United States Government Accountability Office

GAO

Report to Congressional Requesters

December 2004

DAIRY INDUSTRY

Information on Milk Prices, Factors Affecting Prices, and Dairy Policy Options

GAO-05-50

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GAO Accountability • Integrity • Reliability

Highlights

Highlights of GAO-05-50, a report to congressional requesters

Why GAO Did This Study

In 2003, U.S. dairy farmers marketed nearly 19.7 billion gallons of raw milk, one-third of which were used in fluid milk products. Farmers, cooperatives, processors, and retailers receive a portion of the retail price of milk for their part in providing milk to consumers. During 2002 and 2003, farm prices fell while retail prices did not similarly decline. This pattern raised concerns about a growing spread between farm and retail prices. Farm prices have since increased, reaching record highs in April 2004. As requested, GAO examined (1) the portion of retail milk prices received by farmers, cooperatives, processors, and retailers, how this changed over time, and the relationship between price changes at these levels; (2) how various factors influence prices and affect the transmission of price changes among levels; and (3) how federal dairy program changes and alternative policy options have affected or might affect farm income and federal costs, among other considerations.

What GAO Recommends

To continue informed decision-making, the Secretary of Agriculture should build on GAO's analysis of the potential effects of various policy options as USDA proposes future changes or provides information to the Congress. USDA expressed concern about the practicality of some of the dairy policy options discussed. USDA did not comment on the report's recommendation.

www.gao.gov/cgi-bin/getrpt?GAO-05-50.

To view the full product, including the scope and methodology, click on the link above. For more information, contact Lawrence J. Dyckman, (202) 512-3841, dyckmanl@gao.gov.

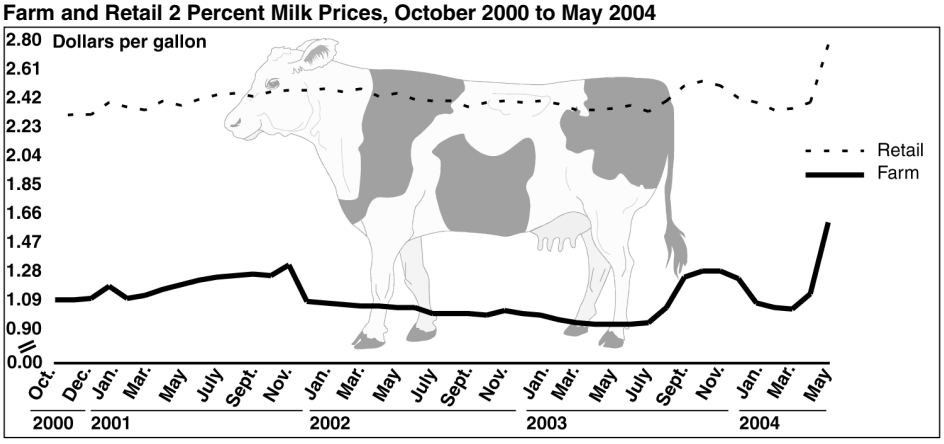
What GAO Found

Between October 2000 and May 2004, on average, farmers received about 46 percent, cooperatives 6 percent, wholesale processors 36 percent, and retailers over 12 percent of the retail price of a gallon of 2 percent milk (the most common type of milk purchased) in the 15 U.S. markets GAO reviewed. During this period, in 12 of the 15 markets, the spread between farm and retail prices increased. However in some markets, the price spread between these levels increased and then moderated. Price changes at one level were most closely reflected in changes at adjacent levels of the marketing chain.

Farm, cooperative, wholesale, and retail milk prices are determined by the interaction of a number of factors. For example, farm prices are affected by the supply of raw milk and the demand for milk products such as fluid milk, cheese, and butter, as well as by federal and state dairy programs. At the cooperative level, prices are influenced by the cost of services that cooperatives provide, and the relative bargaining power of cooperatives and milk processors. At the wholesale and retail levels, input costs such as labor and energy, and the continued consolidation of firms influence milk prices.

Recent changes in federal dairy programs have affected farm income, federal costs, and other considerations. For example, the Milk Income Loss Contract program has supported some farm incomes but has exceeded initial cost estimates because of low farm prices. A number of options have been suggested to change federal dairy policies such as amending federal milk marketing orders and raising or eliminating the support price. In general, these options would have mixed effects depending upon whether milk prices were high or low over the short or long term. For example, options that increase farm income over the short term tend to increase milk production and lower farm prices over the long term. These options also tend to be costly for the federal government during periods of low prices.

Farm and Retail 2 Percent Milk Prices, October 2000 to May 2004



Source: GAO analysis of data provided by USDA, the California Department of Food and Agriculture, and Information Resources, Inc.

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Abbreviations

AMS	Agricultural Marketing Service
CCC	Commodity Credit Corporation
DEIP	Dairy Export Incentive Program
FMMO	federal milk marketing order
FSA	Farm Service Agency
MILC	Milk Income Loss Contract
NDEA	National Dairy Equity Act
NEDC	Northeast Interstate Dairy Compact
NYC	New York City
UNY	Upstate New York
USDA	U.S. Department of Agriculture
WTO	World Trade Organization

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Accountability * Integrity * Reliability

United States Government Accountability Office
Washington, D.C. 20548

December 29, 2004

Congressional Requesters:

In 2003, U.S. dairy farmers marketed nearly 19.7 billion gallons of raw milk for which they received approximately $21.2 billion. Roughly one-third of these 19.7 billion gallons were ultimately sold to consumers as fluid milk (milk) products. The milk marketing chain that moves milk from the dairy farm to the consumer is composed of farmers, dairy cooperatives,[1] wholesale milk processors,[2] and retailers, and entities at each level receive a portion of the retail price of a gallon of milk for the functions they perform. These functions include producing, processing, distributing, and selling milk. During 2002 and 2003, farm prices were the lowest since 1979, while retail milk prices generally did not experience a similar decline.[3] This disparity raised concerns about a growing price spread between farm and retail milk prices. However, in 2004, farm price trends have reversed, with farm prices reaching record highs.

Since the 1930s, the U.S. Department of Agriculture (USDA) and some states have operated programs designed to support dairy farmers by ensuring that farm prices do not fall below minimum levels. These programs include, among others, federal milk marketing orders (FMMOs), which use formulas to establish minimum farm prices in different marketing areas of the country; a price support program to sustain farm prices through a standing offer to purchase certain milk products at set prices; and trade restrictions or export subsidies to protect the U.S. milk industry from competition from foreign milk products or reduce supplies.

Low farm prices have generated interest in new federal policies to provide assistance to dairy farmers; however, the cost of these programs during periods of low prices has raised concerns. For example, in the Farm

[1]Dairy cooperatives are member-owned organizations that assist producers in marketing their milk. Cooperatives provide a variety of services for their members such as ensuring adequate raw milk supplies to meet processors' needs, transporting milk, quality assurance, and standardizing milk composition.

[2]Wholesale milk processors include bottlers and major retail food chains with bottling plants, and cooperatives that process, package, and distribute fluid milk for sale to retailers. Our review did not include other entities that market milk at the wholesale level.

[3]In this report, farm prices are the prices paid for raw milk supplies. After the milk has been processed into a fluid milk beverage, references to "milk prices" are retail milk prices.

Security and Rural Investment Act of 2002 (the 2002 Farm Bill), Congress authorized USDA to establish the Milk Income Loss Contract (MILC) program, which provides supplemental payments to farmers during periods of low prices.[4] Depressed farm prices triggered $1.8 billion in MILC payments to dairy farmers in fiscal year 2003. Additionally, USDA spent over $1.5 billion in fiscal years 2001 through 2003 attempting to maintain minimum farm prices at a legislatively set level through the price support program.

