

United States' Agricultural Systems: An Overview of U.S. Dairy Policy

Daniel A. Sumner* and Joseph V. Balagtas**

Published in the *Encyclopedia of Dairy Sciences*, H. Roginski, J. Fuquay, P. Fox, eds.
Copyright 2002, Elsevier Science Ltd. All Rights Reserved.

* Director, University of California Agricultural Issues Center
and
Frank H. Buck, Jr. Professor
Department of Agricultural and Resource Economics
University of California, Davis
Davis, CA 95616 USA
Phone: (530) 752-1668
Email: dasumner@ucdavis.edu

**Graduate Research Assistant and Ph.D. Candidate
Department of Agricultural and Resource Economics
University of California, Davis
Davis, CA 95616 USA
Phone: (530)752-6000
Email: jybalagtas@ucdavis.edu

Key words: dairy policy, regulation, milk marketing order, tariff-rate quota, classified
pricing, revenue pooling, Dairy Export Incentive Program, subsidy, price support, market
loss payment

An active agricultural commodity policy was developed in the United States in the 1930s in response to economic conditions of the Great Depression. Major commodity programs for grains, cotton, peanuts, sugar, tobacco, and dairy that are in place today have their origins in those programs begun more than 60 years ago.

Dairy policy in the United States has been and is comprised of the following major components: (i) border measures that create import barriers for most dairy products and export subsidies for a few manufactured dairy products; (ii) federal and state marketing orders that regulate raw milk prices; and (iii) government purchases of manufactured dairy products to support the farm price of milk. Federal and state governments also have long-standing food safety and sanitation regulations for milk and dairy products. In addition, there are myriad of more recent environmental, land use zoning, labor and other regulations or incentives that influence the dairy industry.

This article provides an overview of the key elements of U.S. dairy policy, and provides some statistics to illustrate the economic effects of these programs.

Border Measures for Dairy

Trade barriers are arguably the most important feature of U.S. dairy policy. Trade barriers for many dairy products have limited U.S. imports of these products to less than six percent of U.S. consumption (Table 1). Imports comprise well less than six percent of consumption of all products including fluid milk, frozen products and soft products such as sour cream and yogurt. Import barriers allow the domestic price of milk and dairy products to often remain well above the price for traded products in world markets (Figure 1). By insulating the domestic dairy economy from foreign supplies of dairy products, the import barriers also make possible the key domestic elements of the dairy

program—milk marketing order pricing rules and the price support program (described in the following sections).

As a part of the Uruguay Round trade agreement that took effect on July 1, 1995, a system of absolute import quotas gave way to a system of tariff-rate quotas (TRQs) that set a relatively low tariff on imports up to a determined quantity (the quota), and a relatively high tariff on over-quota quantities. Although quantity of access expanded with the Uruguay Round agreement, the second-tier tariffs applied to over-quota imports remain prohibitively high; therefore, for the present, the effects of the TRQs remain the same as the absolute quotas that were replaced, though at expanded import quantities. Imports of fluid milk and cream, butter, cheese, and milk powders, and many other dairy products are subject to TRQs. For those products subject to TRQs, imports accounted for six percent or less of domestic consumption, but for other products, including some cheeses, imports are not restricted. Overall, the United States imports more than \$1 billion U.S. dollars worth of dairy product each year, and is a substantial importer in the world market.

In addition to limiting import access to the domestic market for dairy products , the U.S. government continues to provide small amounts of direct financial subsidy for U.S. exporters of dairy products. Subsidized exports, along with donations to domestic food programs and international food aid, long have been used to dispose of stocks of dairy products acquired under the price support program (described below). Subsidized exports have been considered a market for U.S. dairy products that does not disrupt domestic commercial sales. In addition to the disposal of government stocks, the Dairy Export Incentive Program (DEIP) has provided explicit price subsidies for commercial

dairy product exports since the 1980s. Commodities eligible for DEIP are milk powder, butterfat, cheddar, mozzarella, Gouda, feta, cream, and processed American cheeses. The USDA paid U.S. exporters of dairy products about \$145 million in FY 1999, and another \$77 million in FY 2000. Subsidized exports have significant market effects for nonfat dry milk; in some years, DEIP accounts for nearly all nonfat dry milk exports. However, nonfat dry milk exports account for less than one-half of one percent of all nonfat milk solids produced in the country. DEIP has relatively small effects on the markets for butter and cheese. The USDA DEIP was scaled back significantly from 1995 to 2000 as part of the Uruguay Round trade agreement.

