

Missouri Dairy Industry Revitalization Study

Executive Summary

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A comprehensive study was completed by the University of Missouri to provide insight for future efforts to revitalize the Missouri dairy industry. Funding was provided by the Missouri Agricultural and Small Business Development Authority (MASBDA). These six publications were developed in 2015 to provide stakeholders a foundational base for educating the industry and developing a future action plan to revitalize this industry.

Other publications from this study include:

Section 1: Historical Perspective

Section 1 provides an in-depth discussion about Missouri's dairy industry historical trends concerning its dairy cow inventory, farms, production, prices, production economics and processing industry.

Section 2: Economic Contribution

Section 2 discusses what the economic contributions such as jobs, value-added and industry sales are from Missouri dairy farms and the Missouri dairy product manufacturing industry.

Section 3: Needs Assessment

A survey was conducted in fall 2014 to Missouri Grade A dairy farms and industry stakeholders. This survey was intended to gather their perspectives on producers' needs and characteristics of Missouri dairy farms. Section 3 provides a summary of all survey responses received.

Section 4: Value Chain, Marketing and Processing

Section 4 provides a discussion about dairy product demand and current opportunities to enhance the farmer's position in the value chain. Further processing opportunities and dairy niche marketing are discussed in this section.

Section 5: Comparative Analysis to Identify Gaps

What is the competitiveness of Missouri's dairy industry versus other U.S. states? Section 5 seeks to create a common understanding of the Missouri dairy industry's competitive position, benchmark Missouri's dairy industry and environment against other states and look at ways that other states have attempted to revitalize their dairy industries.

Complete copies of all publications can be found at <http://dairy.missouri.edu/revitalization/>.

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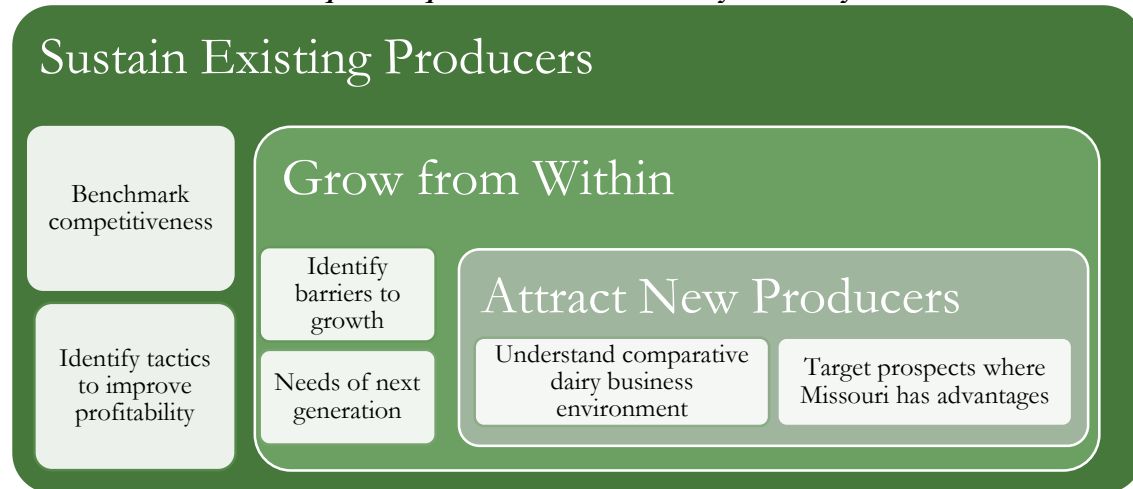
Executive Summary

The number of Missouri’s dairy farms and processing plants are declining slowly, as they have for decades. Unless reversed, the state will lose thousands of milk production and processing jobs. This Missouri Dairy Industry Revitalization Study examines the state of the Missouri dairy industry and offers producer and stakeholder ideas to reverse the decline. The Missouri Agricultural and Small Business Development Authority provided funding for the study and the University of Missouri dairy team conducted the study. This summary highlights key points and issues told in later sections.

Competitiveness of Missouri’s Dairy Industry

An understanding of the dairy industry’s competitive position is necessary for stakeholders to see changes needed to reverse the decline. Existing producers benchmarked against other producers identify areas to improve. For producers wanting to expand or for next-generation producers, seeing the barriers is important. For all stakeholders allied to the dairy industry, understanding how Missouri compares to other states in attracting new dairies is important. For Missouri to sustain and expand a dairy industry, existing producers, next-generation producers and new farmers recruited from outside the state are needed. Finally, learning how other states revitalize their dairy industries offers lessons.