Recent changes in milk prices have illustrated the volatility of milk price cycles. For example, as of April 2004, farm prices reached record highs as USDA announced a minimum price for raw milk used in manufacturing cheese that was approximately 36 percent higher, at $19.66 per hundredweight, than the March price of $14.49 per hundredweight, an increase of nearly $0.45 per gallon of milk.[5] This increase reflected a number of changed market conditions that decreased the amount of raw milk production, while also increasing the demand for some manufactured dairy products.[6] However, high farm prices create incentives for farmers to produce more milk, which then tends to depress milk prices over the long term, thereby increasing concerns about farm viability in the future.

At your request, this report examines (1) what portion of the retail price of fluid milk is received by dairy farmers, dairy cooperatives, wholesale milk processors, and retailers in selected markets throughout the United States, how this distribution has changed over the period of our review (October 2000 through May 2004), and the relationships among price changes at these levels; (2) how various factors, such as costs, influence the price of milk as it moves from the farm to the consumer, as well as how these and other factors affect the extent to which changes in price are transmitted among levels as milk moves from the farm to the consumer; and (3) how changes in dairy policies and alternative policy options have affected or

[4]Pub. L. No. 107-171, 116 Stat. 134 (2002).

[5]A hundredweight is a unit of measure equal to 100 pounds of, in this case, raw milk. Approximately 11.6 gallons of fluid milk can be made from 100 pounds of raw milk.

[6]Recent evidence suggests that retail milk prices have also begun rising with the recovering farm prices.

might affect farm income, federal costs, economic efficiency,[7] and consumer prices, among other policy considerations. It also updates other information on milk prices included in our June 2001 report.[8]

To update our information on the pricing distribution among the various levels of the milk marketing chain, we analyzed milk prices in 15 selected markets nationwide, ensuring that (1) these markets provided national geographic coverage; (2) at least one market was located in each of the federal milk marketing order areas, as they existed during the majority of the period from October 2000 through May 2004; (3) the selected markets included both state and federally regulated markets; and (4) these areas represented similar marketing areas for which we reported information in our June 2001 report.[9] For these 15 markets, we obtained data from USDA, the cognizant state milk control agency, the Department of Defense's Commissary Agency, and a private data collection company on the prices received by farmers, cooperatives, wholesale milk processors, and retailers.[10] We limited our data collection efforts to whole, skim, 2 percent, and 1 percent milk as sales of these milk types constitute over 93 percent of fluid milk sales annually. We also confined our analysis to the prices of these milk types sold in gallon containers as milk sold in gallon containers

[7]There can be different kinds of economic efficiency effects. Government policies may be more or less economically efficient depending upon the extent to which they prevent the transmission of market price signals and lead to a misallocation of resources into excess production. Policies may also be more or less efficient depending upon the extent to which they affect the distribution of production between farmers with high or low costs of production.

[8]GAO, *Dairy Industry: Information on Milk Prices and Changing Market Structure*, GAO-01-561 (Washington, D.C.: June 15, 2001).

[9]The beginning of our period of analysis corresponds to the end of the data presented in our previous report, GAO-01-561. The end point represents the most recent month for which data were available from all of our sources.

[10]We were unable to obtain actual data on the prices received by wholesale milk processors because these data are considered proprietary. As a proxy for these data we used data obtained from the Defense Commissary Agency on the prices at which it sold milk. Commissary prices reflect a 5 percent markup above the prices at which the commissaries purchase milk from wholesale suppliers. We obtained data from 39 different commissary locations near the 15 markets in our analysis.

accounts for about 65 percent of fluid milk products sold under FMMOs.[11] We focused our detailed data analysis on 2 percent milk sold in gallon containers, the largest volume of reduced-fat milk sold nationwide. As a result, our analysis may not reflect pricing trends for all types of milk and package sizes.

To update our information on factors influencing milk prices, explore price transmission within the milk marketing chain, and examine the effects of federal dairy policy changes and alternative policy options, we contacted a number of national dairy experts in academia or representing federal and state agencies, cooperatives, processors, retailers, or industry groups. We also reviewed relevant legislation, studies, and other publications. We qualitatively analyzed the effects of recent changes in federal dairy programs, as well as alternative policy options, on various policy considerations as identified in previous GAO reports, relevant studies, and legislation, as well as through our conversations with dairy policy experts. These policy considerations included farm income, milk production, federal costs, price volatility, economic efficiency, and consumer prices. Different stakeholders in the dairy policy arena may have alternative views on the relative importance of these policy considerations, as well as other considerations that we did not include, which could lead to differing perspectives on these options. We conducted our review from September 2003 through October 2004 in accordance with generally accepted government auditing standards. We did not independently verify the data we received from various sources. However, we discussed with these sources the measures they take to ensure the accuracy of data, and these measures seemed reasonable. Appendix I provides additional information on the scope and methodology of our review.

In summary, we found the following:

- Between October 2000 and May 2004, on average, farmers received 45.9 percent, cooperatives 6.1 percent, wholesale milk processors 35.6 percent, and retailers 12.5 percent of the retail price of a gallon of 2 percent milk in the 15 markets we reviewed. However, these percentages varied widely depending on the specific market. For example, the farmers' portion ranged from 36.0 percent to about 58.6 percent.

[11]This estimate is based on USDA data for the month of November for selected years between 1991 and 2001, which were the most recent data we could obtain.

- Furthermore, during this time period, the price spread between farm and retail prices increased in 12 of the 15 markets we examined. However, in some of the 12 markets, the spread between farm and retail milk prices increased dramatically, and then moderated. In 9 of the 15 markets, retail prices showed a statistically significant increase. In 4 of the remaining markets, retail prices decreased over time, while in the other 2 markets, retail prices showed no statistically significant change. At the same time, farm prices decreased in 12 of the 15 markets and increased in the remaining 3 markets during the 44-month period. However, declines in farm prices, in most cases, began to reverse during the latter months of our period of analysis. Price changes generally correlated across levels in the marketing chain, with the strongest correlations occurring between adjacent levels. For example, in most of the markets we analyzed, changes in cooperative prices correlated strongly with changes in wholesale prices. However, changes in cooperative prices correlated less strongly with changes in retail prices.

- Prices at all levels of the milk marketing chain are determined by the interaction of a number of factors. For example, farm prices are determined primarily by factors affecting the supply of raw milk, such as costs of production; the demand for milk products, such as fluid milk, cheese and butter; and the effects of federal and state dairy programs. At the cooperative level, the difference between what cooperatives pay farmers for raw milk and the prices at which they sell raw milk to wholesale fluid milk processors is influenced by the types of services the cooperatives provide, the relative bargaining power of cooperatives and milk processors, as well as collective action taken by dairy cooperatives. Factors that affect the difference between what processors pay for this raw milk and the prices at which they sell fluid milk products to retailers include input costs, such as labor, energy, transportation and packaging; the level of services they provide to retailers; innovations in processing technology; and changes in the structure of the fluid milk processing industry, such as increases in the consolidation and market share of some firms. At the retail level, costs such as labor and energy, along with other factors such as consumer demand and the structure of the market, help determine the difference between what retailers pay for fluid milk products and the prices they charge consumers for those products.

