

A Center for Dairy Profitability Report and UW-Extension publication

WISCONSIN AgFA DAIRY FARMS PROFITABILITY REPORT

2009 PRODUCTION YEAR

by

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Acknowledgements

This report is dedicated to the memory of Lee Milligan for his contributions to the Agriculture Financial Advisor (AgFA©) and Dairy Farm Business Summary programs, and perhaps more importantly his commitment to farm business management education for the producers he served.

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The Agriculture Financial Advisor (AgFA©) data set was used for this study. AgFA© represents a sample of Wisconsin dairy farms from which financial and production data are collected annually. It is an active/real-time database program. The database is growing in the number of farms and participants each year.

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Profitability Analysis

This report analyzes the “profitability” of a select number of dairy farm businesses. It enables the owner/operator/manager to compare her/his dairy farm business to other dairy farm businesses on the basis of profitability. Farms that were more profitable tended to have greater financial efficiency, more milk produced per cow, higher average herd size, lower capital investment per cow, and lower interest expenses per cow.

Data Source and Methodology

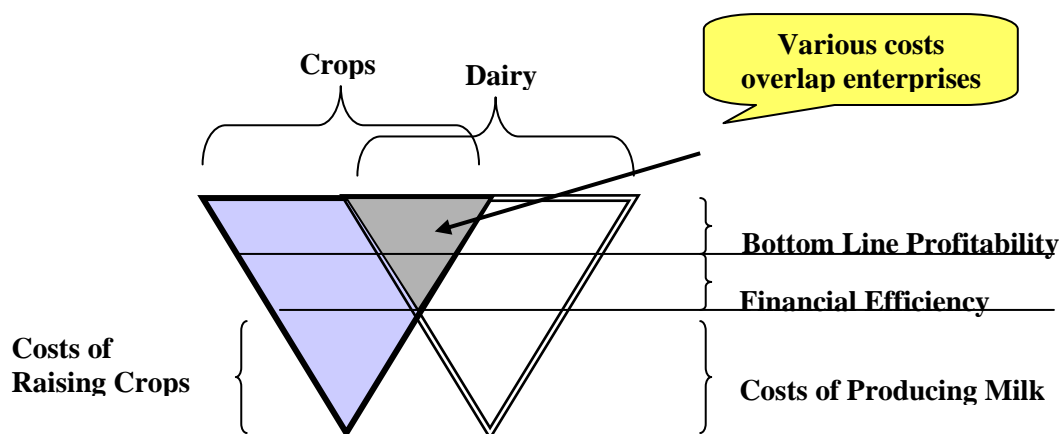
The Agriculture Financial Advisor (AgFA©) data set was used for this study. AgFA represents a sample of Wisconsin dairy farms from which financial and production data are collected annually. This study uses 2009 data composed of a sample of approximately 506 dairy farms. Of these 506 farms, 213 reported the number of operators on their farm. This profitability analysis report is based on data from the 213 farms reporting the number of operators on their farm.

Bottom-Line Profitability Analysis

This profitability analysis considers the “whole” farm’s performance rather than only the dairy enterprise. The level of profitability is based on three Farm Financial Standards Council (FFSC) profitability measures: Net Farm Income (NFI), Rate of Return on Equity (ROE), and Rate of Return on Assets (ROA).

The procedure used for this analysis is to first identify dairy farms that exceed a benchmark profitability level of \$30,000 labor, management, and equity income per operator/manager. The profitability measure is applied across all farms, regardless of size, production, technology, etc. Secondly, the FFSC financial efficiency measures (e.g., operating expense ratio, interest expense ratio, etc.) are applied to compare more and less profitable farms and provide reasoning for differences in profitability. Third, the costs of dairy production are analyzed.

These three steps for analyzing profitability performance are reflected in the following diagram:



The inverted triangles represent crop and dairy enterprises. Initially, bottom line profitability is determined for the whole farm, including all enterprises (crop, dairy) because various costs overlap enterprises and are too difficult to allocate among the enterprises. This continues to be the case among enterprises as financial efficiency measures are applied. However, some costs can be specifically associated with an enterprise for analysis. For example, veterinary, breeding, and milk marketing costs can be analyzed directly related to the dairy enterprise.

