

Regional Multi-State Interpretation of Small Farm Financial Data from the Fifth Year Report on 2004 Great Lakes Grazing Network Grazing Dairy Data October 2005

Overview

The data and conclusions of this paper are derived from the report with the above title from a USDA Initiative for Future Agricultural and Food Systems (IFAFS) Grant project #00-52101-9708. Some strengths of this work include standardized data handling and analysis procedures, combined actual farm data of ten states and one province to provide financial benchmarks to help farm families and their communities be successful and sustainable. The main report is also based upon work supported by Smith Lever funds from the Cooperative State Research, Education and Extension Service, U.S. Department of Agriculture. The full report is available at:

<http://cdp.wisc.edu/pdf/GLGN%20USDA%202004%20ReportF.pdf>

Participating grazing dairy farms must typically obtain 85% or more of gross income from milk sales, or 90% of gross income from dairy livestock sales plus milk sales, harvest over 30% of grazing season forage by grazing and must provide fresh pasture at least once every three days.

Management Intensive Rotational Grazing (MIRG) has become a more common dairy system in the northern U. S. This analysis of actual farm financial data from 101 graziers in 2004, 102 in 2003, 103 in 2002, 126 in 2001, and 92 in 2000 (more than 203 farms supplied at least one year of data), mainly from the Great Lakes region, provides some insight into the economics of grazing as a dairy system in the northern U.S.:

- There is a range of profitability amongst graziers. The ratio between the most profitable half and the least profitable half's Net Farm Income from Operations (NFIFO) per cow and per Hundredweight Equivalent (CWT EQ) was greater in the lower profit years (usually with lower milk prices) than in the higher profit years. For more information, see Fact Sheet #2 of this series.
- The average grazing herd with less than 100 cows had a higher NFIFO per cow and per CWT EQ than the average grazing herd with 100 cows or more. The smallest margin appeared in the 2003 data. For more information, see Fact Sheet #3 of this series.
- Differences between seasonal and non-seasonal calving/milking herds were reviewed. Non-seasonal herds had a large NFIFO per cow and per CWT EQ advantage in 2000 and 2002. The seasonal herds (stop milking at least one day each calendar year) had a large NFIFO per cow and per CWT EQ advantage in 2001 and 2004 and a very small advantage in 2003. **Careful examination of the data suggests that achieving a given level of NFIFO per cow or per CWT EQ is more difficult in a seasonal system.** The seasonal group had a smaller range of financial performance within a year but experienced more variability of financial performance from year to year. Less than 15 percent of the herds in the data were seasonal. For more information, see Fact Sheet #4 of this series.
- The graziers in the study were economically competitive with confinement herds in the states that had comparable data from both groups. For more information, see Fact Sheet #5 of the series.
- While breed of cattle is a minor factor affecting profitability, the Holstein herds in the data had better financial performance in four years of comparisons with other breeds. For more information, see Fact Sheet #6 of this series.
- The ranking of major cost items is remarkably similar between grazing and confinement herds. For more information, see Fact Sheet #7 and #8, of this series.
- Relatively consistent differences in financial performance between states have appeared in all years. These differences must be considered when interpreting the data.

The study also confirms that accounting methodology and financial standards are important both in the accuracy and in the standardization of comparison values across large geographic areas that involve different combinations of production assets and management skills. In comparing the results of this study with other data, it will help to understand the measures used here but not in all places in the country.

Major Cost Items on Wisconsin Grazing and Confinement Dairy Farms

Cost management should receive regular attention on any farm. Focusing on the largest cost categories is an important tactic in controlling costs.

It is widely believed that there is a big difference in cost structure between grazing and non-grazing dairy farms. Actual farm financial data shows that **the similarities are as striking as the differences.**

Ten years (1995-2004) of comparisons of the financial performance of an average of 26 grazing and an average of 736 confinement herds in Wisconsin show that graziers in the data consistently had lower costs per hundredweight equivalent (CWT EQ) and per dollar of income at the basic, non-basic, allocated and total cost levels and had higher net farm income from operations (NFIFO)/CWT EQ than their confinement counterparts (**Important. See cost definitions at the end**).

As explained in Chapter VI of the full report, comparing different systems within the same state is more useful than comparing one system from one state to another system from a different state.

Differences

Graziers' basic costs tend to be 90% of the confinement basic cost/CWT EQ. Graziers non-basic costs tend to be about 73% of the confinement non-basic cost/CWT EQ. In ten years, 57% of the graziers' advantage in NFIFO per CWT EQ resulted from their advantage in non-basic costs. The graziers' advantage was spread across many cost items.

