

Food & Marketing



DairyField Magazine

U.S. Dairy Product Markets Restructuring

The U.S. dairy industry has been changing at all levels in the last 50 years. Once heavily dependent on human labor, most dairy farming activities, including milking, are now mechanized. Farms with 100 cows were large in 1950. Today, those with 5,000 head are not uncommon, especially in the West. Onfarm milk storage and milk assembly have shifted from 40-quart cans picked up at the farm by the processor's truck to bulk tank storage pumped into tank trucks (most operated or hired by dairy cooperatives) for delivery to processing or manufacturing sites.

Technological developments have also brought about changes in processing and distribution. Large-scale processing and manufacturing plants are more common. Over half of all milk was delivered to the home in quart bottles in 1950; today, that share is only 2 percent—most milk is now sold through supermarkets in gallon jugs. Retail sales of cheese, butter, ice cream, yogurt, and other dairy products are now mostly branded products sold through supermarkets.

Four common themes of change run through all levels of the dairy industry. First, technological advances have improved raw milk and dairy product quality and consistency, leading to larger economies of plant size and fewer opportunities for product differentiation.

Second, economies of size on the farm and in plants have been facilitated by automation. Third, reduced transportation costs have led to integration of local markets into regional or even national markets. Finally, rapid capital flows and ownership changes have altered the objectives of dairy marketing and distribution firms. Investment decisions on the farm seem to be based less on prior experience in the industry than on new factors such as investment opportunities, market pressures to expand production, and recognition of the declining role of government in the industry.

Milk Production & Pricing Have Been Changing

Changes in milk production and pricing in the last 30 years have changed the face of the dairy industry. Both aggregate production and milk per cow have increased since 1970. Farm numbers have declined and herd size has increased, but ownership and production remain firmly in the hands of individuals and families. Most

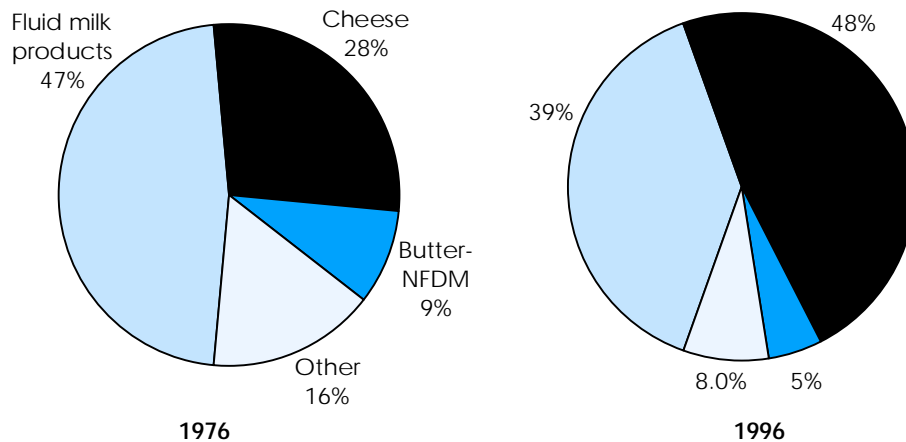
large corporate farms are family-owned and operated.

Production growth in the Southern Plains, Mountain, and Pacific regions has led to changes in the regional pattern of production. Readily available land, good climate, ample supplies of high-quality forages, lower production costs, growing markets—both local and more distant—for fluid milk and other dairy products, and relatively stable prices combined to make these western areas fast-growing milk production centers.

The consequent growth of milk supplies in Idaho, California, New Mexico, and Washington has stimulated construction of large modern dairy product manufacturing plants, as well as rehabilitation of older plants. Cheese and associated dry whey production in the region has grown especially rapidly, though production of butter and nonfat dry milk remains important. Both cooperatives (e.g., Darigold) and proprietary firms (e.g., Leprino) have built or purchased additional cheese capacity in the West. The trend toward milk production for manufactured product markets will likely continue, since fluid markets, though they continue to grow, are more than amply supplied.