The profitability criterion, “labor, management, and equity income per operator/manager,” was used in this report to determine more and less profitable farms. The formula for this criterion is: Return on Equity + Benefits Paid to Dependents + Wages Paid to Dependents + Pension and Profit Sharing Plans for Dependents + Value of Unpaid Labor and Management divided by the Number of Operators/Managers. Farms that had \$30,000 or more in “labor, management, and equity income per operator/manager (dollars available-family living per operator/manager) were considered to be the “more profitable” farms. The selection of \$30,000 as the criterion for being more or less profitable is a somewhat arbitrary determination. The authors justified this criterion based on the lower end needs for family living for a typical Wisconsin family, and more importantly for consistency between this report and past AgFA© and Dairy Farm Business Summary reports. Applying the profitability criterion of \$30,000 identified 85 farms which were more profitable among all AgFA© farms in this data set (213 farms). Average Labor, Management, and Equity Income per Operator/Manager differed by \$67,796 between the more and less profitable farms, reflecting a substantial difference in the average level of profitability between the two subsets.

Who were the more and less profitable farms in this report?

Table 1 depicts the farm profiles and Table 2 the profitability analysis of the more and less profitable farms. In general, many producers in the dairy industry have reflected on 2009 as one of the toughest years, economically, in recent memory. Still, 85 farms in this data set were able to break the \$30,000 Labor, Management, & Equity Income per Operator/Manager. At first glance, what set these farms apart?

- The more profitable farms received \$0.94/cwt more for their milk than the less profitable farms
- The more profitable farms averaged 2,037 more pounds of milk per cow
- The more profitable farms averaged 55 more cows per herd

The more profitable farms on average earned \$128,222 more Labor, Management, and Equity Income per Operator/Manager. Average Net Farm Income (NFI) was \$100,892 greater for the more profitable farms. Additionally, returns to equity and assets (ROE and ROA) were each positive for the more profitable farms, while both ROE and ROA were negative for the less profitable farms.

Table 1: Farm Profiles

Farms: 213

	<i>More Profitable Farms</i>	<i>Less Profitable Farms</i>
Total # Farms	85	128
Average Herd Size	169	114
Production per Cow (lbs)	23,468	21,431
Average Milk Price (\$/Cwt)	14.10	13.16

Table 2: Profitability Analysis

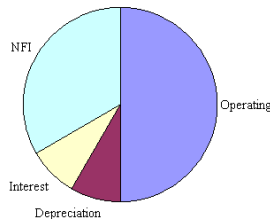
Total Farms: 213

	<i>More Profitable Farms (n=85)</i>	<i>Less Profitable Farms (n=128)</i>
Labor, Management & Equity Income per Operator/Manager	\$98,009	\$-30,213
Net Farm Income	\$77,098	\$-23,794
Return on Equity (%)	2.63%	-7.84%
Return on Assets (%)	3.32%	-2.83%

Why were some AgFA© dairy farms more profitable than others?

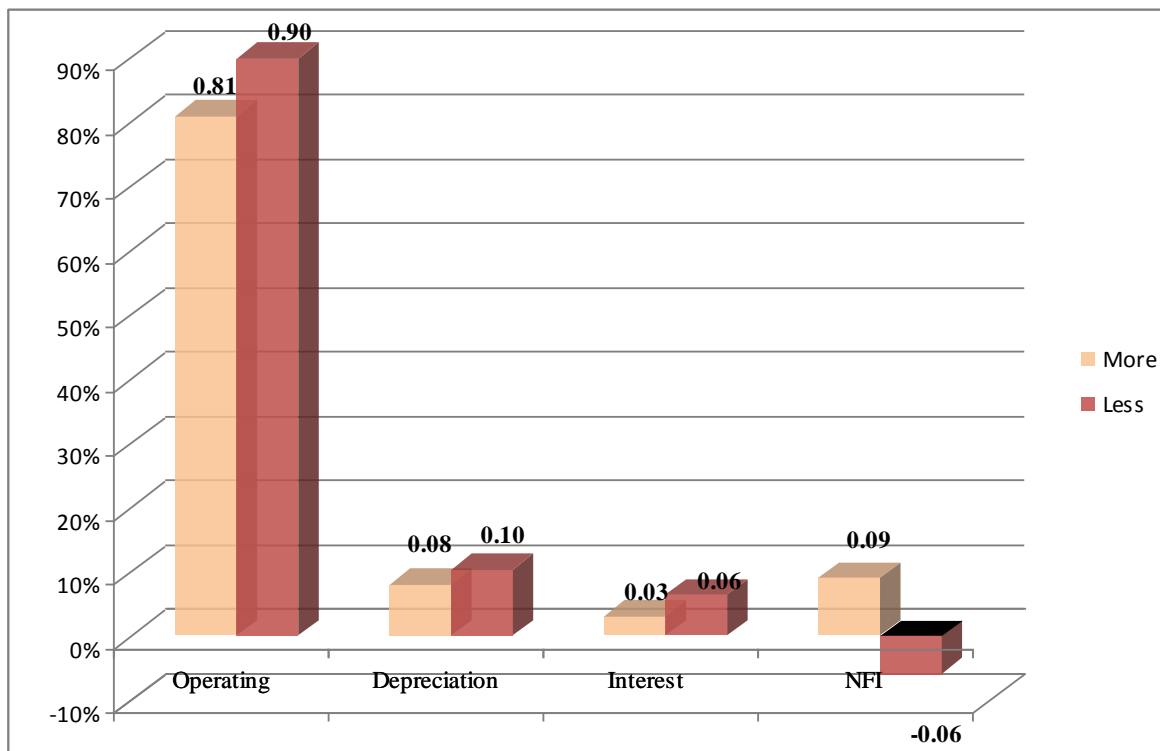
Financial efficiency was greater among the more profitable farms. Operating, depreciation, and interest costs were all a lesser percentage of the Total Farm Income (TFI) for the more profitable farms. In defining Total Farm Income, it may be helpful to think of the TFI as a pie, with NFI being the slice left over after operating, depreciation, and interest are paid (Figure 1). $NFI = TFI \text{ minus operating, depreciation and interest expense.}$

