

Major Cost Items on Wisconsin Organic, Grazing, and Confinement (Average of All Sizes) Dairy Farms

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February 19, 2008

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

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

Seven years (1999-2005) of comparisons of the financial performance of a yearly average of 10 organic herds, 26 grazing herds, and 736 confinement herds in Wisconsin show that graziers providing 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) per dollar of farm income than their confinement counterparts (Important-see cost definitions on page 4 and 5). The contrast between the cost items by system would be different if a different measure such as cost per cow were used. However, from an economic point of view, using NFIFO per dollar of income is more useful. Organic farms costs typically were in between the confinement and grazing levels.

As explained in the Great Lakes Grazing Network Dairy Grazing Farm Financial Summary, 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

The differences in economic performance between the systems were spread across many cost items. A careful look at all the details is needed to understand all the differences.

Basic costs typically used 60.3% of income for confinement, 56% for organic, and 54.9% for grazing herds.
Non-basic costs typically used 25.4% of income for confinement, 23% for organic, and 19.6% for grazing herds.
Allocated costs typically used 85.7% of income for confinement, 79% for organic, and 74.5% for grazing herds

Basic plus non-basic cost equals allocated cost.

With 74.5% of income used up by allocated costs (basic plus non-basic), 25.5 cents of every dollar of income was left for NFIFO (returns to unpaid labor, management and equity) for graziers.

With 79.0% of income used up by allocated costs (basic plus non-basic), 21 cents of every dollar of income was left for NFIFO (returns to unpaid labor, management and equity) for organic farms.

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.

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Similarities

The similarities appear more striking than the differences. The four largest seven-year average cost items were essentially the same items for grazing and confinement herds, although the ranking slightly differed. Organic herds shared three of the four largest cost items with the other two systems.

The Big Four Organic Dairy Costs used 39.6% of the income!

The Big Four Grazing Dairy Costs used 42.4% of the income!

The Big Four Confinement Dairy Costs used 44.1% of the income!

	Graziers	% of income	Organic	% of income	All Confinement Sizes	% of income
1	Purchased feed	19.9	Purchased feed	14.0	Purchased feed	18.8
2	Non-livestock depr	11.5	Non-Livestock depr	13.3	Paid Labor & Mgt	11.2
3	Paid Labor & Mgt	5.9	Repairs, all	7.0	Non-livestock depr	9.0
4	Repairs, all	5.1	Interest	5.3	Repairs, all	5.1

The Second Big Four Grazing Dairy Costs used another 14.2% of the income!

The Second Big Four Confinement Dairy Costs used another 16.5% of the income!

The Second Big Four Organic Dairy Costs used another 16.6% of the income!

	Graziers	% of income	Organic	% of income	All Confinement Sizes	% of income
5	Interest	4.6	Supplies	5.0	Interest	4.9
6	Supplies	4.1	Paid Labor & Mgt	4.3	Other Farm Exps	4.4
7	Other Farm Exps	3.0	Rent, all	4.0	Rent, all	4.2
8	Rent, all	2.5	Custom Hire	3.3	Custom Hire	3.0

The Eight Largest Costs for Organic Herds used 56.2% of the income!

The Eight Largest Costs for Grazing Herds used 56.6% of the income!

The Eight Largest Costs for Confinement Herds used 60.6% of the income!

The eight largest seven-year average cost items for organic herds are discussed below.

