The Economics Of Organic, Grazing And Confinement Dairy Farms

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Keywords

Confinement, Dairy, Economics, Grazing, Organic

Abstract

Actual farm financial data shows that dairy farms practicing management intensive rotational grazing (MIRG) and organic practices can be economically competitive with dairy farms practicing neither. The data also indicates that MIRG contributes more toward profitability than organic practices do. Organic dairy farms clearly need the price premium to be competitive with graziers without organic practices. Organic dairy data is still relatively scarce. Some of the data used in this comparison came from a project initially sponsored by USDA IFAFS grant project #00-52501-9708 titled "Regional Multi-State Interpretation of Small Farm Financial Data".

Introduction

Potential organic dairy producers want to know three things about the economic impact of choosing that system:

1. What are the potential rewards once the goal is achieved?
2. How long will it take to attain the goal?
3. What will it cost to attain the goal?

Consequently, analyzing the economic performance of organic farms is fairly complex. It is often said "when switching from conventional to organic, things will get worse before they will get better." It would help people make the decision whether or not to switch to organic if data measured the financial challenge of the

transition and estimated how long it might take to make-up for that challenge. To better understand and fairly compare the financial performance of organic farms, the stages of progression of individual organic farms should be recognized.

These stages or categories of organic production are:

A. **Pre-organic-** The period of operation of a farm before it attempted to become organic. Since anyone not attempting to become organic could be called pre-organic, it may not be as important to gather data from that period as it is to gather data from farms at some other "organic stage."
B. **Transitional organic-** The period of operation of a farm from the time it began to adopt organic practices until achieving organic certification. This is expected to be the least profitable stage
C. **Certified organic-** The period of operation of a farm from the time it achieved organic certification until receiving organic milk price premiums.
D. **Certified market organic-** The period of operation of a farm during which it receives organic milk price premiums.

In reality, few farms will supply financial data from years prior to the point at which they "join the project." At times farms may slip into and out of the above stages or categories, especially between certified organic and certified market organic. Some certified organic producers only obtain organic premiums for part of the year. When that happens, additional judgment will be required to determine the best way to sort the data. Initially there was an attempt to collect organic dairy data from the states involved in the Great Lakes Grazing Network (GLGN), Dairy Grazing Farms Financial Project. However, data from states outside of Wisconsin was far less available than Wisconsin data.

Data from organic dairy farms are scarce.

Actual farm financial data from organic dairy farms is still scarce but increasing. Much of the Wisconsin organic data was collected by the Fox Valley and Lakeshore Farm Management Assns, and Wisconsin Farm and Business Management Inc. Because of the scarcity of the organic data in any single year, this analysis and comparison of Wisconsin certified market organic financial performance with other systems focuses on a seven year average for each group. None of the summarized groups are random. Some Wisconsin organic herds graze only as much as required to remain certified organic, and they are not categorized as management intensive rotational graziers (MIRG) in this analysis. Similarly, some of the graziers in the Wisconsin grazing summary were certified market organic producers. Organic graziers and non-organic graziers were also summarized together as graziers and separately. Since organic graziers' performance was similar to non-organic graziers, the results from the together version were used in this analysis. It would have been ideal to have enough data to make meaningful comparisons of grazing and non-grazing organic herds. A greater emphasis on grazing from organic certification standards may soon eliminate non-grazing organic dairy farms.

The Wisconsin organic dairy farms that shared financial data were a fairly experienced group, especially prior to 2005. Six started farming from 1970 to 1977. Only five started after 1990. The most recent start-up was in 2003 with an already certified herd and farm. Less experienced producers are not likely to perform as well as the group that shared data.

Table 1 below more clearly shows the number of organic and grazing organic farms in the summary by year.

Table 1		
	Wisconsin	Wisconsin
Year	Organic Farms	Organic and Graze
1999	6	2
2000	8	2
2001	8	4
2002	8	4
2003	12	8
2004	11	7
2005	17	10
2006	14	9
2007	9	6

Table 2 shows the annual average price received for milk by each group in this analysis.