Figure 1: Total Farm Income



In Figure 2, the largest difference between the more and less profitable farms was in operating costs (81% vs 90%), followed by NFI (9% vs -6%) and depreciation (8% vs 10%) costs. Interest was 3% of NFI for the more profitable farms compared to 6% for the less profitable farms. In 2009, the less profitable farms' operating, depreciation, and interest costs exceed income, resulting in a negative NFI.

Figure 2: Financial Efficiency



Tables 3 and 4 show selected expense categories on a per cow and per cwt basis, respectively. The more profitable farms had \$35 more in production expenses per cow and \$.53 per cwt. Within the selected expense categories per cow, purchased feed had the greatest difference between the more and less profitable farms (+116). On a per cwt basis within the selected expense categories, labor had the greatest difference between the more and less profitable farms. On average the more profitable farms spent \$1.28 more per cwt on labor than the less profitable farms. Interest costs were less for the more profitable farms, being \$89 less per cow and \$0.47 less per cwt.

Because 2009 was a relatively low year for milk prices, one of the questions the authors had was if the more profitable farms were more profitable because of non-milk product sales? As a percentage of Total Farm Income (TFI), milk sales comprised nearly equal percentages for the more and less profitable farms (77.1% and 76.6%, respectively). Looking specifically at crop sales, the more profitable farms had a slightly greater percentage of their TFI from crop sales, 5.3%, compared to 4.8% for the less profitable farms. On an absolute basis, the more profitable farms did have \$18,577 more in crop sales than the less profitable farms (\$38,588 vs \$20,011).

Table 3: Expense Categories per Cow
Total Farms: 213

	<i>Costs per Cow:</i>		
	<i>More Profitable Farms</i> <i>(n=85)</i>	<i>Less Profitable Farms</i> <i>(n=128)</i>	<i>Difference</i>
Breeding	\$ 47	\$ 62	-15
Custom Hire	133	116	+17
Feed Purchased	1031	915	+116
Gas, Fuel, Oil	128	127	+1
Interest	147	236	-89
Labor	539	472	+67
Repairs	187	203	-16
Supplies	85	113	-28
Utilities	95	102	-7
Vet & Medicine	121	123	-2
Other	232	241	-9
TOTAL	\$2745	\$2710	35

Interest = Mortgage and Other Interest

Labor = Employee Benefits (Dependent and Non-dependent) + Labor Hired (Dependent and non-dependent)

Other = Fertilizer & Lime + Seed Purchase + Chemicals

Table 4: Expense Categories per Cwt

Total Farms: 213

	<i>Costs per Cwt:</i>		<i>Difference</i>
	<i>More Profitable Farms (n=85)</i>	<i>Less Profitable Farms (n=128)</i>	
Breeding	.20	.29	-.09
Custom Hire	.57	.54	+.03
Feed Purchased	4.39	4.27	+.12
Gas, Fuel, Oil	.54	.59	-.05
Interest	.63	1.10	-.47
Labor	3.48	2.20	+1.28
Repairs	.80	.80	0
Supplies	.36	.53	-.17
Utilities	.41	.48	-.07
Vet & Medicine	.52	.57	-.05
Other	.99	.99	0
<i>TOTAL</i>	<i>12.89</i>	<i>\$12.36</i>	<i>.53</i>

