive with cash crop production in southwestern Ontario, when considering the costs incurred during the grazing season.

Historical comparisons of corn, soy and beef net revenues between 2005 and 2015 show that the price for beef (\$/lb) was more consistent than the price of either cash crop (\$/bu). In five of those 10 years, growing corn was more profitable than pasture raising beef, while for three years corn was less profitable. In that same span of 10 years, six years show soybeans being more profitable than pasture raised beef, and five years had soybeans as less profitable.

The net revenue of the study herds varied from \$180 per acre to \$551 per acre. A broader and more in-depth study would be required to determine the factors that contributed to this variability.

B. Introduction

Recently, cash crop prices have been declining while the price for beef has been increasing. The North American beef herd is now at its smallest size since the 1950s, which is helping to drive increasing prices. This case study will investigate if, with the use of modern pasture management, pasture-based beef systems can be financially competitive with cash crop production.

Between 2006 and 2011 over 500,000 acres of Ontario forage and pasture lands were converted to cash crop acres (Table 1). This corresponds to a decrease of almost 70,000 beef cattle during the same period (Table 2). The principal driving factor behind this decrease was modest net revenues from beef production, particularly when compared to high prices for cash crops such as corn and soybeans during that timeframe. Declining ability to profit from beef production led to the retirement of many older and marginal beef producers. These farms were generally transitioned into cash crop operations.

Table 1: Change in Ontario forage acres, 2001 to 2011¹

Census year	Crop (Acres)				Change
	Alfalfa and mixtures	Other tame hay and fodder	Tame pasture	Total	
2001	1,610,809	893,217	773,650	3,277,676	
2006	1,622,370	900,267	749,719	3,272,356	-5,320
2011	1,346,210	731,701	648,758	2,726,669	-545,687

Table 2: Ontario beef cow numbers, 2001 to 2011²

Census year	Beef cows	Replacement heifers > 1 year	Total	Change
2001	376,020	81,932	457,952	
2006	377,354	48,756	426,110	-31,842
2011	282,062	41,986	324,048	-102,062

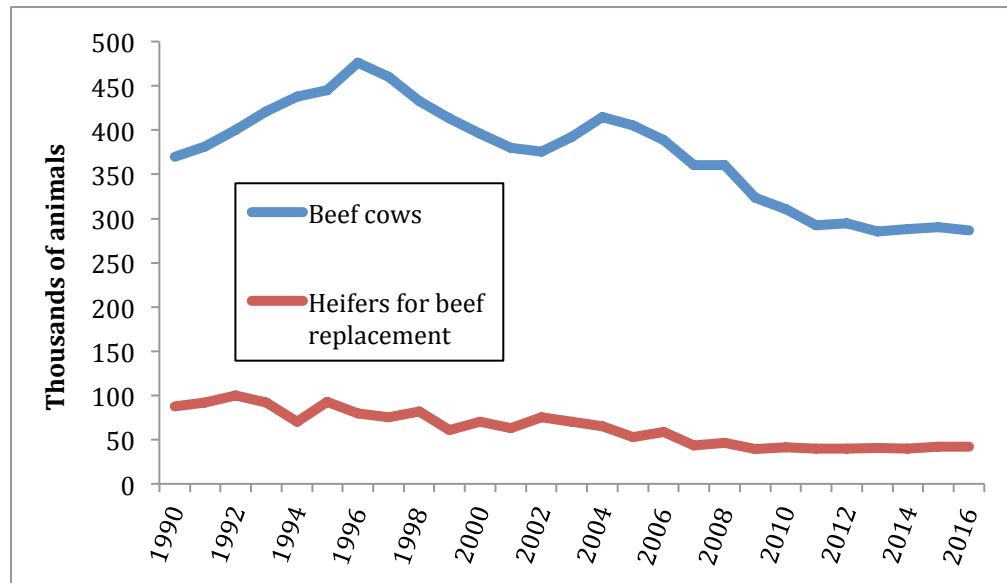


Figure 1. Ontario beef cow numbers (thousands of animals), 1990 to 2016³

This study compares net revenue for cash crops and pasture grazed beef operations to determine if beef can be a viable financial production option in southwestern Ontario, particularly when modern pasture management practices are used. The net revenue for cash crops was obtained from OMAFRA’s published crop budgets, reported Agricorp yield averages and Risk

¹ Statistics Canada

² Statistics Canada

³ Statistics Canada

Management Plan (RMP) price levels for the 2005-2015 growing seasons. On-farm data from 15 successful cow-calf operators has been collected and analyzed to allow comparisons to the cash-crop data over the same time frame. The cow-calf operators relied upon in this study were selected to be representative of the industry in terms of geography, scale of operation and type of herd (purebred or commercial).