- While price changes at one level of the milk marketing chain are generally reflected in price changes at other levels, several factors can influence the extent or speed at which these changes are reflected and

whether price increases and decreases are reflected differently. For example, increasing concentration, resulting in greater market power at successive levels of the milk marketing chain, may provide entities an opportunity to influence how changes in prices are transmitted among the different levels. In addition, other factors, such as federal and state dairy policies, can affect prices in ways that can cause market participants to alter the way they transmit price changes between marketing levels. Some recent economic studies of the U.S. fluid milk market have found that these and other factors may cause retail milk prices to react more completely and quickly to farm price increases than to decreases.

- Recent changes in the FMMO program, adjustments to the prices of products purchased under the price support program, and the establishment of the MILC program have had various impacts on policy considerations such as dairy farm income, federal costs, and price volatility. Reforms to the FMMO system had mixed effects on farm income depending on the geographic location of the farmer, while the overall effects on all farmers are less clear. Further, recent adjustments to the prices of products purchased under the price support program have generally decreased federal costs but also decreased farm income during periods of low prices. Finally, government payments introduced through the MILC program have kept some small dairy farms in business, but the program has exceeded initial federal cost estimates because farm prices during 2002 and 2003 were lower than anticipated.

- A number of options that would modify existing policies or introduce alternative policies have been proposed or discussed. While we examined the potential impacts of these options on a range of policy considerations related to the dairy sector, we did not assess their overall economic or budgetary impacts or their consistency with U.S. international trade commitments or positions in ongoing negotiations. As a result, the purpose of this analysis is not to take a position for or against any of these options, but simply to discuss their likely effects on the policy considerations we identified. Various policy options could affect dairy policy considerations in different ways under different scenarios, such as periods of high or low prices. Also, short-term effects may differ from long-term effects. In general, options that increase farm income over the short term also tend to increase milk production and thus the potential for oversupply and lower average farm prices over the long term. For example, the dairy support price could be raised, which would limit the fall of farm prices and increase farm income in the short

term. However, it would spur additional production and therefore reduce average farm prices over the long term. Such options also tend to be costly for the federal government during periods of low prices. Thus, extending the MILC program, which is scheduled to expire at the end of September 2005, would allow the federal government to continue to support farm income but could also increase federal costs if farm prices trend downward in the future. In some cases, options that increase the economic efficiency of federal dairy programs also increase price volatility because they allow clearer transmission of market price signals. For example, eliminating the price support program would increase volatility by removing the price floor on manufactured dairy products, but it would also increase economic efficiency by reducing incentives to allocate resources to surplus production. Also, to the extent that price changes at the wholesale level are passed through to the retail level, a number of options would likely have mixed effects on consumer prices depending upon the particular product under consideration (e.g., butter, cheese, or fluid milk).

As a result of recent farm bills, such as those in 1996 and 2002, USDA has studied different aspects of dairy policy, either to implement program changes mandated by the Congress or to provide information to the Congress on the effects of various dairy programs. For example, the 2002 farm bill required USDA to conduct studies of dairy policy issues, including an economic evaluation of the effects of various elements of the national dairy policy and of terminating federal dairy programs relating to milk price support and supply management. One study required by this legislation, which addressed the subject of changing standards for fluid milk, was issued in August 2003.[12] A second study, which included both an evaluation of the effects of various elements of the national dairy policy and the termination of federal milk price support and supply management programs, was provided to the Congress in September 2004.[13]

[12]USDA/Agricultural Marketing Service, *Raising the Minimum Nonfat Solids Standard to the National Average in Raw Milk: A Study of Fluid Milk Identity Standards* (Washington, D.C.: August 2003).

[13]USDA, *Economic Effects of U.S. Dairy Policy and Alternative Approaches to Milk Pricing*, (Washington, D.C.: July 2004). This study combined the results of work by more than 20 researchers from 10 universities, as well as information provided by researchers at USDA.

This report is divided into nine appendixes. Appendix I describes in detail our objectives, scope, and methodology. Appendix II provides information on average milk prices at the farm, cooperative, wholesale, and retail levels; changes in farm and retail milk prices and how they affect the farm-to-retail price spread; and the extent to which price changes at one level of the milk marketing chain correlate with price changes at other levels. Appendix III compares retail prices of whole, 2 percent, 1 percent, and skim milk. Appendix IV provides the average monthly prices and annual prices of the four types of milk at each level of the milk marketing chain. Appendix V describes the factors that influence prices as milk moves from the farmer to the consumer. Appendix VI provides a technical review of recent research examining price transmission within the milk marketing chain. Appendix VII provides a qualitative analysis of the effects of recent changes in federal dairy programs and alternative dairy policy options that have been proposed or discussed. Appendix VIII presents USDA's comments and our evaluation of them. Appendix IX lists GAO contacts and contributors to this report.

Conclusions

The difference in price between what farmers receive for their raw milk and what consumers pay for fluid milk products has increased in recent years. This growing spread between farm and retail prices may be attributable to a number of factors at each level of the milk marketing chain, including supply and demand forces, changes in input costs to processing and retailing, and the continued concentration of cooperatives, wholesale milk processors, and retailers. A variety of federal policies exist to influence the prices that farmers receive. However, the effects of these policies may not be uniform; they can affect different sizes of farms or regions of the country in different ways. Moreover, policies that benefit farm income may adversely affect other policy considerations such as economic efficiency and federal costs. Given the complexity of federal dairy policy, the decision to change existing policies or introduce new policies requires consideration of a variety of these potential effects. Examining the effects of policy alternatives on a variety of different policy considerations will help the Congress formulate federal dairy policy based on comprehensive analyses that consider these alternatives in relation to their effects on different considerations, farm sizes, and regions of the country. In addition, although recent USDA studies have examined some policy options, there are other potential policy options to consider, as discussed in this report.

Recommendations for Executive Action

To continue the facilitation of informed decision making by USDA and the Congress, we recommend that the Secretary of Agriculture build on GAO's analysis of the potential effects of various dairy policy options as USDA proposes future changes to current dairy laws or regulations or provides information to the Congress in response to congressional proposals.

Agency Comments and Our Evaluation

We provided a draft of this report to USDA and DOD for their review and comment. We received written comments from USDA's Under Secretary for Farm and Foreign Agricultural Services and Under Secretary for Marketing and Regulatory Programs, which are presented in appendix VIII. USDA also provided suggested technical corrections, which we have incorporated into this report, as appropriate. These technical corrections were offered by several USDA agencies, including the Agricultural Marketing Service, Economic Research Service, Farm Service Agency, and Office of the Chief Economist. DOD had no comments on the draft report.

In its written comments, USDA said the information provided in the report on milk prices at the farm, cooperative, and retail levels is valid. However, USDA said it has reservations regarding our use of prices paid for fluid milk at commissaries as an indicator of the wholesale price of fluid milk and that we should make clear the weaknesses of using commissary price data. USDA acknowledged, however, that there seems to be no viable alternative. During the course of our work, we were unable to obtain wholesale price data because these data are considered proprietary by industry officials. After consulting with USDA officials and other dairy experts, we determined that commissary price data were the best surrogate because commissaries generally sell milk at a standard 5 percent markup from cost. Based on USDA's comments, we expanded the discussion in the report of the potential limitations of using commissary data.