For 50 years, Federal price supports have been the backbone of the pricing system

Cheese Overtakes Fluid Milk As Largest User of Raw Milk



NFDM = Nonfat dry milk.
Economic Research Service, USDA

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for milk and dairy products. The method for determining the support level has changed over the years, however, and fixed support prices have declined since 1995 to the point that they have little effect. The milk support price will decline until it reaches \$9.90 per cwt in 1999. After 1999, some support for prices will continue to come from Dairy Export Incentive Program (DEIP) activity.

Previously, the support price underpinned the entire price structure for bulk milk sold directly by farmers or cooperatives. USDA's Commodity Credit Corporation (CCC) stood ready to buy as much butter, nonfat dry milk, and Cheddar cheese as manufacturers wanted to sell at specified prices. These prices were designed to return the support price to the farmer. The price support program thus provided a floor under wholesale milk product prices and the price of milk used to manufacture these products, and indirectly provided support for all milk in all uses.

Milk and dairy product prices have been more volatile in recent years. The 1980's saw large government expenditures for support as surplus milk production grew. As the surplus of the 1980's was brought under control, however, industry participants found themselves operating in a much-changed environment characterized by reduced manufacturing flexibility and cheese price premiums for Midwestern plants, two situations related to the growing mismatch between regional milk supplies and required manufacturing plant capacities.

Two other factors contributing to the changed industry environment were the destabilizing effects of subsidized and some commercial exports, and a tendency to carry stocks insufficient to avoid seasonal price swings dramatically larger than storage costs. The industry appears to be moving toward correcting these structural disequilibria, so prices may become less volatile than very recently, although they will probably remain more variable than in the past.

Firms in the Milk Business Consolidating

Dairy cooperatives and private companies supply both fluid milk and manufactured

dairy products. The number of suppliers has declined over time, and the market shares of cooperatives vs. private companies have shifted. About 86 percent of the milk sold to plants and dealers in 1994 was handled by cooperatives, up from 76 percent in 1973. This trend is expected to continue. As of January 1, 1998, four of the larger cooperatives became one, representing producers throughout the country. This single cooperative, Dairy Farmers of America, will market just over 20 percent of all U.S. milk.

From the 1930's to the 1970's, eight large, specialized proprietary dairy companies dominated the marketing of fluid milk and manufactured dairy products, shaping the structure of the industry and the nature of competition. Since then, corporate restructuring through mergers, acquisitions, and divestitures has put all eight firms out of the dairy business. Large foreign companies increased their share of U.S. dairy processing 11 percentage points from 1950 to 1994, partly by purchasing U.S. firms. Currently, most large corporations in the dairy industry are concentrating on core businesses in branded products—cheese, yogurt, and premium and superpremium ice creams.

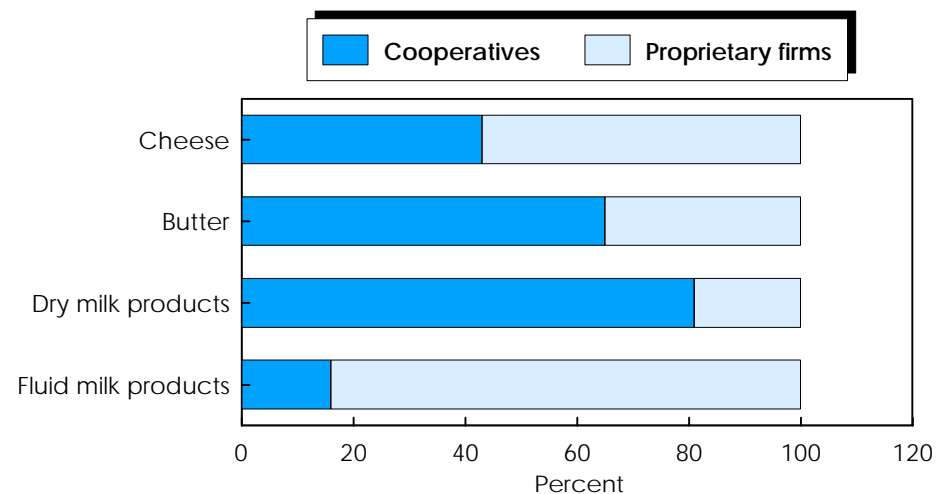
Dairy cooperatives grew into larger regional entities in the 1960's and 1970's

as a result of mergers. Some dairy cooperatives confine their activities to bargaining for the sale and price of milk to processors. Others process milk and/or manufacture dairy products. In 1992, about 68 percent of dairy cooperatives could be considered bargaining-only.

