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DAIRY FARM BUSINESS SUMMARY 1999

by

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MISSION STATEMENT

The Dairy Farm Business Summary (DFBS) program provides dairy farmers with ***economic, financial,*** *and* ***production*** *information to assist them in their decision-making for profitable and feasible dairy farm businesses.*

This report analyzes the "profitability" of dairy farm businesses. It enables the operator/manager to compare his/her dairy farm business to other profitable dairy farm businesses

This report marks the end for DFBS reports and the beginning for the Agriculture Financial Advisor (AgFA) program. Continuity in reporting of the same farm business financial information in a uniform, consistent manner will continue.

PROFITABILITY ANALYSIS

An analysis of farms in the Dairy Farm Business Summary (DFBS) program indicates a wide variation in the level of profitability performance among Wisconsin dairy farm businesses. Farms that were more profitable tended to have higher financial efficiency; with operating, interest, and depreciation expenses representing a smaller proportion of the value of farm production. These farms received a similar milk price while producing more milk per cow from more cows. They also had lower capital investment per cow.

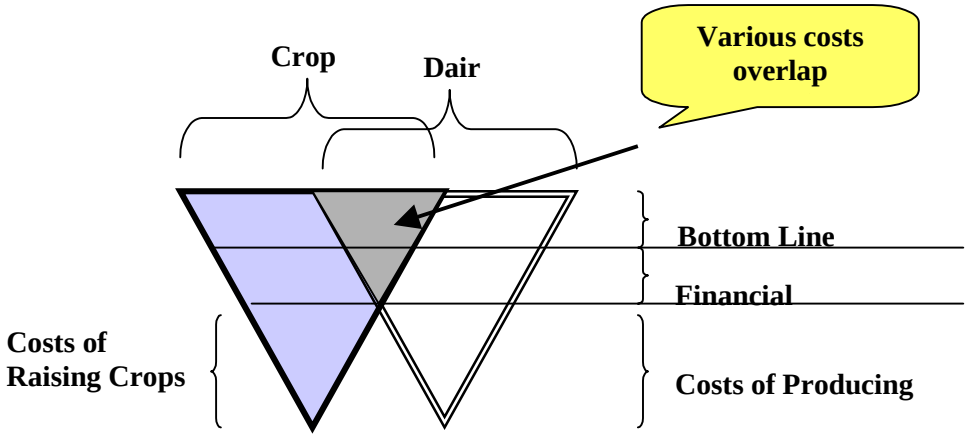
Bottom-Line Profitability Analysis

Bottom-line profitability analysis of Wisconsin dairy farms is done from a business perspective, and not all dairy farms are operated purely from a business perspective. As such, the mission statement of DFBS includes the word *"feasible"* to recognize that farmers' decisions may not be made solely to increase profits.

The profitability analysis considers the "whole" farm's performance rather than only the dairy enterprise. It is consistent with the Farm Financial Standards Council (FFSC) recommendations. The level of profitability is determined based on three 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 and management 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.