USDA said it largely agrees with the report's discussion of the factors that influence the price of milk as it moves from the farm to the consumer and the report's characterization of economic studies of price transmission in the U.S. fluid milk market. However, USDA expressed some concerns regarding the report's discussion of recent federal dairy program changes and alternative policy options. First, USDA said that this discussion appears to be a compilation of policy recommendations that are examined independently and qualitatively within the existing program structure. Our discussion of dairy policy options are not policy recommendations. As stated in the report, to identify these policy options and their potential

impacts we relied heavily on a synthesis of the views of leading dairy experts and the results of an extensive literature search, including our review of more than 50 studies and other publications. Time and resource constraints for completing our work precluded us from developing or contracting for the use of an economic model that would have provided quantitative estimates of these potential impacts. In addition, some of the policy options would have been difficult to model and quantify, such as the potential impacts of accelerating USDA's hearing and rulemaking process for amending FMMOs. The report also notes that we compared the policy options identified against a baseline scenario of policies in place as of August 2004. This baseline scenario existed at the start of our work and was needed to provide a consistent context for our analysis.

Second, USDA suggested that we make clear the caveats of this type of analysis. As noted in the report, we examined the impact of federal dairy program changes and policy options on six policy considerations: farm income, milk production, federal costs, price volatility, economic efficiency, and consumer prices. We acknowledge that other stakeholders may have different views on the importance of these policy considerations, or other considerations that we did not include in our analysis. The report also states that the potential effects of policy options on these considerations could vary depending upon economic conditions and other policy decisions. In this regard, we did not assess the options' overall economic or budgetary impacts, or their consistency with U.S. international trade commitments or positions in ongoing negotiations. In addition, the report does not identify a preferred option or combination of options. As indicated in the report, each option has varying potential impacts on the policy considerations used in our analysis. Despite these caveats, we believe this analysis is informative and helpful to congressional decision makers who must weigh competing interests in determining dairy policy.

USDA also said that in some cases the report mischaracterizes the operation of current programs and the effects that changes to current programs or the introduction of new programs would have on program outlays, producers, and consumers. For example, USDA noted that the report offers several options for improving the operation of the Dairy Export Incentive Program (DEIP), including expanding the use of this program. However, USDA indicated that expanding the use of DEIP is not a legitimate option because, under World Trade Organization (WTO) rules, DEIP is bound by quantitative and monetary caps and product-specific restrictions that limit its use to the current range of eligible dairy

commodities. We do not agree that we mischaracterized the operation of this program. The report clearly states that USDA has announced and awarded subsidies under DEIP to the limits allowed by WTO rules for nonfat dry milk and various cheeses. Regarding expansion, the report discusses options suggested by dairy experts for the additional use of this program as an effective marketing tool, and does not call for expanding its use to exceed relevant WTO caps or restrictions. However, we have adjusted the language in the report to make this distinction clearer.

USDA also offered several comments regarding the FMMO program. Among these, USDA said that the report is incorrect in stating that the objective of this program is "to ensure an adequate level of milk production." According to USDA, this objective is associated with the Dairy Price Support Program. We have revised the report to reflect this clarification and added language suggested by USDA to better describe the FMMO program's objectives.

In addition, USDA raised concerns about the practicality of implementing some of the options discussed in the report, particularly (1) adopting a competitive pay price to establish class prices under the FMMO program and (2) combining Class III and Class IV into a single manufacturing class.[14] Regarding the first, USDA said that it and a committee of academicians spent considerable time several years ago trying to devise a competitive price series that could be used to establish minimum class prices. However, this effort was unsuccessful. USDA said that our report does not identify or indicate how to create such a price series. Similarly, regarding combining Class III and Class IV, USDA notes that no specifics are offered in the report as to how milk in such a class would be priced. We acknowledge that the report does not explain how a competitive price series could be created or how milk would be priced if the classes were merged. However, these options were identified by stakeholders during the course of our work. Other options discussed in the report also may present challenging implementation issues and in many cases the report discusses those issues.

[14]Under the FMMO program, a classified pricing plan provides different classes and minimum prices for milk depending on how it is used. Milk used in fluid products is placed in Class I. Milk used for various manufactured products is placed in Classes II through IV. Class II includes soft products, such as cottage cheese, ice cream, and yogurt. Class III includes spreadable and hard cheeses. Class IV includes butter and dried milk products, such as nonfat dry milk.

Finally, USDA said that it does not believe the hearing and rulemaking process it uses to modify FMMOs inhibits its ability to respond to changing market conditions or the marketing of new dairy products. However, as discussed in the report, some stakeholders cited the slowness of this process as a concern. In addition, the report discusses USDA's efforts to improve this process to more quickly respond to problems or needed changes while ensuring the promulgation of economically sound regulation.

USDA did not comment on the report's recommendation.

As agreed with your offices, unless you publicly announce its contents earlier, we plan no further distribution of this report until 30 days from the date of this letter. We will then send copies of the report to the Senate Committee on Agriculture, Nutrition, and Forestry; the House Committee on Agriculture; other appropriate congressional committees; interested Members of Congress; the Secretary of Agriculture; the Secretary of Defense; the Director of the Office of Management and Budget; and other interested parties. Copies will also be made available to others upon request. In addition, the report will be available at no charge on GAO's Web site at http://www.gao.gov.

If you or your staff have any questions about this report, please contact me at (202) 512-3841. Key contributors to this report are listed in appendix IX.

Lawrence J. Dyckman
Director, Natural Resources
and Environment

List of Requesters

The Honorable Olympia J. Snowe
Chair
Committee on Small Business & Entrepreneurship
United States Senate

The Honorable Hillary Rodham Clinton
United States Senate

The Honorable Susan Collins
United States Senate

The Honorable Christopher J. Dodd
United States Senate

The Honorable James M. Jeffords
United States Senate

The Honorable Edward M. Kennedy
United States Senate

The Honorable John F. Kerry
United States Senate

The Honorable Patrick Leahy
United States Senate

The Honorable Barbara A. Mikulski
United States Senate

The Honorable John D. Rockefeller IV
United States Senate

The Honorable Paul S. Sarbanes
United States Senate

The Honorable Charles E. Schumer
United States Senate

The Honorable Arlen Specter
United States Senate

Objectives, Scope, and Methodology

In March 2003, Senator Snowe, Chair, Committee on Small Business and Entrepreneurship, joined by Senators Clinton, Collins, Dodd, Jeffords, Kennedy, Kerry, Leahy, Mikulski, Rockefeller IV, Sarbanes, Schumer, and Specter requested that GAO examine a number of issues concerning the pricing and marketing of milk in the United States. Specifically, they asked us to update the information contained in our 2001 report, entitled *Dairy Industry: Information on Milk Prices and Changing Market Structure* (GAO-01-561, June 15, 2001), and to address other issues. This report examines (1) what portion of the retail price of fluid milk is received by dairy farmers, dairy cooperatives, wholesale milk processors, and retailers in selected markets throughout the United States, how this distribution has changed over the period of our review, and the relationships among price changes at these levels; (2) how various factors, such as costs, influence the price of milk as it moves from the farm to the consumer, as well as how these and other factors affect the extent to which changes in price are transmitted among levels as milk moves from the farm to the consumer; and (3) how changes in dairy policies and alternative policy options have affected or might affect farm income, federal costs, economic efficiency, and consumer prices, among other policy considerations.[1] It also updates other information on milk prices included in our June 2001 report.