1. **“Purchased feed”** is a basic cost and was the highest cost category for confinement and grazing herds. It was the highest cost for organic herds in five of seven years. Purchased feed cost used a much smaller percent of income for organic herds versus the other two systems mainly because of the organic price premium and the fact that the organic herds in the data raise most of their feed. For graziers, purchased feed cost was often larger than the total non-basic costs. Purchased feed used a higher percent of income for graziers because most of them fed grain but few of them raised grain. Most confinement farms fed and raised grain. Purchased feed used 11-17% of income for organic, from 16-21% of income for confinement and from 19-21% of income for grazing herds. 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 organic and graziers. It was second or a close third for confinement herds. It was the highest cost item for organic herds two of seven years. It used from 10.5% to 15.5% of income for organic herds, 6% to 14% of income for grazing herds and 7% to 13% of income for confinement herds. *Livestock depreciation is a basic cost and was much smaller than non-livestock depreciation. It used from none to 1% of income for organic herds, 1.3% 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 for grazing or organic herds but would move to second place for confinement herds. Livestock depreciation is very low for organic herds because the scarcity and price of certified organic cattle provides a strong incentive to rely mainly on one's own organic replacements.*

3. **“Repairs, all”** was the third highest cost item as a percent of income for Wisconsin organic herds each year. It is a basic cost and used from 5.4% to 7.9% of income on a yearly basis for organic herds. In contrast, repairs had a seven year average ranking of fourth highest for graziers and confinement even though the percent of income used for repairs was fairly similar between the three groups.
4. **“Interest”** is a non-basic cost and was the fourth highest organic cost, five of seven years. It used from 4.2% to 6.4% of income for organic herds. Interest also ranked as the fifth highest cost for confinement and grazing herds.
5. **“Supplies”** was the fifth largest cost item for organic, sixth highest for graziers and ninth highest for confinement. It is a basic cost and presents some interpretation challenges because supplies can include a wide variety of individual expenses. The same is true for the basic cost “other farm expense” which ranks sixth highest for confinement, seventh highest for grazing, and thirteenth highest for organic herds. If supplies and other farm expense were combined, this new category would rank third for organic using 7.2% of income, third for graziers using 7.1% of income, and fourth for confinement using 7.4% of income.
6. **“Paid labor and management”** is a non-basic cost and used from 2.1% to 5.3% of income on a yearly basis for organic herds. It ranked fourth, fifth and eleventh one year each for organic herds. Paid labor and management 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. It used from 8% to 12% of income for confinement, versus 3% to 6% of income for graziers. The difference between confinement and organic and grazing in this category is exaggerated by the fact that the grazing and organic data had less dependent labor in it. Much of the dependent labor paid on farms was paid to family members for tax management purposes. The typical grazing and organic farms in the data are operated by the labor of the owning family. The smaller size of the organic herds could possibly allow organic herds to hire less labor.
7. **“Rent, all”** for all purposes is a basic cost item and was the seventh highest cost item for organic and confinement farms and eighth highest for graziers. Not all farms recorded the rental expenses precisely enough to determine if land rent (for example) represented most of this cost. Rent used from 3.1% to 4.7% of income for organic, 2.2% to 2.9% for graziers, and 3.06% to 5.04% for confinement on a yearly basis.
8. **“Custom hire”** is a basic cost and was eighth highest for organic and for confinement farms, and twelfth highest for grazing farms.

The cost items “custom hire,” “other farm expense” and “supplies,” were in the top eight for two systems but not for the third system. “Supplies” was ranked ninth for confinement herds closely behind “custom hire.” “Custom hire” ranked twelfth for grazing herds. “Other Farm Expense” ranked 13th for organic herds.

Two cost items that often are thought of as being major used 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 used about 1.8% of income for organic and 1.6% graziers and 1.3% of income for confinement. Prior to use value assessment of farm land in Wisconsin, property tax used about 2.2% of income for confinement and grazing herds. Veterinary and medicine typically used about 1.7% of organic income, 2.2% of grazer income and 2.9% of income for confinement herds.

Table 1 uses a seven year simple average of the cost of production per dollar of income and per cow for cost items from Wisconsin organic and Wisconsin confinement herds available from the AgFA database. The cost items are ranked from highest to lowest separately for organic and confinement herds to help readers compare specific cost items between the two dairy systems

A similar comparison is made between organic and grazing data 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 (but not 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).

Relating NFIFO to Cost Categories

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.

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).

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.