Exhibit ES.1 – Roadmap to Improve Missouri’s Dairy Industry



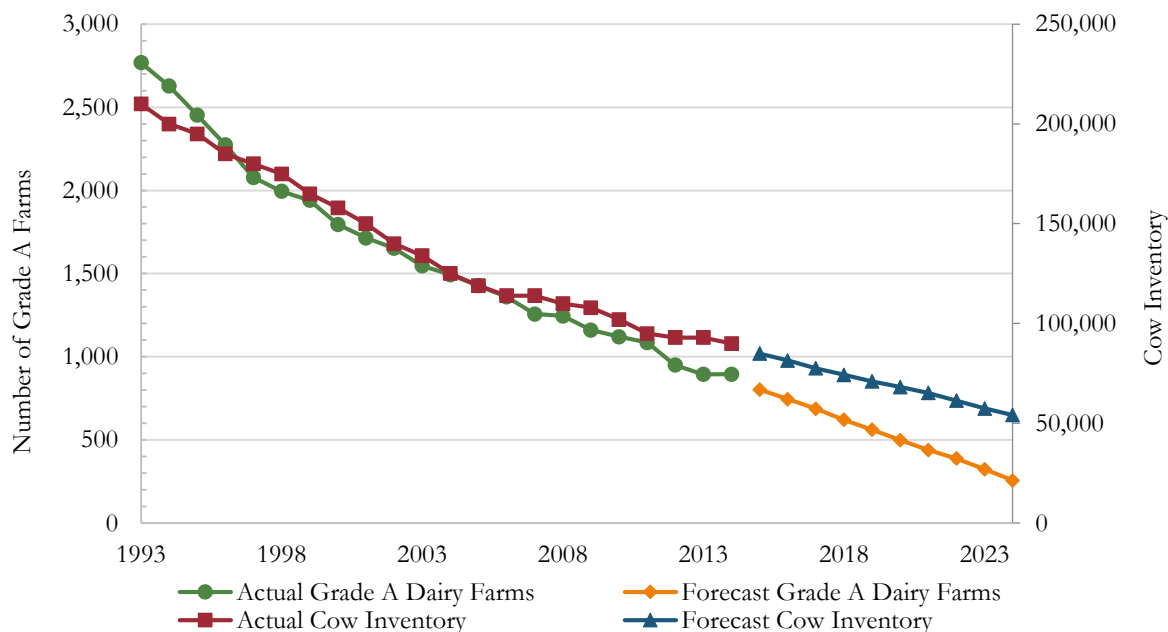
Missouri’s Evolving Dairy Industry

In 1990, Missouri farms had 226,000 milk cows. By 2014, the milk cow count fell to 90,000 cows. While dairy farms are found throughout Missouri, most are in the South Central and Southwest regions. Missouri ranks 24th with other states in milk cows. In December 2014, 1,248 dairy farms operated in Missouri. Of these, 896 were Grade A, and 352 were manufacturing-grade, which includes Amish farms and some goat or sheep dairies. From 2000 to 2014, dairies fell 45.5 percent.

Milk production ranked 25th among other states in 2013. From 1990 to 2013, production fell from 3.04 billion pounds to 1.35 billion pounds. On a milk per cow basis, Missouri ranked 44th in 2013. One reason for the low rank is southern Missouri’s reliance on pasture-based rather than confinement dairy systems.

Long-term projections suggest, unless current trends are reversed, fewer dairies will be in Missouri and the dairy cow numbers will drop. Exhibit ES.2 shows these forecasts. Since 1993, Grade A dairy farms in Missouri dropped 5.3 percent annually. Dairy cow numbers dropped 3.8 percent annually. Assuming these trends continue in the next decade, Grade A dairies in Missouri will fall from 896 to 257 and the milk cow numbers will drop to 54,166 cows in 2024.