To update our information on the price distribution among the various levels of the milk marketing chain, we analyzed milk prices in 15 selected markets nationwide: Atlanta, Georgia; Boston, Massachusetts; Charlotte, North Carolina; Cincinnati, Ohio; Dallas, Texas; Denver, Colorado; Miami, Florida; Milwaukee, Wisconsin; Minneapolis, Minnesota; New Orleans, Louisiana; Phoenix, Arizona; Salt Lake City, Utah; San Diego, California; Seattle, Washington; and Washington, D.C.[2] In selecting these markets, we ensured that (1) they provided national geographic coverage; (2) at least one market was located in each of the federal milk marketing orders (FMMOs) as they existed during most of the period from October 2000 through May 2004; (3) the selected markets included both state and federally regulated markets; and (4) these areas represented similar marketing areas for which we reported information in our June 2001 report. For the 15 markets, we collected data on the prices received by

[1]This report does not specifically address consolidation and concentration trends in the dairy industry and what is known about the impact of concentration on milk prices, as the 2001 report did. However, the report discusses market concentration as one of the factors that influence the price of milk as it moves from the farm to the consumer. (See app. V.)

[2]Portions of some of these market areas lie in adjacent states.

farmers, cooperatives, wholesale milk processors, and retailers for October 2000 through May 2004. We limited our data collection efforts to the prices of whole, 2 percent, 1 percent, and skim milk because sales of these milk types constitute over 93 percent of fluid milk sales annually. We also confined our analysis to the prices of these milk types sold in gallon containers because milk sold in gallon containers accounts for about 65 percent of fluid milk products sold under FMMOs.[3]

There is no precise method for calculating the price that farmers receive for raw milk that is ultimately processed and sold in fluid milk products because dairy farmers receive a blend price for their milk, which is the average price for milk used for fluid and manufactured products. Therefore, any calculation of the value received by farmers for raw milk that is to be used for fluid milk products is necessarily only approximate. To estimate a farm price for raw milk used in fluid milk products, we used data provided by the U.S. Department of Agriculture's (USDA) Agricultural Marketing Service (AMS). AMS developed an adjustment, which accounts for various charges such as hauling and marketing fees, that we subtracted from the announced cooperative Class I price to obtain the estimated farm price for raw milk used in fluid milk products for each of the selected markets in our review except San Diego, which is not part of the FMMO system.[4] AMS's adjustment accounts for farm-to-plant hauling costs, cooperative dues and capital assessment, mandatory advertising and promotion costs, competitive and receiving credits, and a representative estimate of the value of reimbursements to cooperatives for the services performed for handlers and for transportation costs not covered by the order minimum price.[5] Most of the items that make up the adjustment are not available for the specific fluid milk market that we selected, but rather are based on information collected for milk used over wider geographical areas. Therefore, an order-wide value used for any of these items provides an estimate rather than the actual value for this item. Also, the values for

[3]This estimate is based on USDA data for the month of November for selected years between 1991 and 2001. It was the most recent data we could obtain.

[4]Under the federal milk marketing orders, a classified pricing plan provides different classes and minimum prices for milk depending on how the milk is used. Milk used in fluid products is placed in Class I, which is the highest-priced class. Milk used for various manufactured products is placed in lower-priced classes.

[5]Handler is the federal order term for cooperatives, processors, or dealers of milk who commonly purchase raw milk and sell pasteurized milk and milk products. See 7 C.F.R. §1000.9 for a more complete definition.

two of the adjustment items—reimbursements to cooperatives for services performed for handlers and for transportation costs not covered by the order minimum price—were not readily available so they were estimated indirectly based on other reported data and, in some cases, on anecdotal information provided by industry members. However, despite these limitations, AMS believes that the estimated farm price is a good representation of the price that dairy farmers receive for raw milk used in fluid milk products. For the farm price for San Diego—a state-regulated market—we used mailbox price data collected by the California Department of Food and Agriculture. The mailbox price is the weighted average of the prices received by dairy farmers in the market for all of their raw milk sold and therefore is computed as the total net dollars received for milk divided by the total pounds of milk marketed.[6] This price is likely to be lower than the price received for milk used for fluid purposes because the prices for milk used for manufacturing purposes are generally lower. However, it is the best measure we could obtain.

To determine cooperative prices, we used AMS data on announced cooperative prices to represent prices that wholesale milk processors paid to cooperatives. Wholesale milk processors in federally regulated markets generally purchase milk from cooperatives and pay the federal minimum price for milk plus premiums that are negotiated between cooperatives and wholesale milk processors. The announced cooperative price is the Class I milk price announced by the major cooperative in each of the markets. This price does not apply to all Class I sales in federally regulated markets and is not necessarily the price actually received for all of the milk sold by the major cooperative; the announced cooperative prices have not been verified by USDA as actually having been paid by processors. For San Diego, we used the minimum fluid prices established by the state of California. Data on the premiums paid in excess of these minimums were not available for this market. (See app. V for a detailed discussion of over-order premiums.)

To determine wholesale prices, we used the prices paid at Department of Defense Commissary Agency locations. The Defense Commissary Agency purchases milk under competitive and noncompetitive contracts with

[6]The mailbox price information collected by the California Department of Food and Agriculture does not account for all of the various factors that influence farm prices. As a result, it does not provide as good a measure of the price that farmers receive based on the value of their milk as the AMS adjustment does for the FMMO markets where it is available.

wholesalers. We used commissary prices as surrogates for privately established wholesale prices because (1) defense commissaries sell groceries at a standard 5 percent markup from cost to active and retired military personnel and (2) wholesale price data are considered proprietary by industry officials and were not available to us. The commissary network of stores ranks twelfth in the United States in sales volume for supermarket chains. We selected 39 different commissary locations near the 15 markets we reviewed, and the Defense Commissary Agency provided us with weekly prices paid by consumers at these locations for gallons of whole, 2 percent, 1 percent, and skim milk.[7] We averaged these weekly prices to obtain monthly prices. We then adjusted these monthly prices to account for the 5 percent markup. Where we had multiple commissary locations for a market, we averaged the adjusted monthly prices to obtain a wholesale price for the market. We recognize that these locations may not provide an ideal match with other price data analyzed for a given location; for example, in some markets the available commissary locations were not in close proximity to the selected marketing areas. Also, wholesale processors may provide these commissary locations with different levels of service than they do for retailers in these markets.[8] In such cases, the prices paid by these commissaries for fluid milk may have been different than the prices that retailers in the selected markets paid to their wholesale suppliers. However, these were the best wholesale data that we could obtain. In those locations where commissaries sold more than one brand of milk, we used the price for the brand that had the highest sales volume for a particular period.

For retail prices, we contracted with Information Resources, Inc., a private data collection and analysis company, to obtain average weekly retail prices for whole, 2 percent, 1 percent, and skim milk sold in gallon containers. These data represented a weighted average of prices at supermarkets with yearly sales exceeding $2 million for the markets included in our analysis. We then averaged these weekly prices to obtain monthly prices. We were unable to obtain data from some types of nonsupermarket retailers such as mass merchandisers, thus the retail

[7]The 39 commissary locations were selected either because they were within the marketing area for one of our 15 selected markets (as defined by our source for retail pricing data, Information Resources, Inc.), or because they were the closest location available.

[8]In addition to shipping the products to stores, some wholesalers provide in-store services, including unloading the milk on the store dock, restocking the dairy case, and removing outdated or leaking containers.

pricing data that we present may not be representative of fluid milk prices at those locations. Figure 1 shows the locations of the 15 selected markets, the corresponding commissaries, and the federal milk marketing order areas.

Figure 1: Selected Milk Markets, Corresponding Defense Commissaries Used for Our Analysis, and Federal Milk Marketing Order Areas Prior to April 2004

Source: GAO, based on USDA and Defense Commissary Agency information.

Note: The Western Order was terminated as of April 1, 2004. However, because the order existed during the majority of our period of analysis we chose to include the data in this report. Farm and cooperative level prices for this order for April and May 2004 were provided by USDA based on what they would have been had the order still existed.