Dairy Product Markets Are Distinct

The dairy sector is divided into several distinct markets, including bulk raw milk, bulk natural cheese, processed cheese, butter, packaged fluid milk products, frozen desserts, and ingredients (dry milk products). Each market has unique characteristics and participants. Although several firms are active in multiple markets, no one firm is involved in all markets. Cooperatives have been most important in the manufactured product markets, while proprietary firms have gravitated toward fluid milk processing and frozen products, as well as yogurt and cheese. Branded consumer dairy products—including cheese, ice cream, yogurt, frozen yogurt, and sour cream—are made primarily by proprietary companies. These companies have spearheaded product development, much of which emphasizes low fat content.

Cooperatives Dominate in Manufactured Product Markets, Proprietary Firms in Fluid Milk Markets



1992 data.
Source: Rural Business and Cooperative Development Service, USDA
Economic Research Service, USDA

Fluid milk processing has changed dramatically during the last 40 years as participation in the business by large dairy companies, supermarket chains, convenience stores, and dairy cooperatives has changed. Fluid milk processing has changed from an emphasis on service to an emphasis on efficiency and minimizing costs. Beverage milk is sold as a set of homogeneous commodity lines—whole milk, 2% milk, 1% milk, and skim—so lower cost is the only competitive element. As a result of increasing efficiencies, fluid milk plant numbers fell from almost 10,000 in 1940 to 460 in 1996, accompanied by an increase in average volume processed from 1.2 million to 128.3 million product pounds per year. Plant and company numbers will almost certainly decline further.

Each market participant has contributed in its own way to the evolution of the fluid, milk processing business. Until the 1950s, home delivery of fluid milk prevailed, although supermarket and dairy store sales were increasing rapidly. Fluid milk processors were numerous in most markets, and competition generally deferred to the going price structure. All market participants recognized the repercussions of destructive competition.

However, the markets could not always assimilate changes taking place in the structure of the fluid milk business, and price wars commonly marked such adjustments. Current competitive conditions in fluid processing rest on the nearly wholesale switch from home delivery to supermarket sales. With centralized buying by chains and retailer groups, the pricing policies of supermarket chains selling their own brand are now the major determinant of milk prices. As more chains retire captive plants with too much capacity or outdated technology, their incentive to maintain margins and profits using foods they manufacture themselves will weaken.

As in the fluid industry, plant numbers in the *manufactured product markets* have declined while average volume produced or sold has increased. Pricing of all manufactured dairy products, except for frozen products, generally involves formula pricing: buyers and sellers use a quoted reference price, commonly from an exchange

such as the Chicago Mercantile Exchange, and then make various adjustments to establish prices. In recent years, this pricing method has come under fire as a result of allegations of price manipulation on the now-defunct National Cheese Exchange. Frozen products tend to be priced more closely to “what the market will bear,” partly because of increased demand for superpremium ice creams and nonfat products.

Among nonfluid dairy products, cooperatives dominate the butter and ingredient markets. The *butter-powder industry*, as it was known in the 1950’s and 1960’s, no longer exists. Throughout that period, surplus milk, especially Grade B but some Grade A as well, flowed almost exclusively to butter-powder plants. Organizations such as Land O’Lakes made some butter and powder in separate plants that were part of an organized system, with the milk separated at the butter plant and the skim milk moved to a powder plant. Since then, surplus whole milk has gradually disappeared, with separate surpluses of butterfat and skim milk arising at different points in the dairy marketing system.

As lowfat milks replaced much whole milk, cream sales declined and the fat content of fluid products shrank. Butterfat use in fluid milk products fell below the butterfat content of milk coming into fluid milk plants. The surplus went first to ice cream manufacture, as many ice cream operations were integrated or nearby. Any remaining fat was made into butter. Cheese plants manufacturing part-skim Mozzarella, American, and other cheeses also had a cream surplus, which often went to butter production. However, there was no skim surplus to be moved to powder plants.