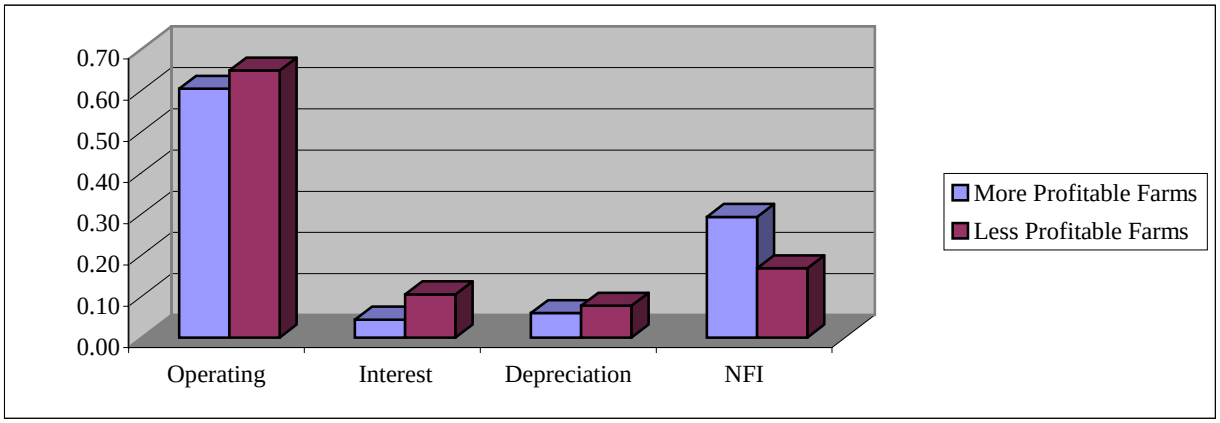
The profitability criterion used to determine more and less profitable farms is "labor and management income per operator/manager". This represents the residual of net farm income per operator/manager after allocating payment to unpaid labor and a five percent return to owner equity. Farms that had $30,000 or more labor and management income per operator/manager were considered to be "more profitable" farms. The $30,000 value was selected as representing family living withdrawals for a typical Wisconsin family. Applying the profitability criterion of $30,000 labor and management income per operator/manager, 32 farms were more profitable among all DFBS farms (below), reflecting a substantial difference in the average level of profitability between the more and less profitable farms:

	More Profitable Farms (32)	*Less Profitable Farms (29)*
Labor & Management Income per Operator/Manager	**$65,525**	**$2,779**
Net Farm Income	$125,525	$22,728
Return on Equity	14.3%	-1.2%
Return on Assets	11.3%	3.2%

Why were some DFBS dairy farms more profitable than others?

1) Financial efficiency was higher among more profitable farms…

Operating, interest, and depreciation expenses were each a lower percentage of the value of farm production (VFP) for the more profitable farms:



The relatively lower operating (60% v. 65%), interest (4% v. 11%), and depreciation (6% v. 8%) expenses for more profitable farms meant that their net farm income (NFI) was relatively higher (29% v. 17% of VFP). The median NFI for more profitable farms was $107,429 compared with $27,813 for less profitable farms.

Expense *categories* were:

	Costs per Cow:	
	More Profitable Farms (32)	*Less Profitable Farms (28)*
Hired Labor	$376	$350
Feed	658	603
Machinery	377	384
Livestock	757	437
Crops	248	354
Real Estate	196	234
Other	369	590
Total	*$2,982*	*$2,952*

Farm expenses (above) totaled, on average, $26 per cow more for more profitable farms. Dairy expenses (labor, feed, livestock) were higher, on average, among the more profitable farms, while other expenses (machinery, crops, real estate, and other) were higher, on average, for less profitable farms on a per cow basis.

Various costs can be analyzed more specifically related to the dairy enterprise. Costs of producing milk on a per cow and per cwt. basis were:

	Costs per Cow: *More Profitable Farms (32)*	*Less Profitable Farms (28)*
Purchased Feed & Crop Expense	$824	$861
Breeding	48	39
Veterinary & Medicine	107	103
Milk Marketing	63	60
Other	176	87

	Costs per Cwt: *More Profitable Farms (32)*	*Less Profitable Farms (28)*
Purchased Feed & Crop Expense	$3.91	$4.39
Breeding	.23	.20
Veterinary & Medicine	.50	.52
Milk Marketing	.30	.32
Other	.81	.93

2) More profitable farms, on average, had more cows with higher production per cow, yet received just about the same milk price, with similar costs of production per cow and lower costs of production per cwt. than less profitable farms…

The more profitable farms averaged 75 more cows than the less profitable farms (159 and 84 cows, respectively), with more pounds of milk per cow sold (21,037 lbs. compared to 19,442 lbs.). More profitable farms received, on average, $.02 per cwt. less for their milk ($14.60 compared to $14.62), while operating expenses were, on average, $2.91 per cwt. less ($8.04 compared to $10.95).