To determine (1) the portion of the retail price of a gallon of milk received by farmers, cooperatives, wholesale milk processors, and retailers; (2) how changes in retail and farm prices affect the farm-to-retail price spread; and (3) how price changes at any level of the marketing chain correlate to changes in prices at other levels, we limited our analysis to 2 percent milk, which currently represents the largest volume of reduced-fat milk sold nationwide. Therefore, our analysis of 2 percent prices may not necessarily reflect pricing patterns and trends for the other three kinds of milk. Appendix II includes graphs that show the relationships among the farm, cooperative, wholesale, and retail prices for a gallon of 2 percent milk for each of the 15 markets. Because farm and cooperative prices reflect a higher milkfat content than that in 2 percent milk, we adjusted these prices to reflect the value of removing milkfat and replacing it with skim milk.[9] This adjustment allowed us to use farm and cooperative prices that were comparable to the wholesale and retail prices for our analysis.

To determine the degree that farm and retail prices had changed and the effect these changes had on the farm-to-retail price spread from October 2000 through May 2004 for each of the 15 markets, we used a statistical procedure to estimate farm-level and retail prices at the beginning and end of the period.[10] We relied on estimated rather than actual prices to reduce the influence of the starting and ending months and years selected for our analysis in markets in which milk prices varied from month to month. We

[9]For San Diego, we used prices that were adjusted for 2 percent milkfat and 10 percent nonfat milk solids so that they were comparable with the prices of retail milk sold in California.

[10]We used a regression procedure for each market to determine whether the price could be reliably predicted as a function of time for both farm-level and retail prices. This procedure allowed us to estimate initial and final prices for farm-level and retail prices that take into account the variability in these price series during the 44-month period. This regression procedure was done on time and time-squared because we observed that prices generally fell for part of the period and then rose. Including the time-squared variable in the regression provided a better fit for the data. A statistically significant relationship indicates that we found a consistent association, either up or down, between price and time. For statistically significant relationships, we calculated a final price estimate (computed for the last month of our data series) and compared to an estimated price calculated for the first month. In the absence of a statistically significant relationship–when no consistent association was found–we treated initial and final estimates of price the same, even if actual beginning and final prices differ.

used the differences between the estimated initial and final prices to represent the changes during the period. When our statistical procedure did not find a consistent association between prices and time, we treated the difference in the estimated initial and final prices as zero. We calculated the change in the farm-to-retail price spread as the estimated retail price difference minus the estimated farm price difference.

To describe the relationship between price changes at any given level in the milk marketing chain and price changes at the other levels, we tested for correlations between price changes at the various levels for each of the 15 markets included in our analysis. Specifically, we calculated coefficients describing the degree of correlation between changes in farm prices and price changes at the cooperative, wholesale, and retail levels; price changes at the cooperative level and price changes at the wholesale and retail levels; and price changes at the wholesale and retail levels. In appendix II, we report those correlation coefficients and indicate which are statistically different from zero at the 95 percent confidence level.

To update information provided in our June 2001 report on the retail prices for four kinds of milk, we analyzed the retail price data that we obtained from Information Resources, Inc. We array these data in appendix III for each of the selected 15 markets for October 2000 through May 2004.

To update information provided in our June 2001 report on average monthly and annual farm and cooperative prices, and wholesale and retail prices for different kinds of milk, we analyzed data obtained from USDA, the California Department of Food and Agriculture, the Department of Defense Commissary Agency, and Information Resources, Inc. We report these data in appendix IV for each of the selected 15 markets for October 2000 through May 2004.

To update our information on the major factors influencing milk prices and explore price transmission within the milk marketing chain, we conducted more than 50 interviews with national dairy experts working with the

federal and state governments,[11] cooperatives,[12] processors,[13] retailers,[14] or industry groups,[15] or in academia.[16] We also reviewed a number of relevant studies and publications from USDA and other sources. Where possible, we obtained data on production costs, services provided by cooperatives, as well as inputs to processing and retailing. We also obtained information on concentration and market power at each level of the milk marketing chain. We present information on the factors influencing the price of milk in appendix V.

To compare the results and methodologies of various studies looking at the issue of price transmission in fluid milk marketing from the farm to the retail level, we performed a technical review of 14 academic studies conducted over the past 10 years, looking at model descriptions, assumptions, and results. We also spoke with the economists involved in these studies concerning their model results and the causes of differences in fluid milk price transmission across markets. The scope of these studies encompassed national, regional, and city-level models of fluid milk price transmission. Appendix VI provides a summary of our review of price transmission and the various price transmission studies.

To identify and examine the effects of federal dairy program changes and alternative policy options, we contacted many of the same dairy experts previously mentioned. We also conducted an extensive literature search and reviewed more than 50 relevant studies and other publications we identified. We qualitatively analyzed the effects of federal dairy program

[11]Federal government sources included officials from USDA's AMS, Economic Research Service, and Farm Service Agency.

[12]Cooperatives we contacted included Dairy Farmers of America; California Dairies, Inc.; Agri-Mark; Land O'Lakes, Inc.; and Prairie Farms.

[13]Fluid milk processors and processors of manufactured dairy products that we contacted included HP Hood LLC and Leprino Foods, as well as cooperatives and retailers that process and manufacture these products.

[14]Retailers that we contacted included Wal-Mart, Albertsons, the H. E. Butt Grocery Company, and Demoulas Super Markets, Inc.

[15]Industry groups that we contacted included the National Milk Producers Federation, the International Dairy Foods Association, and the Food Marketing Institute.

[16]Academic dairy experts that we contacted included professors from Cornell University, North Carolina State University, Ohio State University, Texas A&M University, University of Connecticut, University of Wisconsin–Madison, and the University of California–Davis.

changes and policy options we identified on six main policy considerations: farm income, milk production, federal costs, price volatility, economic efficiency, and consumer prices. We evaluated impacts on these policy considerations under both high- and low-price scenarios, over the short and long terms. We identified these policy considerations by reviewing previous GAO reports, relevant studies, and legislation, as well as through our conversations with dairy policy experts. Different stakeholders in the dairy policy arena may have alternative views on the relative importance of these policy considerations, as well as other considerations that we did not include, which could lead to differing perspectives on these options. In addition, the potential effects of policy options on these considerations could vary depending upon economic conditions and other policy decisions. We compared the dairy policy options we identified against a baseline scenario of the policies in place as of August 2004: FMMO regulations, a Milk Income Loss Contract (MILC) program that is scheduled to expire at the end of fiscal year 2005, a price support program at $9.90 per hundredweight, a Dairy Export Incentive Program (DEIP), trade restrictions, and milk regulatory policies in some states. We include a discussion of the effects of recent federal dairy program changes and alternative policy options in appendix VII.

We conducted our review from September 2003 through October 2004 in accordance with generally accepted government auditing standards. We did not independently verify the data we received from various sources. However, we discussed with these sources the measures they take to ensure the accuracy of the data, and these measures seemed reasonable. Additionally, we consulted with the following dairy experts concerning the results of our analysis of price transmission within the milk marketing chain and the effects of changes in federal dairy programs and alternative policy options:

- Ed Jesse, Ph.D., Professor, Department of Agricultural and Applied Economics, University of Wisconsin–Madison;
- Daniel Lass, Ph.D., Professor, College of Natural Resources and the Environment, University of Massachusetts, Amherst;
- Richard Sexton, Ph.D., Professor, Department of Agricultural and Resource Economics, University of California–Davis; and
- Mark Stephenson, Ph.D., Senior Extension Associate, Department of Applied Economics and Management, Cornell University.