Basic costs typically used 70% of allocated costs for confinement and 74% for grazing herds.
Basic costs typically used 60% of income for confinement and 54% for grazing herds.

Non-basic costs typically used 30% of allocated costs for confinement and 26% for grazing herds.
Non-basic costs typically used 25% of income for confinement and 18% for grazing herds.

With 72.4% of income used up by allocated costs (basic plus non-basic), 27.6 cents of every dollar of income was left for NFIFO (returns to unpaid labor, management and equity) for graziers.

With 85.7% of income used up by allocated costs (basic plus non-basic), 14.3 cents of every dollar of income was left for NFIFO (returns to unpaid labor, management and equity) for confinement farms.

*Without non-farm income, NFIFO (plus depreciation taken) is **the annual source** of family living funds.*

Similarities

A striking similarity is that the four largest cost items per CWT EQ were essentially the same for both graziers and confinement.

The Big Four Grazing Dairy Costs! (used 55.4% of the total allocated cost and 40% of the income)
The Big Four Confinement Dairy Costs! (used 52.0% of the total allocated cost and almost 45% of the income)

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FACT SHEET # 7: MAJOR COST ITEMS ON WISCONSIN GRAZING AND CONFINEMENT

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Graziers		Confinement	
1. Purchased feed	20.70% of income	Purchased feed	18.70% of income
2. Non-livestock depreciation	9.30% of income	Paid Labor & Mgt	10.40% of income
3. Interest	5.20% of income	Non-livestock depr	9.70% of income
4. Repairs	4.80% of income	Interest	5.90% of income

The Second Big Four! (used another 13% of income for graziers and 16% of income for confinement farms)

Graziers		Confinement	
5. Paid Labor and Mgt	4.0% of income	Repairs	5.5% of income
6. Supplies	3.8% of income	Other Farm Expense	4.1% of income
7. Other Farm Expense	2.9% of income	Rent	3.6% of income
8. Vet and Medicine	2.3% of income	Supplies	3.0% of income

The "High Five" cost items were the same for graziers and confinement although the ranking differs a little bit.

1. **Purchased feed** was the highest cost category for each system each year. It ranged from 25% to 33% of the allocated cost on grazing and 20% to 26% on confinement farms. It ranged from 16% to 21% of income for both systems. Paid labor and management, depreciation and interest were the other three of the four major costs for all systems. These three cost categories together are the non-basic cost category and typically accounted for another 25% of allocated costs on grazing and 30% on confinement farms. These three cost categories used from 17% to 21% of income on grazing and 22% to 28% of income on confinement farms depending on the year. Purchased feed is a basic cost. For graziers, purchased feed cost was often larger than the total non-basic costs. Purchased feed was a higher percent of total allocated costs and income for graziers because most of them feed grain but few of them raised grain. Most confinement farms feed and raise grain. Obviously the purchased feed category doesn't measure the cost of raised feed.

2. **Non-livestock depreciation is a non-basic cost and was the second largest cost** in most years for graziers. It was second or a close third for confinement herds. It ranged from 8% to 15% of total allocated costs for grazing and 9% to 17% for confinement herds. It ranged from 6% to 14% of total income for grazing and 7% to 13% of income for confinement herds. **Livestock depreciation** is a basic cost and was much smaller than non-livestock depreciation. Its amount ranged from 1.9% to 3.2% of income for confinement herds and from 0.3% to 2.5% of income for graziers. Herds that increase or maintain size by purchasing replacements experience higher amounts of livestock depreciation. If livestock depreciation were added to non-livestock depreciation, its ranking among cost categories would not change.

3. **Paid labor and management is a non-basic cost and was the second highest cost category for confinement herds** in most years. It was third highest when it wasn't in second place. For graziers, it ranked from third to sixth highest among the ten years. It ranged from 10% to 13% of total allocated costs and 8% to 12% of income for confinement, and 4% to 8% of allocated costs and 3% to 6% of income for graziers. The difference between confinement and grazing in this category is exaggerated by the fact that the grazing data had less dependent labor in it. Much of the dependent labor paid on farms is paid to family members for tax management purposes.

4. **Interest** ranged from about 5% to 9% of total allocated cost and 4% to 7% of income for graziers and confinement herds.

5. **Rounding out the high five, repair costs** were the third highest in three years, fourth highest in four years, and fifth highest in three years for graziers. **Repair costs** were the fourth highest in two years and fifth highest in eight years for confinement herds.

The four cost items included in the second big four but not the high five in either system are all basic costs. "Other farm expense" and "supplies" were in the second big four for both systems but difficult to interpret since each one can contain a wide variety of individual items.