Butter production today is predominantly in the hands of cooperatives. In 1994, Land O’Lakes marketed almost all of the branded consumer butter—136 million of the total 140 million pounds. Store brands account for almost half the butter sold in supermarkets, while almost one-third of all butter sold goes to restaurants. Butter production has changed from serving as an outlet for surplus butterfat to requiring active pursuit of butterfat to meet customer demand.

Dry and bulk condensed milk products, which are used almost entirely as ingredients in other dairy and nondairy food products, are made mostly by cooperatives and sold in competitive markets. Changes in the nonfat dry milk, casein, and whey product markets during the last 40 years have been dramatic. Around 1960, the bakery market was by far the most important ingredient use for nonfat dry milk. Whey replaced nonfat dry milk as bakers found that a “baker’s mixture” composed of dry whey, sodium caseinate, and mineral salts worked better and cost less than nonfat dry milk, particularly in the emerging continuous-mix process of bread baking. In prepared dry mixes for cakes, rolls, and related products and in confectionery, the use of milk ingredients increased, although whey products have been increasingly substituted for nonfat dry milk.

The use of nonfat dry milk and whey in manufactured dairy products has increased, mainly in frozen desserts, processed cheese foods and spreads, and cottage cheese. Whey is being substituted for nonfat dry milk in frozen desserts and processed cheese foods and spreads. Processed meat products, once a significant outlet for nonfat dry milk, use much less. A small portion of that decline was taken up by casein, whey, yeast proteins, and single-cell proteins.

The *natural cheese market* is shared—43 percent cooperatives, 57 percent proprietary firms in 1992. American cheese, which can be sold to the CCC under the Federal price support program, is produced mostly by cooperatives—71 percent in 1992—and largely by the big cooperatives. Proprietary companies supply the largest proportion of Italian cheese—74 percent in 1992. About half of the natural cheese goes to the “industrial” market and is used in processed cheese and in frozen pizzas and other manufactured food products.

Most of the natural cheese used in products is produced by cooperatives under long-term agreements. The major cooperative cheesemakers include AMPI, Mid-Am, and Land O’Lakes. (Mid-Am and part of AMPI have become part of Dairy Farmers of America.) AMPI produces natural cheese and was Kraft’s largest suppli-

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er in the early 1990's. It also produces unbranded processed cheese from its own natural cheese. Mid-Am produces Italian, American, and packaged cheese and buys cheese to meet its sales commitments. It produces shredded Cheddar cheese for Taco Bell and large quantities of Mozzarella for pizza. Land O'Lakes is a supplier of bulk cheese to Kraft and Schreiber and produces branded natural, processed, and shredded products.

Kraft and Borden are the major sellers of *branded processed cheese*. (Borden recently sold its cheese business, including the label, to Mid-Am.) During 1988-93, about 45 percent of all processed cheese sold at retail carried the Kraft brand name; Borden had about 8 percent of the retail market in 1992. Both companies purchase cheese to meet their needs—Kraft buys 60 percent of the cheese it uses. Although 75 percent of Kraft's sales are through retail stores, Kraft plays an important role in other segments of the cheese market.

Food service buys a substantial share of cheese for pizzas, cheeseburgers, tacos, and salad bars. Most is produced by large firms, both cooperative and proprietary, under long-term contracts with fast-food and restaurant chains or their suppliers. The firms supplying the foodservice industry are mostly different companies from those in the branded food markets.

Private firms dominate the *frozen products market*. Ice cream was primarily a soda fountain product until the 1930's. The growth of supermarkets and the appearance of specialty ice cream stores transformed ice cream merchandising. Retail sales rapidly shifted to supermarkets after

the introduction of prepackaged half-gallon containers in the late 1940's. The specialty ice cream stores that became common in the 1950's and 1960's sold relatively high-priced ice cream with different characteristics (higher butterfat content, a different texture, a wider selection of flavors) than the ice creams available in supermarkets. Borden introduced the first nationally distributed premium ice cream—Lady Borden.

Premium ice cream accounted for 42 percent of supermarket sales of ice cream in 1994. Superpremium ice creams, essentially created in 1959 with the introduction of Haagen Dazs, accounted for an additional 13 percent of sales. Superpremiums have national or regional distribution, mostly through supermarkets, but the volume in most markets does not justify operating an ice cream plant. Most often, distribution is by another ice cream or frozen food firm under contract, and production may be contracted to the distributor as well.

