

**KANSAS FARM MANAGEMENT ASSOCIATION ENTERPRISE ANALYSIS:  
EXAMINING DIFFERENCES AMONG HIGH-, MEDIUM-, AND  
LOW-PROFIT DAIRY OPERATIONS**

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**Summary**

Thirty-one dairy producers participated in the Kansas Farm Management Association (KFMA) dairy enterprise analysis each year from 2002 to 2004. The dairy farms were sorted based on 3-year average returns over total costs and were categorized as high-, medium-, and low-profit farms. The highest-profit farms earned an average of \$795 more per cow (\$4.20 per cwt of milk) than the low-profit farms earned. High-profit farms averaged \$521 more milk sales per cow than low-profit farms did. This difference in profitability was due entirely to greater milk production, inasmuch as milk prices among profit groups did not differ from each other. High-profit farms produced almost 4,000 lb more milk per cow per year and had slightly lower costs than low-profit farms had. Returns for the mid-profit farms were more than \$400 per cow less than returns of the top farms, but were more than \$350 per cow greater than those of low-profit farms. The mid-profit farms had production levels similar to those of the high-profit farms, but their costs were significantly greater. Over the 3 years analyzed, it was better to have high production and high costs than to have low production and low costs. But these 3-year averages indicate that dairies can achieve high production levels while keeping costs in check, and these operations are significantly more profitable than other dairies.

(Key Words: Cost, Economics, Management, Profitability)

**Introduction**

The U.S. dairy industry has been downsizing in terms of the number of dairy operations for more than 50 years. In recent years, however, it seems that the rate of consolidation has been occurring at a faster pace. For dairies to be competitive and survive in the future, it is imperative that managers understand what their strengths and weaknesses are. By recognizing business strengths and weaknesses, dairy managers can better focus their management efforts in areas in which they will be most beneficial. The best way for an individual dairy to identify its strengths and weaknesses is to benchmark the operation against other dairies. Related to this, producers also can benefit by simply understanding why some dairy producers are more profitable than others. Thus, the objective of this study is to examine differences in profitability that exist among Kansas dairy operations in Kansas and attempt to identify the major determinants of these differences.

**Procedures**

Income, cost, and a limited amount of production data for individual producers participating in the Kansas Farm Management Asso-

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ciation *Enterprise PROFITCENTER Summary* for the years 2002 through 2004 were collected for analysis. Multiple years were used because returns for an individual producer can vary considerably from year to year due to factors beyond their control (e.g., prices and weather); thus a multi-year average should be a better indication of the dairies' long-run expected profits relative to other dairies. The number of farms with data in the KFMA database for the years 2002 to 2004 ranged from 56 to 63 in any individual year, but this analysis only considered those operations that had participated during all 3 years. In addition, some farms were dropped from the analysis due to missing or incomplete data. After these criteria were met, 34 dairy operations had complete data for all 3 years. A similar analysis was done using the last 5 years (2000 to 2004). This reduced the number of operations for analysis to 31. Results for the 5-year analysis were similar, so only the 3-year average results are reported herein.

After all farms meeting data requirements were identified (34 dairies), 3-year averages for relevant income, cost, and production measures were calculated. These measures were calculated per dairy, per cow, and per cwt of milk produced. In addition, economic-return measures, such as returns above variable cost (VC), returns above total cost (TC), and returns to labor and management, were calculated. Fixed costs represent depreciation, unpaid labor, taxes on real estate, and an assigned interest charge. Variable costs represent all other costs, with the major expense categories being feed, hired labor, repairs, vet, breeding, and dairy supplies (for a listing of all expenses, see the *Enterprise PROFITCENTER Summary 2004* report). To see the *Enterprise PROFITCENTER Summary 2004* report, go to:

<http://www.agmanager.info/farmmgt/income/>

Three-year averages for all income, cost, and production measures were sorted from high to low on the basis of returns over total costs per cwt, such that profit categories could be identified. The 11 farms with the highest returns over total cost were classified as being the High 1/3, the next 12 farms were classified as being the Mid 1/3, and the 11 farms with the lowest returns over total cost were classified as the Low 1/3. It is important to recognize that the reported averages for all measures were based on the sort by returns over total cost. Thus, by definition, the High 1/3 farms will have the highest profit, but this does not necessarily hold for other income and cost measures.

