

# Grass-fed and Organic Beef: Production Costs and Breakeven Market Prices, 2008 and 2009

## A.S. Leaflet R2684

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### Summary and Implications

Higher prices offered for grass-fed and organic grass-fed beef appear attractive, but production costs, in many cases, are also higher than for conventional beef. With accurate costs of grass-fed beef production beef producers and potential producers can use these tools to make better informed decisions about entering this specialty beef production stream, establishing breakeven selling prices and determining the necessary selling price for economic sustainability of the enterprise. These data suggest that in 2008 and 2009, after adjustments are made for cull cow sales, these producers would need to receive \$209/hundredweight of live market animal produced to breakeven.

### Introduction

Production costs and the margin between these costs and price have not been well defined or documented for grass-fed or organic grass-fed beef production streams. The objective of this project was to document the costs of production for grass-fed and organic grass-fed beef.

### Materials and Methods

More than 50 grass-fed beef producers in Iowa, Nebraska and Wisconsin were invited to participate in this two-year project. Producers were reimbursed a stipend after completion of each year's data. Twelve producers completed 2008 data, and 11 completed both 2008 and 2009 data. Data collected and analysis was similar to the ISU Beef Cow Business Records SPA computations, with minor changes. Twenty-five of these data sets were used in the final calculation. Operations that were organic but utilized some grain were cow herd only, finish only, or that were in

the process of major inventory changes were excluded from the data set. University Extension Field Beef specialists in Iowa, County Extension agents in Wisconsin, and contract employees in Nebraska met one-on-one with producers to organize production and financial records for their beef enterprises and to document costs and sales.

One challenge in the development of this project was consistent terminology and decisions related to what phases of beef production to use. Many organic and grass-fed operations include the entire life cycle from breeding through harvest with very little differentiation between phases. However, in order to compare all the different types of grass-fed operations and to compare to conventional production, operations were divided into two distinct phases: the cow herd and the finishing phase. This method necessitates assigning a weight and value to the calves as they transfer from one phase to the next in order to 'credit' the phase that produced the weight gain without a true sale value. A few producers actually weighed calves at weaning but most simply estimated the weaning weight.

The value of weaned calves was determined and standardized using the USDA market reporting service for the first January auction at the Tama Livestock Auction, Tama, IA. This auction market is approximately in the geographic center of the three states involved. Based on market prices, breeding animal inventory values was set at \$900 for cows and \$1300 for bulls.

Harvested forage is based on a hay comparison so any high moisture forages were converted to 85% dry matter. Grazing costs were calculated using the actual rental rate for rented ground or the 4% land value charges plus taxes for owned ground. Animal Unit Months are used as the standard measure of grazing days and density. One AUM was calculated to equal 1000 pounds of body weight grazing for 30 days. AUM adjustment involved calculation of grazing days which was multiplied by the beginning body weight of that class of cattle and then converted to AUM. Pasture feed expenses are allocated to the cow herd or finishing herd based on the average number of cows throughout the year, and the average number of growing or market animals throughout the year.

For comparing costs of production, an average of the 2008 and 2009 Suggested Closing Inventory Prices (Table 1) was used to standardize feed prices.

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**Table 1. Suggested closing inventory prices for 2008 and 2009 records.**

Grain (bu.)	2008	2009	Average	Per pound
Corn	\$ 3.00	3.75	3.38	.060
Soybeans	8.00	9.50	8.75	
Oats	1.90	2	1.95	.061
Wheat	4.65	4.50	4.57	
Sorghum (per cwt.)	5.15	5.75	5.40	
Silage (ton)				
Corn silage	\$ 30.00	37.50	33.75	.017
Oat silage	25.00	28	26.50	.013
Haylage	57.50	55	56.25	.028
Hay and Straw				
Alfalfa - per ton	\$ 115.00	110	112.50	.056
Grass - legume - per ton	\$ 90.00	75	82.50	.041
Cornstalks - per ton	\$ 50.00	45	47.50	.024

Depreciation of equipment was calculated at 10% of the value of all machinery and equipment times the percent allocation to the cow herd. Buildings and improvements depreciation was 5% of the value of buildings times the allocation to the cow herd. Depreciation was allocated to enterprises at the same rate as family labor. Cow depreciation is calculated at 5% of the beginning value of the cow herd. Interest charges is the percent of non-land interest paid that is allocated to the cow herd or finishing herd.