Regional Milk Marketing Orders

The pricing of nearly all of the milk produced in the United States is regulated by milk marketing orders. Since January 2000, eleven federal marketing orders regulate the sale of 70 percent of all milk produced in the country. California, which operates its own marketing order, regulates the sale of another 19 percent of the country's milk. Most of the remainder is regulated by other state marketing orders (Maine, Montana, Nevada, Virginia), and a small portion is not regulated by any marketing order.

Both federal and California milk marketing orders use price discrimination to raise the average price received by producers, setting minimum prices that processors must pay for Grade A milk according its end-use (classified pricing)^a. Federal orders distinguish between four end-use "classes", one for fluid products, one for soft and frozen products, one for cheese and one for butter and dry milk powder. Each month, federal orders set the minimum prices for milk used in cheese, and milk used in butter and dry milk according to formulae that take into account the wholesale prices of these products.

The minimum price for milk used in fluid products (Class I) in each order is set as a fixed differential over the manufacturing-use minimum prices^b. California distinguishes between five end-use classes, and uses similar formulae to set minimum prices for each class.

In addition, each federal marketing order administers a revenue-sharing or “pooling” scheme that distributes revenues from relatively high-priced Class I milk across all Grade A milk. Each month, each federal order pools revenues from all end-use classes and pays a uniform, order-wide average price to individual farmers delivering milk to that order, regardless of how any individual producer’s milk was actually used. The weighted average or pool price in any order depends not only on the classified prices but also on the utilization rates of milk in the various end-use classes, which also vary from order to order.

California’s revenue-sharing scheme differs from that used in the federal system. In California, a “quota” program determines how milk revenues from the various end-use classes are distributed among producers. The milk quota program in California does not restrict production or marketing. Rather, for each 100 kg of milk quota owned by an individual producer, the producer is paid \$3.75 from the statewide pool of total milk revenues in a month. The remainder of total regulated milk revenues (that is, total revenues - \$3.75 times quota) is distributed uniformly among all producers. Overall, quota covers about 30 percent of all the milk produced in the state, and quota revenue accounts for about four percent of total milk revenue.

By raising the average price of milk, both federal and state milk marketing orders encourage milk production. By setting relatively high prices for milk used in fluid

products, marketing orders reduce sales of fluid milk. As a result, marketing orders encourage production of manufactured dairy products such as cheese, butter and nonfat dry milk.

Each marketing order regulates milk within a geographically defined marketing area. Figure 1 is a map of the eleven federal marketing areas. The relationship of prices among federal orders is determined, in part, by the formulae used to set minimum prices in each order. By formula, the minimum prices for milk used in manufactured dairy products are the same across orders. However, the fluid differentials, and thus the minimum price for milk in fluid uses, can vary significantly across orders. Differentials range from a high of \$9.48/100kg in parts of Florida, to a low of \$3.53/100kg in parts of the Upper Midwest and West. Table 2 lists representative fluid differentials, Class I prices, and pool prices for the eleven federal orders in December 2000^c.

In order to maintain different minimum prices in each marketing order, regulations are in place to discourage the transport of milk across regions. Milk transported freely across marketing order borders would undermine the maintenance of separate fluid milk markets in different orders. Regulations on inter-order milk shipments ensure that there is little economic advantage to arbitrage across prices in different orders. Because marketing orders create separate fluid milk markets in different regions, the benefits and costs of milk marketing orders vary regionally.

The Northeast Dairy Compact was a regional modification to the FMMO system. The Northeast Compact deviated from the pricing rules of the FMMO system for milk sold in New England by administering a minimum Class I milk price independently of the FMMO pricing system, thereby raising the average producer price for dairy farms

delivering milk to New England processors. The Compact lasted from July 1997 through September 2001. The Farm Security and Rural Investment (FSRI) Act of 2002 replaced the Compact with a national program of direct payments to small and mid-sized dairy farms, under which the magnitude of the payment is inversely related to the price of fluid milk in Boston.