Table 1: Wisconsin Organic and Confinement Dairy Farms Seven-Year Average Cost of Production Items Ranked from Highest to Lowest

	Organic*			Confinement (All Sizes)	
Range of Observations per Year	6-17		Range of Observations per Year	581-660	
Range of Average Herd Size per Year	48-64		Range of Average Herd Size per Year	97-134	
	Per Cow	% of Income		Per Cow	% of Income
<u>Income</u>	\$3,473.66	100.00%	<u>Income</u>	\$3,657.12	100.00%
<u>Expenses</u>			<u>Expenses</u>		
Total Allocated Cost	\$2,741.63	78.99%	Total Allocated Cost	\$3,135.61	85.66%
Total Basic Cost	\$1,947.40	55.99%	Total Basic Cost	\$2,205.44	60.31%
Total Non-basic Cost	\$794.23	23.00%	Total Non-basic Cost	\$920.13	25.43%
Feed Purchase	\$487.20	13.95%	Feed Purchase	\$685.68	18.75%
Depreciation: Non-livestock	\$461.85	13.34%	Total Paid Labor Cost	\$409.96	11.21%
Repairs all	\$242.13	7.02%	Depreciation: Non-livestock	\$358.14	9.79%
Total Interest Cost	\$184.10	5.34%	Rent, all	\$186.89	4.25%
Supplies Purchased	\$174.50	5.03%	Total Interest Cost	\$178.10	4.87%
Total Paid Labor Cost	\$148.28	4.32%	Veterinary Fees and Medicine	\$161.03	2.93%
Rent, all	\$142.31	4.00%	Marketing & Hedging	\$155.55	1.70%
Custom Hire (Machine Work)	\$115.82	3.31%	Custom Heifer Raising	\$109.74	0.53%
Gasoline, Fuel, and Oil	\$107.19	3.08%	Seeds and Plants Purchased	\$108.95	2.00%
Seeds and Plants Purchased	\$87.43	2.52%	Utilities	\$107.27	1.97%
Utilities	\$83.63	2.40%	Fertilizer and Lime	\$79.89	2.18%
Fertilizer and Lime	\$77.95	2.24%	Gasoline, Fuel, and Oil	\$77.74	2.13%
Other Farm Expenses	\$77.83	2.23%	Depreciation: Livestock	\$75.94	2.08%
Freight and Trucking	\$73.80	2.13%	Repairs all	\$73.17	5.11%
Taxes	\$63.49	1.83%	Taxes	\$71.91	1.35%
Marketing & Hedging	\$61.09	1.78%	Other Farm Expenses	\$62.08	4.40%
Farm Insurance	\$59.06	1.69%	Chemicals**	\$49.97	1.37%
Veterinary Fees and Medicine	\$57.35	1.66%	Supplies Purchased	\$49.44	2.98%
Breeding Fees	\$43.22	1.24%	Farm Insurance	\$44.36	1.21%
Car and Truck Expense	\$25.27	0.73%	Breeding Fees	\$42.52	1.16%
Gain (Loss) on Sale of All Farm Assets	\$21.17	0.61%	Freight and Trucking	\$36.44	1.00%
Depreciation: Livestock	\$13.31	0.36%	Custom Hire (Machine Work)	\$19.30	3.00%
Chemicals**	\$1.86	0.06%	Car and Truck Expense	\$16.46	0.45%
Custom Heifer Raising	\$0.00	0.00%	Gain (Loss) on Sale of All Farm Assets	\$9.97	0.29%
Combined Non-Cash Adjustments	(\$7.48)	-0.20%	Combined Non-Cash Adjustments	(\$4.83)	-0.13%
Net Farm Income from Operations (NFIFO)	\$732.03	21.01%	Net Farm Income from Operations (NFIFO)	\$521.50	14.26%

*Two to twelve of these farms are graziers.