Participants did not record the number of cows exposed to the bull in the prior breeding season, so all reproduction values use the number of bred and open cows in the herd on January 1 as the number of cows exposed to bulls the year prior.

Factors considered critical for success in conventional beef cow operations were regressed against cost of production to determine the degree of variation explained.

### Results and Discussion

Table 2 summarizes grazing production costs. This component is particularly crucial to grass based beef operations. On average producers had 1507 acres in grazing production that supported 2186 AUMs of grazing annually. Total pasture costs were \$67 per acre or \$22 per AUM. Of this land costs were the most significant component at \$45 per acre.

Table 3 summarizes production and financial information of the cow-herd enterprise. Total economic costs per cow averaged \$769 or \$190 per cwt produced. Feed costs represent an average of 63% of these costs. Operations averaged an 86% calf crop weaning percentage.

Summarized in Table 4 is the weaning to market summary. This includes feed consumption, grazing days and the hours of labor per head.

The final section (Table 5) is an overall summary of the entire beef operation, where both the cow herd and the finishing operations are combined to show the costs for the full system. Both financial and economic costs are calculated per hundredweight of market beef sold adjusted for cull breeding stock sales. Financial costs include feed, operating and paid labor. Economic costs include financial costs plus depreciation on equipment, facilities, and cattle, and family operating charges. Given the integrated nature of many of these operations, this table represents the most reliable and complete summary of data for both production and costs.

Economic cost per hundredweight of beef produced adjusted for cull breeding stock sales was used as the comparison for all data and is on the X axis. Adjustments are made for breeding stock sales because sales of breeding stock may make one year look more profitable, but will reduce the future earning potential of the operation.

Iowa State University SPA data identifies the top 10 critical factors in determining cow herd profitability, so those were also tested against this set of data. Figure 1 shows that economic cost of the breeding herd per cow defines 13% of variability in the economic cost per cwt of the full operation.

While the only way to have a market animal to sell is to wean a live calf, the weaning percent rate only explained 1% of the variability in total cost of market beef produced (Figure 2). This doesn't negate the importance of weaning rate, but reflects that other factors have more impact on costs of production of the market animal.

Increasing the grazing period of the cow herd accounts for 12% of the variability in the cost of overall beef production (Figure 3). However, grazing days for the wean-to-market herd accounted for only 9% of the overall cost of production (Figure 4). This suggests that effective

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utilization of grazing, especially during the cow-calf phase is an important contributor to lowering cost of production.

Significance of herd size is often questioned in calculating profitability. In this set of records, herd size predicts 19% of the variability in total costs (Figure 5). It appears from the figure that herd size above about 30 to 50 cows has a sizeable impact on cost variation, but little impact below 30-50 cow herd size.

Total cost of all feed fed to the entire operation (Figure 6) predicts 25% of the variation in total costs. This is a factor of both the amount of feed fed and the cost of the feed. This further emphasizes the importance of feed cost in

determining the overall cost. This includes both stored feed used and grazing cost.

These data demonstrate that there is considerable variation in the cost structure of grass based operations. It is reasonable to assume that branded markets should garner a premium for process verified production. Producers need to carefully monitor their costs to ensure that the premiums are sufficient to cover additional cost that may be incurred.

### Acknowledgements

This project was funded by the USDA North Central Regional Sustainable Agriculture Research and Development (NCSARE) Program.