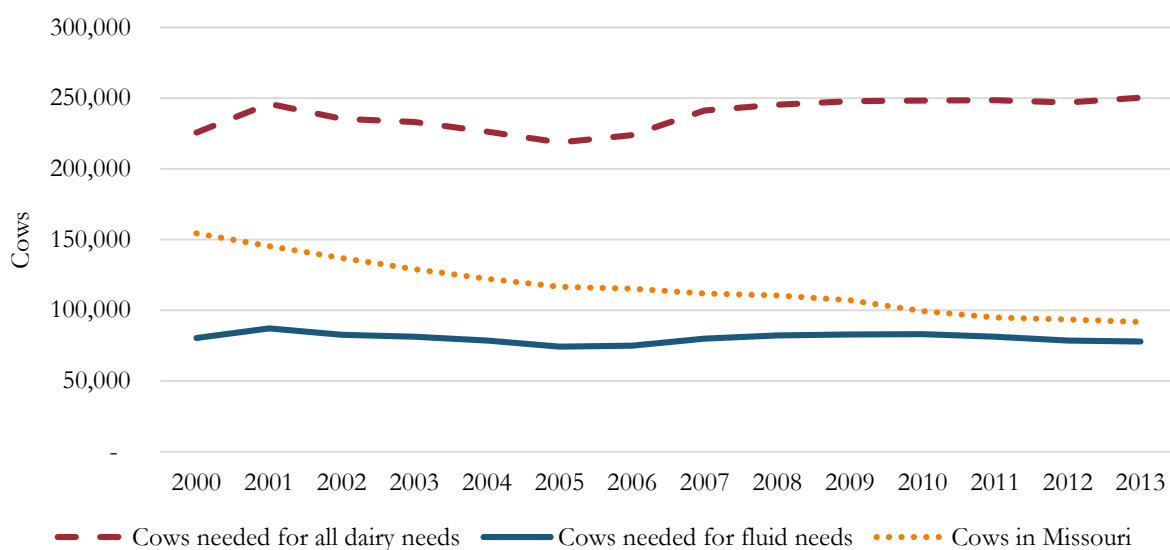
Exhibit ES.2 – Missouri Grade A Dairy Farms, Milk Cow Inventory, 1993 to 2014 and Forecasts through 2024



Dropping milk production in Missouri and closure of dairy manufacturing plants means that Missouri’s dairy industry produced just enough milk to meet its fluid demands. National per capita fluid milk and cream use averaged 189 pounds in 2013. Thus, the state’s dairy farms must produce 189 pounds of milk per person or import milk to satisfy in-state fluid milk needs. On a milk equivalent basis, per capita use of all dairy products in the U.S. averaged 607 pounds in 2013. Missouri produced 223 pounds of milk per capita in 2013, meeting the required 189 pounds of fluid milk per capita. However, Missouri production was deficient to meet the demand for all dairy products.

Exhibit ES.3 illustrates the difference between milk needs and supply in cows. The yellow dotted line illustrates the recorded change in Missouri milk cow numbers. The blue line estimates the milk cows needed to meet fluid milk needs. Missouri cows more than met the fluid milk needs between 2000 and 2013. But, note the gap between actual Missouri milk cow inventory and cows needed for fluid milk consumption has narrowed. The red dashed line shows Missouri needed about 250,000 milk cows in each of the past five years to produce milk to meet all dairy needs. Considering Missouri milk cow numbers fell below 100,000 the past three years, the state isn’t close to having enough cows to meet milk needs for all dairy products.

Exhibit ES.3 – Missouri’s Evolution toward a Fluid-Only Milk Supply, 2000 to 2013



As Missouri milk production dropped, dairy processing plants followed suit. In the past five years, the number of dairy product plants grew in the U.S. but fell in Missouri. Missouri had 47 dairy product plants in 2009. By 2013, they dropped to 36. The dairy plant trend reflects the food-industry trend to fewer, larger plants with higher volumes and lower costs. Large plants are a greater share of packaged food suppliers. However, small firms have adapted by filling market niches.

Missouri Dairy Producer Needs

In late 2014, an 18-question survey of all Grade A dairy producers in Missouri gathered their needs associated with growing the state’s dairy industry. In all, 276 producers answered. Responses by district roughly represented the geographic distribution of Missouri dairy operations.

The top four dairy producer needs identified were:

1. Higher milk prices and profit margins,
2. More dairy infrastructure,
3. More competitive milk markets, and
4. Manage heat stress and other production issues.

The top four challenges for their farms were:

1. Labor,
2. Animal health,
3. Forage issues, and
4. Weather.

Regarding five-year plans for their dairy farms, 44 percent said they plan to continue operating as is. One-fourth plan to expand size by 10 to 50 percent. And 13.2 percent plan to quit. Smaller shares said that they would downsize (3.5%), expand less than 10 percent (7%) or expand more than 50 percent (7%).