Federal Price Supports for Dairy

As early as 1935, the federal government was purchasing manufactured dairy products in order to support the farm price of milk. The Agricultural Act of 1949 required the USDA to continue to support the farm price of milk. Since that time, the USDA has purchased butter, nonfat dry milk, and cheese from processors at administratively determined prices calculated to ensure that the farm prices of manufacturing milk remain above the legislated support price. Table 3 lists the support price for milk and the corresponding government purchase prices for the various dairy products from January through September of 2001.

In the 1990s dairy price supports played a minor role and relatively little milk (in the form of manufactured products) was taken by the government. The 1996 FAIR Act, lowered dairy price supports by 33 cents per 100 kg per year to \$21.83 per 100 kg through 1999, at which time the program was scheduled to be completely eliminated. However, the price support program was extended to the end of 2000, and then extended again to the end of 2001. The FSRI Act has extended the price support through 2007.

The support price program plays a potentially important role in maintaining manufacturing milk prices above the support price, and, in recent years, the government has occasionally bought significant amount of cheese or nonfat dry milk for a month or

two. However, in general, with the support price at \$21.83, the price support system provides only the lowest of safety nets under the market price of milk.

Recent U.S. farm bills have represented incremental movements towards a less regulated, more market-oriented U.S. agricultural sector. In the case of dairy, this meant federal marketing order reform and gradual elimination of dairy price supports.

However, low prices for many commodities in recent years have prompted Congress to postpone the elimination of the price support program and to provide ad hoc emergency assistance for farmers. U.S. dairy farmers received “market loss” payments of \$200 million in FY 1999, and \$125 million in FY 2000. Payments for FY 2001 are estimated to be \$675 million. The new national payment program discussed above is expected to reduce the likelihood of these annual ad hoc payment programs.

Final remarks

In the United States, the federal government and several state governments subsidize milk production and regulate dairy prices. These programs stimulate additional milk output, raise the price of beverage milk, and shift income from taxpayers and consumers to the dairy industry. Economic research has documented that costs to taxpayers and consumers are significantly larger than gains to producers as a group, but of course, any individual producer gains much more than the system costs a typical dairy consumer or taxpayer. The largest effects are through import barriers that keep U.S. dairy prices higher than they would otherwise be.

Table 1. U.S. production, trade and consumption of select dairy products, 1997-2000

	1997	1998	1999	2000
<hr/>				
All cheese	Metric tons			
U.S. production	3,325,054	3,398,403	3,602,126	3,744,224
U.S. exports	38,000	37,000	38,000	47,000
U.S. imports	141,485	168,430	197,537	189,800
Consumption ^a	3,406,967	3,475,460	3,688,197	3,843,000
	Percent			
Imports/Consumption	4	5	5	5
Butter	Metric tons			
U.S. production	522,204	529,794	579,284	577,713
U.S. exports	18,000	3,000	3,000	8,000
U.S. imports	10,956	31,919	18,059	13,700
Consumption ^a	505,761	547,945	591,944	593,000
	Percent			
Imports/Consumption	2	6	3	2
Dried milk ^b	Metric tons			
U.S. production	607,663	579,532	670,258	708,960
U.S. exports	127,000	116,000	159,000	110,000
U.S. imports	6,080	8,223	10,557	8,400
Consumption ^a	458,133	454,504	418,670	384,000
	Percent			
Imports/Consumption	1	2	3	2

Source: data compiled from USDA *Agricultural Statistics, 2001*; and U.S. Bureau of the Census.

a/ Due to storage, consumption does not equal production plus imports minus exports.

b/ Includes whole and nonfat dry milk.