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Rent paid for any farm asset (land, buildings, equipment) was part of the second big four only for confinement herds. Vet and medicine was part of the second big four only for graziers.

Two cost items that often are thought of as being major use a much smaller part of income than most people would suspect. These two items are **veterinary and medicine expense and property tax**. Property tax typically represented about 1.9% of income for graziers and 1.4% of income for confinement. Prior to use value assessment of farm land in Wisconsin, property tax used about 2.2% of income for both groups. Veterinary and medicine typically represented about 2.3% of grazer income and 2.8% of income for confinement herds.

The ranking of major cost items in the “high five” list may differ slightly from the ranking in the tables mainly because the rankings in the “high five” list combine both dairy systems. In addition, expense items were ranked each year for each system to obtain ranges in values discussed in the “high five” list. Remember that an average doesn’t reveal the amount of variation from one year to another.

Table 1 uses a ten year simple average of the cost of production per CWT EQ, percent of allocated cost and per dollar of income for cost items from Wisconsin graziers and Wisconsin confinement herds available from the AgFA database. The cost items are shown in the same sequence for graziers and confinement herds to help readers compare specific cost items between the two dairy systems. The cost items appear in a format fairly similar to their appearance in a typical AgFA® cost of production report with basic costs shown nearly alphabetically. Non-basic costs are listed below the basic costs. NFIFO and NFI are also shown below total costs.

The same data are formatted differently in **Table 2** where cost items are ranked from highest to lowest, separately for graziers and confinement herds. Total costs, NFIFO and NFI are not included in Table 2.

Careful readers of the tables will notice that all of the percentages in a column add up to more than 100%. That is because the tables include major cost categories such as allocated, basic and non-basic and total, in addition to the individual cost items that make up these larger categories. For example, non-basic costs include paid labor and management, interest and non-livestock depreciation. Because of rounding, other small mathematical differences might be found in the tables.

Definitions

Total cost includes all cash and non-cash costs including the opportunity cost of unpaid labor, management and equity capital. The total cost concept is needed to determine the minimum revenue required to meet long-run financial obligations of the business. All long-run financial obligations include a satisfactory reward for the owners’ unpaid labor, management and equity capital (opportunity costs).

In the calculation of NFIFO, all costs are accounted for EXCEPT the opportunity cost of unpaid labor, management and equity capital. All costs combined except opportunity costs are called total allocated costs. Total allocated costs are subtracted from total income to calculate NFIFO. When opportunity costs are calculated and added to total allocated costs, the result is what economists call total costs. A simple definition of opportunity cost is: “The return to unpaid labor or unpaid management or equity capital in its best realistic alternative use.”

In large companies such as publicly traded companies, there are NO opportunity costs of **unpaid** labor, management and equity capital, because all work and management is performed by paid employees, and dividends are paid to the stockholders which own the equity. Total income for such businesses must regularly exceed total costs to be considered profitable. Most industries are dominated by businesses that are able to pay total costs.

However, in the case of many dairy farms, one person or family supplies all of the unpaid labor, management and equity capital. In such cases, the value of unpaid labor, management and equity capital must be estimated to determine if total income exceeds total cost.

The total cost of production for businesses that have no unpaid labor, management and equity capital is more accurate than those which have unpaid costs because there isn’t a universally agreed upon best method for calculating the opportunity cost of unpaid labor, management and equity. Therefore, special caution is required when interpreting

total cost data from businesses such as small family farms when you do not know the method used to calculate the opportunity costs or the amount of those costs.

NFIFO is the return to the resources that farm families contribute to the farm business. The resources are unpaid family labor, unpaid family management, and the family's equity (net worth) in the farm business. **Quite often, NFIFO is less than the opportunity cost of unpaid family labor, management and equity capital.** NFIFO is seldom all cash.

For the farm family without non-farm income, NFIFO (plus depreciation taken) is the source of funds for family living expenses, including housing and furnishings, food, medical expenses, children's education, the family car, entertainment, social security taxes, income taxes, and other personal items. It also represents money to pay principal on borrowings for land, buildings, and equipment and is a source of funds for new business and personal savings.

When there is no outside source of income and NFIFO is less than the family living expenses, equity will decline, whether or not NFIFO exceeds opportunity costs. The cash to pay for living expenses above NFIFO may come from loans, savings, or from the portion of net farm earnings allocated to capital items or inventory adjustment. When the latter happens, it is often said that the family is living off of depreciation. This is a way in which cash flow can hide a lack of profitability.

Allocated Cost equals total cost minus the opportunity cost of unpaid labor, management and capital supplied by the owning family. Allocated cost also equals total income minus NFIFO.