To determine if profit-category averages of the various measures differed statistically from one another, a two-tailed *t*-test was used, along with a 90% confidence level. For example, this *t*-test indicated if the average profit of the 11 best farms was statistically different from the average profit of the 11 worst farms, and likewise for the middle grouping.

## Results and Discussion

Figure 1 shows the return over total cost plotted against herd size for the 34 different farms, by profit category. A number of things can be seen from this figure. First, returns over total cost differed by approximately \$7/cwt from the most to the least profitable dairies. Second, the number of cows in the herd for this group of 34 dairies ranges from 37 to 237 cows, indicating that the data represent the traditional family operation compared with the large commercial dairies that are becoming more prevalent in the industry. Finally, Figure 1 reveals a positive relationship between profitability and farm size. But there are dairies that are counter to this trend (i.e., the most profitable dairy was a small herd, and some of the larger herds have below-average profits).

Table 1 shows the 3-year averages for selected economic measures of the dairy producers, by profit category. Reinforcing the trend in Figure 1, the data show that high-profit dairy farms had larger herd sizes, and this was statistically different from both the mid- and low-profit dairies. The high- and mid-profit groups produced more milk than did low-profit dairies. Milk prices were not different among profit categories and, thus, differences in gross income per cow were driven principally by production (other income also had a small impact).

The mid-profit group had higher costs than the other groups had, whereas little difference existed in costs per cow between the high- and low-profit groups. Because the high-profit farms had high production and relatively low costs per cow, they had the lowest costs per cwt of milk produced. No differences were detected between feed and variable costs per cwt for the mid- and low-profit groups, due to the trade-off between production and costs (i.e., mid-profit farms had higher costs and higher production). But the mid-profit farms had lower fixed costs per cwt that resulted in lower total costs per cwt as well. High-profit dairies had a cost-per-cwt advantage of \$3.64, compared with low-profit dairies (\$1.95 advantage over mid-profit farms), indicating that they can withstand low milk prices much better.

There was almost an \$800 difference in profits per cow (\$4.20 per cwt of milk) between the high-profit dairies and the low-profit dairies. The low-profit dairies had an average return of -\$386 per cow, indicating

that these dairies likely are losing equity over time or are relying upon outside income to help support the dairy. These dairies show a positive return to labor and management of \$116 per cow, but this is somewhat misleading because they paid \$178 per cow for hired labor. Thus, even though the dairy owner(s) may be willing to work for low labor returns, their employees are not likely to do the same and, therefore, this positive return to labor and management offers little consolation.

Figure 2 shows the relationship between profitability (returns over total cost per cwt of milk) and annual costs per cow. The lack of a strong relationship in these data indicates that being a low-cost operator, in terms of dollars per cow (compared with dollars per cwt) does not necessarily ensure higher profitability. The high-profit dairies tended to have lower costs per cow than did the mid-profit farms with comparable production. The low-profit farms also generally had lower costs than the mid-profit farm, but their production was significantly lower. Thus, with these data, it seems that striving for high production is preferred to being low cost (i.e., comparing mid-profit farms with low-profit farms). The high-profit farms indicate that it is not an either-or decision (i.e., either high production or low costs). This group of dairies was able to attain both high production and relatively low costs over this 3-year period (this result held true in the 5-year analysis). This indicates that dairy producers wanting to be competitive selling commodity milk need to strive for high production levels, but cost control is still extremely important.