C. The Study

i. Overview

Fifteen producers, identified as being skilled grazing managers through a variety of industry sources, agreed to participate in the study (Appendix 2). All 15 producers are located within southwestern Ontario, between Cayuga, Chesley and Chatham. Producers were contacted in person (n=14) or by telephone (n=1) in February and early March of 2015. They were asked for details of their beef herds and management practices, as well as potential future research priorities for grazing, and what could be done to encourage cow-calf production in Ontario. Detailed responses to the two latter questions are summarized in Appendices 4 and 5.

Herd size in the study farms ranges from 30 to 250 head of cattle, with an average of 152 head per herd. Total farm size ranges from 88 ac to 2,000 ac with between 33 ac and 650 ac devoted to grass and/or legume pasture. For the purposes of this study, pasture is defined as grass/legume mixtures devoted to grazing either on a permanent or rotational basis. A number of participants include alternative management practices such as grazing crop residues like corn stalks, grazing cover crops following the harvest of cash crops and, in one case, grazing standing corn that was left purposely for winter grazing. While these can be important aspects of producing beef in Ontario, they were difficult to accurately quantify and were not included in the analysis, and outside the parameters established for the study. See Appendix 3 for a complete summary of the survey data.

As shown in Figure 2, an average of 1.54ac/cow are devoted to pasture, with a minimum area of 0.91ac/cow to a maximum of 3.23ac/cow. Two of the producers kept all, or a major portion, of their herd in dry lot during the summer months rendering that data unsuitable for this analysis.

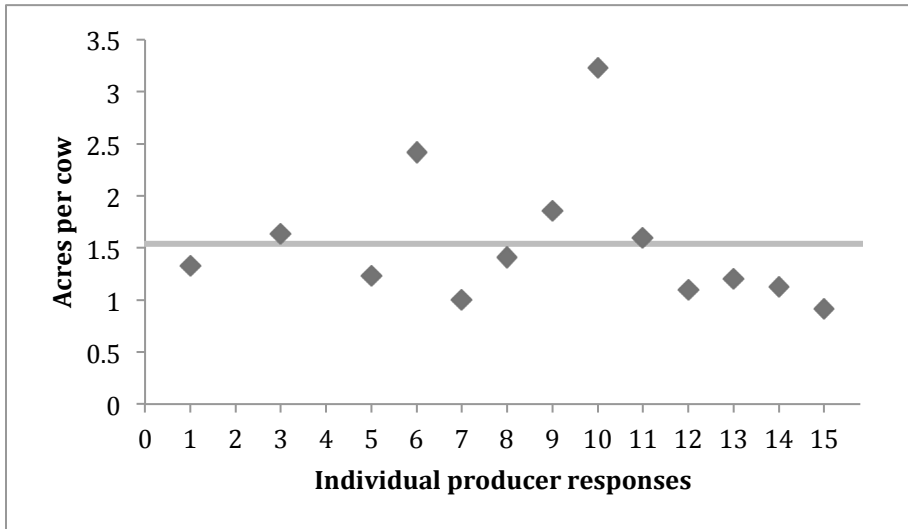


Figure 2: The number of acres of pasture per cow for each herd, compared to the average of 1.54 acres

Cattle were grazed for an average of 171 days, however this varies annually due to weather conditions and the availability of grazing land (Figure 3). Most grazing occurs between May and September, although some herds are able to graze longer. As stated previously, days spent grazing alternative forages were not included in the analysis.