Table 2	Organic	Graziers	Confinement
Year	Milk Price $ per Liter	Milk Price $ per Liter	Milk Price $ per Liter
1999	$0.41	$0.34	$0.33
2000	$0.41	$0.28	$0.27
2001	$0.45	$0.35	$0.34
2002	$0.43	$0.28	$0.28
2003	$0.43	$0.31	$0.29
2004	$0.45	$0.39	$0.37
2005	$0.47	$0.38	$0.36
2006	$0.53	$0.31	$0.31
2007	$0.56	$0.44	$0.42

The differences in milk price between confinement and graziers are small compared to the differences between these two groups and the organic herds. The price of organic milk is typically higher and more stable than the non-organic milk price. The organic milk price has been on a gradual upward trend while the non-organic price has bounced up and down. Under this price atmosphere,

organic financial performance can be expected to be at its relative best in years that the national average milk price is low.

Table 3 shows the milk sold per cow for each group in this analysis.

Table 3	Organic	Graziers	Confinement
Year	Liters Milk Sold/Cow	Liters Milk Sold/Cow	Liters Milk Sold/Cow
1999	6,806	6,857	9,014
2000	6,816	7,173	9,164
2001	6,358	6,977	9,122
2002	6,656	6,977	9,303
2003	6,046	7,045	9,520
2004	6,322	7,371	9,490
2005	6,157	7,448	9,729
2006	6,373	7,252	9,878
2007	6,447	7,376	9,809

The liters of milk sold per cow by organic and grazing herds was about 70% and 75% less respectively compared to confinement. Liters of milk sold per cow appear to be increasing a bit for confinement and grazing herds but declining for organic herds. This decline in liters of milk sold per organic cow could be a result of doubling the number of organic observations in later years.

Comparing Financial Performance of Some Wisconsin Organic, Grazing and Confinement Dairy Farms From 1999 to 2007

Since many non-organic farmers are asking how the financial performance of organic farming compares with non organic systems, a seven year simple average cost of production summary was compiled for Wisconsin organic, grazing and confinement herds.

Several measures should be examined when analyzing financial performance because no single measure tells the whole story. However one usually has to use just a few measures to explain the results. The primary measure used here to

discuss the cost of production of organic, confinement, and grazing herds is cost per dollar of income or as a percent of income. This is a measure commonly used in the non-agricultural business world and provides a much better apples-to-apples comparison than cost per cow or per liter sold. It is quite similar to the hundredweight equivalent (CWT EQ) measure used in Wisconsin. In fact, the cost per dollar of income and cost/CWT EQ measures applied to the same data will provide the same relative results.

The need to use this measure is driven mainly by two factors. The organic milk price was usually much higher than the milk price received by confinement and grazing herds. The milk sold per cow by confinement herds was 30% and 40% more per cow sold by grazing and organic herds respectively.

To help compare the financial performance of three Wisconsin dairy systems, Appendix I contains the nine-year simple average cost of production as a percent of income report for Wisconsin organic, grazing and confinement dairy farms. It contains values for many cost items.

Table 4 shows the range in observations size, herd size, NFIFO/$ income and nine-year simple average NFIFO/$ income for organic, grazing, and the all Wisconsin confinement group.

Table 4	Farm # Range	Ave. Herd Size Range	NFIFO/$ Income	Range
Graziers	21-43	61-68	25.33%	19.23-31.86%
Organic	6-17	48-65	21.78%	13.53-26.26%
All Confinement	581-660	96-149	14.40%	6.99-19.4%

The cost of labor does explain part but not all of the difference in NFIFO/$ of income advantage of graziers over organic and both over confinement herds.

In three of nine years, the summarized Wisconsin organic farms (ones which received organic prices the entire year) had an advantage in NFIFO as a percent of income over the summarized Wisconsin graziers. The organic herds had a small advantage in 2002, 2003 and 2006 respectively. Wisconsin graziers had larger advantages in NFIFO as a percent of income over Wisconsin organic farms from 1999 to 2001, from 2004 to 2005, and in 2007.