People employed in the dairy industry were also surveyed at the same time on their views on dairy industry needs. Thirty-one stakeholders answered. Those were dairy cooperative field men, veterinarians, vendors and nutrition consultants. As in the producer survey, the stakeholder identified producer needs and greatest challenges. The top two needs they saw were higher profit margins and business/risk management. Stakeholders said financing and business management were the two greatest challenges for farmers.

Both producer and stakeholder surveys asked about Missouri dairy infrastructure and training needs. For producers, the top infrastructure concerns that present big problems now or may become problems were manure/lagoon spreading contractors, dairy equipment sales and service and dairy quality forage contractors.

From a list of 23 topics, producers and stakeholders were asked to rate training priorities. Producers said their top training priorities were reproductive management, mastitis prevention and treatment and forage quality improvement. Stakeholders named financial and business management, milk and feed price risk management, reproductive management and heat stress.

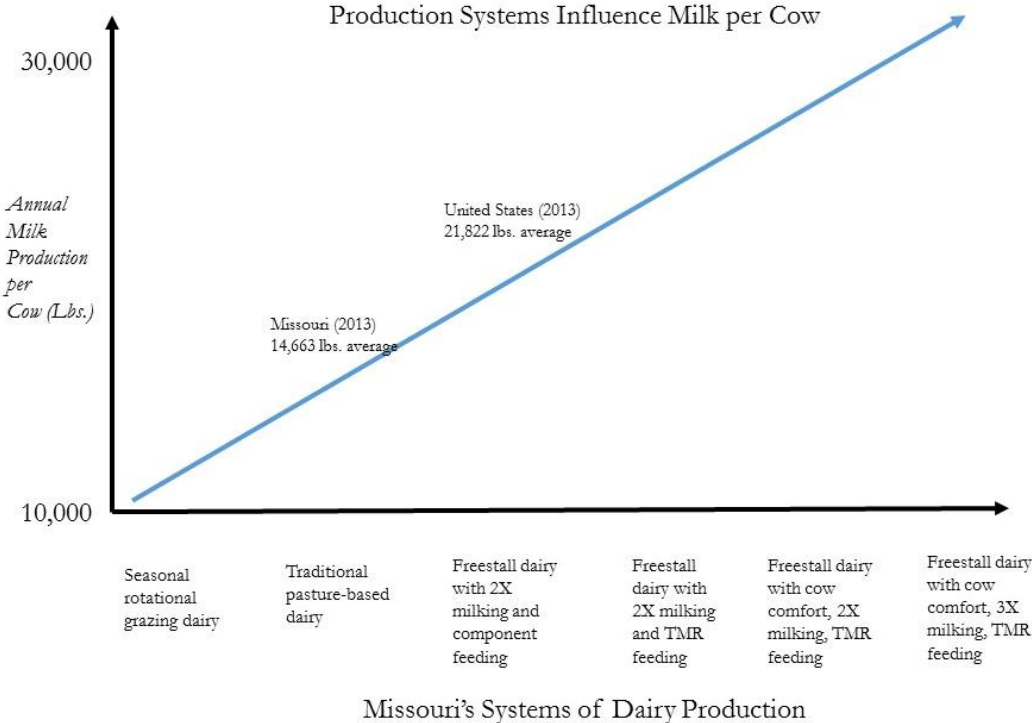
Current Competitive Landscape in Dairy Industry

Since 2007, dairy farming areas expanding in the U.S. include areas across western Texas, Southwestern Kansas, Northeastern Iowa, Minnesota, Wisconsin and Michigan. In Southeast, pockets of growth appear in Georgia and Florida. In Missouri, growth pockets from new, larger grazing dairies were in Southwest and Southeast Missouri. Other growth was in Mennonite areas near Versailles and Memphis, Missouri, and in West Central and North Central Missouri. Declines are in the Ozarks, mostly in South Central Missouri, which traditionally was Missouri's most dairy-dense area.

Missouri's dairy industry is a mix of distinct types of dairy farming. Traditionally, the Ozarks were home to pasture-based dairies. In Northern Missouri and counties along Missouri and Mississippi rivers, confinement or partial confinement dairies evolved. Soil types and cropping potential determined systems dairy producers chose over the decades. In the last 20 years, larger confinement farms appeared throughout Missouri. Rotational grazing dairies grew in the southern half of Missouri.

System choices impose different limits on milk production per cow. This diversity makes benchmarking Missouri's dairy farms more challenging than just comparing per-cow milk production. However looking at benchmarks may reveal relative strengths and weaknesses. Exhibit ES.4 depicts milk per cow seen in Missouri and the system of production associated with it, as well as the average production in Missouri and the U.S.