**Table 2. Summary of grazing production costs.**

	Average	Min	Max	Std Dev	Count
Number of Acres in Grazing Production	1507	36	13944	3021	25
Number of Animal Unit Months	2186	123	10419	2693	25
Per Acre					
Land charges	\$45	\$0	\$154	\$38	25
Facility and equipment depreciation	\$3	\$0	\$17	\$4	25
Pasture Operating Expenses	\$8	\$0	\$31	\$8	25
Human & Allocated Cash Costs	\$1	\$0	\$12	\$3	25
Operator & Family Labor	\$11	\$0	\$44	\$14	25
<b>TOTAL PASTURE COSTS</b>	<b>\$67</b>	<b>\$9</b>	<b>\$180</b>	<b>\$50</b>	<b>25</b>
Grazing cost without land charge	\$22	\$0	\$78	\$22	25
Per AUM					
Land charges	\$15	\$0	\$44	\$9	25
Facility and equipment depreciation	\$1	\$0	\$4	\$1	25
Pasture Operating Expenses	\$2	\$0	\$6	\$2	25
Human & Allocated Cash Costs	\$0	\$0	\$5	\$1	25
Operator & Family Labor	\$3	\$0	\$13	\$4	25
<b>TOTAL PASTURE COSTS</b>	<b>\$22</b>	<b>\$9</b>	<b>\$51</b>	<b>\$11</b>	<b>25</b>
Grazing cost without land charge	\$7	\$0	\$18	\$5	25

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**Table 3. Cow herd summary.**

<b>10 Critical Success Factors</b>	ISU-IRM-SPA					
	Iowa State University Extension Animal Science	Average	Min	Max	Std Dev	Count
<b>Return &amp; Cost Factors</b>						
Total Economic Cost per Cow		\$769	\$434	\$1,234	\$232	25
Total Economic Cost per Cwt. Produced		\$190	\$79	\$815	4155	25
<b>Feed Resource Factors</b>						
Total Feed Cost per Cow		\$489	\$228	\$979	\$179	25
Total Feed Cost per Cwt. Produced		\$143	\$50	\$930	\$175	25
Economic Pasture Cost per Animal Unit Month		\$22	\$9	\$51	\$11	25
Stored Feed Fed per Cow (Dry Matter)		5,525	220	9,692	2593	25
<b>Production Factors</b>						
Calf Crop Weaning Percentage		86%	56%	105%	13%	25
Grazing Days per cow (Based on Jan 1 inventory)		209	99	349	68	25
<b>Summary of Feed Utilization in Cow Herd</b>						
	based on cows in the herd on January 1	Average	Min	Max	Std Dev	Count
Dry Matter Consumption:	Lbs / Head					
Forages		5360	220	9654	2614	25
Vit/Min		28	0	108	28	25
other		136	0	1250	358	25
Totals on Dry Matter Basis		5,525	220	9,692	2593	25
<b>Reproduction Rates</b>						
Average producing cows in herd		128	15	655	154	25
Breeding stock death loss, %		2%	0%	6%	2%	25
Number of Females Exposed		131	15	640	157	25
Number of Cows per Bull at Breeding Start		25	0	67	14	25
Calving Percentage		88%	69%	105%	11%	25
Calf Death Loss Percentage		2%	0%	13%	4%	25
Calf Crop (or Weaning) Percentage		86%	56%	105%	13%	25
Female Replacement Rate Percentage		15%	0%	52%	14%	25
Average Weight of Breeding Stock Sold		1142	0	1828	399	25
Average lbs of Breeding Stock Sold / Cow Exposed		255	0	890	253	25
Average lbs of Breeding Stock Sold / Cow in Herd (Ave)		264	0	1101	273	25

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**Table 4. Combined wean to market summary.**

Summary of Feed Utilization in Wean to Market	Average	Min	Max	Std Dev	Count
Dry Matter Consumption:                      Lbs / Head					
Forages	3419	44	8339	2301	25
Vit/Min	24	0	133	29	25
Supplements	90	0	988	241	25
Other	102	0	1811	367	25
 TOTALS On Dry Matter Basis	 3635	 45	 8374	 2329	 25
 Grazing Days per Wean to Market head marketed	 106	 0	 321	 74	 25
 Hours of Labor per wean to market animal	 5	 0	 13	 4	 25

