

# Wisconsin Grazing Dairy Profitability Analysis

## **A Preliminary Five-Year Comparison of the Cost of Production of Selected “Conventional” and Grazing Wisconsin Dairy Farms**

Tom Kriegl  
UW Center for Dairy Profitability  
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The costs of production comparisons are made between 600 plus “conventional” Wisconsin dairy farms that are Farm Management Association clients and 23 Wisconsin grazing dairy farms. Within these grazing farms, cost of production comparisons are also made between as many as five seasonally milking herds and 15 non-seasonally milking herds.

Merging different data sets from different sources is always a challenge in the quest to make fair comparisons. Without those challenges, this report from the Wisconsin Grazing Dairy Profitability Analysis (WGDPA) would be well beyond the preliminary stage. Until additional analysis is completed, **readers are cautioned not to make too many final conclusions about individual cost item comparisons**, because some differences could be caused by differences in data categorization. For example, an expense that might have been called marketing by one group might have been included as “other farm expense” by another group. But while much more interpretation remains, the data in this report confirms some beliefs and contradicts others. More will be said about this in the final report. While the data sets are not equal in size, there are several observations that can be made with confidence.

1. Dairy farms practicing management intensive rotational grazing (MIRG) in the studied data had basic, allocated, and total per hundred weight equivalent of milk costs of production that were lower than the traditional and modern confinement farms of all sizes analyzed in Wisconsin.
2. The cost of production for graziers in the data is higher than many expected. Part of this is because graziers sell less milk per cow and per farm.
3. Among types of graziers, those which were fully seasonal in the data set had basic, allocated, and total per hundred weight equivalent of milk costs of production that were higher than the non-seasonal herds in the last four years.
4. Graziers consistently had a higher cost of **purchased** feed per cwt. equivalent of milk sold. This is at least partially due to the fact that most of the graziers purchased grain, while the conventional farms grew most of the grain and forage consumed by their cows.

Benjamin Franklin said, “A penny saved is a penny earned.” This is as true today as it was in Franklin’s day, but how much difference does a penny make? If multiplied by a large enough number, a penny can amount to a lot. For example, a penny amounts to \$10,000 if multiplied by a million. A penny saved per 100 pounds of milk sold per average grazer in the WGDPA would add about \$110 of profit per year. (A penny added to the price per 100 pounds would have the same effect.)

Not to dismiss Benjamin Franklin, it is obvious that to the average grazier in the WGDPA, it takes more than a few pennies per 100 pounds of milk sold to make a big difference in profitability. Still, enough pennies in enough places can add up to important differences.

While much additional interpretation remains to be completed, two tables of the data are provided for your review. You are encouraged to read the rest of this narrative to enhance your understanding of the data in the tables.

## **DEFINITIONS-TYPES OF FARMS COMPARED**

With farms, “one size does not fit all.” So in analyzing the cost of production, it's important to define the kinds of farms being analyzed and compared.

### Types of Conventional or Confinement Dairy Farms

The terms conventional and confinement are often used loosely and interchangeably and therefore need to be clarified for the purposes of this comparison. For many years, the typical Wisconsin dairy farm housed and milked cows in two story stanchion barns, raised and mechanically harvested most of the feed (including grain) used on the farm and calved and milked cows all year. Most of these farms were about the size that one family could handle without much hired labor. Because cattle on this type of farm are confined to buildings or paved lots most of the time, the term confinement became a popular term to describe them. Since most Wisconsin dairy farms shared these characteristics for many years, the term conventional also became a popular term to describe them. “Traditional confinement” or simply “traditional” are better terms to use to differentiate them from the other farms often referred to as conventional or confinement farms.

Beginning mainly in the 1990s, some Wisconsin farms expanded to much larger sizes and built entirely new facilities including free stall barns, with natural ventilation, milking parlors, etc. They continued to raise and deliver mechanically harvested feed (including grain) to their confined cattle. They continued to calve, and milk year-round.

Most of the labor is hired on such farms and many have 300 or more cows. This type is also often referred to as conventional but is better described as “large modern confinement”.

The Farm Management Association farms include all types of Wisconsin dairy farms, including a few graziers and large modern confinement farms, but most of the farms with the associations are traditional in type. Most referrals in the WGDPA to confinement, or conventional, will be referrals mainly to “traditional” farms.

