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## THE U.S. DAIRY INDUSTRY

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### INTRODUCTION

The dairy industry is comprised of milk producers, dairy cooperatives, proprietary processors and manufacturers, and the firms that market milk and dairy products. In 1993, cash receipts (including government payments) from dairy products totaled \$19.6 billion, ranking third behind meat animals (\$51.4 billion) and poultry and eggs (\$19.7 billion). Milk's production and marketing characteristics shape the industry with prices coordinating the actions of producers, processors and manufacturers, marketers, and consumers.

Key features of milk production are its location, quantity (both aggregate and per cow), the size and distribution of herds, farm numbers and ownership, producers' financial conditions, and the ability of producers to respond to changing economic conditions. Milk is produced and processed or manufactured in every State but over half of total production in 1993 came from five states: Wisconsin, California, New York, Pennsylvania, and Minnesota. The growth of milk production in areas outside of the traditional dairy areas (the Northeast and the Upper Midwest) continues. Farm numbers and cow numbers have continued to decline while output per cow continues to rise. Various measures suggest that dairy farmers' financial positions have improved in recent years. Decisions affecting production response are essentially based on long-term expectations.

A wide array of firms and businesses are engaged in transforming and distributing milk and its products. The dairy cooperative is an important link in the transformation and marketing process. Highly developed commercial fluid and manufactured dairy products industries have arisen over time, each characterized by fewer numbers of plants serving larger markets than previously. The role of cooperatives in each industry has been different.

There are active wholesale and retail markets for milk and dairy products in the United States. Both the Federal government and international dairy markets offer outlets for what is mainly a domestic industry. Commercial disappearance, which measures the demands of all commercial buyers, has grown by about 1.5 percent per year since 1980. Trends in the commercial use of individual products vary widely. Commercial trade in the international dairy markets has not, as a rule, been a major industry activity. Average

imports during the 1988-92 period were about 1.8 percent of domestic disappearance. Exports averaged about 2 percent of production during the same period. This situation may change as the world moves toward more open agricultural trade.

Public policies and programs play major roles in the pricing and the marketing of milk and dairy products in the United States. Federal regulations are most important in most areas—California being a major exception. The major Federal dairy policies date from the 1930s and 1940s when the dairy industry looked much different than today. The policies have been modified since then by periodic reauthorization. The two major Federal policies are the dairy price support program and the milk marketing orders. Import quotas on dairy products have been used in conjunction with the price support program. The two major policies have been under increasing pressures to change in recent years. There has also recently been a revival of State-level regulations designed to improve dairy farmers' income.

The dairy industry is shaped by the production and market characteristics of milk. Raw milk is a bulky (about 87 percent water), extremely perishable product with a high potential for disease transmittal. Sanitary production and handling conditions, rapid movement, refrigeration, and heat treatment are a must. Joint assembly and hauling is required for most dairy farmers. Production (supply) and demand are seasonally unsynchronized and supply and demand responses to price changes are highly inelastic—small changes in supply and/or demand will cause large price changes.

Price differences in U.S. dairy markets are much smaller today than formerly. Improved farm milk quality, bulk handling, better refrigeration, and transportation advances have sharply reduced the costs of moving milk across both space and time. As a share of milk price, the late 1920s costs of hauling milk from the farm to the cheese plant (an average of 3 miles) would not only cover today's much longer farm-to-plant hauling—but would also pay to ship the cheese anywhere in the country. Similarly, the costs then required to move milk to New York, Chicago, or Philadelphia from supply stations 200 miles away would now pay to move milk to Miami from supply plants in New York or Wisconsin. About 95 percent of the milk produced in the United States is Grade A.

## **MILK PRODUCTION**

Key features of milk production are: location, quantities (both aggregate and per cow), herd size and distribution, farm numbers and ownership, producers' financial conditions (including revenues, costs, and returns), and the ability of producers to respond to changing economic conditions. Divergent beliefs as to what are sound farming practices and differing viewpoints about the changes taking place in farming and rural areas underlie these issues in the dairy industry. The major factors affecting milk supply are shown in Appendix Table 1.

## **Location and Quantities**

Regional issues quickly surface in discussions of milk production and dairy policies. These issues relate to the geographic location of milk production and the character of dairy farms in different parts of the country. Milk production has grown in areas outside the heavy producing tier of northern States stretching from New England around the Great Lakes to Minnesota (Appendix Table 1). Wisconsin is still considered "America's Dairyland" but California surpassed it in milk production in August 1993 and has maintained this monthly production advantage through the most current data available. In 1993, Wisconsin produced just over 23 billion pounds of milk, 15.3 percent of total U.S. production, while California's production totaled about 22.9 billion pounds or 15.2 percent of the U.S. total. In 1960, Wisconsin outproduced California by more than two to one (14.4 percent versus 6.6 percent).

Past regional population shifts help, in part, to explain the current location of milk production in States such as Arizona, California, Texas, and Florida. The current growth of production in those states, and others, is likely more related to other factors such as land and facilities costs, climate, the supply and quality of hay and forage, the availability of a labor supply compatible with dairy operations, and opportunities to specialize strictly in managing and milking cows. Large drylot facilities of 1,000 cows or more, which are common in western areas, apparently show economies of both specialization and scale which lead to reduced production costs.

Over half of 1993's total milk production (51.2 percent) came from five States: Wisconsin, California, New York, Pennsylvania, and Minnesota and over two-thirds of was produced in 10 States. Production per cow varied widely among States, ranging from 19,425 pounds in California (24.9 percent above the U.S. average of 15,423 pounds) to 11,492 pounds (26.1 percent below the U.S. average) in Tennessee.

One recent attempt to develop an aggregate measure of the changes in location of milk production in the United States is the "propensity to produce milk" index (PTPM), Appendix Table 2. The PTPM in a particular State reflects the State's changing relative share of U.S. production adjusted by the changing level of relative milk prices.

The top 10 states based on PTPM indices in 1992 were New Mexico, Arizona, Nevada, California, Florida, Washington, Texas, Colorado, Utah and Idaho. The PTPM index in each of these states was much greater in 1992 when compared to both 1985 and 1975 indices. The 10 states with the lowest PTPM's—ranked in reverse order—were Rhode Island, New Jersey, West Virginia, Illinois, North Dakota, Wyoming, Mississippi, Kansas, Iowa and Alabama. In contrast to the top 10 states, these PTPM's were much lower in 1992 when compared to both 1985 and 1975.

A careful evaluation of the PTPM indices and a cursory look at the underlying forces of change indicates that the growth of milk production in the West and Southwest will likely will continue. Some location-related advantages or disadvantages, such as climate, are essentially fixed. However, many of the other forces affecting the location and structure of the dairy industry—size and enterprise specialization, good management practices, business

and sociological philosophies, dairy and business support systems and economic development strategies—are open to change (Fallert, Weimar and Crawford).

### **Farm Numbers**

The number of operations with at least one milk cow in 1993 was estimated to be 162,450, down from almost 2.8 million in 1955. Included in this number are operations that do not sell milk. Milk cow numbers (excluding heifers not yet fresh) have also declined—from 1955's 21 million head to 9.7 million head in 1993. The changing average herd size on all farms with milk cows—from 8 in 1955 to 52 in 1990 to 60 in 1993, is one indication of structural changes taking place in milk production.

### **Herd Size and Distribution**

The National Agricultural Statistical Service of the U.S. Department of Agriculture (NASS) reported operations with 1 to 49 head accounted for just under 60 percent of all operations in 1993. About 20 percent of the cow inventory was in the 1-49 herd size category. Farms with 100 or more cows represented almost 14 percent of the operations in 1994 and accounted for just over 50 percent of the cows.

### **Dairy Farm Ownership**

Since 1969, individual or family ownership organizations have accounted for 80 percent or more of the reporting farms with milk cows, reaching almost 89 percent in 1974. Corporate organizations ranged from .5 to 3 percent of farms over the 1969-1987 period. Most corporate organizations are family-held with small numbers, 10 or less, of stockholders. Ownership and operational decision-making in milk production are firmly in the hands of individuals and families, even for very large farms.

### **Financial Conditions of Milk Producers**

The financial position of milk producers is a key element to understanding structural changes in the dairy industry (particularly on the farm supply side).

**1994 Conditions.** The average net cash farm income of dairy farms in the 1994 FCRS survey was \$38,646, lower than 1992 and 1993. Regional average net cash incomes ranged from \$20,723 per farm in the Corn Belt to \$108,830 in the Southeast region.