Exhibit ES.4 – Common Production Systems in Missouri and Relative Milk Production



Missouri lags national averages on key production indicators. These lags indicate ways for the Missouri dairy industry to compete with other states. For example, the Dairy Herd Improvement Association (DHIA) 2014 rolling per-cow herd average was 17,105 pounds in Missouri and 21,116 pounds in the U.S. Tactics to raise the rolling herd average include more dry matter intake and better forage quality, lower heat stress and better genetics. Other gaps include somatic cell count, which averaged 338,400 in Missouri and 262,900 in the U.S. in 2014. Calving interval, averaged 15.1 months in Missouri and 14.3 months in the U.S. in 2014.

Eight tactics can improve Missouri dairy farm profits. The eight tactics are summer heat stress abatement, better care for replacement heifers, forage quality, milk quality, better cow housing comfort, dry matter intake, reproductive management and economies of scale.

From a regulatory standpoint, dairies must adhere to water quality rules which vary by state. Some states also set air quality standards. Water quality regulations in Missouri, Iowa, Kansas, South Dakota and Wisconsin were compared. Among the five states, Iowa was the most complex. South Dakota rules were least complex. Missouri ranks near the bottom of those states in regulation complexity.

Township and/or county rules affect dairies and may eliminate potential growth. Health or zoning ordinances are used by local governments to add requirements and fees to animal feeding operations. In Missouri, 17 counties have county health ordinances, five have county zoning, three have township zoning and planning, and one has a county health ordinance and township zoning and planning.

Missouri is a riparian-water-law state. Landowners have a right to reasonably use water sources that touch or underlie their land. A landowner can draw as much water as needed as long as the withdrawal

does not adversely impact other individuals. Missouri water users who draw or divert more than 100,000 gallons per day (equivalent to 70 gallons per minute) from streams, rivers, lakes, wells, springs or other water sources are considered major water users. Major water users must register their water use annually with the Missouri Department of Natural Resources. Groundwater availability in Missouri varies by geography. It is a strategic resource for agricultural producers.

Missouri Dairy Industry's Economic Contribution

Missouri dairy farm and dairy product plants give big dollar benefits to Missouri. In 2013, dairy farms generated \$272.2 million in milk cash receipts. Missouri dairy farms provided a value-added impact of \$131 million to Missouri's gross domestic product.

Dairy plants also contribute to the economy. During 2013, Missouri dairy plant employee wages totaled \$275 million. Overall, the dairy plants in 2013 employed 5,354 people. Annual wages per employee averaged \$51,340. The total direct, indirect and induced employment from dairy processing was 23,049 jobs. Total added to Missouri gross domestic product was nearly \$2 billion. Missouri manufacturing plants produced \$5.1 billion in sales.

Marketing and Processing Opportunities

In marketing and processing, milk may be used as a fluid product or made into dairy products. In the fluid market, milk lost traction with consumers between 1990 and 2013. Beverage milk sales dropped 5.2 percent. Opportunities for fluid milk include targeting active adults with flavored milk and developing milk-protein drinks. Fluid-milk use per capita is projected to decrease through 2023.

Producing and marketing branded products may be an option for selling milk at higher prices. Yogurt performs well. Greek yogurt especially gained use perhaps because of high-protein content. Butter use grew as consumers became comfortable choosing butter over margarine. Cheese consumption also continues to grow. Frozen consumption dropped 16.2 percent from 1990 to 2013.

Marketing differentiated products may include products with value-added traits. Such traits include products labeled: organic, natural, grass-fed, non-GMO and local. Other niche markets include heritage breeds, raw milk, lactose-free milk, milk with higher A2 beta-casein levels, dairies as agri-tourism, products based on protein content, exports and marketing milk from other species like goats.

For success, farm processing requires producers to learn to market and distribute products and operate and manage a dairy product plant. Farmstead processing includes risks most dairy farmers never see as commodity milk producers. New products must displace existing dairy products in the dairy case. Co-packing may be an option for those who want to create and brand a product but prefer to avoid capital investments. Co-packing allows more energy to be spent on marketing and less on operations.

For niche products, serving a market may involve relatively few participants who incur significant costs and risks to develop a brand and dairy products. Other opportunities may exist for virtual cooperatives to develop products, brands and co-packing agreements to reduce infrastructure costs to supply products in demand. However, existing dairy marketing coops may be reluctant to use member capital on risky new products. Proceeding without requests from food companies or retailers is risky. Producers wanting to develop and market value-added products should carefully research markets.