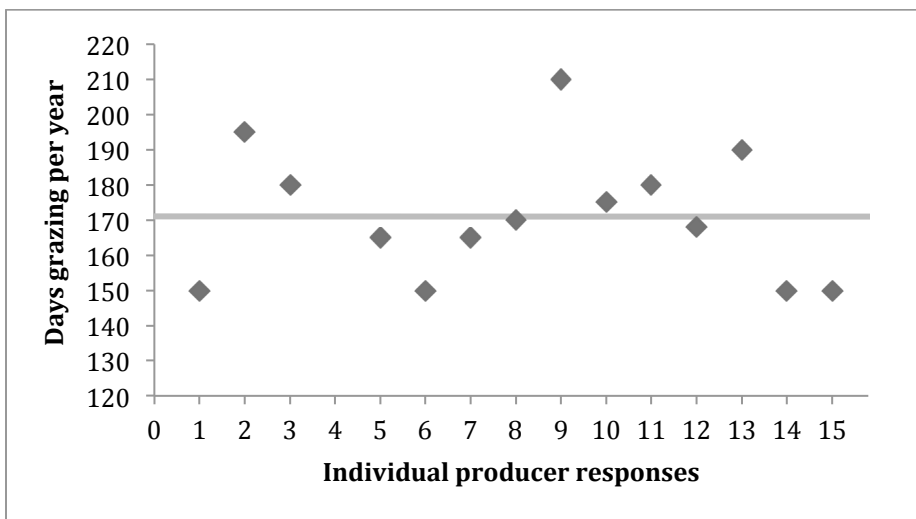


Figure 3: The number of days each herd spent grazing pasture per year, compared to the average of 171 days

ii. Economic analysis – Net revenue per acre

For the purpose of this analysis, it was necessary to estimate an annualized cost of establishing and maintaining a pasture system⁴. The Annual Maintenance Cost aims to account for expenses such as hydro, fertilizer and labour. The labour expense will be highly variable depending on many factors, and in some cases may exceed this figure (Table 3).

Table 3: Annual cost of establishing and maintaining pasture

Item	Capital Cost	Life Expectancy	Annual Capital Cost	Annual Maintenance Cost	Total Annual Cost
Fencing	\$100.00/ac	20 years	\$5.00/ac	\$5.00/ac	\$10.00/ac
Water	\$50.00/ac	10 years	\$5.00/ac	\$5.00/ac	\$10.00/ac
Seeding	\$300.00/ac	10 years	\$30.00/ac	\$30.00/ac	\$60.00/ac
Total	\$450.00/ac		\$40.00/ac	\$40.00/ac	\$80.00/ac

Average revenue values for crop production were used as benchmark figures⁵. Figures were derived for Chatham-Kent, Huron and Bruce counties. Given the consistency of the data in the area, figures for no-till crops in Huron County were chosen to be representative.

To calculate beef production attributed to pasture, the percentage of days the cattle grazed (e.g. $171/365 = 47\%$) was multiplied that by the pounds of beef produced during the grazing season (e.g. 600 pound calf times $47\% = 282$ pounds). This value was divided by the number of acres of pasture within that farm operation to determine a pounds of beef produced per acre value. To determine gross revenue per acre, pounds of beef produced per acre was multiplied by \$2.66, which was the average Ontario price per pound for a 500 to 599 pound steer in 2015.

It is important to note that cull cows were removed from these calculations. Total beef production (lbs) including cull cows was collected, however this provided highly variable data depending on whether a producer was reducing or increasing the herd. For a more meaningful comparison, beef from cull cows was eliminated. The calculations were based on analysis of pounds of beef from calves. In most cases, this was from calves born on the farm and marketed in 2015, but in a few cases some stockers were grazed, and their net gain was included.

To calculate net revenue per acre, the average cost for establishing and maintaining pasture of \$80/acre (Table 3) was deducted from the gross revenue. The resulting individual net revenue values for the study herds compared to the average net revenue for cash crops are shown in Figure 4. These values do not include land costs (rent, property taxes and interest). It is also worth noting that there are many opportunities for producers to receive a calf price greater than the average such as utilizing certified health programs and grouping calves for sales.

⁴ Jack Kyle, Forage Extension Specialist (retired from OMAFRA).

⁵ Steven Duff, Chief Economist, OMAFRA.