Analysis of Prices at Four Marketing Levels for 2 Percent Milk in Selected Markets

This appendix reports on our analysis of prices at four marketing levels for a gallon of 2 percent milk in 15 selected markets for October 2000 through May 2004. Our analysis includes information on (1) the portion of the retail price of a gallon of milk received by farmers, cooperatives, wholesale milk processors, and retailers; (2) how changes in farm and retail milk prices affect the farm-to-retail milk price spread; and (3) how price changes at any level of the marketing chain correlate with changes in prices at other levels.

We limited our analysis to gallons of 2 percent milk because sales of milk with reduced fat content account for nearly 52 percent of all sales of fluid milk and sales of 2 percent milk account for about 62 percent of these reduced-fat sales. The farm and cooperative prices used in our analysis and presented in this appendix have been adjusted to reflect 2 percent milkfat. This analysis may not reflect pricing patterns and trends for other kinds of milk. We present complete data for prices for all four types of milk—whole, 2 percent, 1 percent, and skim—in appendix III.

Portion Received by Farmers, Cooperatives, Wholesale Milk Processors and Retailers

Between October 2000 and May 2004, on average, our data suggest that farmers received 45.9 percent, cooperatives 6.1 percent, wholesale processors 35.6 percent, and retailers 12.5 percent of the retail price of a gallon of 2 percent milk in the 15 markets we reviewed.[1] However, these percentages varied depending on the specific market. For example, the farmers' portion ranged from 36.0 percent to 58.6 percent, while retailers in 12 markets received anywhere from 3.5 percent to 44.1 percent.[2] In comparison, the average percentages we reported in 2001 for the period March 1998 through September 2000 were 43 percent, 5 percent, 33 percent, and 19 percent, respectively, for farmers, cooperatives, wholesale processors, and retailers. Table 1 summarizes the price breakdown for each market.

[1]These figures represent unweighted averages of the percentages for each market.

[2]See explanatory note (a) to table 1. In some places (3 out of 15 markets), retailers experienced negative returns.

Table 1: Portion of the Retail Price of a Gallon of 2 Percent Milk Received by Farmers, Cooperatives, Wholesale Processors, and Retailers for 15 Markets, October 2000 through May 2004

Selected market	Percent received by farmers	Percent received by cooperatives	Percent received by wholesale processors	Percent received by retailers	Subtotal received by wholesale processors and retailers
Atlanta, Ga.	42.7	7.4	34.8	15.1	49.9
Boston, Mass.	51.2	4.5	24.0	20.4	44.4
Charlotte, N.C.	41.1	7.5	46.6	4.8	51.4
Cincinnati, Ohio	45.8	7.6	39.0	7.7	46.7
Dallas, Tex.	55.9	5.3	49.5	(10.7)[a]	38.8
Denver, Colo.	39.4	4.5	25.7	30.3	56.0
Miami, Fla.	50.8	9.5	45.0	(5.3)[a]	39.7
Milwaukee, Wisc.	52.1	7.9	36.5	3.5	40.0
Minneapolis, Minn.	58.6	7.8	64.1	(30.5)[a]	33.6
New Orleans, La.	36.8	9.5	36.6	17.1	53.7
Phoenix, Ariz.	42.5	3.3	34.8	19.4	54.2
Salt Lake City, Utah	44.8	3.6	43.0	8.6	51.6
San Diego, Calif.[b]	36.0	6.8	28.1	29.1	57.2
Seattle, Wash.	36.7	3.2	16.0	44.1	60.1
Washington, D.C.	53.4	3.3	10.2	33.1	43.3
Average for the 15 markets	45.9	6.1	35.6	12.5	48.0

Source: GAO's analysis of farm and cooperative price data provided by USDA (for the San Diego market, the mailbox and Southern California Class I price data were provided by the California Department of Food and Agriculture), wholesale price data provided by the Defense Commissary Agency, and retail price data provided by Information Resources, Inc.

Note: Percentages may not total 100 due to rounding.

[a]Our analysis found that retailers in the Dallas, Miami, and Minneapolis markets received a negative return on a gallon of 2 percent milk for the 44-month period. Officials with one major retailer in the Dallas market indicated that a price war was occurring in Dallas during this time period. We were unable to obtain explanations for the negative returns in Miami and Minneapolis. These negative returns may be the result of problems with comparability between commissary and supermarket data.

[b]Figures for the San Diego market may understate the percent received by cooperatives and overstate the percent received by wholesale processors because the cooperative price data for this market did not include estimates of over-order premiums paid to cooperatives. On the other hand, figures for this market may overstate the percent received by cooperatives and understate the percent received by farmers because unlike the farm price data for other markets, the farm price data for San Diego represent a weighted average of milk sold for all uses. See appendix I.

Changes in Farm and Retail Prices and the Price Spread

From October 2000 through May 2004, the spread between farm and retail milk prices increased in 12 of the 15 markets.[3] However, in some of the 12 markets, the spread between farm and retail milk prices increased dramatically and then moderated. In 9 of the 15 markets, retail prices showed a statistically significant increase. In 4 of the remaining markets, retail prices decreased over time; in the other 2 markets, retail prices showed no statistically significant change. At the same time, farm prices decreased in 12 of the 15 markets and increased in the remaining 3 markets over the 44-month period. However, these declining farm prices began to moderate, or, in most cases, began to rise during the latter months of our period of analysis. Table 2 provides these data for selected markets.[4]

Table 2: Changes in the Farm-to-Retail Price Spread for a Gallon of 2 Percent Milk for 15 Markets, October 2000 through May 2004

Selected market	Change in farm prices	Change in retail prices	Change in the farm-to-retail price spread
Atlanta, Ga.	$0.03	($0.21)	($0.24)
Boston, Mass.	(0.06)	0.12	0.18
Charlotte, N.C.	(0.05)	0.20	0.25
Cincinnati, Ohio	(0.07)	(0.12)	(0.05)
Dallas, Tex.	0.02	0.24	0.22
Denver, Colo.	(0.06)	0.16	0.22
Miami, Fla.	(0.01)	0.25	0.26
Milwaukee, Wisc.	(0.03)	0.05	0.08
Minneapolis, Minn.	(0.02)	[a]	0.02
New Orleans, La.	(0.10)	0.16	0.27
Phoenix, Ariz.	(0.07)	(0.01)	0.06

[3]The price spread of a commodity represents differences in prices between two levels of the marketing chain. These differences reflect the costs incurred and profits received through adding value by processing, transporting, and distributing a commodity.

[4]The values used to calculate the changes in farm and retail prices in table 2 are based on statistical estimates of initial and final prices for these two levels, not the actual prices recorded in the first and last month of the period for which we have data. The method for calculating these estimates is described in appendix I. The changes in the farm-to-retail price spread are the differences between the changes in retail and farm prices from October 2000 to May 2004 and consequently are determined from the statistically estimated initial and final prices for the retail and farm levels.

(Continued From Previous Page)

Selected market	Change in farm prices	Change in retail prices	Change in the farm-to-retail price spread
Salt Lake City, Utah	(0.04)	[a]	0.04
San Diego, Calif.	0.03	(0.16)	(0.19)
Seattle, Wash.	(0.08)	0.10	0.18
Washington, D.C.	(0.03)	0.28	0.32

Source: GAO's analysis of farm and cooperative price data provided by USDA (for the San Diego market, the mailbox and Southern California Class I price data were provided by the California Department of Food and Agriculture), wholesale price data provided by the Defense Commissary Agency, and retail price data provided by Information Resources, Inc.