Wisconsin organic dairy farms had a NFIFO/$ Income advantage over the average Wisconsin confinement herd in eight of nine years from 1999 to 2007. In 2001, the average Wisconsin confinement herd had slightly higher NFIFO as a percent of income.

The cost per cow measure will provide a different (and less useful for comparing systems) perception of financial performance than shown by the cost per dollar of income. However, it is very useful to have for budgeting the startup or expansion of any dairy system. **Therefore, Appendix II contains a nine-year simple average cost of production per cow summary for Wisconsin organic, confinement and grazing herds.**

Additional Observations From Some Wisconsin Organic Dairy Farms From 1999 to 2005

In contrast to Appendix 1 which compares cost items on a nine-year simple average basis, the below comments indicate the consistency in which a cost item of one group is higher than the other group.

Compared to the average Wisconsin grazing herd, the average Wisconsin organic herd had **lower** costs as a percent of income most years in the categories of:

- Purchased feed (9 of 9)
- Chemicals (9 of 9; no surprise here, even though graziers have very low chemical costs)
- Veterinarian and medicine (9 of 9)
- Depreciation of purchased livestock (8 of 9 this results from either turnover or expansion)

In contrast, organic herds had **higher** costs all nine years in the categories of:

- Repairs
- Gas, fuel and oil
- Seeds purchased
- Rent

Organic herds had **higher** costs in most years in the categories of:

- Custom Machine hire (8 of 9)
- Supplies (8 of 9)
- Farm Insurance (8 of 9)
- Breeding fees (6 of 9 and tied once)
- Non-dependent labor (7 of 9)
- Utilities (5 of 9 and tied once)
- Depreciation (5 of 9)

Compared to the average Wisconsin confinement herd, the average Wisconsin organic herd had **lower** costs as a percent of income in most years in the categories of:

- Purchased feed (9 of 9)

- Veterinarian and medicine (9 of 9)
- Chemicals (9 of 9; no surprise here)
- Depreciation of purchased livestock (7 of 9 this results from either turnover or expansion)

In contrast, organic herds had **higher** costs as a percent of revenue most years in the categories of:

- Depreciation (9 of 9)
- Gas, fuel and oil (9 of 9)
- Utilities (9 of 9)
- Supplies (9 of 9)
- Property taxes (9 of 9)
- Farm Insurance (9 of 9)
- Seeds purchased (8 of 9)
- Repairs (8 of 9)
- Marketing and hedging (7 of 9)
- Interest (6 of 9)
- Fertilizer and lime (5 of 9)
- Custom Hire (6 of 9)

More about Feed Cost

Feed (purchased and raised) is the single highest cost item as a percent of income in all systems. As such, it is an important factor in influencing profitability. Still, its impact on profits must be analyzed carefully to avoid inaccurate conclusions. For example, a farm which buys all of its feed tends to have higher purchased feed costs than a farm that raises most or all of its feed. Yet, the total feed cost as a percent of income could be higher for a farm that raises most of its feed. All of the costs of raising feed should be considered when individuals choose their mix of purchased versus raised feed. The cost of raising feed should include the cost of land, equipment, and labor along with the more obvious costs such as fertilizer,

fuel, pesticides, etc. It is beyond the scope of this analysis to try to determine the fixed cost associated with raising feed. Instead, the easily identified cost categories of chemicals, custom machine work, fertilizer and lime, gas, fuel, and oil, seeds and other crop expenses were assumed to be the cost of raising feed in this data. This estimate more likely understates rather than overstates the cost of raising feed for each group.

Purchased Feed Cost as a Percent of Income

The nine-year simple average purchased feed costs as a percent of income was lowest for the organic group and highest for graziers.