Table 2. Federal Milk Marketing Order Prices^a, December 2000

Marketing area ^a	Class I differential	Class I milk price	Pool price ^b
	-----	\$/kg	-----
Northeast (Boston)	7.16	33.91	30.25
Appalachian (Charlotte)	6.83	33.58	32.69
Southeast (Atlanta)	6.83	33.58	31.99
Florida (Tampa)	8.82	35.56	35.49
Midwest (Cleveland)	4.41	31.15	26.81
Upper Midwest (Chicago)	3.97	30.71	23.37
Central (Kansas City)	4.41	31.15	25.09
Southwest (Dallas)	6.61	33.36	28.46
Arizona-Las Vegas (Phoenix)	5.18	31.92	27.34
Western (Salt Lake City)	4.19	30.93	24.69
Pacific Northwest (Seattle)	4.19	30.93	27.05
Weighted Average	5.93	32.67	27.67

Source: USDA-AMS *Class and Producer Milk and Component Prices*,

<http://www.ams.usda.gov/dairy/mmos.htm>

a/ Prices quoted at “principle pricing points” (in parentheses) within each marketing area.

b/ Pool price is the market-wide weighted average of all minimum end-use class prices.

Table 3. U.S. market prices and USDA price support and purchase prices for various dairy products, 2001

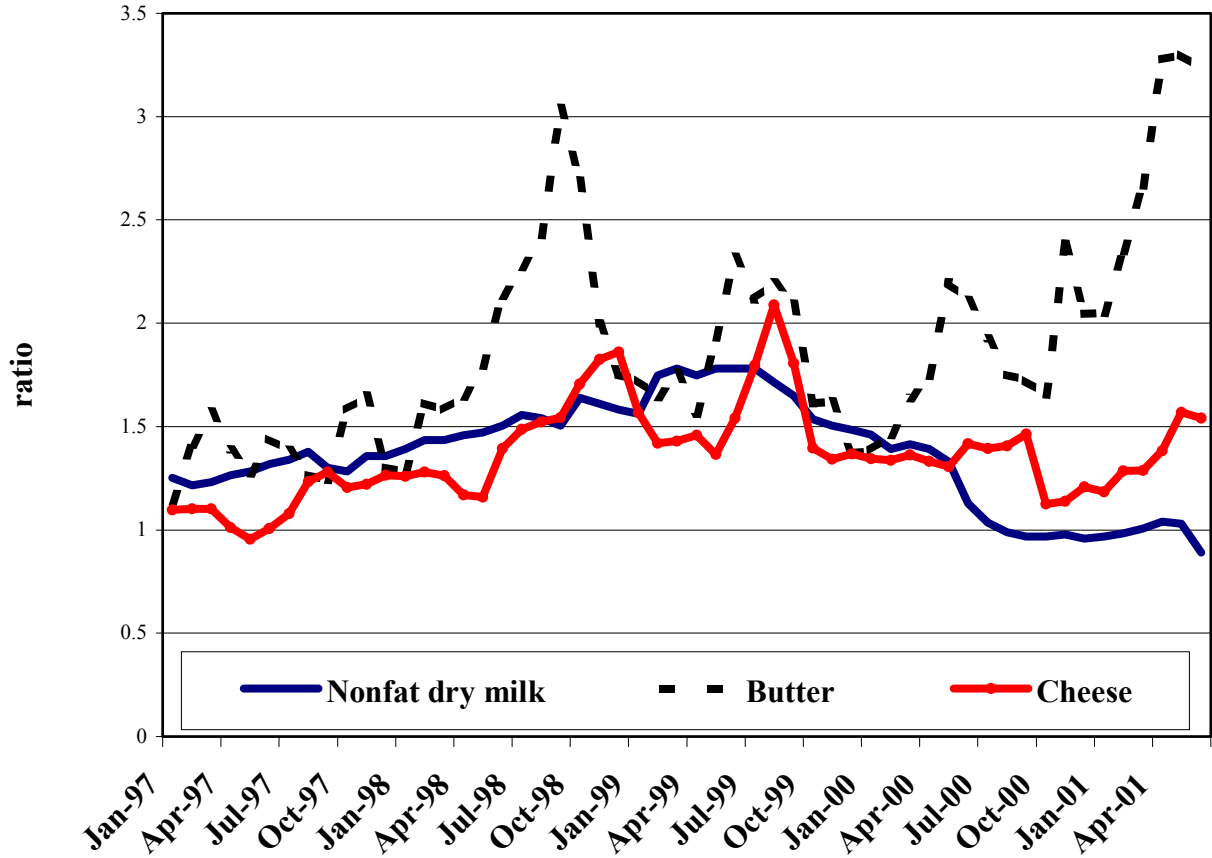
Month	Milk		Butter	Cheddar		Nonfat dry milk		
	Support price ----\$/100 kg----	Class III price ^a	Purchase price	CME ^b cash AA	Purchase price	CME ^b cash 40lb blocks	Purchase price	CME ^b cash Extra Grade
			-----\$/kg-----					
January	21.83	22.02	1.47	2.76	2.49	2.41	2.21	2.27
February	21.83	22.64	1.47	3.05	2.49	2.69	2.21	2.27
March	21.83	25.18	1.47	3.46	2.49	2.90	2.21	2.27
April	21.83	26.59	1.47	4.02	2.49	3.13	2.21	2.27
May	21.83	30.49	1.47	4.13	2.49	3.53	2.21	2.27
June	21.83	33.11	1.88	4.36	2.49	3.66	1.98	2.27
July	21.83	34.08	1.88	4.18	2.49	3.68	1.98	2.22
August	21.83	34.28	1.88	4.60	2.49	3.78	1.98	2.18
September	21.83	35.05	1.88	4.53	2.49	3.79	1.98	2.18
October	21.83	32.19	1.88	3.10	2.49	2.94	1.98	2.18
November	21.83	24.93	1.88	2.97	2.49	2.79	1.98	2.18
December	21.83	26.01	1.88	2.82	2.49	2.48	1.98	2.18

