**Determinants of Financial Performance of Commercial Dairy Farms.**
By Hisham S. El-Osta and James D. Johnson. Resource Economics Division, Economic Research Service, U.S. Department of Agriculture. Technical Bulletin No. 1859.

## Abstract

Data from the 1993 Farm Costs and Returns Survey were used in a multi-variate analysis framework to determine factors associated with the financial performance of commercial dairy farm operations. Statistical equivalency tests revealed regional differences in the way extensive indebtedness, size of operation, and labor cost affect net farm incomes. Regional differences were also found in terms of how milk production per cow, per-unit cost of purchased feed, and level of adoption of capital intensive technologies affect per-unit returns. Examination of the variation in the net farm income of commercial dairy farms using the method of coefficients of separate determination identified the size of the operation, regardless of the location of the farm business, as the factor contributing the most to the variability in net farm income. On a per-unit-of-returns basis, factors found most important in explaining the variation in net returns per hundredweight of milk sold were cow's productivity, and per-cow forage production and purchased feed costs.

**Keywords:** Financial performance, net farm income, technological adoption, Lorenz curve, Gini coefficient.

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# Summary

Data from the 1993 Farm Costs and Returns Survey (FCRS) were used to determine the factors that contribute to the financial performance of commercial dairy operations in the traditional milk-producing States (MN, MI, WI, PA, NY, VT) and the non-traditional milk-producing States (FL, CA, WA, TX, AZ). As in the case of net farm income, the size of operation as measured by the number of milking cows in the non-traditional milk-producing States was at least five times larger than in traditional milk-producing States. Because of their large scale of operation, commercial dairy farms in non-traditional milk-producing States tended to use twice as much labor and own twice as much farm assets. Use of concentration measures such as the Gini coefficient and Lorenz curves demonstrated that milking cow inventory, milk sales, debt capital, farm assets, farm equity, and income (both net cash and net farm) were more concentrated in the non-traditional milk-producing States than they were in the traditional milk-producing States. Concentration in debt capital, farm assets, dairy production, each tended to play a significant role in the explanation of interstate variation in financial performance.

Regression results based on a net farm income model indicated the importance of farm size, regardless of the location of the dairy farm business, in explaining farm financial performance. For commercial dairy farms in the traditional milk-producing States, a milking practice that involved a combination of advanced milking parlors and a membership in a production record keeping system tended to have a positive and significant effect on farm financial performance. Profitability in milk production in the non-traditional milk-producing States depends significantly on the level of indebtedness, as results pointed to a potential reduction in income of nearly $6,310 for every 1-percent increase in debt-to-assets ratio. For commercial dairies in the traditional milk-producing States, increases in the proportion of rented acreage, and per-cow costs of purchased feed and of land, buildings, and equipment were significant in their ability to lower the net farm income of commercial dairies in the traditional milk-producing States. Age of the operator and profitability tended to be negatively correlated.

For commercial farms in the non-traditional milk-producing States, regression results based on a per-unit returns model revealed the importance of controlling the per-unit costs of forage production, purchased feed, labor, and of land, buildings, and equipment. For the traditional milk-producing areas, factors such as purchased feed and forage production costs per cow were all negatively correlated with farm profitability. Regardless of the location of the commercial dairy operation, increases in per-cow milk production tended to significantly increase per-unit returns.

Results of tests of independence of potential or expected net farm income and management practices identified the top 20 percent of performing commercial dairy farms in the non-traditional milk-producing States as those using automatic takeoffs on milking units and artificial insemination in their dairy production. For commercial dairy operations in the traditional milk-producing States, top-performing dairy operations were identified as those using automatic takeoffs on milking units and those that milked their cow herds three times a day. Conducting similar tests on a expected per-unit-of-returns basis identified the top 20 percent of performing commercial dairy farms as those using artificial insemination and automatic takeoffs on milking units, but only if the farm was located in the traditional milk-producing States.