From a balance sheet perspective, the financial position of dairy farms did not change significantly from 1993 to 1994. Debts in 1994 were 21 percent of assets compared with 20

percent in 1993. Liabilities, particularly non-current liabilities, rose in 1994 which combined with increases in assets left the debt/asset ratios effectively unchanged. Regional debt/asset ratios varied from 0.11 in Appalachia to 0.38 in the Mountain States in 1994.

**Revenues.** Dairy cash receipts come from three sources: 1) milk sales, 2) sales of replacement cows, calves, and cull cows, and 3) other sources (including, for example, leasing cattle, sale of manure, and dairy cooperative patronage dividends). Milk sales have, on average, accounted for just over 91 percent of U.S. dairy enterprise revenues during the 1982-1994 period. Steady gains in production per cow and more volatile milk prices during the late 1980s and early 1990s led to a cyclic pattern of total cash receipts from 1988 to 1994.

**Costs.** Variable and fixed cash production expenses are influenced by several factors, including Government policies and programs. Feed and forage costs can be affected by changes in feed grain programs, conservation policies, disaster relief programs and, in some regions, policies related to irrigation water. Environmental, wage, and budget policies and decisions directly effect other variable expenses such as energy costs, labor costs, and assessments. Fixed cash expenses such as taxes, insurance, and interest payments are affected by Federal, State, and local actions. Tax policies and agricultural and non-agricultural credit and interest rate policies play roles in the entry, exit, and expansion decisions of the individual dairy farmer and in the well-being of the entire industry.

The quantity data for calculating dairy cost of production (COP) are not collected every year. Estimates for the years between surveys are based on price indices. From 1982 to 1994, variable cash expenses for the United States ranged from \$7.39 to \$9.00 per cwt, averaging just under 80 percent of total cash expenses. Feed and forage costs, the largest component of cash expenses, either variable or fixed, averaged almost 64 percent of total variable cash expenses. Fixed cash expenses, from a low of \$1.60 to a high of \$2.57 per cwt, accounted for 20 percent of total cash expenses.

The introduction of recombinant bovine somatotropin technology (rbST) on the supply of milk will depend on the extent that it lowers the milk production costs and the degree that producers are willing to use the technology. Studies have show that rbST will lower the cost of producing milk by increasing milk per cow and allowing the fixed costs to be distributed over greater output.

In a study done by the Administration, using the 1989 FCRS dairy COP data and assuming an increase of about 1,800 lbs of milk and additional costs of using rbST cost changes were estimated by regions and by size. The 1,800 pound increase in milk per cow, per year, is the level that would be expected from the existing research and trials using rbST.

There appears to be little difference in the actual levels of increased revenues between herd sizes; however, there is some variation if the increases are expressed in the percentage changes. The regional impacts of rbST show a little more variation but are not that large. rbST technology appears to be size neutral, which is contrary to many people's beliefs. Good

management skills are required in the use of rbST; therefore, the use of rbST is not management neutral.

**Returns.** Cash returns (gross value of production less cash expenses) for dairy enterprises ranged from \$1.60 to \$4.76 per cwt during the 1982-94 period. Milk prices ranged from \$12.20 to \$13.70 per cwt over the same period. We observe both year-to-year increases and decreases in returns during the period. Cash returns peaked in 1982 at \$4.76 and generally declined until 1986. Since 1987 there have been more numerous ups and downs and the magnitudes of the changes have been greater.

## TRANSFORMING AND MARKETING MILK AND DAIRY PRODUCTS

Raw milk from the farm is usually jointly assembled and transported to firms where it is either processed into fluid (beverage) or perishable products or manufactured into storable products such as butter, cheeses, or dry milk products. The dairy cooperative is an important link in the movement of milk from the farm to final dairy product markets. In 1992, about 82 percent of the milk sold to plants and dealers in the United States was marketed through 265 dairy cooperatives.

### **Demands for Milk and Dairy Products—Consumers and Commercial Trade**

There are active wholesale and retail markets for milk and dairy products in the United States. The U.S. Government participates in dairy markets as both a buyer and, in some cases, a seller of manufactured dairy products. International dairy markets offer another outlet for both commercial and Government dairy product sales.

**Commercial Disappearance.** Commercial disappearance measures the quantity of a particular product or all dairy products as a group demanded by all commercial buyers. It includes the generally small exports that are made without subsidy, such as recently have occurred with butter. Changes in commercial use reflect consumer responses to price changes and underlying demand shifts, Appendix Table 3.

**Fluid Milk and Cream Products.** Per capita consumption of fluid milk and cream has declined at a fairly steady rate over time. However, major consumption shifts among the fluid milk and cream products were steady until the late eighties. Whole milk sales have dropped steadily, lowfat milk use grew steadily, and skim milk sales were fairly stable. These trends appear to be changing. Skim milk sales have risen sharply since the late eighties. Since 1991, growth in lowfat milk sales and declines in whole milk use have slowed and become more irregular. Fluid cream use rose steadily, in part because of better shelf life and lower prices.

**Perishable Manufactured Products.** Use of perishable manufactured products such as cottage cheese, ice cream, and yogurt, has been variable. In general, the importance of these products in aggregate measures of milk and dairy product consumption has declined. Ice cream use was steady during the late seventies and early eighties, grew in the mid-eighties, dropped by 1990, and has recovered partially. Sales of other frozen desserts were steady until significant growth started in the mid-eighties. Cottage cheese use dropped steadily. Yogurt sales grew steadily into the 1980s but have been relatively stable since 1986.

**Storable Manufactured Products.** Strong, steady growth in cheese sales has been the dominant factor in demand for storable manufactured dairy products and the overall aggregate demand for milk. Per capita sales of Mozzarella more than tripled between 1975 and 1992, mostly because of the growing pizza market. Other varieties of cheese have also grown strongly, including Cheddar and the other American varieties.

Butter sales were generally flat between the early seventies and 1991. Low prices relative to margarine have triggered large increases since then. Commercial consumption of nonfat dry milk declined until the late eighties, in part because of substitution of whey products. Sales have been higher in recent years, but some of the increase has been to produce other manufactured products. Canned milk use generally decreased.

**Demand Responses to Changing Prices and Incomes.** Aggregate milk demand is relatively unresponsive to both price and income changes (inelastic demand). Consumer responses to individual product prices and the effects of income changes on individual product demands have been widely studied. While product demand elasticities do vary, they are still generally in the inelastic range. Income effects on dairy product demands are also small. Most estimates of own price demand elasticities range from -0.15 for fluid milk to about -0.75 for nonfat dry milk.

**Commercial Trade.** There is a tendency to envision trade of dairy products as a large market, similar to some of the grains. It is important to realize that international dairy product trade, primarily of butter, butteroil, nonfat dry milk, dry whole milk, cheeses, and casein, is a relatively small proportion of total milk production (approximately 7 percent of the 1988-1992 annual average world cows milk production of 430 million tons). The European Union (EU), New Zealand, and Australia together account for about three quarters of the exports, followed by Canada, the United States, and a handful of non-EU European countries. Major dairy product importing countries include Mexico, Russia and Japan.

The equilibrium pricing conditions described previously apply also to the international dairy markets. Butter and nonfat dry milk play the key roles in international trade and their prices would, if allowed, bring the world's dairy markets into alignment. However, the international dairy market has been plagued by distortions associated with export subsidies and import restrictions that reflect the domestic policies of the major dairy trading countries.

The United States was the largest individual milk producing country in the world in 1992 but traditionally has not played a major role in international dairy markets. Average



imports from 1988 to 1992 were 2.5 billion pounds, milk equivalent, about 1.8 percent of domestic disappearance. Cheeses accounted for nearly 90 percent of the dairy products imported. Exports during the same period averaged 3.0 billion pounds, milk equivalent, about 2.0 percent of U.S. milk production.

As the world moves toward more open agricultural trade, as embodied in the Uruguay Round of the General Agreement on Tariffs and Trade (GATT), it is simultaneously embracing regional trading blocs such as the North American Free Trade Agreement (NAFTA). The GATT Uruguay Round concluded on December 15, 1993, to be implemented over the 1995-2000 period, addresses four agricultural areas: export subsidies, market access, internal support measures, and sanitary and phytosanitary rules. The GATT agreement is potentially significant for the U.S. dairy industry in two of the areas—export subsidy programs and market access. The Dairy Export Incentive Program (DEIP) is in fact an export subsidy and U.S. market access has long been curtailed by Section 22 quota rules. Long term effects on the industry are expected to be minor (USDA, March 1994).