Given the higher market price commanded by organic hay and grain, it might be surprising that Wisconsin organic dairy farms had lower purchased feed costs as a percent of income than any other Wisconsin dairy system. Graziers were the highest in this cost item.

The higher price of organic hay and grain provides a powerful incentive for organic dairy farmers to raise most of their livestock feed. It appears that most Wisconsin organic dairy farmers raise a high proportion of their feed just as most Wisconsin smaller confinement dairy farms do. Wisconsin graziers tend to feed but not raise grain. Larger confinement farms appear to raise a smaller proportion of their feed compared to smaller confinement and organic farms.

During 2006 and 2007, due to changes in organic certification rules, several farms had their herds certified organic before their land was certified. Until their land was certified, these new organic farms had to buy a much higher proportion of their feed than was the case for most organic farms in this report. This likely made the financial performance of these new farms different from the organic farms in this report.

Estimated Raised Feed Cost as a Percent of Income

The ranking of for estimated raised feed cost was opposite the ranking for purchased feed cost.

Estimated Total Feed Cost as a Percent of Income

In an attempt to approximate the total feed cost, the estimated cost of raising feed **plus** the cost of purchased feed were combined and summarized for each group. This estimate of total feed cost likely understates rather than overstates total feed cost for all systems.

The Wisconsin organic dairy farms were lowest in estimated total feed cost, followed closely by Wisconsin graziers, then by the confinement herds from smallest to largest in size. The ranking follows herd size within the confinement system.

Because the costs in this report are mainly indexed to income, the higher milk price received by organic farms is part of the reason that organic estimated total feed cost is lowest of all Wisconsin systems. When measured on a per cow basis, one gets a different relative perspective. The per cow perspective is less useful in evaluating financial performance between herds and groups, but useful for individual farm budgeting.

Away from the Corn Belt, it appears like it is more difficult for organic dairy producers to raise most of their own grain. The price of organic grain also appears to be much higher the farther away one goes from the Corn Belt. This is a major financial challenge for organic producers located far from the Corn Belt.

From 1999 to 2005, there had been a slight upward trend in estimated total feed cost among all sizes and systems analyzed here. During this period, the increase

appeared smallest for graziers and largest for organic and large confinement. This trend reversed in 2006 and 2007 but is expected to resume in 2008.

The organic advantage in estimated total feed cost as a percent of income was smallest in 2005. That probably was more a result of greatly increasing the organic farm observations from 1999 to 2005 than any other factor. It occurred before the recent and noticeable spike in energy and grain prices.

The relative ranking of total feed cost as a percent of income among Wisconsin dairy systems has been rather consistent despite recent volatility of milk and input prices.

General Summary of Observations of the Economics of Organic Dairy Farms.

1. Actual farm financial data from organic dairy farms is still scarce (the total number of organic farms is still a small percent of the total number of dairy farms in most states).
2. A number of individual farms are achieving financial success with an organic system. The Wisconsin organic dairy farms that shared financial data were a fairly experienced group, especially prior to 2005. It is likely that a less experienced group would not perform as well as the group that shared data.
3. Wisconsin organic price premiums ranged from $0.06 to $0.22/L compared to Wisconsin non-organic graziers and from $0.07 to $0.22/L compared to Wisconsin non-organic confinement in 1999-2007 data.
4. The price premium is very important to the economic competitiveness of organic dairy farms.
5. Organic dairy producers receiving organic prices were more competitive with other dairy systems in years that the national average milk price was low.