3) More profitable farms, on average, had less capital investment per cow and earned positive net returns on their debt capital…

Generally, a lower level of investment is desirable because it will contribute to lower costs resulting in higher net income. Among the DFBS farms total capital investment was less for more profitable farms:

	Capital per Cow:	
	More Profitable Farms (32)	*Less Profitable Farms (28)*
Total Capital	$7,674	$8,460
Real Estate	$3,129	$3,949
Machinery & Equipment	$1,588	$1,756

Debt per cow has often been used in analyzing dairy farms with the general notion that the amount of debt per cow should not exceed an industry benchmark, and this was imposed across farms. An alternative to this approach is to analyze a farm's ability to use debt capital *profitably*. For example, assume that the cost of debt capital (COD) was similar for all DFBS farms, at 9.0%. The logical ordering among equity and debt capital is ROE>ROA>COD, based on the relative risk positions of the farm's debt and equity holders. Return on equity should be higher than COD because owner equity is at greater risk than is debt capital, and therefore should receive a higher return. Return on assets should be higher than COD or is unprofitable to use debt capital. *In this case, more profitable farms made money using debt capital (14.3>11.3%>9.0%) while less profitable farms lost money using debt capital (-1.2%>3.2%>9.0%*).

4) Physical labor efficiency was higher among more profitable farms…

More profitable farms averaged more cows per worker and more milk sold per worker (as production per cow was also higher):

	More Profitable Farms (32)	*Less Profitable Farms (28)*
Cows per Worker	34	31
Milk Sold per Worker	729,591	594,911
Tillable Acres per Worker	117	132

In summary, more profitable farms (as compared to less profitable farms) had…

- ***Higher financial efficiency***
- ***More cows***
- ***Higher milk production per cow***
- ***Higher (physical) labor efficiency***
- ***Lower operating costs per cwt.***
- ***Lower capital investment per cow***

This resulted in $62,746 higher returns, on average, to labor and management per operator/manager

Finally…

The more profitable farms averaged 159 cows and ranged in size from 38 to 802 cows. There were 3 herds with less than 50 cows and 5 herds over 200 cows. Milk sold per cow ranged from 12,539 lbs. to 27,082 lbs., with 6 herds under 18,000 lbs. and 10 over 23,000 lbs. In other words, profitable performance was evident, *again*, across size and production classes of farms.

Benchmark ’00 Guide

Benchmark ’00 is based on the performance of DFBS dairy farms that have averaged greater than $30,000 return to labor & management per operator/manager over the past year (1999). The values reported are the average values for the more profitable farms.

	Benchmark Values	*Our Farm*
Financial Performance – Profitability		
Return to Labor & Mgt. Per Operator/Manager	64,526	
Rate of Return On Equity (ROE)	14.3	
Rate of Return On Assets (ROA)	11.3	
Net Farm Income	125,525	
Financial Efficiency		
Operating	.60	
Depreciation	.06	
Interest	.04	
Net Farm Income	.29	
Financial Position		
Percent Owner Equity	67	
Investment per Cow	7,674	
Debt per Cow	2,110	
Size of Business		
Number of Cows	159	
Crop Acres Operated	458	
Number of Workers	4.5	
Production Performance		
Lbs. Milk Sold per Cow	21.037	
Lbs. Milk Sold per Worker	729,591	
Number of Cows per Worker	35	
Dairy Enterprise Performance		
Milk Price per Cwt.	14.60	
Dairy Income per Cwt.	16.05	
Operating Cost per Cwt.	8.04	
Costs of Production		
Feed & Crops per Cwt.	3.91	
Breeding per Cwt.	.23	
Vet. & Medicine per Cwt.	.50	
Milk Marketing per Cwt.	.30	
Other per Cwt.	.81	

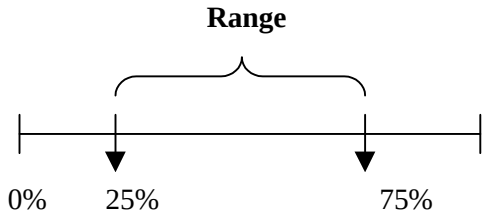
Profile of DFBS Dairy Farm Businesses

The dairy farm businesses are from 9 counties in west central Wisconsin. The 60 DFBS dairy farms averaged 124 cows and 418 tillable acres. There were 3.64 workers per farm, with an average of 32 cows and 666,741 lbs. of milk sold per worker.