Interest = Mortgage and Other Interest

Labor = Employee Benefits (Dependent and Non-dependent) + Labor Hired (Dependent and non-dependent)

Other = Fertilizer & Lime + Seed Purchase + Chemicals

Table 5 illustrates the capital investment per cow. The less profitable farms, on average, had \$1,399 more total capital invested per cow. The difference is slightly greater for real estate, where the less profitable farms had \$1,602 more investment per cow. Machinery & Equipment was slightly lower for the less profitable farms. This finding follows the general notion that a lower level of investment contributes to lower costs, thus resulting in greater net income.

Table 5: Capital per Cow Total
Farms: 213

	<i>Capital per Cow:</i>	
	<i>More Profitable Farms (85)</i>	<i>Less Profitable Farms (128)</i>
Total Capital	\$10,015	\$11,414
Real Estate*	4,522	6,124
Machinery & Equipment	1,593	1,586

*Real Estate = Buildings, Land, House

Table 6 represents the physical labor efficiency for those farms who completed an AgFA labor summary in this dataset (54 out of 85 farms for the more profitable and 95 out of 128 for the less profitable farms). In 2009, the physical labor efficiency for the more profitable farms was higher than the less profitable farms, which is logical as the more profitable farms produced more milk per cow on average.

Table 6: Physical Labor Efficiency
Farms: 213

	<i>More Profitable Farms (n=54*)</i>	<i>Less Profitable Farms (n=95*)</i>
Cows per Worker	43.4	37.5
Milk Sold per Worker	1,067,418	812,897

* Labor Efficiency is reported for those completing a 2009 AgFA Labor Summary - 54 out of 85 farms for the more profitable and 95 out of 128 for the less profitable farms.

In Summary, more profitable farms (as compared to less profitable farms) had:

- Greater financial efficiency
- Slightly greater expenses per cow, especially Purchased Feed and Labor
- Greater labor efficiency, measured as Cows per Worker and Milk Sold per Worker
- Received a higher milk price
- Higher investment per cow, but lower interest and depreciation expenses per cow

Finally, it's important to note that Wisconsin dairy farms of all sizes are represented by the 85 "more profitable" farms. While the "more profitable" farms averaged more cows per herd, the range in herd sizes was 28 to 836 cows. This once again illustrates that herds of all sizes can be profitable in Wisconsin.

Benchmark Guide

Benchmark values are based on the performance of AgFA© dairy farms averaging greater than \$30,000 return to labor, management & equity per operator/manager for 2009. The values reported are the average values for the more profitable farms.

	<i>Benchmark Values</i>	<i>Our Farm</i>
Financial Performance – Profitability		
Return to Labor, Mgt., and Equity Per Operator/Manager	98,009	
Net Farm Income	77,098	
Rate of Return On Equity (ROE) - Percent	2.63	
Rate of Return On Assets (ROA) - Percent	3.32	
Financial Efficiency		
Operating	0.81	
Depreciation	0.08	
Interest	0.03	
Net Farm Income	0.09	
Financial Position		
Percent Owner Equity	69	
Investment per Cow	12,411	
Debt per Cow	2,998	
Size of Business		
Number of Cows	169	
Number of Workers*	4.9	
Production Performance		
Lbs. Milk Sold per Cow	23,468	
Lbs. Milk Sold per Worker*	1,067,418	
Dairy Enterprise Performance		
Milk Price per Cwt.	14.10	
Dairy Income per Cwt.	15.16	
Operating Cost per Cwt.	16.06	

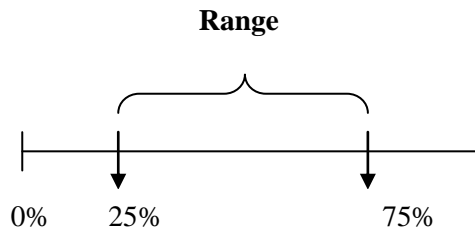
Dairy Income = Cull Cows + Calves Sold + Milk Sold + MILC and other Government Dairy Payments