Source: USDA-AMS *Dairy Market News*, various issues.

a/ Announced FMMO Class III (used in cheese) milk price. b/ Chicago Mercantile

Exchange cash contract.

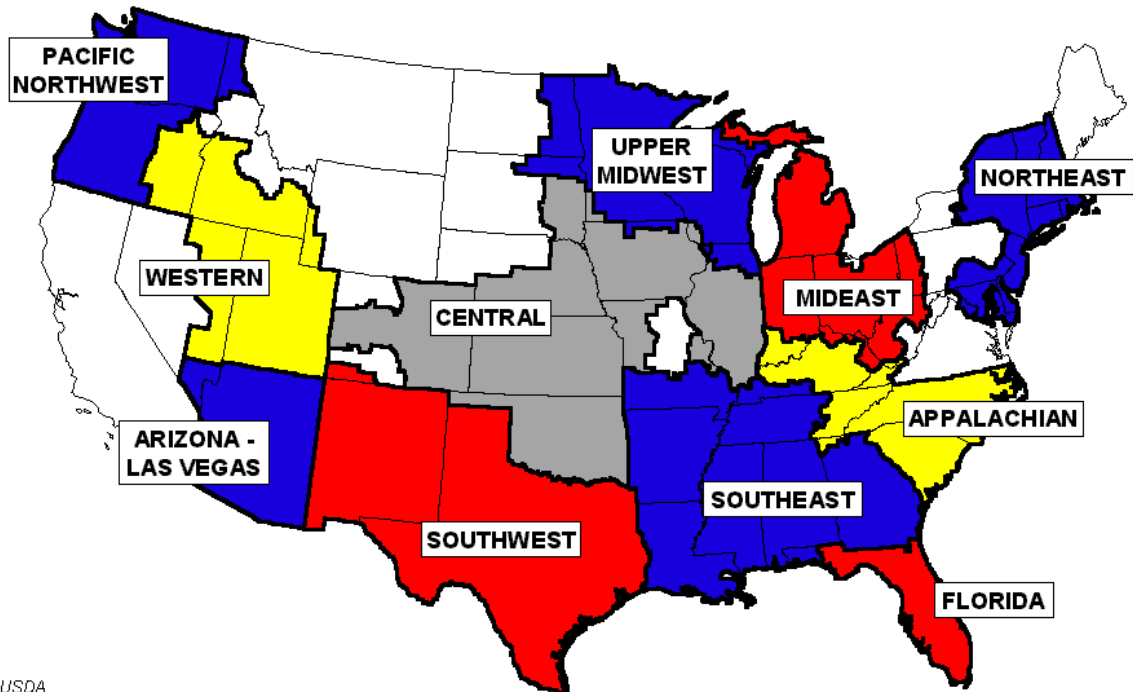
Figure 1. Ratio of U.S. market price to Northern European export price for various dairy products, 1997-2001



Source: Data for charts compiled from USDA-FAS.