The NAFTA, which is effective as of January 1, 1994, sets out separate bilateral agreements on cross-border agricultural trade between the United States and Mexico and between Mexico and Canada. U.S.-Canada trade is still covered by the U.S.-Canada Free Trade Agreement. The major agricultural issues addressed by the NAFTA are: nontariff barriers, tariffs, producer safeguards, rules of origin, and sanitary and phytosanitary rules. Market access under the NAFTA is a primary concern for the U.S. dairy industry, as are rules of origin. The U.S. dairy industry is expected to benefit from the NAFTA in that Mexican demand for milk and dairy products will likely continue to out pace domestic production (USDA, 1993).

## **HISTORY OF U.S. DAIRY POLICIES AND PROGRAMS**

The U.S. dairy industry is affected by a set of regulations including Federal dairy price supports and milk marketing orders (which embody classified pricing), import restrictions, export subsidies, domestic and international food aid programs, and State milk market regulations. The major Federal dairy policies (and some State regulations) date from the 1930s and 1940s, a time when the dairy industry looked much different than today. The current program of dairy price support was established by the Agricultural Act of 1949; Federal milk marketing orders date to the Agricultural Marketing Agreement Act of 1937; and Section 22 dairy import quotas derive from the Agricultural Adjustment Acts of 1933 and 1935, as amended. Federal dairy policies have been modified to meet changing industry and economic conditions by periodic reauthorization.

State regulations operate separately or are superseded by Federal statutes. There are some shared State/Federal regulatory activities--milk safety, sanitary conditions, and environmental regulations for example. State regulations are less prevalent today than previously but State lawmakers have recently shown they are ready and willing to establish rules to aid their dairy farmers. Dairy farmers, analysts, policy makers, and other interested parties need to appreciate the multi-jurisdictional nature of dairy industry regulation.

### **Price Support Activities**

The Agricultural Act of 1949 established the ongoing dairy price support program. The USDA, through the Commodity Credit Corporation (CCC), supports the price dairy farmers receive for their milk by purchasing butter, nonfat dry milk, and cheese meeting announced specifications at announced purchase prices. Purchase prices are calculated using a formula that combines the support price for milk, quoted for manufacturing grade (Grade B) milk, with margins, or "make allowances," to cover costs of processing milk into the products purchased. The purchase prices are such that dairy farmers receive an average of at least the support price.

On January 1, 1990, the support price for manufacturing grade milk was lowered 50 cents to \$10.10 per cwt. The cut was made because CCC purchases during calendar 1990 were projected to exceed 5 billion pounds milk equivalent. The authorizing legislation, as amended by the budget Reconciliation Act of 1989, permitted the support price to remain unchanged or to be lowered by up to 50 cents under these conditions.

The dairy provisions of Title I of the Food, Agriculture, Conservation, and Trade Act of 1990 (1990 Act) made minor adjustments to previous policy. Although price support adjustments are still triggered by CCC purchase levels, combined purchases of cheese, butter, and nonfat dry milk are measured on a milk equivalent, total milk solids basis, instead of a milkfat basis. The 1990 Act also provides that the price of milk be supported at not less than \$10.10 per cwt through 1995. Also continued by the 1990 Act was the search for new methods of supporting and stabilizing milk prices without increasing Government expenditures. The budget pressures that shaped the 1990 Act have not lessened as the 1995 farm legislation debate approaches.

The 1990 Act authorizes the Secretary of Agriculture, for calendar years 1991-1995, to: increase the support price at least 25 cents if USDA's estimate of purchases in the coming year does not exceed 3.5 billion pounds milk equivalent, total milk solids basis; not decrease the support price if USDA's estimate of purchases in each of calendar years 1991-95 exceeds 3.5 billion pounds but not 5 billion pounds milk equivalent, total milk solids basis; and decrease the support price by 25 to 50 cents if USDA's estimate of purchases in each of the calendar years 1991-95 exceeds 5 billion pounds milk equivalent, total milk solids basis. In estimating the level of CCC purchases, the Secretary is instructed to deduct from this figure any increase in the most recent calendar year's dairy product imports from the average imports during 1986-90.

The 1990 Act contained provisions requiring producers to help finance CCC program purchases during calendar years 1992-95 under certain conditions. Any expected purchases above 7 billion pounds, total solids basis, would be financed through a producer assessment on milk marketings. Producers who did not expand production would receive a rebate of their assessment. Excess production assessments have not as of yet been implemented. The Secretary was given discretionary authority to adjust support purchase prices for butter and nonfat dry milk in a way that would result in the lowest cost to the CCC or would achieve other objectives considered appropriate.

The Agricultural Reconciliation Act of 1990 implemented the 1990 deficit reduction agreement, which prescribed spending cuts of more than \$13 billion for agriculture over fiscal years 1991-95. This Act modified the 1990 farm bill in order to reduce outlays as required by the deficit reduction agreement. For the dairy industry, this meant a producer assessment of 5 cents per cwt of milk marketed during calendar 1991. For calendar years 1992-95, the assessment increased to 11.25 cents per cwt.

Producers who do not increase marketings from the previous year are eligible for an annual refund of the assessment. The assessments in a specific year must be raised to recapture refunds made on the previous year's marketings. Eligible producers claimed refunds totaling \$23.2 million in 1991. The 11.25 cent assessment was increased by 2.4 cents per cwt for May-December 1992. For calendar year 1992, producers claimed refunds totalling \$50.7 million. The assessment was increased to 16.35 cents per cwt beginning May 1, 1993.

The Omnibus Budget Reconciliation Act of 1993 contained several dairy price support program-related provisions. Most of the 1990 dairy price support provisions were extended to 1996. The butter purchase price was restricted to be no more than \$0.65 cents per pound while nonfat dry milk's purchase price can be no less than \$1.034 per pound. Instead of the 11.25 cents, the reconciliation assessment was set at 10 cents per cwt for 1996 and 1997. Finally, a 90-day moratorium on the sale of rbST for commercial milk production from the date of FDA approval was written into the legislation. During the moratorium, the deficit reduction assessments were to be lowered by 10 percent.

### **Priorities for purchases under price support programs**

Products acquired under the price support program are committed to specific uses or are put into storage for future use or sale back to the commercial dairy industry. Uses can be categorized as; 1) domestic donations (food aid) such as The Emergency Food Assistance Program (TEFAP) which donates surplus stocks directly to needy persons and child feeding programs, including the School Lunch Program and the Child Care Food Program; 2) international food aid through Section 416(b) of the Agricultural Act of 1949, as amended, and the Food for Peace Program (PL 480) passed in 1954; and 3) export sales. Priorities are based on perceived social value by use and increasingly on budgetary impacts.

## Trade and other programs

U.S. dairy products are traded internationally using the Dairy Export Incentive Program (DEIP) and export credits. Imports of dairy products into the United States have been subject to import quotas since the 1950s. Recently completed trade negotiations will require conversion of the quotas to quota tariffs with reduction in those tariffs to follow. The demand for dairy products is affected by several domestic food assistance programs which are either targeted at the products specifically or designed to raise consumption of all foods.

**DEIP and CCC Export Credits.** The Dairy Export Incentive Program (DEIP) is an export subsidy program similar to but independent of the Export Enhancement Program (EEP) for other U.S. agricultural commodities. The program is used to assist U.S. dairy products to meet competition from subsidizing countries, especially the European Union, in targeted markets. Products currently eligible for the DEIP are milk powder, butterfat, and several cheese varieties. USDA, members of the agricultural community, foreign government official and others may recommend countries for targeting. The DEIP is currently authorized through December 31, 1995.

DEIP sales are made by private firms. Upon contacting a potential buyer, the prospective exporter submits a bid to USDA requesting a cash DEIP bonus that would allow the sale to take place. The bonus is calculated by USDA and paid after the exporter furnishes evidence that the specified commodity has been exported to the target country under the terms of the sales agreement. The DEIP was relatively dormant until March 1991, the first time bonuses exceeded \$10 million. The highest level of DEIP activity thus far was during FY92 when \$76 million was paid in bonuses.

In addition to promoting U.S. trade policy and market expansion, an active DEIP program can also enhance domestic U.S. milk prices under many market conditions. The exception would be when the surplus is heavy enough that DEIP export quantities cannot move prices off support. It is widely accepted that the DEIP enhanced milk prices in 1992 with estimates of the effect ranging from \$0.30 to \$0.50 per cwt.