**Table 5. Total beef enterprise income and expense summary.**

	Average	Min	Max	Std Dev	Count
Total pounds of beef produced per acre grazed	205	13	599	136	25
 Financial Costs per cwt market cattle sold	 Financial Cost				
Feed costs: includes pasture and all feed fed	\$156	\$59	\$314	\$84	25
Operating costs	\$46	\$7	\$140	\$37	25
Depreciation: equip. & housing	\$10	\$0	\$37	\$10	25
Depreciation: cattle					
Interest charge	\$5	\$0	\$27	\$7	25
Hired labor	\$26	\$0	\$348	\$80	25
Value of family & operator labor					
 Total cost per cwt market animal sold	 \$218	 \$84	 \$449	 \$116	 25
Adjusted for Cull Breeding Sales	\$197	\$77	\$415	\$99	25
 Economic Costs per cwt market cattle sold	 Economic Cost				
Feed costs: includes pasture and all feed fed	\$156	\$59	\$314	\$84	25
Operating costs	\$46	\$7	\$140	\$37	25
Depreciation: equip. & housing	\$10	\$0	\$37	\$10	25
Depreciation: cattle	\$11	\$3	\$23	\$6	25
Interest charge	\$8	\$2	\$18	\$4	25
Hired labor	\$26	\$0	\$348	\$80	25
Value of family & operator labor	\$44	\$0	\$167	\$43	25
 Total cost per cwt market animal sold	 \$302	 \$107	 \$698	 \$166	 25
Adjusted for Cull Breeding Sales	\$238	\$100	\$473	\$118	25

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	Average	Min	Max	Std Dev	Count
Financial Costs per cwt market cattle produced	Financial Cost				
Feed costs: includes pasture and all feed fed/cwt sold	\$136	\$29	\$408	\$87	25
Operating costs	\$39	\$4	\$114	\$29	25
Depreciation: equip. & housing	\$9	\$0	\$26	\$8	25
Depreciation: cattle					
Interest charge	\$15	\$0	\$179	\$41	25
Hired labor	\$15	\$0	\$179	\$41	25
Value of family & operator labor					
Total cost per cwt market animal produced	\$215	\$58	\$713	\$151	25
Adjusted for Cull Breeding Sales	\$167	\$54	\$418	\$94	25
Economic Costs per cwt market cattle produced	Economic Cost				
Feed costs: includes pasture and all feed fed/cwt sold	\$136	\$29	\$408	\$87	25
Operating costs	\$39	\$4	\$114	\$29	25
Depreciation: equip. & housing	\$9	\$0	\$26	\$8	25
Depreciation: cattle	\$9	\$2	\$26	\$6	25
Interest charge	\$4	\$1	\$11	\$3	25
Hired labor	\$15	\$0	\$179	\$41	25
Value of family & operator labor	\$39	\$0	\$138	\$38	25
Total cost per cwt market animal produced	\$252	\$68	\$705	\$155	25
Adjusted for Cull Breeding Sales	\$209	\$39	\$581	\$127	25

Figure 1. Economic cost of breeding herd per cow.

