

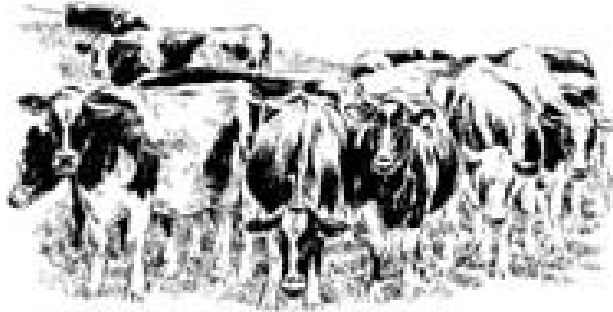
**A UW-RIVER FALLS, UW-EXTENSION AND CENTER FOR DAIRY  
PROFITABILITY REPORT**

**A BAD YEAR/GOOD YEAR SERIES REPORT:  
AN ANALYSIS OF COMMON SINGLE EMPHASIS APPROACHES  
USED TO BECOME PROFITABLE IN THE WISCONSIN DAIRY FARM  
INDUSTRY<sup>1</sup>**

**By**

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**February 2007**



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<sup>1</sup> This research was originally published in Midwest Dairy Business in an article titled "Philosophical Differences" (July 2006). The information from that article has been revised in this report, however, to include data from the 2005 fiscal year.

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## **I. Introduction**

There are many approaches that dairy farm managers employ to become more profitable. Many producers emphasize a single approach to become profitable. For example, a producer may constantly stress increasing his or her milk production per cow to become more profitable. Another may constantly emphasize decreasing their cost-of-production to become more profitable. The purpose of this paper is to examine the effectiveness of some of those single emphasis approaches and to provide further information on why highly profitable dairy farms are profitable. The approaches analyzed are: emphasizing size, high production per cow, high milk price, low investment per cow, low cost-of-production, and low debt per cow. As different single emphasis approaches may be better suited for different market price conditions, this paper analyzes their effectiveness in a bad price year (2003) and a good price year (2005).

## **II. Methods**

It is difficult to determine exactly which approach is predominantly employed on a farm without directly interviewing and observing the dairy farm manager. Because of this difficulty, it was assumed that the 100 Wisconsin AgFA<sup>3</sup> dairy farms with the:

- largest herd size emphasized the size approach;
- best milk shipped per cow per year emphasized a high production per cow approach;
- best average annual milk price received emphasized a high milk price approach;
- lowest investment per cow values, as measured by assets per cow, emphasized a low investment per cow approach;
- best cost of production per hundredweight emphasized a low cost-of-production approach; and,

the 100 AgFA dairy farms with the lowest debt per cow values emphasized a low debt per cow approach. The 100 dairy farms making up each of these 6 approach farm groups were named the SIZE, MILK, PRICE, INVESTMENT, COST, and DEBT farm groups, respectively.

The financial results for the six farm groups were compared to the financial results of the 100 most profitable Wisconsin AgFA dairy farms, which will be referred to as the PROFIT farm group. Because certain approaches may perform better in different price conditions, the comparisons were made in a low price year, 2003, and a high price year, 2005. It should be noted, then, that the composition of the farms in a given farm group in 2003 could be different in 2005.

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<sup>3</sup> AGFA refers to the UW-Extension and the Center for Dairy Profitability Agriculture Financial Advisor program. This program generates financial statements and financial analyses for participating farms.

The seven farm groups' profitability were compared using the DuPont Analysis. The DuPont Analysis links a farm's Rate of Return on Assets (ROROA)<sup>4</sup> to its Asset Turnover ratio (ATO)<sup>5</sup> and its Operating Profit Margin (OPM)<sup>6</sup> by the following formula:

$$\text{ROROA} = \text{ATO} * \text{OPM}.$$

The ROROA is the percentage of profitable returns that both the farm owner and any debt holders receive for the equity and debt capital used to finance the farm assets. In this study, the farm assets were valued at their agricultural use market value.