** Milk house cleaning supplies sometimes are recorded as chemical expense

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Table 2: Wisconsin Organic and Grazing Dairy Farms Seven-Year Average Cost of Production Items Ranked from Highest to Lowest

	Organic*			Grazier**	
Range of Observations per Year	6-17		Range of Observations per Year	21-43	
Range of Average Herd Size per Year	48-64		Range of Average Herd Size per Year	61-69	
	Per Cow	% of Income		Per Cow	% of Income
Income	\$3,473.66	100.00%	Income	\$2,888.40	100.00%
Expenses			Expenses		
Total Allocated Cost	\$2,741.63	78.99%	Total Allocated Cost	\$2,151.22	74.48%
Total Basic Cost	\$1,947.40	55.99%	Total Basic Cost	\$1,585.23	54.88%
Total Non-basic Cost	\$794.23	23.00%	Feed Purchase	\$573.71	19.86%
Feed Purchase	\$487.20	13.95%	Total Non-basic Cost	\$566.00	19.60%
Depreciation: Non-livestock	\$461.85	13.34%	Depreciation: Non-livestock	\$331.41	11.47%
Repairs all	\$242.13	7.02%	Total Paid Labor Cost	\$170.48	5.90%
Total Interest Cost	\$184.10	5.34%	Repairs all	\$146.05	5.06%
Supplies Purchased	\$174.50	5.03%	Total Interest Cost	\$133.26	4.61%
Total Paid Labor Cost	\$148.28	4.32%	Supplies Purchased	\$118.31	4.10%
Rent, all	\$142.31	4.00%	Other Farm Expenses	\$91.12	3.04%
Custom Hire (Machine Work)	\$115.82	3.31%	Rent, all	\$73.47	2.54%
Gasoline, Fuel, and Oil	\$107.19	3.08%	Veterinary Fees and Medicine	\$64.60	2.24%
Seeds and Plants Purchased	\$87.43	2.52%	Utilities	\$62.92	2.18%
Utilities	\$83.63	2.40%	Fertilizer and Lime	\$62.48	2.16%
Fertilizer and Lime	\$77.95	2.24%	Custom Hire (Machine Work)	\$55.65	1.93%
Other Farm Expenses	\$77.83	2.23%	Gasoline, Fuel, and Oil	\$53.42	1.85%
Freight and Trucking	\$73.80	2.13%	Taxes	\$47.60	1.65%
Taxes	\$63.49	1.83%	Marketing & Hedging	\$42.95	1.49%
Marketing & Hedging	\$61.09	1.78%	Farm Insurance	\$39.12	1.35%
Farm Insurance	\$59.06	1.69%	Seeds and Plants Purchased	\$37.57	1.30%
Veterinary Fees and Medicine	\$57.35	1.66%	Breeding Fees	\$29.90	1.04%
Breeding Fees	\$43.22	1.24%	Depreciation: Livestock	\$22.93	0.79%
Car and Truck Expense	\$25.27	0.73%	Custom Heifer Raising	\$17.12	0.59%
Gain (Loss) on Sale of All Farm Assets	\$21.17	0.61%	Freight and Trucking	\$15.24	0.53%
Depreciation: Livestock	\$13.31	0.36%	Car and Truck Expense	\$13.88	0.48%
Chemicals	\$1.86	0.06%	Chemicals**	\$11.85	0.41%
Custom Heifer Raising	\$0.00	0.00%	Gain (Loss) on Sale of All Farm Assets	\$7.19	0.25%
Combined Non-Cash Adjustments	(\$7.48)	-0.20%	Combined Non-Cash Adjustments	\$6.56	0.23%
Net Farm Income from Operations (NFIFO)	\$732.03	21.01%	Net Farm Income from Operations (NFIFO)	\$737.18	25.52%

*Two to twelve of these farms are graziers.

**Milk house cleaning supplies sometimes are recorded as chemical expense.

*Two to twelve of these farms are organic.

**Milk house cleaning supplies sometimes are recorded as chemical expense.