6. Wisconsin Organic dairy farm's nine-year simple average Net Farm Income from Operations, (NFIFO)/$ income ranks below graziers and above all confinement sizes.
7. Grazing Organic dairy farm's nine-year simple average NFIFO/$ income ranks slightly below graziers.
8. Grazing probably "helps" the organic system more than vice versa.
9. For those farms (we've encountered a few of these) whose routine practices for the past three or more years just happen to meet organic requirements, about the only downside to becoming certified and obtaining organic prices is the cost of and record keeping effort to become certified.
10. The three to five year transition from a "conventional" system to organic is often challenging financially and other ways. We have been trying to measure the long-term financial impact of this transition.
11. In a comparison of 10 Quebec farms transitioning to organic with 22 similar sized non-organic Quebec farms, the transitioning farms did better financially in the first year, not as good in the third year and about the same in the fifth year.
12. The liters of milk sold per cow from organic dairy farms were fairly similar from Wisconsin to New England to Quebec. This level was about 70% of the liters of milk sold per cow by Wisconsin confinement herds. Wisconsin grazing herds sold about 75% of the liters of milk sold per cow by Wisconsin confinement herds.
13. Financial performance of Minnesota organic dairy herds looks similar to the financial performance of Wisconsin organic dairy herds.
14. In 2004, 30 organic dairy farms from Maine and Vermont were not as competitive as
    a. non-organic New England dairy farms
    b. any Wisconsin dairy system
15. In 1999, seven Vermont organic dairy farms were economically competitive with New England non-organic dairy farms.

16. Feed costs were much higher for New England farms than in the Corn Belt – especially for those which were organic. Organic grain prices are typically twice the price of non-organic grain in the same location. Organic grain prices in New England can easily be double the price of organic grain in Wisconsin. Organic forage prices are typically about 30% more than the price of non-organic forage in the same location.
17. Be careful about comparing a dairy system from one state to a different dairy system in another state. The financial performance of Wisconsin organic dairy farms looks dramatically different from the financial performance of New England organic dairy farms.
18. The jury is still out regarding many other economic questions about organic dairy farming. Economic data from organic dairy farms is increasing.

Preliminary Nine-Year (1999-2007) Simple Average Cost of Production as a Percent of Income for Wisconsin Organic, Grazing and Confinement Herds

	Graziers*	Organic**	Confinement (All Sizes)
Range of Observations per Year	19-43	6-17	420-660
Range of Average Herd Size per Year	58-69	48-65	97-149
Percent of Income	100.00%	100.00%	100.00%
Expenses			
Breeding Fees	1.05%	1.19%	1.19%
Car and Truck Expense	0.59%	0.74%	0.44%
Chemicals	0.40%	0.07%	1.30%
Custom Hire (Machine Work)	2.26%	3.44%	3.02%
Custom Heifer Raising	0.45%	0.00%	0.51%
Feed Purchase	18.95%	13.40%	18.93%
Fertilizer and Lime	2.31%	2.41%	2.28%
Freight and Trucking	0.65%	1.80%	1.01%
Gasoline, Fuel, and Oil	2.11%	3.18%	2.36%
Farm Insurance	1.39%	1.71%	1.20%
Marketing & Hedging	1.39%	1.57%	1.55%
Rent	2.52%	3.99%	4.07%
Repairs all	4.87%	6.55%	4.93%
Seeds and Plants Purchased	1.48%	2.48%	2.04%
Supplies Purchased	4.29%	5.00%	2.87%
Taxes	1.63%	1.64%	1.08%
Utilities	2.28%	2.46%	2.01%
Veterinary Fees and Medicine	2.12%	1.51%	2.99%
Other Farm Expenses	3.01%	2.28%	5.04%
Combined Non-Cash Adjustments	0.00%	-0.22%	-0.30%
Depreciation: Livestock	0.65%	0.33%	2.30%
Total Basic Cost	**54.40%**	**54.66%**	**60.55%**
Total Interest Cost	**4.86%**	**5.56%**	**5.25%**
Total Paid Labor Cost	**3.54%**	**4.46%**	**11.15%**
Depreciation: Non-livestock	**11.87%**	**13.54%**	**8.65%**
Total Non-basic Cost	**20.27%**	**23.56%**	**25.04%**
Total Allocated Cost (Basic + Non-basic)	**74.67%**	**78.22%**	**85.60%**
Unpaid Labor/Management	16.81%	11.95%	7.22%
Interest On Equity	9.78%	8.37%	7.31%
Total Opportunity Cost	**26.59%**	**20.32%**	**14.53%**
Total Cost	101.26%	98.53%	100.13%
Total Income - Total Cost	**-1.26%**	**1.47%**	**-0.13%**
Net Farm Income from Operations (NFIFO)	**25.33%**	**21.78%**	**14.40%**
Gain (Loss) on Sale of All Farm Assets	0.54%	0.85%	0.43%
Net Farm Income (NFI)	25.87%	22.63%	14.48%

*See Table I showing that two to ten of these farms are organic producers depending on the year.