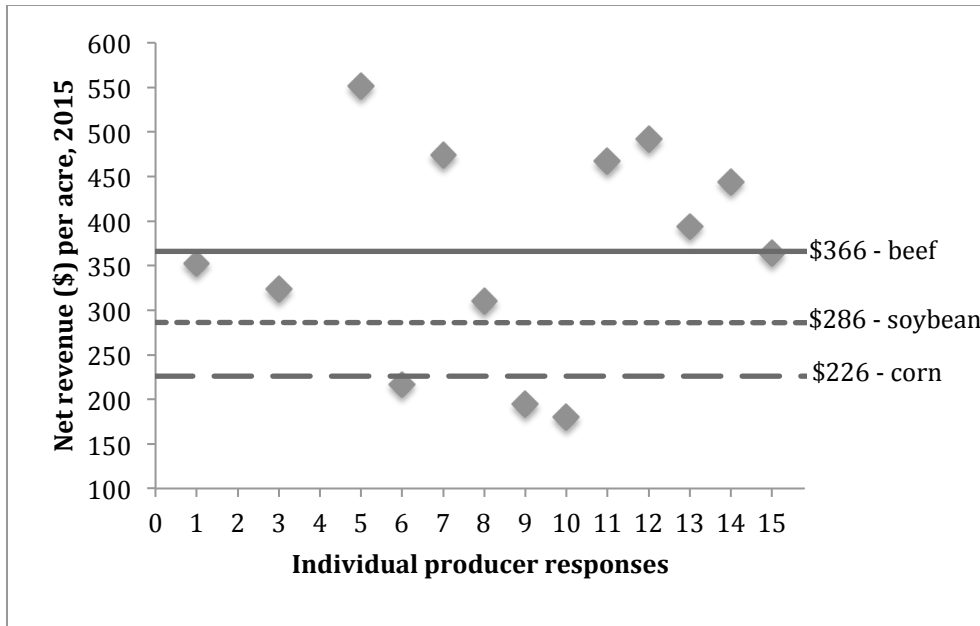


Figure 4: Net revenue in dollars per acre, comparing beef survey responses to average cash crop prices for 2015

The beef herds surveyed saw an average net revenue of \$366/acre of pasture, based on the grazing season portion of the year. In comparison, the average net revenue from soybeans was \$286/acre and from corn \$226/acre. While there were many variables involved in deriving the beef numbers, it is worth noting that only 3 of the 13 participating producers saw net revenue for pasture fed beef production below those of the cash crop averages in 2015.

The past 10 years have seen highly variable commodity prices in Ontario. As can be seen in Figure 5, corn net revenue were lower than the estimates for beef in 3 years, similar in 3 and higher in 5. Soybean net revenue were lower than beef in 5 years and higher in 6. Pasture raised beef has increase significantly in net revenue in the last few year, and has surpassed revenues for cash crops in 2014 and 2015.



Figure 5: Cash crop and beef net revenue, 2005 to 2015

D. Conclusions

This case study has shown that based on 10 year historic revenue data and a more in-depth survey of revenues in 2015, pasture raised beef production can be a viable business practice in southwestern Ontario. While cash crops may see higher revenues in any given year, the long-term stability of beef revenues may be attractive to some producers.

This survey represents a case study of well-established beef producers in southwestern Ontario for the 2015 year. The estimated costs of beef production are just that, estimates, and will differ from producer to producer and from year to year.

In this snapshot of beef herds compared to average cash crop revenues, pastured beef is more reliable in 2015 revenues and consistency of net revenue year after year. More in-depth study would be required to determine the long-term implications and opportunity cost for producers moving from cash crops to cow-calf production.

Future analysis work should focus on annual costs for both beef production and cash crop production. The inclusion of winter housing, and other non-grazing costs, for beef production were beyond the scope of this case study. Likewise, cash-crop producers likely face costs not included in this study, such as the costs of soil sampling, development of precision tools and maps and equipment or custom work costs, all of which were also beyond the scope of this case study. Future work could also consider environmental measures; such as the economic benefits of soil health increases that a pasture system may offer.

E. Acknowledgements

The author wishes to thank the following:

- Mr. Chad Anderson, beef producer and OSCIA board member, and Mr. Jack Kyle, retired extension grazing specialist, for conceiving this project, obtaining funding and assisting with the project's execution.
- Ms. Katherine Fox and Mr. Dan Ferguson of Beef Farmers of Ontario for their assistance in developing the participant list and contacting producers.
- Mr. Jack McCoubrey of Kenpal Farm Products for assistance in selecting and contacting producers.
- Mr. Steve Duff of OMAFRA for assistance with the economic analysis.
- Ms. Christine Schmalz of OSCIA for assistance with study arrangements.
- Mr. Tim Prior, Brussels Agromart for assistance in selecting co-operators.
- All of the producers who took the time to complete the survey.