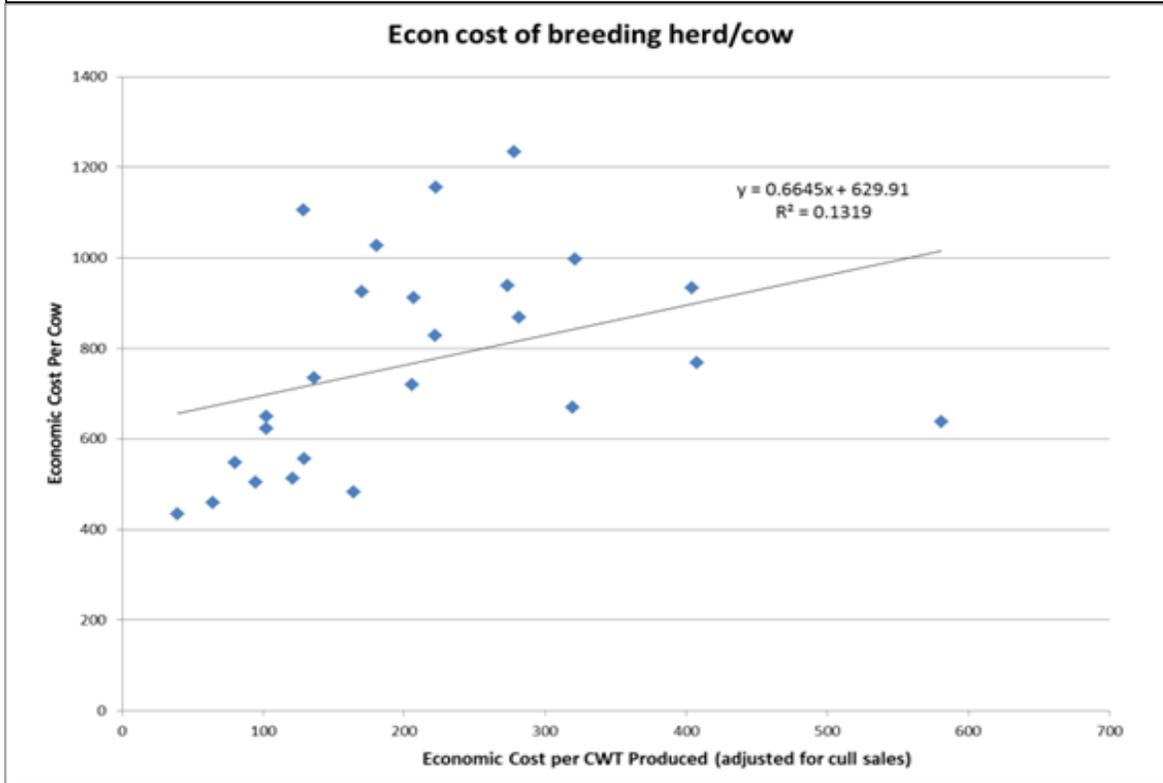


Figure 2. Relationship of weaning percent to economic cost per cwt produced.

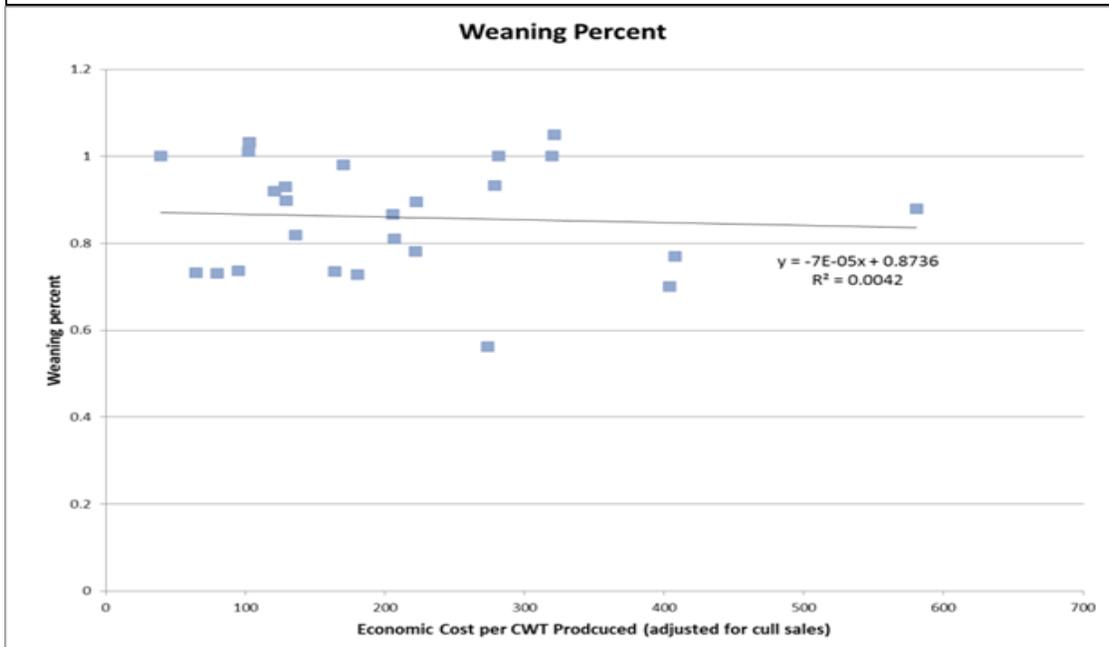


Figure 3. Relationship of grazing days per cow to economic cost per cwt produced.