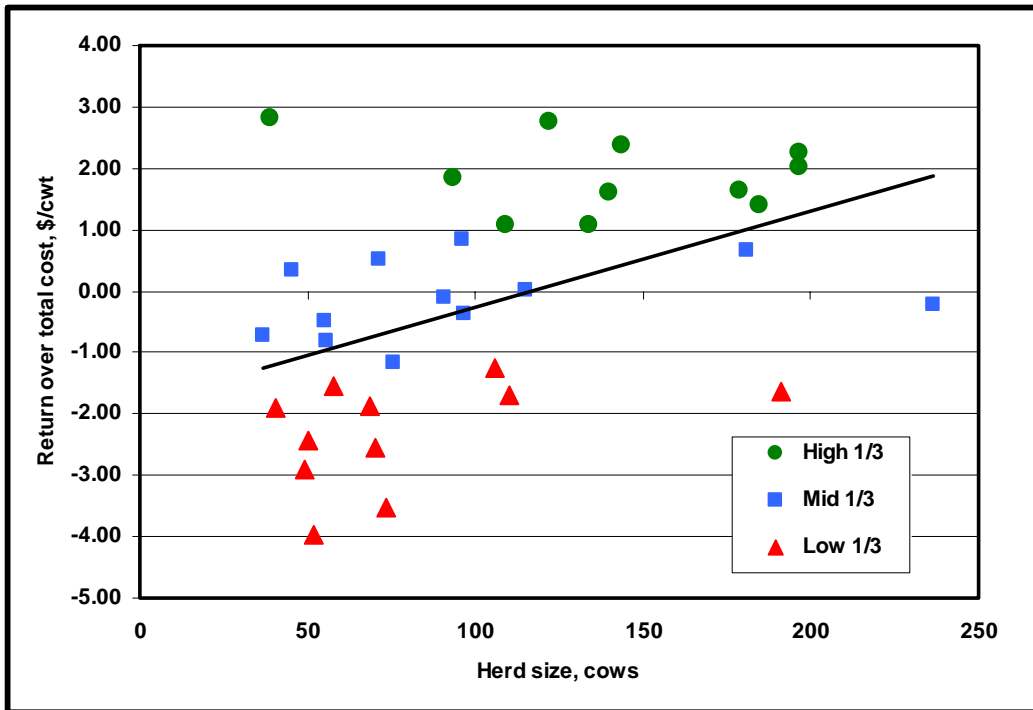


Figure 1. Relationship Between Return over Total Costs per Cwt and Herd Size, by Profit Category.

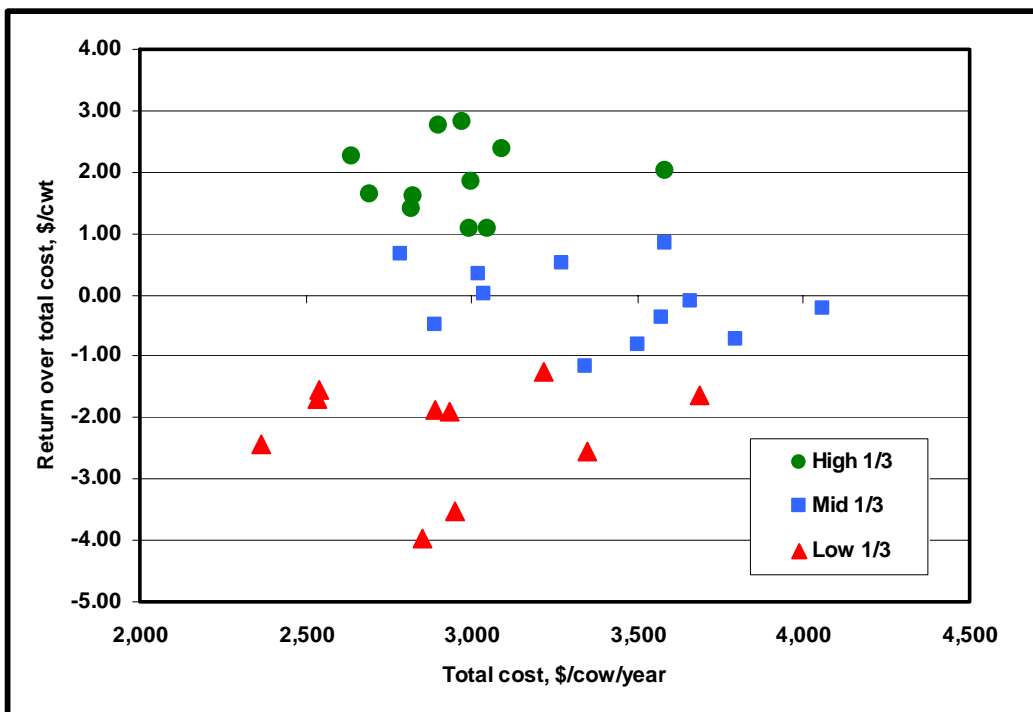


Figure 2. Relationship Between Return over Total Costs per Cwt and Total Cost per Cow, by Profit Category.