Export credit programs to assist commercial exports of U.S. dairy products can also be used. Only GSM-102 is used for dairy product exports (only 5 percent of the total commodities exported under the program). Export credits and the DEIP can be used in combination if the destination country is eligible for both programs.

**Import controls.** Dairy product import restrictions under Section 22 were designed to prevent imports from undermining the dairy price support program. U.S. purchases of dairy products would support international product prices if there were no binding import quotas. Imports of ingredient products are severely restricted under the quota authority while more liberal treatment is given to products that are noncompetitive or partially so—some specialty cheeses for example.

The negotiation of the GATT agreement on multilateral trade and the NAFTA agreement among the United States, Canada, and Mexico will have important ramifications

for the dairy industry. When implemented, all quotas are to be converted to quota tariffs and reduced over time. Also included in the GATT and NAFTA agreements are minimum access requirements which will allow more dairy products to enter the United States than currently. The yearly minimum access increases are clearly defined in the agreements.

Other domestic programs. Domestic food assistance programs have operated in the U.S. since the 1930s. Program goals in the early years were to help feed the poor and unemployed and to help stabilize farm prices by disposing of growing stocks of surplus agricultural commodities. Over time, another goal has been added and emphasized—improving the nutritional well-being of low-income persons and other target groups, such as children and the elderly.

Food assistance programs take a variety of forms and have varying effects on dairy markets and the dairy price support program. Market purchases of all foods are subsidized by the Food Stamp and school feeding programs. Some programs specifically target the purchase or consumption of milk and dairy products--the Women, Infants, and Children (WIC) program and the Special Milk Program.

### **Federal Milk Marketing Orders**

Federal milk marketing orders were authorized by the Agricultural Marketing Agreement Act of 1937. The 1937 Act included many provisions of previous agricultural legislation and established procedures for formulating marketing agreements or orders covering agricultural commodities regarding price, availability, and quality in specified geographical areas. The general administration and oversight of the Federal milk marketing orders are the responsibilities of the Dairy Division of the USDA's Agricultural Marketing Service (AMS).

The intent of the 1937 Act was to secure fair exchange value for farm products by establishing orderly marketing conditions and achieve parity for farmers. These goals were to be met while accounting for consumer interests by only gradually making adjustments in the public interest and feasible in view of consumptive demand.

Only Grade A milk is regulated under Federal milk marketing orders. Some 93,000 producers delivered just under 104 billion pounds of milk to handlers regulated under the 38 Federal orders in effect as of January 1, 1994. The Federal order deliveries represented 70 percent of total U.S. milk marketings during the year (73 percent of the grade A milk produced). California is not part of the Federal order system; it has its own State milk marketing program. Milk marketings in California represented about 16 percent of the 1993 U.S. total Grade A milk.

If the Secretary of Agriculture finds that an order is necessary to achieve the declared intent of the 1937 Act, a notice of a public hearing on the order is issued. All interested parties—including producers, cooperatives, processors, handlers, and consumer groups—may present evidence at the hearing. If the hearing record supports it, the Secretary must issue an order. Milk producers in the geographical area to be covered must approve of

the order before it becomes effective. Procedures for terminating orders if producers indicate a desire to do so are specified. The Secretary can also terminate or suspend, without notice or a hearing, orders or particular order provisions if it is determined that they "obstruct or do not tend to effectuate the purpose of the Act."

The legal scope of milk marketing orders is defined by the provisions of the 1937 Act. Each order includes authority for:

1. classified pricing;
2. establishing the minimum class prices that handlers must pay for milk used in each class;
3. pooling (averaging proceeds of sales by class and apportioning the payments to producers);
4. verifying weights and tests of milk shipped by producers;
5. auditing handler reports to verify milk utilization and payments to producers; and
6. providing market information.

Federal milk marketing orders do not contain provisions that:

1. control production or restrict individual producers' marketings;
2. guarantee producers a market with any buyer;
3. regulate handlers decisions--from whom to buy, to whom to sell, quantity purchased, or what selling price is charged;
4. set maximum prices handlers may pay for milk;
5. guarantee a fixed price to producers;
6. establish sanitary or quality standards; or
7. set wholesale or retail milk and dairy product prices.

Classified pricing, pooling, uniform payments to producers, and no restrictions on marketing are key elements of milk marketing orders. Classified pricing is a pricing system based on the use (utilization) of milk purchased by regulated handlers. All Federal milk marketing orders now provide for at least three classes of milk. Twenty-seven (27) orders, of the 38 in effect at the end of 1993, have been granted the authority for an additional class called III-A. When this fourth class is permitted, the order classifications are:

- Class I - milk used for fluid milk products;
- Class II - milk used for fluid cream or in perishable products such as ice cream, cottage cheese, and yogurt;
- Class III - milk used in American cheese, butter, and condensed milk, and;
- Class III-A - milk used in nonfat dry milk.

When there are only three classes in an order, Classes I and II are as above with Class III and III-A combined as the single Class III.

Each order specifies the minimum price that must be paid by handlers for milk used in each class, which is to be uniform to all handlers, with enumerated provisos. Class I milk

receives the highest price, Class III (or Class III-A) milk the lowest. Class II prices are generally determined by formula but in no case are they below Class III prices. Producers and/or their cooperatives are free to negotiate for prices above the minimums with the handlers buying their milk. In most marketing orders, effective class prices (at least for Class I) are above the established minimums--the result of these "over-order" payment negotiations.

The basis of the class prices in the Federal milk marketing orders currently is the Minnesota-Wisconsin (M-W) price, the average price paid for manufacturing grade milk in the two-State area. The minimum Class III price is set equal to the M-W price and is the same in all orders. The minimum Class I price in each order is the minimum Class III two months previous price plus a fixed Class I differential, which is different in each order and generally increase with distance from the Minnesota-Wisconsin production area. Class I differentials are meant to reflect other costs associated with producing and marketing milk for the fluid markets, such as increased sanitary requirements, balancing, and transportation costs.

Pooling provisions provide the mechanism for payment of uniform or "blend" prices to the producers whose milk is purchased by regulated handlers under the orders. Two types of pools are permitted, marketwide and individual handler. The marketwide pool is currently in use in all but one order. Under a marketwide pool, the dollar value of all milk delivered by producers to regulated handlers is calculated by summing the minimum class price multiplied by the quantity of milk from producers used in each class. The total value is divided by the total producer milk delivered to arrive at the minimum blend or uniform price to be paid to pooled producers, subject to some adjustments if authorized.

### **Federal Program Linkage**

The price support and Federal milk marketing order programs are connected, a fact implying that changes in one will effect both. The link between the two programs is a price--currently the M-W milk price. The classified pricing under Federal milk marketing orders is directly tied to the value of milk for manufacturing which is a market price influenced by the support price for milk. As the mover of class prices in all Federal milk marketing orders, the M-W price coordinates price signals to producers under the orders. For example, a lower M-W (due to a support price reduction) assures that minimum class prices would not continue rising (providing a production incentive) when the support price reduction is required.

The Federal order system similarly affects manufacturing milk markets and the price support program. Production responses to any price distortions or to any stability benefits of the orders will alter the overall market balance, all milk prices, the size of the surplus, and (ultimately) the milk support price.

## **State Regulations**

Several states enforced their own milk pricing and marketing regulations prior to implementation of Federal laws, particularly the marketing orders, and some still do. The California state milk marketing program is an important example. Many States have laws still in place but they are not being enforced. Regulation of milk markets by States and how that regulation effects Federal policies has been the subject of many debates.

Prices paid to producers for fluid-grade milk are regulated by Federal orders and by ten States. The share regulated by the States has declined from nearly 25 percent at one time. California is the largest producing state with state-only pricing regulations. In a number of cases, Federal orders were introduced after State legislation had been repealed or declared unconstitutional. Improvements in transporting milk have diminished the ability of States to effectively regulate markets. Less than 1 percent of the fluid-grade milk sold in the United States is unregulated.

## **1996 DAIRY LEGISLATION**

The 1996 Act presents a departure from past dairy policies. The previous method of supporting milk price through government purchases is extended for 4 years, at reduced support levels, and then eliminated. Replacing the old support method starting in the year 2000 is a recourse loan program aimed at providing seasonal price stabilization. The provision for a minimum support level for milk of \$10.10/cwt is immediately repealed, along with provisions for assessments and for increasing and decreasing support levels over time based on the estimated level of government purchases. The farm bill has no effect on current provisions for import restrictions on dairy products allowed under the Uruguay Round of GATT—provisions that insulate the domestic market from foreign competition.