DFBS dairy farms were larger (by average cow number) and more productive (by average lbs. of milk sold per cow) than the average of all Wisconsin dairy farms. The structure of DFBS farms was similar to all Wisconsin farms – as single enterprise (dairy) farms. DFBS farms and Wisconsin farms averaged 124 and 62 cows, respectively. DFBS farms and Wisconsin farms averaged 20,415 and 16,902 lbs. of milk per cow, respectively.

Performance among Dairy Farm Businesses

The following tables present the median and range values for key performance variables for DFBS dairy farm businesses. 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

	Median	*Range*
Net Farm Income ($)	**55,467**	**30,241 to 109301**
Labor & Mgt Income per Operator ($)	**36, 732**	**12,730 to 59,052**
Return On Assets (%)	**8.00**	**4.7 to 11.4**
Return On Equity (%)	**7.45**	**3.2 to 13.5**

Financial Position

	Median	*Range*
Owner Equity (%)	**62**	**42 to 80**
Investment per Cow($)	**7,655**	**6,566 to 10,090**
Debt per Cow ($)	**2,672**	**1,495 to 4,346**

Dairy Enterprise Performance – *Per Cwt. and Per Cow*

	Median	*Range*
Milk Price per Cwt ($)	**14.48**	**14.11 to 14.99**
Dairy Income per Cwt ($)	**15.81**	**15.07to 16.88**
Operating Cost per Cwt ($)	**10.00**	**7.47 to 11.58**
Total Cost per Cwt ($)		

	Median	*Range*
Milk Income per Cow ($)	**2,994**	**2,697 to 3,236**
Dairy Income per Cow ($)	**3,298**	**2,981 to 3,551**
Operating Cost per Cow($)	**1,937**	**1,490 to 2,451**
Total Cost per Cow ($)	**2,867**	**2,474 to 3,315**

Costs of Production - *Per Cwt. and Per Cow*

	Median	*Range*
Feed & Crop per Cwt ($)	**3.94**	**3.36 to 4.91**
Breeding per Cwt ($)	**.20**	**.15 to .24**
Vet. & Medicine per Cwt ($)	**.46**	**.38 to .63**
Milk Marketing per Cwt ($)	**.27**	**.24 to .33**
Related Dairy Costs per Cwt ($)	**.79**	**.52 to 1.16**

	Median	*Range*
Feed & Crop per Cow ($)	**810**	**665 to 1047**
Breeding per Cow ($)	**42**	**28 to 54**
Vet. & Medicine per Cow ($)	**95**	**76 to 130**
Milk Marketing per Cow ($)	**55**	**45 to 68**
Related Dairy Costs per Cow ($)	**153**	**96 to 247**

Cow and Worker Performance

	Median	*Range*
Lbs. Milk Sold per Cow	**20,256**	**18,476 to 22,531**
Cows per Worker	**32**	**25 to 39**
Lbs. Milk Sold per Worker	**652,284**	**484,888 to 852,646**

Four-Year TREND ANALYSIS

There are two interesting considerations in studying the performance of DFBS farms over time. First, is how the DFBS farms have changed relative to how Wisconsin's dairy farms have changed. Secondly, is how DFBS farms have, themselves, changed over time.

The following table indicates the trend of profitability performance among all DFBS farms since 1994.

	1994	*1995*	*1996*	*1997*	*1998*	*1999*
All Farms	100	116	116	67	63	60
More Profitable Farms	24	22	44	18	44	32
(%) More Profitable Farms	24	19	38*	27	70*	53*

*Milk price averaged $15.15 and $15.76 in 1996 and 1998, respectively, among all DFBS farms. In 1999 milk price averaged $14.61, but operating costs were also lower on average.