The ATO shows how many dollars of Total Farm Income, which is also known as Gross Farm Revenue, is generated per dollar of assets. If a farm's ATO is better (higher) than the farms it is compared to, the difference can be attributed to four things. First, the farm may have been able to obtain better prices than the other farms due to better milk quality, better components, using organic production methods or value added marketing, and/or better marketing plans. Second, the high ATO farm may have achieved higher milk production per cow or crop yields. Third, the farm may have received more indirect farm revenues such as patronage dividends and government program payments. Fourth, the difference in ATO may be due to better asset utilization.

The OPM is the percentage of profitable returns that both the farm owner and any debt holders receive from each dollar of Total Farm Income generated by the farm. If a farm's OPM is better (higher) than the farms it is being compared to, it is due to having better cost efficiency.

Once the Dupont Analysis was conducted, the PROFIT farm group's herd size, milk shipped per cow per year, average annual milk price received, assets per cow, cost-of-production and debt per cow were analyzed and compared to those of the other six farm groups.

### III. 2003 DuPont Analysis Results and Conclusions

Table 1 displays the DuPont Analysis results for 2003. Emphasizing price was the best single approach to emphasize in 2003, a low milk price year. The PRICE farm group earned 12.5 cents of profit for every dollar invested in assets. The PRICE farms' ATO of 0.48 indicates that they generated 48 cents in Total Farm Income for every dollar invested in assets. Their OPM of 13.42 % indicates that these farms earned 13.42 cents of profit for every dollar of Total Farm Income generated.

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<sup>4</sup> ROROA = [(Net Farm Income from Operations + Interest – Unpaid Labor)/(Average Farm Assets)]\*100%

<sup>5</sup> ATO = (Total Farm Income)/(Average Farm Assets)

<sup>6</sup> OPM = [(Net Farm Income from Operations + Interest – Unpaid Labor)/(Total Farm Income)]\*100%

Emphasizing a low investment per cow was the second best single emphasis approach in 2003. The INVESTMENT farms achieved a ROROA of 6.14 %. They achieved this ROROA primarily through their extremely high ATO. On average, these farms generated 66 cents of Total Farm Income for every dollar invested in assets, which was the highest ATO for all farm groups – including the PROFIT farms. It also ranked as the second most profitable single emphasis approach despite earning the lowest OPM, 9.37 %.

**Table 1. 2003 DuPont Analysis Results**

Rank	Farm Group (by Financial Strategy Emphasizd)	ROROA	ATO	OPM
1	PROFIT	12.15 %	0.52	23.58 %
2	PRICE	6.44 %	0.48	13.42 %
3	INVESTMENT	6.14 %	0.66	9.37 %
4	COST	5.89 %	0.33	17.98 %
5	MILK	5.87 %	0.48	12.18 %
6	SIZE	5.86 %	0.52	11.27 %
7	DEBT	4.78 %	0.30	16.16 %

Somewhat surprisingly, farms that utilized a low cost-of-production approach did not do as well as the PRICE and INVESTMENT farm groups in this low price year. The COST farms earned an ROROA of 5.89 %. Although these farms had a relatively high OPM of 17.98 %, they generated only 33 cents of Total Farm Income per dollar invested in assets. Further analysis showed that these farms had the second-lowest production per cow and the lowest milk price, resulting in the lowest milk income per cow of all seven farm groups. This may indicate that their low cost of production came at the expense of achieving an adequate milk income level.

Following closely in fifth and sixth place were the farms that emphasized milk production and size. While both the MILK and SIZE farm groups earned high ATO values, 0.48 and 0.52 respectively, they both earned relatively low OPM measures, 12.18 % and 11.27 %. The low OPM of the SIZE farms may surprise some. It is often thought that larger dairy farms have cost efficiency advantages. Nevertheless, this analysis indicates that their actual comparative advantage is generating a high Total Farm Income relative to their investment in assets.

The least effective single emphasis approach was maintaining a low debt per cow. Although they had the third best OPM at 16.16 %, these farms had the lowest ATO. This may indicate that maintaining a low debt level hindered their ability to invest in inputs and technologies that would enhance production and/or asset utilization.

When comparing the results of the six single emphasis approach farm groups to the PROFIT farms, it becomes evident that the PROFIT farms are very different. The PROFIT farm group's 12.15 % ROROA was 1.89 times higher than the second rank ROROA of the PRICE farm group. Unlike the other farm groups, which tended to have

either good ATO or good OPM values, the PROFIT farms have arranged their farm operations and assets so that they achieve both a high ATO and a high OPM.