The farm bill for the first time requires a major restructuring of Federal Milk Marketing Orders (FMMO), a regional system of pricing established pursuant to the Agricultural Marketing Act of the 1937.

### **The Milk Price Support Program**

The 1996 Act states that the Secretary shall support the price of milk through the purchase of cheese, butter, and nonfat dry milk at the following rates per hundredweight for milk containing 3.67 percent butterfat (calendar year basis):



Year	Dol./cwt.
1996	10.35
1997	10.20
1998	10.05
1999	9.90
2000 and beyond	Not Applicable

There are no provisions in the 1996 Act to adjust these support levels over time. And there are no provisions at all for government purchases to support milk prices after 1999. The prior program, as extended by the 1990 Act, required support prices to be increased or decreased if the estimated level of government purchases of dairy products ("total solids basis") reached certain trigger levels.

**Assessments.** Assessments are eliminated under the 1996 Act (related refunds for 1995 and 1996 will be made). The 1990 and 1993 Budget Reconciliation Acts mandated milk marketing assessments to help pay the cost of the price support program. The budget reconciliation assessment for 1996 had been established at 10 cents per hundredweight. Producers who did not increase production over the previous-year level would receive a refund of the assessment, and an additional assessment would be used by the CCC to recapture the cost of the refunds.

**Butter and Nonfat Dry Milk and Cheese Provisions.** The 1996 Act gives the Secretary flexibility to set butter and nonfat dry milk support prices at levels that will minimize the level of expenditures by the CCC or achieve other appropriate objectives. The support price for these products are set such that a weighted average of these product prices (based on the yield from 100 lbs. of milk), less processing costs ("make allowance") will equal the milk support price. The previous law was more restrictive than the 1996 Act about the support levels for dairy products. The level of butter price, under the prior law, could be no higher than \$.65 per pound and the level of powder prices could be no lower than \$1.034.

**Recourse Loan Program for Commercial Processors of Dairy Products.** Recourse loans will be available to commercial processors of dairy products to promote within-year price stability. The 1996 Act states that beginning January 1, 2000, the Secretary shall make recourse loans available to commercial processors to assist them in the management of inventories through temporary storage of eligible dairy products. Funds and authorities of the Commodity Credit Corporation shall be used to carry out the program. The rate of interest charged participants under this program shall not be less than the rate of interest charged the Commodity Credit Corporation (CCC) by the United States Treasury. (This

interest rate could, therefore, be 1 percent lower than the CCC rate charged crop producers for nonrecourse loans in the 1996 Act.)

The loan rate for dairy products will be established at a milk equivalent value of \$9.90 per hundredweight (3.67 percent butterfat milk). The eligible products are cheddar cheese, butter, and nonfat dry milk, the same as for the price support program. The length of the loan contracts may not extend beyond the end of the fiscal year. However, the Secretary has the discretion to extend the loan for a period not to exceed the end of the next fiscal year.

### **Consolidation and Reform of the Federal Milk Marketing Orders**

The 1996 Act modifies the Federal Milk Marketing Order (FMMO) system that is used to set regional prices of milk used for fluid milk. The FMMO system, started by the Agricultural Marketing Act of 1937 and modified by the 1985 Farm Bill, provides provisions for the pricing of milk in different regions by establishing geographically determined order areas. Milk is classified according to use. The order determines the minimum prices that handlers in the orders must pay for different classes of milk. Producers in an order then receive an average (pooled) price for all the milk marketed in the order. All prices are keyed off the price for manufactured dairy products. Predetermined FMMO class I (fluid grade milk) price differentials for each order are added to the class III (manufacturing grade milk) price to determine the class I price. (This is classified pricing.)

The 1996 Act mandates that the Agricultural Marketing Service (AMS) is to: 1) consolidate the number of orders from the present 33 orders to not less than 10 nor more than 14 orders; 2) allow the California state order to enter the FMMO system as a separate order if the producers in California choose to enter the Federal system; 3) use the informal notice and comment procedures for rulemaking to implement the changes in the FMMO system; 4) announce the specific proposed amendments to the FMMO system within 2 years of the date of the Act, 5) implement final amendments to the FMMO system within 3 years of the passage of the Act; and 6) submit a report to Congress by April 1, 1997 on the progress being made in making the changes to the system, along with recommendations for further changes.

As part of the consolidation of the FMMO system, the Secretary is also authorized to implement: 1) the use of utilization rates and the use of multiple basing points for the pricing of fluid milk, and 2) the use of uniform multiple component pricing in the basic formula price of manufacturing milk. (See glossary for definitions.)

**Multiple basing points.** Under the 1996 Act, the Secretary may establish multiple basing points using more than one surplus area as the basis for calculating class I prices in different areas. The Upper Midwest order, which has been used as the one surplus area-basing point, has the smallest Class I differential of all orders. Class I differentials in all other orders have been loosely based on the the Upper Midwest order differential, plus the cost of transporting milk from Upper Midwest. However, over time, other areas besides Upper Midwest have expanded production and could now be classified as surplus area-basing points to implement

the new FMMO system. The 1996 Act specifically forbids the Secretary from using the class I differentials mandated in the 1985 Farm Bill.

***Rule making process/timing.*** Unlike previous changes in orders where the AMS has reacted to proposals from the industry, AMS can use informal rule making. This approach allows the agency to put forth its proposal and then respond to subsequent comments. AMS has 2 years from the date of the enactment to put forth a proposal and another year to enact the changes. If the changes are challenged in court and a court order stops the reform, additional time is allowed before the AMS is penalized. If the AMS does not complete the reforms in the specified period, the authority of this agency to collect assessment used to pay for the order operations is suspended.

***Effect on Fluid Milk Standards in State of California.*** The 1996 Act allows California to maintain their different standards for fluid milk in terms of fat and nonfat components. At present, California requires that milk sold in California (fortified milk) have more nonfat solids in fluid milk than is required in other parts of the country. Milk directly from a cow in the United States averages about 3.67 percent fat. Whole fluid milk as sold in the stores contains about 3.2 percent fat. Two-percent milk and 1-percent milk are aptly named, and skim milk is effectively fat free. California effectively forces fluid processors to increase the amount of nonfat solids in milk.

***Milk Manufacturing Marketing Adjustment.*** This provision sets the manufacturer, or "make" allowance for butter and nonfat dry milk and cheese at not more than \$1.65 per hundredweight for butter and nonfat dry milk and not more than \$1.80 per hundredweight for cheese, for any state or Federal order participating in the Federal support program. California, under its order system has been allowing a higher make allowance to processors than specified by the CCC. The effect was to widen the processor margin and give a lower price to milk producers. The 1990 Farm bill (Section 102 ) prohibits states from using a higher make allowance than designated by the CCC. However, this prohibition was never enforced, and it was repealed by the 1996 Act.

***Promotion.*** This section authorizes the continued collection of the fluid and manufacturing milk promotion assessment. This program pays for generic advertising for milk and milk products. The program will continue as long the referendum of participants passes.

***Northeast Interstate Dairy Compact.*** In this section of the law, Congress consents to the Northeast Interstate Dairy Compact. This compact is an agreement between the states of Maine, New Hampshire, Vermont, Massachusetts, Connecticut, and Rhode Island, that allows these states to place an additional over order charge on Class I milk. This additional charge on the Class I price is set at a maximum of \$1.50 a gallon increased by the rate of inflation since 1990. In 1996 the level of the Class I price maximum under the order is around \$20.00 a hundredweight or about \$5.00 over the present Class I price.

The compact is in place until the completion of the FMMO reform. In addition the states of New York, New Jersey, Delaware, Pennsylvania, Maryland, and Virginia may join if they are contiguous to a participating state. The compact must compensate the CCC for any additional costs CCC incurs as a result of the compact. The compact can not limit any movement of milk into the compact area. Further, any fluid milk that is sold in the compact area from noncompact areas will receive the same price, as if it had been produced in one of the compact states.

***Dairy Export Incentive Program.*** The Dairy Export Incentive Program (DEIP) is extended to 2002 in the new Farm Bill. This section of the law also requires the Secretary to maximize the amount of DEIP allowable under the WTO agreement.

***Authority to Assist in Establishment and Maintenance of One or More Export Trading Companies.*** This section allows the Secretary to assist in the establishment of one or more export trading companies under the Export Trading Company Act of 1982. The organization or organizations are to be designed to develop export markets for the US dairy products.