**See Table I showing that two to ten of these farms are graziers depending on the year.

Nine-Year (1999-2007) Simple Average Cost of Production per Cow for Wisconsin Organic Grazing and Confinement Herds

	Grazier*	Organic**	Confinement
Range of Observations per Year	19-43	6-17	420-660
Range of Average Herd Size per Year	58-69	48-65	97-149
Income	**$3,023.55**	**$3,678.01**	**$3,815.12**
Expenses			
Breeding Fees	$31.69	$43.92	$45.28
Car and Truck Expense	$17.96	$27.34	$16.70
Chemicals	$12.12	$2.57	$49.69
Custom Hire (Machine Work)	$68.41	$126.51	$19.49
Custom Heifer Raising	$13.72	$0.00	$115.40
Feed Purchase	$573.08	$492.90	$722.17
Fertilizer and Lime	$69.91	$88.56	$87.07
Freight and Trucking	$19.76	$66.13	$38.67
Gasoline, Fuel, and Oil	$63.83	$116.89	$89.87
Farm Insurance	$42.12	$62.93	$45.79
Marketing & Hedging	$42.05	$57.92	$59.16
Rent	$76.34	$118.39	$176.31
Repairs all	$147.33	$240.99	$187.93
Seeds and Plants Purchased	$44.82	$91.05	$77.71
Supplies Purchased	$129.71	$184.08	$109.37
Taxes	$49.35	$60.24	$41.19
Utilities	$68.79	$90.46	$76.56
Veterinary Fees and Medicine	$64.25	$55.43	$113.93
Other Farm Expenses	$90.98	$83.87	$192.39
Combined Non-Cash Adjustments	$2.11	($8.25)	($11.44)
Depreciation: Livestock	$19.63	$12.22	$87.59
Total Basic Cost	**$1,644.81**	**$2,010.34**	**$2,310.10**
Total Interest Cost	**$146.95**	**$204.38**	**$200.22**
Total Paid Labor Cost	**$106.97**	**$163.88**	**$425.21**
Depreciation: Non-livestock	**$358.89**	**$498.17**	**$330.00**
Total Non-basic Cost	**$612.80**	**$866.43**	**$955.44**
Total Allocated Cost (Basic + Non-basic)	**$2,257.62**	**$2,876.76**	**$3,265.55**
Unpaid Labor/Management	$508.24	$439.48	$275.61
Interest On Equity	$295.73	$307.81	$278.90
Total Opportunity Cost	**$803.97**	**$747.29**	**$554.50**
Total Cost	$3,061.59	$3,624.05	$3,820.06
Total Income - Total Cost	($38.04)	$53.96	($4.94)
Net Farm Income from Operations (NFIFO)	**$765.93**	**$801.25**	**$549.56**
Gain (Loss) on Sale of All Farm Assets	$16.37	$31.17	$16.30
Net Farm Income (NFI)	$782.31	$832.44	$552.56

*See Table I showing that two to ten of these farms are organic producers depending on the year.

**See Table I showing that two to ten of these farms are graziers depending on the year.

Case study paper for Farm Management theme

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3276 words[1]

Some of the data used in this paper came from a project led by Tom Kriegl and initially sponsored by USDA IFAFS grant project #00-52501-9708 titled "Regional Multi-State Interpretation of Small Farm Financial Data". Coworkers in the grant project are listed below. Some of the earlier data (mainly grazing data) has been used in earlier reports.

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