### Types Of Grazing Dairy Farms

To be included in the study, a dairy farm practicing management intensive rotational grazing (MIRG) had to be big enough to potentially support a family in exchange for family labor (this doesn't preclude hired help). Dairy and forage (often grass) are the major enterprises and the dairy cows graze more than 30% of the forage they consume during the year. Pastures are rotated daily in most cases. “Winter” forage is likely to be raised on the farm in a typical year. Grain is likely to be fed in near conventional amounts although grain is less likely to be raised on the farm. Being a low or high input operator alone doesn't eliminate someone from being considered a grazier. Young stock is likely to graze on the farm.

### Seasonal vs. Non-seasonal Calving and Milking

The seasonal calving strategy is an independent practice that is used extensively in combination with MIRG in New Zealand and in some other places, but not so extensively in other places, such as Wisconsin and Argentina. In this study, a herd is not considered seasonal unless the dry period of all the cows in the herd overlap enough to shut down the milking facility for more than a day and preferably for at least a few weeks. Defined as semi-seasonal are those herds that make a serious attempt to "bunch" their calving to one or two times of the year, but don't sacrifice healthy, highly productive animals that don't quite fit that mold. A semi-seasonal calving herd milks at least one cow every day of the year (and many more on most days). Any calving strategy not meeting the preceding seasonal definition is referred to as non-seasonal in this analysis.

### **Measuring the Cost of Milk Production in Wisconsin Grazing Dairy Herds**

The cost of production is extremely important to any business! But as important as the cost of production is, it must be put into perspective.

Many seem to think the cost of production is the economic bottom line. In fact, the cost of production is at least one step away from the economic bottom line of a business. This becomes a bit easier to understand by examining the three major factors of profitability, which are:

- Control of Investment/Debt
- Control of Operating Expense
- Income Generation

As it is referred to, the cost of production directly deals with operating cost and indirectly deals with investment/debt control. It doesn't deal with the third factor – income generation.

Graziers tend to over focus on controlling cost and investment while non-graziers tend to over focus on income generation.

The most successful managers optimize the interrelationship of all three.

Because all businesses must cover all costs to succeed in the long run, it's important to calculate "total cost." However there are other cost categories that can help determine why costs are high or low. Dr. Gary Frank of the University of Wisconsin Center For Dairy Profitability in his annual (since 1992) *Cost of Milk Production on Selected Wisconsin Dairy Farms* report has popularized two other cost groupings called "allocated costs" and "basic costs." He compares all three cost groupings on a per cow and per cwt. Of equivalent of milk sold basis. To make it easy to compare the grazer's cost of production data with that of conventional farms, the following cost measures have been calculated (but not always reported) for some years of the study:

1. Total cost per cwt. equivalent of milk sold
2. Total cost per cow
3. Allocated cost per cwt. equivalent of milk sold
4. Allocated cost per cow
5. Basic cost per cwt. equivalent of milk sold
6. Basic cost per cow

All three cost groupings have pluses and minuses. The following definitions will help understand these pluses and minuses.

**Total costs** Traditionally, total cost is divided into fixed and variable cost. While these traditional cost breakdowns are still valid, there are some difficulties associated with comparisons of the financial performance of farms of greatly differing size and type that aren't adequately handled by these traditional measures. Therefore, other measures can be useful. Total costs include all cash and non-cash costs including the opportunity cost of unpaid labor, management and equity capital. Also to describe the Opportunity Cost is that it is a reasonable reward for the unpaid labor, management and capital supplied by the owning family.

The total cost concept is needed to determine the minimum revenue required to meet all long run financial obligations of the business, which includes a satisfactory reward for the owners' unpaid labor, management and equity capital (opportunity costs).

Since many business owners are willing to work for less than the opportunity cost of their labor, management and equity, and because the inclusion of opportunity cost requires some assumptions, the allocated cost group becomes useful too.

**Total allocated cost** equals total cost minus the opportunity revenue of unpaid labor, management and capital supplied by the owning family. Since opportunity cost isn't consciously calculated by everyone, allocated cost is often used by default in place of total cost.

Caution must be exercised in comparing the allocated costs of graziers versus Farm Management Association farms. Included in the expenses of many of the Farm Management Association farms are wages and benefits paid to dependent family members primarily for tax purposes. Wage and benefit payments made to dependent family members were not collected as expenses from grazing farms and were excluded from the conventional farm costs in this report to make comparisons more fair.

**Basic cost per hundredweight equivalent of milk sold** (hereafter referred to simply as basic cost/cwt.) is another useful measure. Allocated cost minus the cost of interest, depreciation, labor, and management equals basic cost. Another way of saying this is that basic costs are all the cash and non-cash costs except interest, depreciation, labor, and management.