F. Appendices

1. Environmental benefits of forages

In a report prepared for the Ontario Forage Council in 2012, five environmental benefits of forage crops, beyond improved soil structure and fertility, were identified:

1. Reduced soil erosion
2. Carbon sequestration
3. Improved species at risk (bird) habitat
4. Prevention and/or reduction of herbicide resistant weeds
5. Improved pollinator habitat and pollination of other crops

The full text of this report is available at <http://ontarioforagecouncil.com/about-us/forage-research/159-rev-draft-3-the-value-of-forages-in-a-high-commodity-price-environment>

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2. Survey Questionnaire

OSCIA/GLASI 2016 Cow/Calf and Cropping Study

1) Contact information

Farm Name: _____

Principal Operator(s) _____

Mailing Address _____

911 Address _____

Email _____

Phone (H) _____ (C) _____

Township _____

County/RM _____

Self-perception as type of Manager:

High Production Low Input Labour Efficient Generalist

2) Farming operation

(Unless otherwise specified all numbers are as of December 31, 2015)

a) General

Number of acres Owned: _____ Rented/Leased _____ Total _____

In the past 5 years has this number has increased decreased .

If so by how much? _____

What % of your acres would you classify as soil type: 1-2 _____ 3-5 _____ 6-7 _____

What is your typical corn heat unit rating: _____

In 2015 how many acres were devoted to crops **not for** the cow herd

Crop _____ Acres

In 2015 how many acres were devoted to crops **for** the cow herd:

Pasture _____ Was this pasture permanent or rotated every _____ years?

Hay or hay crop silage _____

Cereal silage _____

Corn silage _____

Other forage _____

Small grain _____

Corn grain _____

b) Vegetation

Realizing that not all paddocks are the same, please characterize what typical paddock vegetation consists of:

Species present and % of each:

___ Red Clover _____ % of acreage that was seeded or re-seeded

___ Bluegrass for grazing during the last 10 years.

___ Alfalfa

___ Ladino Clover

___ Native White Clover _____ % of pasture used this season from which

___ Birdsfoot Trefoil forages were also harvested mechanically.

___ Orchardgrass

___ Fescue, Tall What species would you plant for any new seeding?

___ Timothy _____

___ Bromegrass, smooth

___ Ryegrass, perennial

___ Reed Canary

___ Quack Grass

___ Weeds (Please specify) _____

Were weeds a problem? Yes No. If yes, which ones and how was the problem dealt with?

Did you forage test the pastures this summer? yes no

c) Fertilization

Did you soil test this year? Yes No If yes # of acres or % _____

Was lime applied to the pasture? Yes No. Did you apply any manure mechanically? Yes No

Was commercial fertilizer applied to the pasture? Yes No

If commercial fertilizer was used, what product(s) were applied and when?

d) Water

Was water provided in every paddock? Yes No

If no, was water available in a lane near paddocks cattle were grazing? Yes No.

Predominant source of pasture water: Well Pond Spring Stream

3) Cow calf operation

a) General

Purebred Commercial

Number of cows and heifers over 6 months being kept for breeding _____

In the past 5 years has this number increased decreased ? If so by how much?

Breed of cattle (1) _____ % _____ Avg. cow weight (lb) _____

(2) _____ % _____ Avg. cow weight (lb) _____

(3) _____ % _____ Avg. cow weight (lb) _____

What is the average culling % _____

What percent of your cows are bred A.I.? _____.

What percent of your heifers are bred A.I.? _____.

Do you try to control internal parasites in your cows? yes, no. Heifers? yes, no.

Do you try to control external parasites in your cows? yes, no. Heifers? yes, no.

Did you sample and test stored forages? yes no

b) Production cycle

When do cows calve? _____ Where? _____

When do cows go to pasture? _____

When come off pasture/grazing? _____

Typical pasture rotation: season _____ days _____
 season _____ days _____
 season _____ days _____

Typical number of days when supplemental feed/forage other than mineral is fed

Feed _____ days _____
Feed _____ days _____

When are calves weaned? _____

Fate of weaned calves not intended for breeding: _____

c) Output

How many pounds of beef did you produce in 2015 as:

Cull cows # _____ @ _____ = _____

Calves produced and sold in 2015# _____ @ _____ = _____

Calves produced in 2015 and kept for breeding# _____ @ _____ = _____

Calves from previous years or purchased (Net gain in 2015) # _____ @ _____ = _____

Breeding stock sold# _____ @ _____ = _____

Total _____

d) Purchased inputs for cow herd

Forages (type and amount) _____ Cost (\$) _____

Grains (type and amount) _____ Cost(\$) _____

Minerals(type and amount) _____ Cost(\$) _____

Parasite control products (type and amount) _____ Cost(\$) _____

Other _____

e) Environmental activities related to cow calf operation

Fenced water sources _____ Pumped water to tanks _____

Manure storage _____

Environmental farm plan _____

Endangered species support _____

Other _____

4) Other livestock enterprises (describe)

5) What should future research priorities relating to cow calf production be?