Non-Basic Costs include interest, non-livestock depreciation, labor, and management. Allocated cost minus basic cost equals non-basic cost.

Basic Costs are all the cash and non-cash costs except the opportunity costs and interest, non-livestock depreciation, labor, and management. Basic cost is a useful measure for comparing one farm to another that differs by: the amount of paid versus unpaid labor; the amount of paid versus unpaid management; the amount of debt; the investment level; and/or the capital consumption claimed (depreciation).

Table 1 Wisconsin Grazier and Confinement Ten Year Average Cost of Production						
	Wis. Grazier 10 Year Average Cost of Production			Wis. Confinement 10 Year Average Cost of Production		
	/CWT EQ	As a % of Allocated Cost	As a % of Income	/CWT EQ	As a % of Allocated Cost	As a % of Income
U. S. Average Milk Price	\$13.88		100.00%	\$13.88		100.00%
Cash Expenses						
Breeding Fees	\$0.14	1.39%	1.01%	\$0.15	1.26%	1.08%
Car and Truck Expense	\$0.04	0.40%	0.29%	\$0.07	0.59%	0.50%
Chemicals	\$0.05	0.50%	0.36%	\$0.20	1.68%	1.44%
Conservation Expenses	\$0.00	0.00%	0.00%	\$0.00	0.00%	0.00%
Custom Hire (Machine Work)	\$0.28	2.79%	2.02%	\$0.36	3.03%	2.59%
Custom Heifer Raising	\$0.01	0.10%	0.07%	\$0.05	0.42%	0.36%
Feed Purchase	\$2.88	28.66%	20.75%	\$2.59	21.78%	18.66%
Fertilizer and Lime	\$0.31	3.08%	2.23%	\$0.36	3.03%	2.59%
Freight and Trucking	\$0.12	1.19%	0.86%	\$0.12	1.01%	0.86%
Gasoline, Fuel, and Oil	\$0.21	2.09%	1.51%	\$0.27	2.27%	1.95%
Farm Insurance	\$0.18	1.79%	1.30%	\$0.17	1.43%	1.22%
Marketing & Hedging	\$0.16	1.59%	1.15%	\$0.17	1.43%	1.22%
Rent/Lease Equipment	\$0.09	0.90%	0.65%	\$0.10	0.84%	0.72%
Rent/Lease Other	\$0.22	2.19%	1.59%	\$0.50	4.21%	3.60%
Repairs all	\$0.67	6.67%	4.83%	\$0.76	6.39%	5.48%
Seeds and Plants Purchased	\$0.17	1.69%	1.22%	\$0.29	2.44%	2.09%
Supplies Purchased	\$0.53	5.27%	3.82%	\$0.42	3.53%	3.03%
Taxes - Other	\$0.26	2.59%	1.87%	\$0.20	1.68%	1.44%
Taxes - Payroll	\$0.00	0.00%	0.00%	\$0.00	0.00%	0.00%
Utilities	\$0.28	2.79%	2.02%	\$0.27	2.27%	1.95%
Veterinary Fees and Medicine	\$0.32	3.18%	2.31%	\$0.39	3.28%	2.81%
Other Farm Expenses	\$0.40	3.98%	2.88%	\$0.57	4.79%	4.11%
Other Crop Expenses	\$0.03	0.30%	0.22%	\$0.04	0.34%	0.29%
Combined Non-Cash Adjustments	-\$0.05	-0.50%	-0.36%	-\$0.04	-0.34%	-0.29%
Depreciation: Livestock	\$0.15	1.49%	1.08%	\$0.27	2.27%	1.95%
Total Basic Cost	\$7.47	74.33%	53.82%	\$8.28	69.64%	59.65%
Total Interest Cost	\$0.72	7.16%	5.19%	\$0.82	6.90%	5.91%
Total Dependent Labor Cost	\$0.03	0.30%	0.22%	\$0.42	3.53%	3.03%
Total Non-Dependent Labor Cost	\$0.54	5.37%	3.89%	\$1.02	8.58%	7.35%
Total Paid Labor Cost	\$0.56	5.57%	4.03%	\$1.44	12.11%	10.37%
Depreciation: Non-livestock	\$1.29	12.84%	9.29%	\$1.35	11.35%	9.73%
Total Non-basic Cost	\$2.57	25.57%	18.52%	\$3.51	29.52%	25.29%
Total Allocated Cost (Basic + Non-basic)	\$10.05	100.00%	72.41%	\$11.89	100.00%	85.66%
Unpaid Labor/Management	\$2.40	23.88%	17.29%	\$1.26	10.60%	9.08%
Interest On Equity	\$1.23	12.24%	8.86%	\$1.04	8.75%	7.49%
Total Opportunity Cost	\$3.63	36.12%	26.15%	\$2.30	19.34%	16.57%
Total Cost	\$13.68	136.12%	98.56%	\$14.19	119.34%	102.23%
Total Income - Total Cost	\$0.20			-\$0.31		
Net Farm Income from Operations	\$3.83	38.11%	27.59%	\$1.99	16.74%	14.34%
Gain (Loss) on Sale of All Farm Assets	\$0.05	0.50%	0.36%	\$0.04	34.00%	0.29%
Net Farm Income (NFI)	\$3.88	38.61%	27.95%	\$2.02	16.99%	14.55%