***Standby Authority to Indicate Entity Best Suited to Provide International Market Development and Export Services.*** The Secretary has the authority to indicate the best entity suited to assist the U.S. dairy industry in the development of international markets. The Secretary may make this designation provided that 1) the industry has not established a trading company under the Export Trading Company Act of 1982 on or before June 30, 1997 and 2) U.S. exports during the 12 month period preceding July 1, 1998 do not exceed the dairy product exports in the 12 months ending July 1, 1997 by 1.5 million pounds total solids basis. The Secretary is also required to identify sources of funding. The life of this section is from July 1, 1997 to September 30, 2000.

***Study and Report Regarding Potential Impact of Uruguay Round on Prices, Income, and Government Purchases.*** The Secretary of Agriculture shall conduct a study, on the impact of the increased access of cheese from the WTO agreement on the U.S. milk prices, dairy producer income, and U.S. dairy program costs. This study is to be done by variety of cheese. The study is to be completed by July 1, 1997. The limitation of the number of studies imposed on the Department by Congress does not apply to this study.

***Promotion of United States Dairy Products in International Markets Through Dairy Promotion Program.*** This section allows the Dairy Board to expend funds in the promotion of dairy products overseas. The life of this program is for each fiscal years 1997 through 2001.

## GLOSSARY

**Agricultural Marketing Service (AMS):** A USDA agency responsible for administering the marketing of several agricultural commodities, including providing market news and stock reports. AMS oversees the operation of the Federal milk marketing order system.

**Agricultural Stabilization and Conservation Service (ASCS):** A USDA agency responsible for administering farm price support and income support programs and some conservation and forestry cost-sharing programs.

**Balancing:** The market services of moving milk between various uses and among processors to meet fluctuating needs of individual processors from various supplies and of maintaining a reserve of milk to meet fluctuations in aggregate market needs.

**Blend price:** A weighted average price based on the proportion of Grade A milk in a pool allocated to each of the use classes. Producers participating in a pool receive its blend price with adjustments for butterfat content and farm location if so specified.

**Class I differential:** The amount added to the M-W price to obtain a given order's Class I price. Two components usually make up the effective or total Class I differential: a minimum Federal order differential and an over-order payment.

**Class I use:** Grade A milk used in Class I milk products as defined under a milk marketing order. Class I products generally include all beverage milks and may include other fluid products.

**Class II use:** Grade A milk used in fluid cream products or perishable manufactured products (ice cream, cottage cheese, and yogurt) under Federal marketing orders with three classes. The designation also refers to Grade A milk used to produce any manufactured product under a Federal marketing order with only two classes.

**Class III use:** Grade A milk used to produce storable manufactured products (cheese, butter, canned milk, and dry milk) under a Federal marketing order with three classes.

**Class III-A use:** Grade A milk used to produce nonfat dry milk under Federal milk marketing orders where the class has been delimited.

**Classified pricing:** A structure of prices that differ according to category of use. In particular, the Federal order pricing system under which regulated processors pay into the pool for Grade A milk according to the class in which it is used.

**Commodity Credit Corporation (CCC):** A federally owned and operated corporation within the U.S. Department of Agriculture created to stabilize, support, and protect farm income and prices through loans, purchases, payments, and other operations.

**Cooperative:** A firm that is owned by its farmer-members, is operated for their benefit, and distributes earnings on the basis of patronage (volume of milk).

**Cost of production:** An amount, measured in dollars, of all purchased inputs, allowances for operator labor and management, and rent, that is necessary to produce farm products.

**Economies of size:** Increasing returns as use of factors is expanded in least-cost combinations. Once the size of an operation reaches a certain size, the marginal cost of producing additional output begins to decline.

**European Union:** Formerly known as the European Community, an attempt originating under the Treaty of Rome in 1957 to unify and integrate member economies by establishing a customs union and common economic policies, including the Common Agricultural Policy. The EU currently has 12 members.

**Farm act:** The omnibus agricultural legislation that expires every 4 or 5 years. The act's titles include program commodities, trade, conservation, credit, agricultural research, food stamps, and marketing.

**Federal milk marketing order:** A regulation issued by the Secretary of Agriculture specifying minimum prices and conditions under which regulated milk handlers must operate within a specified geographic area.

**Fluid grade (Grade A) milk:** Milk produced under sanitary conditions that qualify it for fluid consumption. Only Grade A milk is regulated under Federal marketing orders.

**Fluid product:** Packaged dairy products traditionally including beverage milks, milk and cream mixtures, cream, eggnog, and yogurt.

**Fluid utilization:** The proportion of Grade A milk pooled in a market and used to produce fluid (Class I) products.

**Food, Agriculture, Conservation, and Trade Act of 1990 (PL 101-624):** The omnibus food and agricultural legislation signed into law on November 28, 1990, that provides a 5-year framework for the Secretary of Agriculture to administer various agriculture and food programs.

**General Agreement on Tariffs and Trade (GATT):** An agreement originally negotiated in 1947 by 23 countries, including the United States, to increase international trade by

reducing tariffs and other trade barriers. The agreement provides a code of conduct and a framework for periodic multilateral negotiations on trade issues.

**Handlers:** Generally refers to fluid milk processors but can include manufacturing plants that also supply fluid markets.

**Make allowance:** The difference between the Government support price for milk and the value of its products at the CCC announced purchase prices for butter, nonfat dry milk, and cheese. The allowance is administratively set to attain the desired level of prices for milk in manufacturing uses.

**Manufacturing grade (Grade B) milk:** Milk not meeting the fluid grade standards. Less stringent standards generally apply.

**Manufacturing milk:** Grade B milk or the Grade A milk assigned to Class II and Class III or otherwise used in the production of a manufactured product.

**Manufacturers:** Generally refers to the producers of cheese, butter, nonfat dry milk, and other storable dairy products.

**Milk equivalent:** The amount of farm milk represented by a quantity of dairy products. Most often used to aggregate stocks, trade, or removals of various dairy products on a common basis, either milkfat or skim solids. Milkfat basis refers to the quantity of milk needed to provide the milkfat contained in the dairy products. Similarly, skim solids basis refers to the milk needed to provide the skim solids used in production. Total solids basis is an arbitrary weighting of net removals on the two bases used for adjusting the support price for milk. The weights currently are 40 percent milkfat basis and 60 percent skim solids basis.

**Minnesota-Wisconsin (M-W) price:** The average price per cwt paid to farmers for manufacturing grade milk in Minnesota and Wisconsin as estimated by USDA.

**North American Free Trade Agreement (NAFTA):** A region-wide (the United States, Canada, and Mexico) agreement effective January 1 which: 1) progressively eliminates tariffs and nontariff barriers to trade in goods; 2) establishes principles of and improves access for services trade; 3) establishes rules for investment; 4) strengthens protection of intellectual property rights; and 5) creates an effective dispute settlement mechanism. Other countries have expressed interest in joining in the agreement.

**Over-order payment:** A payment negotiated between buyers and sellers to cover the cost of providing market services or attracting milk away from manufacturing plants. Over-order payments could also result from market power.

**Parity price:** Originally defined as the price which gives a unit of a commodity the same purchasing power today as it had in a base period, traditionally 1910-14. In 1948, parity procedures were modified to adjust for changes in relative farm prices between the base period and the most recent 10 years.

**Perishable manufactured dairy products:** Manufactured dairy products with limited storage life, including ice cream, cottage cheese, yogurt, and sour cream.

**Processors:** Generally refers to firms that process raw Grade A milk into fluid dairy products.

**Public Law 480 (PL 480):** Common name for the Agricultural Trade Development and Assistance Act of 1954 which seeks to expand foreign markets for U.S. agricultural products, combat hunger, and encourage economic development in developing countries.

**rbST (Recombinant bovine somatotropin):** A synthesized copy of a protein hormone, bovine somatotropin (bST), which naturally occurs in cattle. The hormone is secreted by the cow's pituitary gland and directs how energy and nutrients from feeds are used for growth, milk production, and other body functions. Initial studies of the hormone emphasized its relation to growth and led to it being called bovine growth hormone (bGH), a name that is still sometimes used.

**Reconstituted milk:** Fluid milk recombined from ingredients (nonfat dry milk, condensed milk, cream, butter, and butter oil) or concentrated milk.

**Revenue pool:** With a classified pricing system such as that used in Federal and State orders, processors pay for milk at different prices for each use category. Producers are paid a weighted average, or "blend" price for all uses of milk in a particular order or market. Processors pay into the pool on the basis of their uses of milk; these are the pool revenues. Producers participating in the pool receive identical uniform blend prices, with adjustments for butterfat content and location of the farm.