The fact that some farms have only unpaid labor while others pay family members or non-family hired help makes it difficult to compare farms fairly on only a total, allocated, fixed, or variable cost basis. Basic cost is a useful measure for comparing one farm to another because it is not influenced by the farm's debt structure, the amount of paid versus unpaid labor, the investment level, or the capital consumption claimed (depreciation). The costs of interest, depreciation and management have characteristics that make direct comparisons across large numbers of farms problematic. Basic cost is very similar to the cost of goods concept that is commonly used by many non-farm businesses.

Since basic cost primarily includes day-to-day expenses (those most affected by daily decisions), it is often the best single cost of production measurement to use in comparing farms that differ by relative size, percentage of debt and amount of hired labor.

The difference between the allocated cost and the basic cost provides some indication of the relative impact of investment/debt control operation costs on the total of production.

Also by calculating the basic cost of production on the per cwt. equivalent of milk sold basis, the analysis focuses on the primary product that is sold and puts all farms on an equal footing in terms of milk price for analysis purposes.

Version used in preliminary 5 yr report  
 Comparing the Cost of Production of Wis Grazing and Traditional Dairy Farms From 1995 to 1999

	<u>1999</u>		<u>1998</u>		<u>1997</u>		<u>1996</u>		<u>1995</u>	
<b>U. S. Average Milk Price</b>	<b>14.37</b>	<b>14.37</b>	<b>15.43</b>	<b>15.43</b>	<b>13.34</b>	<b>13.34</b>	<b>14.88</b>	<b>14.88</b>	<b>12.74</b>	<b>12.74</b>
	Graziers	Conventional	Graziers	Conventional	Graziers	Conventional	Graziers	Conventional	Graziers	Conventional
<b>Cash Expenses</b>										
Breeding Fees	0.12	0.16	0.1	0.14	0.13	0.14	0.16	0.12	0.13	0.15
Car and Truck Expense	0.01	0.08	0.01	0.07	0.01	0.06	0.01	0.08	0	0.05
Chemicals	0.04	0.21	0.04	0.26	0.06	0.2	0.06	0.21	0.03	0.18
Custom Hire (Machine Work)	0.22	0.39	0.33	0.36	0.25	0.24	0.27	0.24	0.15	0.21
Custom Heifer Raising		0.14		0.15						
Feed Purchase	2.94	2.3	3.25	2.77	3.03	2.76	3.47	2.94	2.69	2.12
Fertilizer and Lime	0.33	0.35	0.36	0.45	0.26	0.4	0.37	0.49	0.29	0.47
Freight and Trucking	0.03	0.11	0.2	0.07	0.22	0.09	0.18	0.08	0.21	0.11
Gasoline, Fuel, and Oil	0.16	0.21	0.16	0.23	0.20	0.26	0.2	0.3	0.16	0.26
Farm Insurance	0.14	0.15	0.16	0.17	0.20	0.16	0.21	0.18	0.17	0.18
Marketing & Hedging	0.23	0.14	0.11	0.16	0.08	0.14	0.08	0.2	0.07	0.28
Rent/Lease Equipment	0.13	0.1	0.07	0.1	0.06	0.09	0.09	0.11	0.07	0.07
Rent/Lease Other	0.17	0.49	0.17	0.49	0.17	0.46	0.24	0.51	0.14	0.54
Repairs and Maintenance (Bldg. & Machinery)	0.66	0.88	0.7	0.9	0.58	0.72	0.61	0.86	0.53	0.77
Seeds and Plants Purchased	0.09	0.25	0.13	0.35	0.17	0.28	0.18	0.34	0.12	0.34
Supplies Purchased	0.47	0.48	0.45	0.43	0.5	0.41	0.59	0.45	0.39	0.44
Taxes - Other	0.21	0.2	0.25	0.22	0.25	0.2	0.36	0.29	0.3	0.3
