

Structure, Management, and Performance Characteristics of Specialized Dairy Farm Businesses in the United States

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Introduction

U.S. farming is changing in several important ways. Farms have become more industrial in character, with output becoming more concentrated on larger farms. Use of contracts and other arrangements has become much more prevalent, changing how farms are organized. Farmers have become more attuned to participation in global markets. Meanwhile, emerging technologies such as computerized planting and input application, bio-engineered and other inputs, and management information systems have had an impact on how farmers conduct business activities.

Dairy farming and milk production, in particular, have undergone dramatic structural changes in the last 50 years. Three forces that have been at work are technological innovations, changes in the production system, and specialization. Substituting capital in the form of machinery and equipment for labor has greatly increased efficiency in milk production. Dairy farmers could redirect their energy toward milk production when farm machinery freed them for other tasks such as crop or forage production. Mechanical milking machines, feeding systems, and waste handling equipment have also led to efficiencies. Electrification brought refrigeration and bulk tank storage, with associated improvements in health and sanitary conditions. On-going design changes in milking parlors and animal housing, development of computerized monitoring tools, and further refinements in existing technologies continue to change milk production.

The second change that occurred was a widespread shift from pasture/forage-based milk production systems to confinement feeding systems that freed up labor and, in some cases, capital (including human capital) for other

uses such as focusing on cow management. Increases in milk per cow were achieved as the change was made. Expanding production provided a means to reduce costs and take advantage of existing economies of size.

Finally, forces promoting specialization have been at work. Milk production has changed from one of several activities on a farm with milk cows to an activity on an operation where milk production is the sole or the most important activity. Specialized milk production has changed the farmer to a more specialized worker. Farmers may not be in the barn at all; they may function as buyers of inputs (like feed), managers of inputs (labor and cows, for example), or financial managers.

Accompanying these structural changes have been recent changes in legislation that will affect farmers' decisions with regard to how they will allocate resources both within the farm unit and among farm and other competing interests. The 1996 Federal Agriculture Improvement and Reform Act phases out dairy price supports and provides for reform of the Federal milk marketing order system. Eliminating the guarantee of a floor under milk prices changes the magnitude and character of the risk dairy farmers face. Since 1940, policy has allowed dairy farmers in most of the country to produce whatever quantities they wished and pass them on to their cooperatives (see glossary) for marketing. Cooperatives could take almost unlimited quantities and sell excess output to the U.S. Department of Agriculture's (USDA) Commodity Credit Corporation (CCC). With price supports gone in the near future, the supply-balancing function of CCC purchases of butter, cheese, and nonfat dry milk will disappear. In addition, as a participant in the General Agreement on Tariffs and Trade (GATT) Uruguay Round, the United States is committed to reducing border protection and to increasing access of dairy imports to the U.S. market. Consequently, milk producers will have to adjust to markets that are more dependent on the forces of supply and

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demand. That being the case, milk producers' business structure, management, and performance have become major issues.

This report provides a review of structural, financial, and managerial strategies used by both successful and not so successful specialized dairy farm businesses. The analysis provides some insights into how dairy farm businesses can continue to be viable in the new millennium.

Related Studies

This report builds primarily on the work by Short and McBride (1996) and El-Osta and Johnson (1998), both of which used data from the USDA's 1993 Farm Costs and Returns Survey (FCRS). In their analysis of enterprises, Short and McBride examined the structure and economics of U.S. milk production by comparing production costs and selected production and farm characteristics among U.S. milk producers. They used distributional analysis to identify and measure sources of cost variation. They showed that, while low-cost milk producers are distinguished from high-cost producers by size of operation, animal performance, and production methods, differences in feed and labor efficiency have the greatest influence on milk production costs.

El-Osta and Johnson used multivariate analysis to determine factors associated with the financial performance of commercial dairy farm operations. They showed that, regardless of the location of the farm business, size of operation contributed the most to variability in net farm income. Factors found most important in explaining the variation in net returns per hundredweight (cwt) of milk sold were: (1) cow productivity, (2) per-cow forage production, and (3) purchased feed costs.

The analysis provided in this report broadens the scope of the previous work of Short and McBride and El-Osta and Johnson in two ways: (1) it looks beyond the milk production enterprise to focus on the structure, management, and performance of the whole dairy farm business, and (2) it provides a look at dairy farm businesses over a period of time.

The analysis of total farm businesses is the subject of numerous studies. Financial ratio analyses are used in this report as a basis for comparing the financial strength

of dairy farm businesses across regions and time (USDA's Economic Research Service (1997); Morehart, Nielsen, and Johnson (1988); James and Stoneberg (1986); Fraser (1988); and Plumley and Hornbaker (1991)). Ratio analysis shows the relationships between financial performance elements (solvency, liquidity and coverage, efficiency, and profitability) and various farm characteristics. Ratio analysis can give farmers/ranchers, lenders, investors, analysts, and policymakers a more complete perspective on the performance of a farm/ranch or group of farms/ranches and may help identify actions to modify their performance.

Common size financial statements (Fraser, 1988) are used here to compare dairy businesses with different levels of sales or total assets. These statements facilitate the evaluation of the financial condition and performance of dairy businesses over time simply by introducing a common denominator. Common size income statements are income statements with each line expressed as a percentage of sales. Common size balance sheets are balance sheets with each line expressed as a percentage of total assets.

The comparative analysis approach, for a single farmer and similar farms, used by Harsh, Connor, and Schwab (1981) is the basis for comparing determinants of regional productivity. This report focuses on six milk production regions (see glossary) and the United States. Determinants of productivity included are size indicators; profit measures; income statement factors; and various efficiency and productivity measures per cow, per cwt of milk sold, and per hour of labor used.

Trend analysis is used here to compare dairy businesses' performance indicators. This type of analysis is very useful when an operator is considering expansion because lenders can, at a glance, get an idea of the business' financial progress (Harsh, p.146).

Using the approach developed by Perry and Johnson (1996) for U.S. farmers, this report evaluates the management decisionmaking process of dairy farm businesses. Management decisions by dairy farmers dealing with the risk associated with milk production are classified into three categories: production, financial, and marketing.