**Section 22:** A section of the Agricultural Adjustment Act of 1933 (PL 73-10) that authorizes the President to restrict imports by imposing quotas or fees if the imports interfere with Federal price support programs or substantially reduce U.S. production of products processed from farm commodities.

**Storable manufactured dairy products:** Manufactured dairy products, including butter, nonfat dry milk, and cheese, which can be stored for relatively long periods of time.

**Surplus:** The difference between commercial milk supplies and the amount demanded by the market at a given price. CCC net removals (price-support purchases plus DEIP shipments minus domestic sales for unrestricted use) approximate the surplus during a particular period.



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Appendix Table 1. Milk Production and Factors Affecting Supply, Selected Years, 1970-93

Year	Milk cattle on farms, January 1			Milk production		Average prices received by farmers per cwt		
	Milk cows and heifers that have calved	Milk cow replacements; heifers 500 pounds and over	Milk cows on farms, average during year	Per cow	Total	All milk, wholesale	Milk eligible for fluid market	Milk manufacturing grade
	Thousand	Number per 100 cows	Thousand	Pounds	Million pounds	----- Dollars -----		
1970	12,091	3,880	12,000	9,751	117,007	5.71	6.05	4.70
1971	11,909	3,843	11,839	10,015	118,566	5.87	6.19	4.86
1972	11,776	3,828	11,700	10,259	120,025	6.07	6.38	5.08
1973	11,622	3,872	11,413	10,119	115,491	7.14	7.42	6.20
1974	11,297	3,941	11,230	10,293	115,586	8.33	8.66	7.13
1975	11,220	4,087	11,139	10,360	115,398	8.75	9.02	7.63
1976	11,071	3,956	11,032	10,894	120,180	9.66	9.93	8.56
1977	10,998	3,887	10,945	11,206	122,654	9.72	9.96	8.70
1978	10,896	3,886	10,803	11,243	121,461	10.60	10.80	9.65
1979	10,790	3,932	10,734	11,492	123,350	12.02	12.20	11.06
1980	10,758	4,159	10,799	11,891	128,406	13.05	13.23	12.01
1981	10,849	4,342	10,898	12,183	132,770	13.77	13.95	12.72
1982	10,986	4,547	11,011	12,306	135,505	13.61	13.80	12.60
1983	11,047	4,545	11,059	12,622	139,588	13.58	13.75	12.61
1984	11,059	4,533	10,793	12,541	135,351	13.46	13.61	12.49
1985	10,777	4,770	10,981	13,024	143,012	12.76	12.90	11.72

(Appendix Table 1 continued)

Year	Milk cattle on farms, January 1			Milk production		Average prices received by farmers per cwt			
	Milk cows and heifers that have calved	Milk cow replacements; heifers 500 pounds and over	Milk cows on farms, average during year	Per cow	Total	All milk, wholesale	Milk eligible for fluid market	Milk manufacturing grade	
	Thousand	Number per 100 cows	Thousand	Pounds	Million pounds	----- Dollars -----			
1986	11,116	4,709	10,773	13,285	143,124	12.51	12.62	11.46	
1987	10,466	4,305	10,327	13,819	142,709	12.54	12.66	11.37	
1988	10,311	4,122	10,262	14,145	145,152	12.26	12.36	11.15	
1989	10,212	4,161	10,126	14,244	144,239	13.56	13.66	12.38	
1990	10,153	4,227	10,127	14,646	148,314	13.74	13.89	12.34	
1991	10,156	4,220	9,992	14,860	148,477	12.27	12.30	11.05	
1992	9,913	4,202	9,835	15,419	151,647	13.15	13.19	11.91	
1993	9,838	4,224	9,705	15,554	150,954	12.86	12.88	11.80	

(Appendix Table 1 continued)

Year	Dairy ration value per cwt		Milk/feed price ratio /2		Milk cow cost		Grain and other concentrates fed to milk cows			Dairy pasture feed conditions, as percent of normal		Alfalfa hay prices received by farmers per ton		Slaughter cow prices per cwt 3/	
	Dollars	Pounds			Price received per head	Milk required to buy a cow	Total fed	Per cow	Per cwt of milk produced	Percent		----	Dollars	----	
					Dollars	Cwt	Thousand Tons								
1970	3.28	1.74			332	58	24,870	3,979	42.4	81		24.70		21.32	
1971	3.44	1.71			358	61	25,107	4,070	42.4	79		27.10		21.62	
1972	3.52	1.72			397	65	25,162	4,298	41.9	80		31.45		25.21	
1973	4.88	1.46			496	69	25,042	4,389	43.4	83		41.55		32.82	
1974	6.23	1.34			500	60	24,586	4,384	42.6	75		52.58		25.56	
1975	6.25	1.40			412	47	24,274	4,357	42.1	79		54.38		21.09	
1976	6.30	1.53			477	49	25,083	4,545	41.7	70		60.81		25.31	
1977	6.20	1.57			504	52	25,518	4,709	42.1	72		60.57		25.32	
1978	6.08	1.74			675	64	26,018	4,803	42.8	76		52.25		36.79	
1979	6.68	1.80			1,040	87	27,207	5,070	44.1	82		60.37		50.10	
1980	7.42	1.76			1,190	91	28,433	5,260	44.2	70		72.00		45.73	
1981	8.02	1.72			1,200	87	28,513	5,220	42.9	79		70.90		41.93	
1982	7.45	1.83			1,110	82	29,661	5,380	43.7	83		72.73		39.96	
1983	7.88	1.72			1,030	76	30,162	5,438	43.2	77		78.70		39.35	
1984	8.16	1.65			895	66	28,449	5,253	42.0	74		79.48		39.81	
1985	7.35	1.73			860	67	8,891	5,427	41.8	77		73.67		38.31	
1986	7.00	1.79			820	66	29,913	5,534	41.8	80		64.85		37.18	

(Appendix Table 1 continued)

Year	Dairy ration value per cwt		Milk/feed price ratio /2		Milk cow cost		Grain and other concentrates fed to milk cows			Dairy pasture feed conditions, as percent of normal		Alfalfa hay prices received by farmers per ton		Slaughter cow prices per cwt	
	Dollars	Pounds			Price received per head	Milk required to buy a cow	Total fed	Per cow	Per cwt of milk produced	Percent					
							Thousand Tons	----	----- Pounds ----						
1987	6.81	1.84			920	73	29,607	5,736	41.6	79		65.97		44.80	
1988	7.74	1.58			990	81	29,853	5,820	41.2	59		82.51		47.91	
1989	8.20	1.65			1,030	76	29,602	5,845	41.0	73		95.98		50.11	
1990	7.98	1.71			1,160	84	32,402	6,397	43.7	74		92.56		53.32	
1991	7.73	1.58			1,100	90	30,934	6,192	41.7	78		78.96		51.50	
1992	7.68	1.69			1,130	86	31,572	6,417	41.6	82		75.45		49.69	
1993	7.73	1.64			1,160	90	32,185	6,637	42.7	84		85.73		50.14	

1/ Preliminary.

2/ Pounds of average concentrate ration equal in value to 1 pound of milk.

3/ Utility grade, Omaha 1965-87, Wisconsin auctions 1988 and after.