Utilities	0.26	0.25	0.26	0.25	0.26	0.25	0.28	0.28	0.25	0.28
Veterinary Fees and Medicine	0.32	0.38	0.32	0.4	0.32	0.35	0.34	0.39	0.33	0.37
Other Farm Expenses	0.58	0.51	0.63	0.55	0.42	0.55	0.32	0.55	0.51	0.31
Combined Non-Cash Adjustments	-0.06	-0.07	-0.46	-0.3	0.07	0.11	-0.19	-0.06	-0.05	-0.02
Livestock Depreciation*	0.08	0.36	0.39	0.39	0.04	0.31	*	*	*	*
<b>Total Basic Cost/Cwt.</b>	<b>7.13</b>	<b>8.07</b>	<b>7.63</b>	<b>8.61</b>	<b>7.28</b>	<b>8.18</b>	<b>7.83</b>	<b>8.56</b>	<b>6.49</b>	<b>7.41</b>
<b>Total Interest Cost</b>	0.72	0.78	0.82	0.94	0.91	0.91	0.83	0.94	0.67	0.92
<b>Labor Cost</b>										
Employee Compensation- Dependants**			1999 Conv. 0.5	Conv. 0.49	Conv. 0.47	Conv. 0.36	Conv. 0.35	Conv. 0.35	Conv. 0.35	Conv. 0.35
Employee Benefits Non-Dependants		0.23		0.2	0	0.16		0.15		0
Employee Wages Non-Dependants	0.51	0.73	0.58	0.76	0.79	0.72	0.91	0.84	0.79	0.72
<b>Total Non-Dependent Labor Cost</b>	<b>0.51</b>	<b>0.96</b>	<b>0.58</b>	<b>0.96</b>	<b>0.79</b>	<b>0.88</b>	<b>0.91</b>	<b>0.99</b>	<b>0.79</b>	<b>0.72</b>
<b>Depreciation</b>										
Depreciation (see **** below)	1.45	1.47	0.95	1.41	1.00	1.37	1.24	1.92	1.04	1.57
<b>Allocated Minus Basic Costs</b>	<b>2.68</b>	<b>3.21</b>	<b>2.35</b>	<b>3.31</b>	<b>2.7</b>	<b>3.16</b>	<b>2.98</b>	<b>3.85</b>	<b>2.5</b>	<b>3.21</b>
<b>Total Allocated Costs</b>	<b>9.81</b>	<b>11.28</b>	<b>9.98</b>	<b>11.92</b>	<b>9.98</b>	<b>11.34</b>	<b>10.81</b>	<b>12.41</b>	<b>8.99</b>	<b>10.62</b>
Unpaid Labor		1.05		1.14		1.08		1.25		1.03
Unpaid Management	2.26	0.4	2.08	0.41	2.36	0.42	2.39	0.41	1.93	0.42
Interest On Equity	0.82	1.03	0.96	0.93	1	0.84	1.08	1.12	0.92	1.06
<b>Total Opportunity Costs</b>	<b>3.08</b>	<b>2.48</b>	<b>3.04</b>	<b>2.48</b>	<b>3.36</b>	<b>2.34</b>	<b>3.47</b>	<b>2.78</b>	<b>2.85</b>	<b>2.51</b>
<b>Total Expenses</b>	<b>12.89</b>	<b>13.76</b>	<b>13.02</b>	<b>14.4</b>	<b>13.34</b>	<b>13.68</b>	<b>14.28</b>	<b>15.19</b>	<b>11.84</b>	<b>13.13</b>
Net farm Income Operations (NFIFO) (NFIFO=Nat'l Ave. Price-Total Allocated Cost)	4.56	3.09	5.45	3.51	3.36	2	4.07	2.47	3.75	2.12
Gain (Loss) on Sale of All Farm Assets					0.19		0.06		0.06	
Net Farm Income (NFI)	4.56	3.09	5.45	3.51	3.55	2	4.13	2.47	3.81	2.12
Grazier Advantage from Basic Cost/Cwt. Milk Eq.		0.94		0.98		0.9		0.73		0.92
Grazier Advantage from "Other" Cost/Cwt. Milk Eq.		0.53		0.96		0.46		0.87		0.71
<b>Grazier Advantage in NFIFO/Cwt. Milk Eq.</b>		<b>\$1.47</b>		<b>\$1.94</b>		<b>\$1.36</b>		<b>\$1.60</b>		<b>\$1.63</b>

\* Not separated from other depreciation in 1995-6.

\*\* Dependent compensation was not collected from graziers. Therefore dependent compensation is also omitted from conventional cost of production totals.

\*\*\* Dependent compensation for 1995 conventional was extrapolated from other years.

\*\*\*\* Actual tax depreciation used for conventional all years and for graziers in 1999. A form of economic depreciation was used for graziers in previous years.

Using tax depreciation for graziers in all years may have shown slightly higher total depreciation costs for graziers in 1995-1998.