Frozen products, yogurt, and cheese are the only dairy products that have attracted large publicly traded companies in recent years. Many of the large companies involved in frozen products (mainly ice cream) are foreign-owned. In 1988, Pillsbury, which had acquired Haagen Dazs in 1983, was in turn bought by Grand Metropolitan plc, a British firm. As a result, Haagen Dazs achieved worldwide distribution. Unilever, a British-Dutch company that has long owned Good Humor, purchased Kraft's ice cream division in 1993. At the time, Kraft's Breyer's brand was the largest selling brand of ice cream. Kraft retained their Frusen Gladje superpremium line. The large ice cream


manufacturers are consolidating manufacturing operations in fewer locations and establishing distribution depots—sometimes using closed ice cream plants.

The Future of U.S. Dairy Product Markets

What does the future hold for dairy markets? Dairy farmers, who supply a relatively standardized raw material to processors, will have few opportunities to market differentiated, identity-preserved products, except perhaps organic or non-BST milk. With a bulk commodity, the chief opportunity for individual farmers to earn premiums will be for volume and quality, and for components of value to dairy product manufacturers as ingredients, such as protein or butterfat. With more volatile markets, returns to producers will largely depend on the bargaining power of cooperatives.

Dairy cooperatives could face a significant change in role as public dairy programs are either reduced or eliminated. Members may expect efforts to reduce price volatility, set production quotas to limit milk production, manage product supplies and inventories, and expand marketing activities related to sales. However, as cooperatives have grown, their membership has become more diverse, meaning member satisfaction may be more elusive. The outcome of the merger of four large, essentially regional cooperatives into one large, national cooperative, Dairy Farmers of America, may offer some insights on how to secure satisfaction for a diverse membership.

Proprietary firms will continue to emphasize production and marketing of branded consumer products, much as in the recent past. They will, however, face a different business environment with the formation of Dairy Farmers of America, which as a large national cooperative has diverse marketing and production facilities, some overlapping the proprietary firms' holdings. It is likely that mergers and acquisitions will continue to play a role in the future of proprietary dairy firms.

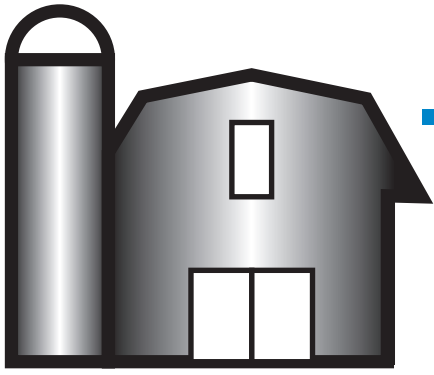
Don Blayney (202) 694-5171 and Alden Manchester (202) 694-5179
 dblayney@econ.ag.gov
 manchest@econ.ag.gov 

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Announcing . . .

The 1997 Census of Agriculture

The census of agriculture is a complete accounting of U.S. agricultural production and the only source of uniform, comprehensive agricultural data for **every county** in the Nation. Taken every 5 years, it was last conducted in 1992 by the Bureau of the Census. The census of agriculture now is the responsibility of a USDA agency, the National Agricultural Statistics Service (NASS).

In late December 1997, questionnaires were mailed to farmers and ranchers across the U.S. The census defines a farm as any operation where \$1,000 or more of agricultural products was produced and sold, or normally would have been sold, during the census year. The 1997 Census of Agriculture will be similar to the 1992 and 1987 censuses, containing data on:

- *land use and ownership*
- *operator characteristics*
- *crops area & production*
- *machinery & equipment*
- *livestock*
- *fertilizer*
- *poultry*
- *chemicals*
- *value of products*
- *energy expenditures*
- *irrigated land*
- *production expenses*
- *type of organization*
- *farm programs*
- *corporate structure*

Census of Agriculture Publications, 1992

Agricultural Atlas
Census History
Congressional Tabulation
Coverage Evaluation
Ram & Ranch Irrigation
Geographic Area Series - Vol. 1
Horticulture Specialties (1987)
Outlying Areas
Public Use File
Ranking-States & Counties
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Next year's annual issue of the ERS-NASS Catalog will provide up-to-date information on products and services that will be available from the 1997 Census of Agriculture.