**Appendix Table 2. Propensity to produce milk index, relative production index, and relative price index, by State, 1992, 1985 and 1975**

State	Propensity to produce milk index <sup>a</sup>				Relative production index <sup>b</sup>			Relative price index <sup>c</sup>		
	1992	1992	1985	1975	1992	1985	1975	1992	1985	1975
Rank										
New Mexico	1	1070	474	198	749	394	166	70	83	84
Arizona	2	421	324	257	341	268	211	81	83	82
Nevada	3	378	282	222	291	231	182	77	82	82
California	4	278	206	155	231	185	150	83	90	97
Florida	5	254	193	233	183	152	182	72	79	78
Washington	6	236	154	147	212	137	134	90	89	91
Texas	7	189	137	137	151	114	114	80	83	83
Colorado	8	153	113	115	136	110	105	89	97	91
Utah	9	152	124	131	146	129	131	96	104	100
Idaho	10	150	117	96	164	134	107	109	114	111
Pennsylvania	11	141	151	130	130	132	177	92	87	90
Georgia	12	140	132	152	113	103	120	81	78	79
Oregon	13	138	121	101	124	110	94	90	91	93
Vermont	14	124	126	127	110	111	116	89	88	91
Louisiana	15	115	115	155	94	95	136	82	82	88
New York	16	103	104	120	96	94	109	93	91	91
North Carolina	17	93	110	111	76	93	99	82	84	89
Virginia	18	91	103	102	83	90	93	91	87	91
Wisconsin	19	87	99	97	110	121	114	127	122	118
Maine	20	86	96	109	74	81	94	86	84	86
New Hampshire	21	86	102	113	70	81	94	81	80	83
Maryland	22	84	108	117	77	95	109	92	88	93
South Dakota	23	83	92	108	94	107	116	113	116	107
Connecticut	24	81	95	113	60	72	88	74	76	78
Michigan	25	79	87	88	84	92	91	106	105	104
Ohio	26	72	80	86	73	80	87	101	100	101
Tennessee	27	71	78	92	77	83	94	109	107	102
Oklahoma	28	70	71	79	66	66	74	94	94	94
Delaware	29	67	73	76	60	64	70	90	87	92
South Carolina	30	67	100	106	55	86	94	82	86	89
Minnesota	31	63	75	82	82	95	98	130	126	119
Kentucky	32	61	68	92	69	75	97	113	110	105
Massachusetts	33	61	86	106	51	66	84	83	76	79
Arkansas	34	59	66	71	61	69	72	104	105	108
Montana	35	58	65	65	55	63	62	95	96	96
Missouri	36	57	59	76	63	64	79	110	109	104
Indiana	37	51	57	66	55	61	69	108	107	105
Nebraska	38	49	55	77	47	54	72	96	98	93
Alabama	39	48	52	78	39	44	69	82	85	89
Iowa	40	46	48	58	56	56	67	122	118	115
Kansas	41	46	48	68	48	54	73	103	111	108
Mississippi	42	46	56	70	45	55	69	98	98	99
Wyoming	43	44	58	58	43	58	59	98	100	102
North Dakota	44	43	52	57	46	53	56	106	102	98
Illinois	45	41	45	51	47	51	56	116	113	109
West Virginia	46	35	52	57	31	46	52	89	88	92
New Jersey	47	32	47	62	26	37	50	80	78	80
Rhode Island	48	29	39	71	21	28	52	72	72	73

<sup>a</sup> The "propensity to produce milk index" is the relative production index divided by the relative price index. Figures may not divide exactly because of rounding.

<sup>b</sup> The Relative Production Index is:  $\frac{(\text{State's milk prod. in year } t)}{(\text{Tot. U.S. milk prod. in year } t)}$   $\frac{(\text{State's avg. milk prod. in 1957-59})}{(\text{U.S. avg. milk prod. in 1957-59})}$  X 100

<sup>c</sup> The Relative Price Index is:  $\frac{(\text{State's all milk price in year } t)}{(\text{U.S. all milk price in year } t)}$   $\frac{(\text{State's avg. all milk price, 1957-59})}{(\text{U.S. avg. all milk price, 1957-59})}$



**Appendix Table 3. Per capita consumption of milk and dairy products, United States, 1975-94<sup>a</sup>**

Evaporated and condensed milk								
Year	Fluid milk and cream	Butte r	Cheese			Whole		
			American	Other	Cottage	Canned	Bulk	Skim
Pounds								
1970	277	5.3	7.1	4.4	5.2	5.9	1.2	5.0
1971	275	5.1	7.4	4.7	5.4	5.7	1.1	5.1
1972	276	4.9	7.8	5.3	5.5	5.1	1.2	4.7
1973	272	4.8	7.9	5.7	5.3	4.8	1.1	4.3
1974	262	4.5	8.6	6.0	4.7	4.4	1.2	3.5
1975	261	4.7	8.4	6.1	4.7	3.9	1.4	3.6
1976	260	4.3	9.0	6.7	4.7	3.7	1.3	3.6
1977	258	4.3	9.3	6.8	4.7	3.2	1.1	3.9
1978	254	4.4	9.6	7.4	4.7	3.1	1.0	3.5
1979	251	4.5	9.6	7.6	4.5	3.0	1.1	3.3
1980	246	4.5	9.6	7.9	4.5	2.8	1.0	3.3
1981	242	4.2	10.2	8.0	4.3	2.9	1.2	3.2
1982	236	4.4	11.3	8.6	4.2	2.7	1.3	3.0
1983	236	4.9	11.6	8.9	4.1	2.7	1.1	3.2
1984	238	4.9	11.9	9.6	4.1	2.4	1.3	3.7
1985	241	4.9	12.2	10.4	4.1	2.2	1.4	3.8
1986	240	4.6	12.1	11.0	4.1		2.2	1.4
1987	239	4.7	12.4	11.7	3.9	2.2	1.5	4.2
1988	235	4.5	11.5	12.2	3.9	2.1	1.4	4.2
1989	236	4.4	11.0	12.8	3.6	2.0	1.1	4.7
1990	234	4.4	11.1	13.5	3.4	2.2	1.0	4.8
1991	233	4.4	11.1	13.9	3.3	2.1	1.1	5.0
1992	231	4.4	11.3	14.7	3.1	2.1	1.1	5.2
1993	227	4.7	11.4	14.8	2.9	1.9	1.1	5.2
1994	226	4.8	11.6	15.3	2.8	1.8	1.4	4.8

Appendix Table 3. (continued)

Year	Frozen products				Dry products			
	Ice cream	Ice milk	Sherbet	Other products <sup>c</sup>	Whole milk	Nonfat dry milk	Butter Milk	Whey <sup>d</sup>
	Pounds							
1970	17.6	7.8	1.6	1.4	0.2	5.3	0.2	0.9
1971	17.5	7.7	1.6	1.3	0.2	5.3	0.3	1.0
1972	17.3	7.7	1.6	1.4	0.1	4.6	0.2	1.7
1973	17.3	7.6	1.5	1.2	0.1	5.3	0.2	1.8
1974	17.4	7.7	1.5	1.1	0.1	4.2	0.2	2.0
1975	18.5	7.7	1.5	1.0	0.1	3.3	0.2	2.2
1976	17.9	7.3	1.5	0.8	0.2	3.5	0.2	2.4
1977	17.5	7.7	1.5	0.7	0.2	3.3	0.3	2.4
1978	17.4	7.7	1.4	0.8	0.3	3.1	0.2	2.4
1979	17.1	7.3	1.3	0.6	0.3	3.3	0.2	2.7
1980	17.5	7.1	1.3	0.3	0.3	3.0	0.2	2.7
1981	17.4	7.0	1.3	0.6	0.4	2.1	0.2	2.7
1982	17.6	6.6	1.3	0.6	0.4	2.1	0.2	2.9
1983	18.1	6.9	1.3	0.6	0.4	2.2	0.2	3.1
1984	18.2	7.0	1.0	0.6	0.4	2.5	0.2	3.2
1985	18.1	6.9	1.3	1.3	0.4	2.3	0.2	3.5
1986	18.4	7.2	1.3	0.9	0.5	2.4	0.2	3.7
1987	18.4	7.4	1.3	1.0	0.5	2.5	0.2	3.6
1988	17.3	8.0	1.3	1.0	0.6	2.6	0.2	3.5
1989	16.1	8.4	1.3	2.8	0.5	2.1	0.2	3.5
1990	15.8	7.7	1.2	3.6	0.6	2.9	0.2	3.7
1991	16.3	7.4	1.1	4.3	0.4	2.6	0.2	3.6
1992	16.3	7.1	1.2	4.4	0.5	2.8	0.2	3.8
1993	16.1	6.9	1.3	5.0	0.5	2.4	0.2	3.8
1994 <sup>e</sup>	16.1	7.6	1.4	4.9	0.5	3.5	0.2	3.6

<sup>a</sup> Domestic disappearance divided by total population including military overseas (resident population for fluid products).

<sup>b</sup> Product weight of beverage milks, fluid creams, egg nog, and yogurt sold or consumed on farms.

<sup>c</sup> Includes mellorine. May not be comparable across time.

<sup>d</sup> Includes modified whey products.

<sup>e</sup> Preliminary or estimated.



**THEME: WHAT IMPACTS HAVE PAST U.S./CANADIAN DAIRY POLICIES  
HAD ON STRUCTURE, EFFICIENCY, AND TRADING RELATIONSHIPS?**

**OBJECTIVE**

To describe the economic effects resulting from past policies in the United States and Canadian dairy sectors with emphasis on prices, supply, demand, trade, structure and efficiency.