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	Graziers	Conventional	Graziers	Conventional	Graziers	Conventional	Graziers	Conventional	Graziers	Conventional
<b>Cash Expenses</b>										
Breeding Fees	0.12	0.16	0.1	0.14	0.13	0.14	0.16	0.12	0.13	0.15
Car and Truck Expense	0.01	0.08	0.01	0.07	0.01	0.06	0.01	0.08	0	0.05
Chemicals	0.04	0.21	0.04	0.26	0.06	0.2	0.06	0.21	0.03	0.18
Custom Hire (Machine Work)	0.22	0.39	0.33	0.36	0.25	0.24	0.27	0.24	0.15	0.21
Custom Heifer Raising		0.14		0.15						
Feed Purchase	2.94	2.3	3.25	2.77	3.03	2.76	3.47	2.94	2.69	2.12
Fertilizer and Lime	0.33	0.35	0.36	0.45	0.26	0.4	0.37	0.49	0.29	0.47
Freight and Trucking	0.03	0.11	0.2	0.07	0.22	0.09	0.18	0.08	0.21	0.11
Gasoline, Fuel, and Oil	0.16	0.21	0.16	0.23	0.20	0.26	0.2	0.3	0.16	0.26
Farm Insurance	0.14	0.15	0.16	0.17	0.20	0.16	0.21	0.18	0.17	0.18
Marketing & Hedging	0.23	0.14	0.11	0.16	0.08	0.14	0.08	0.2	0.07	0.28
Rent/Lease Equipment	0.13	0.1	0.07	0.1	0.06	0.09	0.09	0.11	0.07	0.07
Rent/Lease Other	0.17	0.49	0.17	0.49	0.17	0.46	0.24	0.51	0.14	0.54
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Utilities	0.26	0.25	0.26	0.25	0.26	0.25	0.28	0.28	0.25	0.28
Veterinary Fees and Medicine	0.32	0.38	0.32	0.4	0.32	0.35	0.34	0.39	0.33	0.37
Other Farm Expenses	0.58	0.51	0.63	0.55	0.42	0.55	0.32	0.55	0.51	0.31
Combined Non-Cash Adjustments	-0.06	-0.07	-0.46	-0.3	0.07	0.11	-0.19	-0.06	-0.05	-0.02
Livestock Depreciation*	0.08	0.36	0.39	0.39	0.04	0.31	*	*	*	*
<b>Total Basic Cost/Cwt.</b>	<b>7.13</b>	<b>8.07</b>	<b>7.63</b>	<b>8.61</b>	<b>7.28</b>	<b>8.18</b>	<b>7.83</b>	<b>8.56</b>	<b>6.49</b>	<b>7.41</b>
<b>Total Interest Cost</b>	0.72	0.78	0.82	0.94	0.91	0.91	0.83	0.94	0.67	0.92
<b>Labor Cost</b>										
Employee Compensation- Dependants**			1999 Conv. 0.5	Conv. 0.49	Conv. 0.47		Conv. 0.36		Conv.*** 0.35	
Employee Benefits Non-Dependants		0.23		0.2	0	0.16		0.15		0
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Depreciation (see **** below)	1.45	1.47	0.95	1.41	1.00	1.37	1.24	1.92	1.04	1.57
<b>Allocated Minus Basic Costs</b>	<b>2.68</b>	<b>3.21</b>	<b>2.35</b>	<b>3.31</b>	<b>2.7</b>	<b>3.16</b>	<b>2.98</b>	<b>3.85</b>	<b>2.5</b>	<b>3.21</b>
<b>Total Allocated Costs</b>	<b>9.81</b>	<b>11.28</b>	<b>9.98</b>	<b>11.92</b>	<b>9.98</b>	<b>11.34</b>	<b>10.81</b>	<b>12.41</b>	<b>8.99</b>	<b>10.62</b>
Unpaid Labor		1.05		1.14		1.08		1.25		1.03
Unpaid Management	2.26	0.4	2.08	0.41	2.36	0.42	2.39	0.41	1.93	0.42
Interest On Equity	0.82	1.03	0.96	0.93	1	0.84	1.08	1.12	0.92	1.06
<b>Total Opportunity Costs</b>	<b>3.08</b>	<b>2.48</b>	<b>3.04</b>	<b>2.48</b>	<b>3.36</b>	<b>2.34</b>	<b>3.47</b>	<b>2.78</b>	<b>2.85</b>	<b>2.51</b>
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Using tax depreciation for graziers in all years may have shown slightly higher total depreciation costs for graziers in 1995-1998.