**Table 1. Selected Average Economic Measures of Dairy Producers, by Profit Category<sup>1</sup>**

	Profit Category			Difference between High 1/3 and Low 1/3	
	High 1/3	Mid 1/3	Low 1/3	Difference	%
Number of farms	11	12	11		
Number of dairy cows	140 <sup>a</sup>	96 <sup>b</sup>	79 <sup>b</sup>	61	77%
Pounds of milk per cow	20,998 <sup>a</sup>	20,994 <sup>a</sup>	17,045 <sup>b</sup>	3,953	23%
<b>INCOME</b>					
Milk sales, \$/cow	\$2,835 <sup>a</sup>	\$2,845 <sup>a</sup>	\$2,314 <sup>b</sup>	\$521	23%
Gross income, \$/cow	\$3,370 <sup>a</sup>	\$3,363 <sup>a</sup>	\$2,636 <sup>b</sup>	\$733	28%
Milk price, \$/cwt	\$13.51	\$13.55	\$13.66	-\$0.15	-1%
Gross income, \$/cwt	\$16.09	\$16.01	\$15.53	\$0.56	4%
<b>COSTS</b>					
Variable costs, \$/cow	\$2,419 <sup>a</sup>	\$2,817 <sup>b</sup>	\$2,421 <sup>a</sup>	-\$2	0%
Feed costs, \$/cow	\$1,415 <sup>a</sup>	\$1,654 <sup>b</sup>	\$1,428 <sup>a</sup>	-\$13	-1%
Fixed costs, \$/cow	\$542	\$560	\$601	-\$59	-10%
Total costs, \$/cow	\$2,961 <sup>a</sup>	\$3,376 <sup>b</sup>	\$3,022 <sup>a</sup>	-\$61	-2%
Variable costs, \$/cwt	\$11.57	\$13.41 <sup>b</sup>	\$14.21 <sup>b</sup>	-\$2.63	-19%
Feed costs, \$/cwt	\$6.73 <sup>a</sup>	\$7.86 <sup>b</sup>	\$8.51 <sup>b</sup>	-\$1.78	-21%
Fixed costs, \$/cwt	\$2.62 <sup>a</sup>	\$2.73 <sup>a</sup>	\$3.63 <sup>b</sup>	-\$1.00	-28%
Total costs, \$/cwt	\$14.19 <sup>a</sup>	\$16.14 <sup>b</sup>	\$17.83 <sup>c</sup>	-\$3.64	-20%
<b>RETURNS</b>					
Returns above VC, \$/cow	\$951 <sup>a</sup>	\$545 <sup>b</sup>	\$216 <sup>c</sup>	\$735	341%
Returns over TC, \$/cow	\$409 <sup>a</sup>	-\$14 <sup>b</sup>	-\$386 <sup>c</sup>	\$795	-206%
Returns to labor and mgt, \$/cow	\$847 <sup>a</sup>	\$452 <sup>b</sup>	\$116 <sup>c</sup>	\$731	631%
Returns above VC, \$/cwt	\$4.52 <sup>a</sup>	\$2.60 <sup>b</sup>	\$1.32 <sup>c</sup>	\$3.20	242%
Returns over TC, \$/cwt	\$1.90 <sup>a</sup>	-\$0.13 <sup>b</sup>	-\$2.30 <sup>c</sup>	\$4.20	-182%
Returns to labor and mgt, \$/cwt	\$4.01 <sup>a</sup>	\$2.12 <sup>b</sup>	\$0.66 <sup>c</sup>	\$3.35	509%

<sup>1</sup>Profit categories were based on sorting 3-year average (2002 to 2004) of Return over Total Cost (\$/cwt).

<sup>a,b,c</sup>Values having different superscript letters differ (P<0.10).