6) What could be done to encourage more cow calf production in southern Ontario?

3. Summary of herd data by producer

Producer	# cows	Beef production (lbs)	# acres	Acres /cow	Beef /acre	# acres	Acres /cow	Beef /acre (lbs)	Gross revenue (\$)/acre	Net revenue (\$)/acre	Days grazing /year
		Calves	Total			Pasture					
1	134	70,740	330	2.46	214	179	1.33	395	432	352	150
2	300	162,500	696	2.32	233	100	n/a	n/a	n/a	n/a	195
3	200	100,000	495	2.48	202	325	1.63	308	404	324	180
4	100	43,000	203	2	212	8	n/a	n/a	n/a	n/a	n/a
5	70	46,200	167	2.4	277	88	1.23	532	631	551	165
6	118	77,560	294	2.5	271	286	2.42	271	296	216	150
7	65	29,925	195	3	153	65	1	460	554	474	165
8	66	29,300	93	1.41	315	93	1.41	315	390	310	170
9	350	116,600	650	1.85	179	650	1.86	179	275	195	210
10	62	40,800	331	5.34	123	200	3.23	204	260	180	175
11	75	50,080	159	2.12	315	120	1.6	417	547	467	180
12	30	15,400	88	2.9	186	33	1.1	467	571	491	168
13	60	24,300	106	1.77	229	71	1.2	344	474	394	190
14	300	163,000	569	1.89	286	340	1.13	479	524	444	150
15	350	130,000	420	1.2	309	320	0.91	406	444	364	150
Average	152	73,294	320	2.4	234	192	1.54	367	446	366	171
Standard Deviation	115.8	49,748.5	204.2	1.0	60.2	168.8	0.6	108.4	119.1	119.1	18.6
Standard Error	29.9	12,845.0	52.7	0.2	15.6	43.6	0.2	30.1	33.0	33.0	5.0

n/a denotes data that was not used in the economic analysis

4. Suggestions for future research in pasture beef production

Crops

- Impact and/or value of grazing e.g. corn stalks, cover crops on compaction, nutrient recycling/credits, etc.
- Helping agronomists understand value of organic matter in soil when cattle are involved.
- Economics of utilizing cover crops for grazing
- Pasture management under intensive grazing
- Value of legumes vs grasses in Ontario
- Fertility (esp. nitrogen) research on pastures

Cattle

- What are benchmarks for grazing results (what is good, etc.)
- What is ideal cow size/genetics for different markets and grazing systems
- What is the impact of breeding in August with no shade overall heat stress
- Value/issues of virgin bulls as beef source
- EPD of cows for different feeding programs
- How to integrate cows with other operations e.g. cash cropping
- Economic modeling/example agreements/using pasture as rotation
- Long term impact of feeding various by-products, opportunities for grazing supplementation
- Energy and protein needs of cows grazing corn stalks
- Heritability of meat tenderness in cow and bull families

5. How could more cow-calf production be encouraged in Ontario?

- Assistance with capital cost of perimeter fencing (\$20K for 50 acres estimated) (4 producers suggested this)
- Have fencing program like tile drainage (pay over longer time)
- Financing program that includes corrals and handling facilities (especially portable ones)
- Encourage more calf sales through calf clubs (higher net revenue)
- Breeder loan program
- Better marketing for calves (e.g. grouping for sale)
- Better education about what programs are available
- EFP for manure storage
- Economic case for pasture, using pasture as part of rotation
- More flexible rules for source water fencing (page wire too expensive and washes away)
- Quantify the environmental benefits of cows grazing cover crops
- Program to match up cows with producers who have cover crops or corn stubble to be grazed (Program run by Joe Duquart in Dakotas)
- Promote cows as integral part of crop rotation
- Mentorship program for new graziers
- Supply management
- Marketing clubs for calves in non-traditional beef areas