The rank order of the single emphasis financial approaches changed in 2005, the high price year of our analysis. The farms that emphasized low investment per cow had the second highest ROROA – up one place from 2003 (Table 2). Achieving a high milk production per cow was a much more fruitful strategy in 2005 than in 2003. The MILK farm group had the 5<sup>th</sup> rank ROROA in 2003 and third place ROROA in 2005. The COST farm group once again had the 4<sup>th</sup> place ROROA. The larger farms earned the fifth place ROROA, up one place from 2003. The PRICE farm group, which had the second highest ROROA in 2003 with their price emphasis approach, had the 6<sup>th</sup> ranked ROROA in 2005. The farms that emphasized maintaining a low debt per cow were, once again, the worst performing farm group.

**Table 2. 2005 DuPont Analysis Results**

Rank	Farm Group (by Emphasized Approach)	ROROA	ATO	OPM
1	PROFIT	15.88 %	0.65	24.44 %
2	INVESTMENT	12.03 %	0.76	15.93 %
3	MILK	10.37 %	0.58	17.83 %
4	COST	9.84 %	0.38	25.81 %
5	SIZE	9.80 %	0.59	16.62 %
6	PRICE	8.94 %	0.51	17.46 %
7	DEBT	6.15 %	0.33	18.69 %

The difference in ROROA narrowed between the PROFIT farm group and second place farm group. Nevertheless, the PROFIT farm group was able to combine the second highest ATO and OPM, which shows, once again, that striking a good balance between ATO and OPM was a much more effective means of being profitable than using approaches that emphasized either ATO or OPM.

If a dairy farm manager were to adopt a single emphasis approach with consistently decent performance in both low and high price years, the DuPont Analysis results suggest that managers should adopt the low investment per cow approach or possibly the low cost-of-production strategy. The INVESTMENT farm group placed third in the low price year of 2003 and second in the high price year of 2005. The COST farm group placed fourth in both years.

Nevertheless, it is clear that no farm that utilizes a single emphasis strategy can outperform a farm that is able to earn both a good ATO and OPM. How the PROFIT farm group was able to achieve this balance is described in Section IV.

#### Section IV. What Makes Highly Profitable Farms Profitable

Table 4 shows how the PROFIT farm group compares to the other six farm groups in select measures. These measures represent the various strengths of the single emphasis approach farm groups. For instance, the herd size measure is the strength of the SIZE farm group, and the milk price measure is the strength of the PRICE farm group.

When looking at these non-profit measures, the farms of PROFIT group were not the best in any category. Nevertheless, they weren't the worst in any category either. From an overall perspective, the PROFIT farm group performed well in most of the measures. In both 2003 and 2005, they earned the second ranked milk price as compared to the other farm groups. Their milk production per cow and assets per cow ranked third in 2003 and second in 2005. Their herd size and cost/cwt ranked fifth in 2003 and third in 2005, and they had the fourth ranked debt per cow in both years.

**Table 3. How the PROFIT Farm Group Compared in Select Measures**

Measure	2003 Rank	2003 Value	2005 Rank	2005 Value
Herd Size	5	167	3	233
Milk Price	2	\$13.18	2	\$16.22
Cost/cwt	5	\$14.70	3	\$15.00
Milk/cow	3	22,515	2	23,647
Assets/cow	3	\$7,432	2	\$7,262
Debt/cow	4	\$3,086	4	\$3,023

Clearly, being good in most of the measures listed in Table 3 is better than being great in any single category. The law of diminishing marginal returns dictates that it requires incrementally more of our scarce resources to achieve incremental improvements in any given measure. As farmers devote more-and-more resources to one activity, they may inadvertently take away needed resources essential for maintaining the optimal performance level in another activity. Thus, those who utilize a single emphasis approach to achieve profitability may actually hinder their farm's financial performance by over-emphasizing that approach. For example, those who emphasize a high milk production approach may inadvertently drive their cost-of-production too high to be highly profitable. Conversely, those who emphasize a low cost-of-production strategy may drive their costs too low, resulting in a production level that is too low to be highly profitable. This suggests that the key to high profitability is to not overemphasize a single approach but to utilize a more balance approached to achieve superior financial performance.