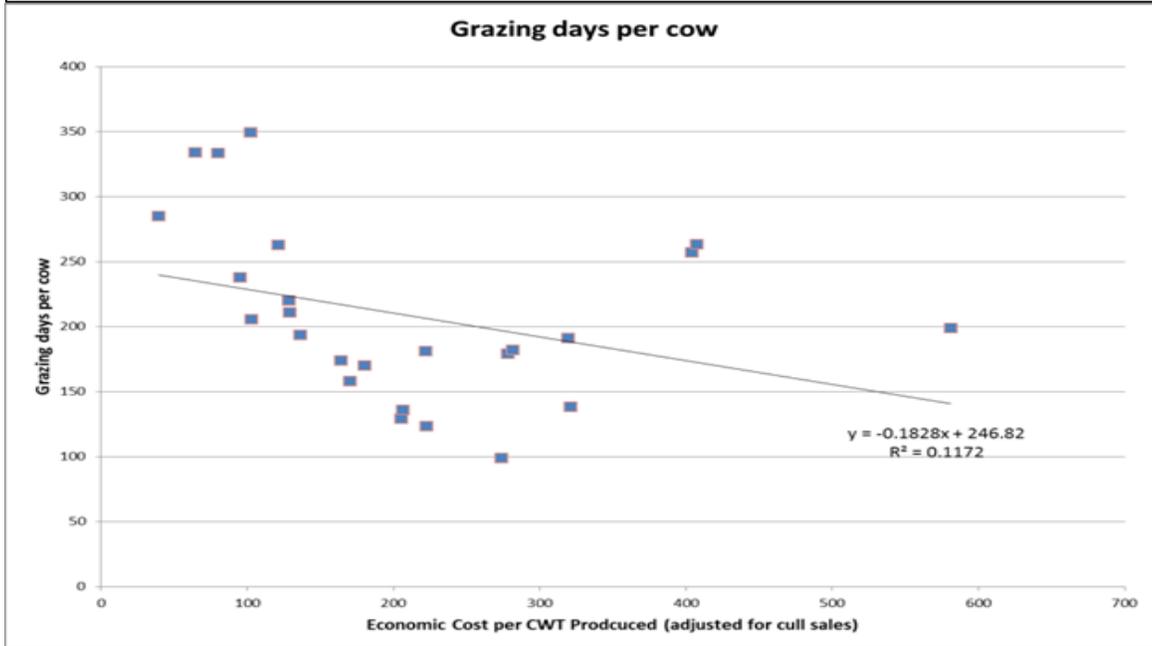
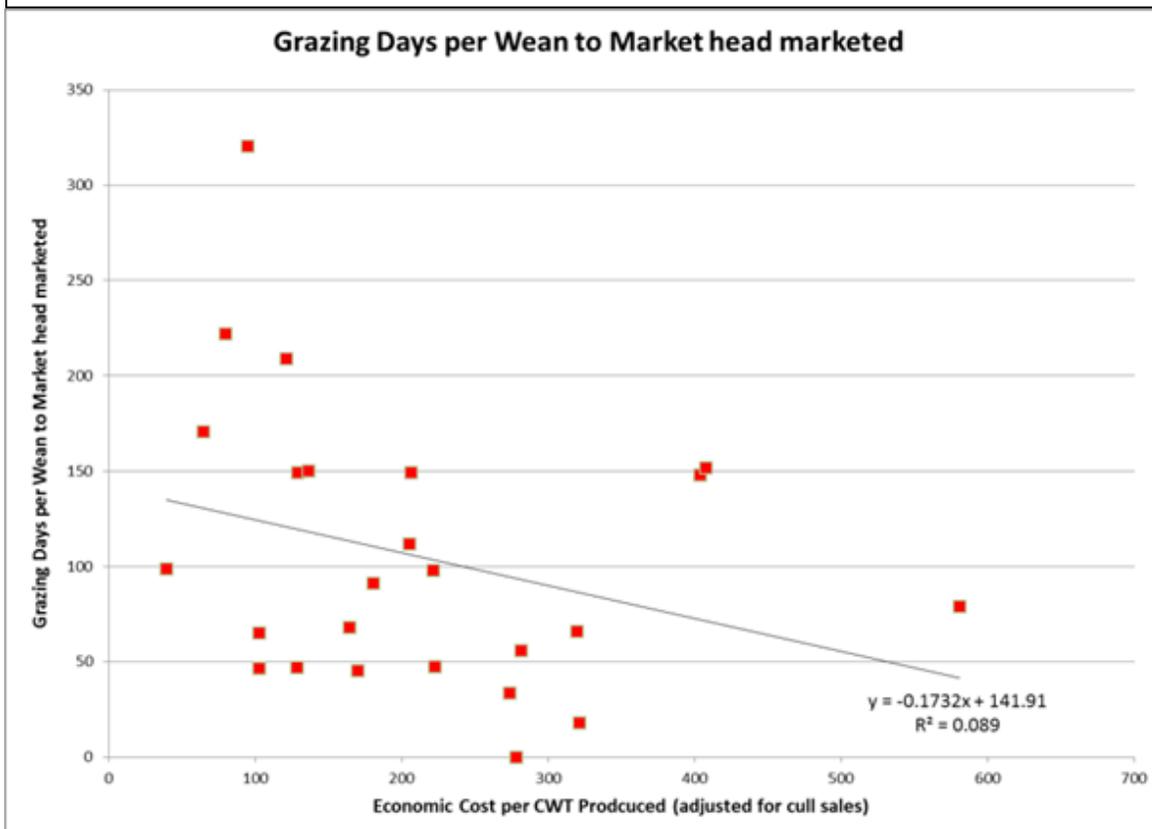
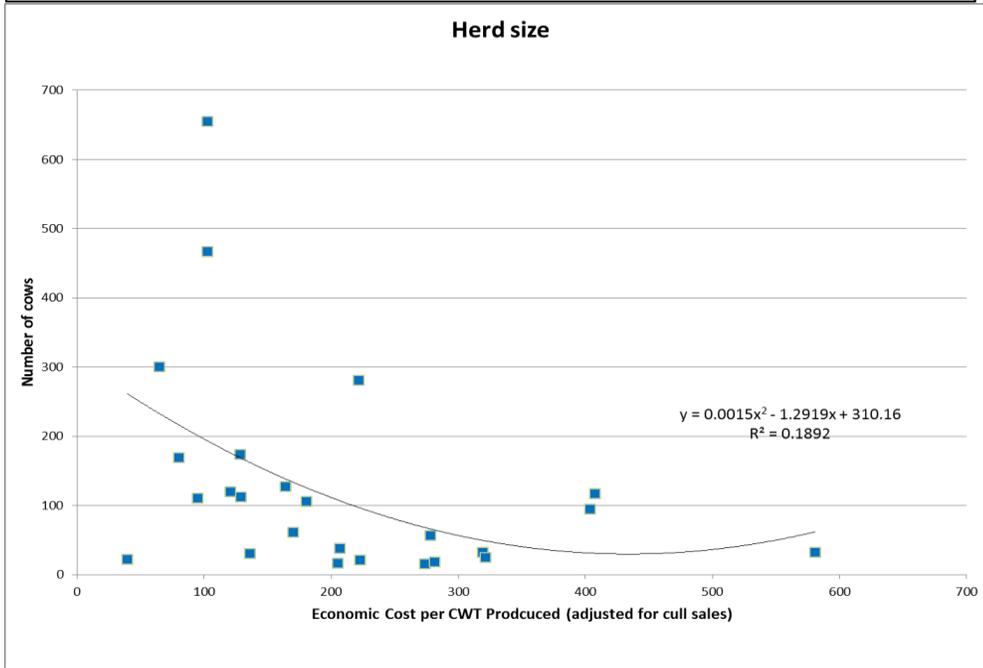


Figure 4. Relationship of grazing days per weaned to market to economic cost per cwt produced.



**Figure 5. Relationship of herd size to economic cost per cwt produced.**



**Figure 6. Relationship of total cost of all feed fed to economic cost per cwt produced.**