Table 2		Wisconsin Grazier and Confinement 10 Year Average Cost of Production Items Ranked from Highest to Lowest									
		Wisconsin Grazier 10 Year Average					Wisconsin Confinement 10 Year Average				
		Cost of Production					Cost of Production				
		As a % of					As a % of				
		/CWT EQ	Allocate	Income			/CWT EQ	Allocate	Income		
		\$13.88		100.00%			\$13.88		100.00%		
U. S. Average Milk Price		U. S. Average Milk Price									
Cash Expenses		Cash Expenses									
Total Allocated Costs (Basic + Non-basic)		\$10.05	100.00%	72.41%			\$11.89	100.00%	85.66%		
Total Basic Cost		\$7.47	74.33%	53.82%			\$8.28	69.64%	59.65%		
Feed Purchase		\$2.88	28.66%	20.75%			\$3.51	29.52%	25.29%		
Non-basic Costs		\$2.57	25.57%	18.52%			\$2.59	21.78%	18.66%		
Depreciation: Non-livestock		\$1.29	12.84%	9.29%			\$1.44	12.11%	10.37%		
Total Interest Cost		\$0.72	7.16%	5.19%			\$1.35	11.35%	9.73%		
Repairs all		\$0.67	6.67%	4.83%			\$1.02	8.58%	7.35%		
Total Paid Labor		\$0.56	5.57%	4.03%			\$0.82	6.90%	5.91%		
Total Non-Dependent Labor		\$0.54	5.37%	3.89%			\$0.76	6.39%	5.48%		
Supplies Purchased		\$0.53	5.27%	3.82%			\$0.57	4.79%	4.11%		
Other Farm Expenses		\$0.40	3.98%	2.88%			\$0.50	4.21%	3.60%		
Veterinary Fees and Medicine		\$0.32	3.18%	2.31%			\$0.42	3.53%	3.03%		
Fertilizer and Lime		\$0.31	3.08%	2.23%			\$0.42	3.53%	3.03%		
Custom Hire (Machine Work)		\$0.28	2.79%	2.02%			\$0.39	3.28%	2.81%		
Utilities		\$0.28	2.79%	2.02%			\$0.36	3.03%	2.59%		
Taxes - Other		\$0.26	2.59%	1.87%			\$0.36	3.03%	2.59%		
Rent/Lease Other		\$0.22	2.19%	1.59%			\$0.29	2.44%	2.09%		
Gasoline, Fuel, and Oil		\$0.21	2.09%	1.51%			\$0.27	2.27%	1.95%		
Farm Insurance		\$0.18	1.79%	1.30%			\$0.27	2.27%	1.95%		
Seeds and Plants Purchased		\$0.17	1.69%	1.22%			\$0.27	2.27%	1.95%		
Marketing & Hedging		\$0.16	1.59%	1.15%			\$0.20	1.68%	1.44%		
Depreciation: Livestock		\$0.15	1.49%	1.08%			\$0.20	1.68%	1.44%		
Breeding Fees		\$0.14	1.39%	1.01%			\$0.17	1.43%	1.22%		
Freight and Trucking		\$0.12	1.19%	0.86%			\$0.17	1.43%	1.22%		
Rent/Lease Equipment		\$0.09	0.90%	0.65%			\$0.15	1.26%	1.08%		
Chemicals		\$0.05	0.50%	0.36%			\$0.12	1.01%	0.86%		
Car and Truck Expense		\$0.04	0.40%	0.29%			\$0.10	0.84%	0.72%		
Other Crop Expenses		\$0.03	0.30%	0.22%			\$0.07	0.59%	0.50%		
Total Dependent Labor		\$0.03	0.30%	0.22%			\$0.05	0.42%	0.36%		
Custom Heifer Raising		\$0.01	0.10%	0.07%			\$0.04	0.34%	0.29%		
Combined Non-Cash Adjustments		-\$0.05	-0.50%	-0.36%			\$0.04	-0.34%	-0.29%		