Operating Cost = Total Basic Cost + Wages and Benefits

* Labor Efficiency is reported for those filling out a 2009 AgFA Labor Summary - 54 out of 85 farms were reported for the more profitable

Performance Among Dairy Businesses

The following tables present the median and range values for key performance variables for AgFA© dairy farms achieving \$30,000 or greater return to labor, management, & equity per operator/manager for 2009. Out of 213 farms reporting the number of operators on the farm 85 met this criterion. The values presented in this section likely differ from those used before because the median is presented in this section, whereas averages were used in prior sections. The median (or middle) value is presented instead of the mean to guard against the potential influence of extreme values. For example a 1000 cow herd could significantly affect “average” herd size for a relatively large number of farms with most herds under 100 cows. The range is for the middle 50% of the farms, represented by the 1st and 3rd quartile values. In other words, 25% of the farms will have values lower than the 1st quartile and 25% of the farms will have values higher than the 3rd quartile. This range provides a good idea as to the performance among all farms while not misleading about performance by including the absolute lowest and highest values. These values are sometimes outliers because of unique circumstances and could potentially misrepresent performance.



Financial Performance

	<i>Median</i>	<i>Range</i>
Net Farm Income (\$)	69,543	48,127 - 120,623
Labor & Mgt Income per Operator (\$)	77,451	55,795 – 130,317
Return On Assets (%)	3.10	1.52 - 4.80
Return On Equity (%)	2.75	1.45 - 4.99

Financial Position

	<i>Median</i>	<i>Range</i>
Owner Equity (%)	80	76 - 100
Investment per Cow(\$)	14,186	10,736 - 17,555
Debt per Cow (\$)	726	66 – 2,983

Dairy Enterprise Performance – Per Cwt. and Per Cow

	<i>Median</i>	<i>Range</i>
Milk Price per Cwt (\$)	13.03	12.60 – 13.54
Dairy Income per Cwt (\$)	14.25	13.48 - 15.11
Operating Cost per Cwt (\$)	13.75	11.91 - 17.04
Total Cost per Cwt (\$)	17.24	15.61 - 21.81
Total Income per Cwt (\$)	18.21	16.79 - 22.41

	<i>Median</i>	<i>Range</i>
Milk Income per Cow (\$)	\$2,854	2,341 - 3,152
Dairy Income per Cow (\$)	\$2,992	2,580 - 3,534
Operating Cost per Cow(\$)	\$2,846	2,262 - 2,438
Total Cost per Cow (\$)	\$3,725	3,263 - 4,323
Total Income Per Cow (\$)	\$3852	2,249 - 4,729

Costs of Production - Per Cwt. and Per Cow

	<i>Median</i>	<i>Range</i>
Breeding per Cwt (\$)	.28	.16- .40
Custom Hire per Cwt (\$)	.43	.21 - .72
Feed Purchased per Cwt (\$)	3.45	2.67 – 5.10
Gas, Fuel, Oil per Cwt (\$)	.57	.88 - 1.93
Interest per Cwt (\$)	.62	.21 – 1.37
Labor per Cwt (\$)	2.29	1.18 - 3.29
Repairs per Cwt (\$)	.86	.56 - 1.53
Supplies per Cwt (\$)	.46	.27 - .88
Utilities per Cwt (\$)	.56	.41 - .76
Vet. & Medicine per Cwt (\$)	.42	.35 - .61
Related Dairy Costs per Cwt (\$)	1.36	.80 - 2.08

	<i>Median</i>	<i>Range</i>
Breeding per Cow (\$)	55	33 - 81
Custom Hire per Cow (\$)	82	42 - 174
Feed Purchased per Cow (\$)	720	525 – 1090
Gas, Fuel, Oil per Cow (\$)	114	88 - 164
Interest per Cow (\$)	123	41 - 269
Labor per Cow (\$)	465	219 - 749
Repairs per Cow (\$)	175	114 - 280
Supplies per Cow (\$)	100	46 - 152
Utilities per Cow (\$)	112	91 - 178
Vet. & Medicine per Cow (\$)	85	60 - 120
Related Dairy Costs per Cow (\$)	282	162 - 419

Cow and Worker Performance (based on those farms reporting number of operators)

	<i>Median</i>	<i>Range</i>
Lbs. Milk Sold per Cow	21,239	17,428 - 22,840
Cows per Worker	40	38 - 43
Lbs. Milk Sold per Worker	859,324	675,920 - 924,045