Figure 2. Map of the Federal Milk Marketing Order Areas

FEDERAL MILK MARKETING ORDER AREAS
January 1, 2000



USDA
Agricultural Marketing Service
Dairy Programs

DIFFERENCES IN SHADING MERELY SERVE TO
DIFFERENTIATE BETWEEN MARKETING AREAS

References and Further Reading

Bailey, K.W. (1997) *Marketing and Pricing of Milk and Dairy Products in the United States*. Iowa State University Press, Ames, IA.

Benedict, M.R. (1953) *The Farm Policies of the United States, 1790-1950*. The Twentieth Century Fund, Inc., New York, NY.

California Department of Food and Agriculture. "Dairy Programs" web page. Available online at <http://www.cdfa.ca.gov/dairy>.

Chite, R. M. (April 2, 2001) *Dairy Policy Issues*. Congressional Research Service, Issue Brief No. 97011. Library of Congress, Washington, D.C.

Cox, T. L. and J.-P. Chavas. (February 2001) "An Interregional Analysis of Price Discrimination and Domestic Policy Reform in the U.S. Dairy Sector." *Am. J. Agr. Econ.* v.83, pp.89-106.

Ippolito, R.A. and R.T. Masson. (April 1978) "The Social Cost of Government Regulation of Milk." *J. Law Econ.* v21, pp.33-65.

Manchester, A. C. (1983) *The Public Role in the Dairy Economy: Why and How Governments Intervene in the Milk Business*. Westview Special Studies in Agricultural Sciences and Policy. Westview Press, Boulder, CO.

Manchester, A. C. and D. P. Blaney. (February 2001) *Milk Pricing in the United States*. ERS Agriculture Information Bulletin No. 761, U.S. Department of Agriculture, Washington, D.C.

Northeast Dairy Compact Commission. "Northeast Dairy Compact Commission" web page. Available online at <http://www.dairycompact.org>.

Sumner, D. A. and T. Cox. (January 1998) "FAIR Dairy Policy," *Contemporary Economic Policy*, v.16, pp.58-68.

Sumner, Daniel A and Norbert Wilson. (2000) "Creation and distribution of economic rents by regulation: Development and evolution of milk marketing orders in California," *Agr. History*, v.74, 198-210.

Sumner, Daniel A and Christopher Wolf. (May 2000) "Quotas Without Supply Control: Effects of Dairy Quota Policy in California." *Am. J. Agr. Econ*, v.78, pp.354-366.

U.S. Department of Agriculture, AMS (a). "Federal Milk Marketing Orders" web page. Available online at <http://www.ams.usda.gov/dairy/orders.htm>.

U.S. Department of Agriculture, AMS (b). *Federal Milk Order Market Statistics*, various issues.

U.S. Department of Agriculture, FAS, *Agricultural Export Assistance Quarterly Report*, various issues. <http://www.fas.usda.gov/excredits/deip.html>.

U.S. Department of Agriculture, NASS. *Agricultural Statistics*, various issues.

U. S. General Accounting Office. (September 14, 2001) *Dairy Industry: Estimated Economic Impacts of Dairy Compacts*. GAO-01-A66, Washington D.C.

Endnotes

^a States set separate sanitary standards for milk that may be used in fluid products and milk that may be used only in manufactured dairy products. Grade A milk is milk that meets sanitary standards for use in fluid products. Ninety-seven percent of all milk produced in the United States was Grade A in 1999. Grade B milk is eligible only for use in manufactured dairy products and is not regulated by milk marketing orders.

^b Although the details of the FMMO pricing rules have changed over time, the key element of price discrimination remains; the minimum price for milk used in fluid products is set at a premium over the minimum price set for milk used in manufactured dairy products. Manchester and Blaney discuss the evolution of the FMMO pricing rules and provide the current set of pricing rules.

^c Table 2 lists Class I differentials and prices announced at the major metropolitan area in each marketing area. Class I differentials vary within marketing areas, as well.