How have DFBS farms responded to change within Wisconsin's dairy industry environment over the past five years relative to all Wisconsin dairy farms? A group of thirty-five dairy farms has reported in the DFBS program for at least four of the past five years. Most of these farms have reported in all five years. These farms include more and less profitable farms. Comparing the 35 DFBS farms and Wisconsin dairy farms in terms of size and production (below), DFBS were larger than Wisconsin's dairy farms (85 cows and 53 cows, respectively) in 1995 and had higher milk production per cow (19,054 lbs. and 15,397 lbs., respectively). From this starting point, Wisconsin dairy farms increased milk production at a faster rate (9.8% vs. 6.9% over five years); however, DFBS farms continue to have higher production per cow. DFBS farms grew their farm businesses substantially more than Wisconsin's dairy farms (33% compared to 17%), increasing their average herd size from 85 cows to 113 cows over the five years.

	1995	*1996*	*1997*	*1998*	*1999*
<u>DFBS Dairy Farms</u>					
Lbs. Milk per Cow	19,054	19,066	19,409	19,954	20,365
Number of Cows	85	91	109	120	113
<u>Wisconsin Dairy Farms</u>					
Lbs. Milk per Cow	15,397	15,442	16,057	16,685	16,902
Number of Cows	53	54	56	60	62

How have DFBS dairy farms changed over the past five years? The numbers for thirty-five dairy farms participating in the DFBS program may provide us with a glimpse of change among dairy farms in Wisconsin, depending how we judge these farms to represent Wisconsin's dairy farms. We know that the DFBS dairy farms average larger size herds and have higher milk production per cow. We know that the DFBS dairy farms have grown faster than Wisconsin's dairy farms.

The five-year trend in profitability performance among the thirty-five DFBS farms shows swings in profits following the variation in milk prices.

	1995	*1996*	*1997*	*1998*	*1999*
Profitability Performance					
Return to Labor & Management per Operator/Manager ($)	18,973	30,840	16,171	53,404	25,474
Rate of Return On Equity (%)	1.7	6.2	1.0	16.9	8.3
Rate of Return On Assets (%)	4.9	7.1	4.7	11.5	7.9

Milk price increased faster than operating expenses, on average; however, 1996 and 1998 are generally years of higher than normal prices if we consider a longer trend with respect to milk prices.

	1995	*1996*	*1997*	*1998*	*1999*
Receipts & Expenses					
Milk Price ($)	13.03	15.09	13.50	15.69	14.78
Operating Expenses ($)	8.27	9.78	9.15	8.92	9.28
Margin ($)	*4.76*	*5.31*	*4.35*	*6.77*	*5.50*

A closer look at specific dairy expenses on a per cwt. basis (below):

	1995	*1996*	*1997*	*1998*	*1999*	*AVG*
Feed & Crop ($)	4.05	4.87	4.49	4.29	4.03	*4.45*
Marketing ($)	.42	.29	.25	.25	.30	*.30*
Breeding ($)	.21	.20	.21	.23	.24	*.22*
Veterinary & Medicine ($)	.48	.50	.48	.50	.48	*.49*

The trend with respect to financial position (below) indicates that, while investment per cow and debt per cow have varied, both have trended upward; debt at a faster rate. In 1999, investment per cow ranged from $2,039 to $19,474 and debt per cow ranged from $0 to $6,943.

	1995	*1996*	*1997*	*1998*	*1999*
Financial Position					
Investment per Cow ($)	7,925	7,893	7,899	8,122	8,161
Debt per Cow ($)	2,539	2,736	2,962	3,017	2,988

The trend in physical labor efficiency indicates a modest gain over the past four years:

	1995	*1996*	*1997*	*1998*	*1999*
Physical Labor Efficiency					
Cows per Worker	31	32	32	33	34
Lbs. Milk per Worker	591,978	611,738	633,817	658,202	699,579

In summary, the trend of thirty-five dairy farms participating in the DFBS program over the past five years indicates growth, increased production efficiency, and gains in profitability.