Note: Differences between changes in farm and retail prices may not add to the change in the farm-to-retail price spread due to rounding.

[a]No statistically significant change was observed in the price spread over the 44-month period.

Correlation between Price Changes at the Four Marketing Levels

We found that price changes generally correlated across levels in the marketing chain, with the strongest correlations occurring between adjacent levels. The values of correlation coefficients presented are estimates of the degree that price changes at one level in the milk marketing chain are associated with price changes at other levels. The higher the coefficient, the closer the association between changes in prices at different levels. Changes in cooperative prices, in general, were strongly correlated with changes in wholesale prices.[5] However, changes in cooperative prices correlated less strongly with changes in retail prices. As discussed in appendix V, many factors other than farm or wholesale prices influence the retail price of fluid milk.

Correlation coefficients between prices at different marketing levels varied across markets. For example, correlations between cooperative and wholesale prices in individual markets range from a high of 0.982 to a low of –0.031. We ranked the 15 markets by the extent of correlation between cooperative and wholesale prices. The correlation coefficient for the

[5]As discussed in appendix I, farm prices were estimated by subtracting out certain cost factors, provided by USDA, from the announced cooperative Class I prices. To the extent that these factors do not change much over time, it would be expected that price changes at the farm level would closely correlate with price changes at the cooperative level, except for San Diego. As discussed in appendix I, we estimated the farm and cooperative prices differently in San Diego because California is not part of the federal milk marketing order system. The approach that we used for San Diego would not be expected to generate a similarly close correlation between farm and cooperative prices. Because farm prices for raw milk used for fluid purposes are not directly observed but are derived from cooperative prices, correlations of wholesale and retail prices with cooperative prices provide a better picture of the price relationship across levels in the milk marketing chain.

market that fell in the middle of this ranking was 0.788. In comparison, the market in the middle of a similar ranking for the time period analyzed in our 2001 report had a lower correlation coefficient between these prices, 0.716. Similarly, correlations between cooperative and retail prices in individual markets range from a high of 0.879 to a low of 0.214. We did a comparable ranking of the 15 markets by the extent of correlation between cooperative and retail prices. The correlation coefficient for the market that fell in the middle of this ranking was 0.588. In comparison, the market in the middle of a similar ranking for the time period presented in our 2001 report again had a lower correlation coefficient between these prices, 0.483. Tables 3 through 5 present data from our correlation analysis of price changes across marketing levels.

Table 3: Correlation between Farm Price Changes and Changes in Cooperative, Wholesale, and Retail Prices for a Gallon of 2 Percent Milk for 15 Markets, October 2000 through May 2004

Selected market	Correlation coefficients for cooperative prices	Correlation coefficients for wholesale prices	Correlation coefficients for retail prices
Atlanta, Ga.	0.999*	0.525*	0.537*
Boston, Mass.	1.000*	0.691*	0.780*
Charlotte, N.C.	0.995*	0.693*	0.778*
Cincinnati, Ohio	1.000*	0.983*	0.589*
Dallas, Tex.	0.998*	0.813*	0.713*
Denver, Colo.	0.999*	0.932*	0.428*
Miami, Fla.	0.999*	(0.024)	0.826*
Milwaukee, Wisc.	0.999*	0.683*	0.881*
Minneapolis, Minn.	0.999*	0.220	0.503*
New Orleans, La.	0.993*	0.784*	0.863*
Phoenix, Ariz.	1.000*	0.542*	0.217
Salt Lake City, Utah	1.000*	0.829*	0.360*
San Diego, Calif.	0.407*	0.432*	0.341*
Seattle, Wash.	1.000*	0.939*	0.249
Washington, D.C.	1.000*	0.962*	0.810*

Source: GAO's analysis of farm and cooperative price data provided by USDA (for the San Diego market, the mailbox and Southern California Class I price data were provided by the California Department of Food and Agriculture), wholesale price data provided by the Defense Commissary Agency, and retail price data provided by Information Resources, Inc.

Note: In calculating the correlation coefficients for each market, we omitted the months for which data were missing.

*Indicates that the correlation coefficient estimated for this time period is statistically significant at the 5 percent level (i.e., the probability that the two price series are uncorrelated is less than 5 percent).

Table 4: Correlation between Cooperative Price Changes and Changes in Wholesale and Retail Prices for a Gallon of 2 Percent Milk for 15 Markets, October 2000 through May 2004

Selected market	Correlation coefficients for wholesale prices	Correlation coefficients for retail prices
Atlanta, Ga.	0.546*	0.543*
Boston, Mass.	0.694*	0.775*
Charlotte, N.C.	0.697*	0.778*
Cincinnati, Ohio	0.982*	0.588*
Dallas, Tex.	0.818*	0.725*
Denver, Colo.	0.939*	0.436*
Miami, Fla.	(0.031)	0.823*
Milwaukee, Wisc.	0.682*	0.879*
Minneapolis, Minn.	0.228	0.499*
New Orleans, La.	0.788*	0.861*
Phoenix, Ariz.	0.540*	0.214
Salt Lake City, Utah	0.830*	0.360*
San Diego, Calif.	0.969*	0.480*
Seattle, Wash.	0.939*	0.250
Washington, D.C.	0.962*	0.809*

Source: GAO's analysis of cooperative price data provided by USDA (for the San Diego market, the Southern California Class I price data were provided by the California Department of Food and Agriculture), wholesale price data provided by the Defense Commissary Agency, and retail price data provided by Information Resources, Inc.

Note: In calculating the correlation coefficients for each market, we omitted the months for which data were missing.

*Indicates that the correlation coefficient estimated for this time period is statistically significant at the 5 percent level (i.e., the probability that the two price series are uncorrelated is less than 5 percent).

Table 5: Correlation between Wholesale and Retail Price Changes for a Gallon of 2 Percent Milk for 15 Markets, October 2000 through May 2004

Selected market	Correlation coefficients for retail prices
Atlanta, Ga.	0.319*
Boston, Mass.	0.348*
Charlotte, N.C.	0.746*
Cincinnati, Ohio	0.544*
Dallas, Tex.	0.802*
Denver, Colo.	0.429*
Miami, Fla.	(0.003)
Milwaukee, Wisc.	0.744*
Minneapolis, Minn.	0.205
New Orleans, La.	0.734*
Phoenix, Ariz.	0.419*
Salt Lake City, Utah	0.270
San Diego, Calif.	0.497*
Seattle, Wash.	0.183
Washington, D.C.	0.778*

Source: GAO's analysis of wholesale price data provided by the Defense Commissary Agency and retail price data provided by Information Resources, Inc.

Note: In calculating the correlation coefficients for each market, we omitted the months for which data were missing.

*Indicates that the correlation coefficient estimated for this time period is statistically significant at the 5 percent level (i.e., the probability that the two price series are uncorrelated is less than 5 percent).

Comparison of Average Annual and Monthly Prices for 2 Percent Milk

Tables 6 through 10 show the average annual price for a gallon of 2 percent milk in the 15 markets for each of the four marketing levels during part of 2000, all of 2001, 2002, and 2003, and part of 2004. Figures 2 through 16 present average monthly data for the period October 2000 through May 2004 on farm, cooperative, wholesale, and retail prices for gallons of 2 percent milk in each of the 15 markets. Gaps in any of the lines shown in the figures indicate that data were unavailable for those months.

Table 6: Average Annual Farm, Cooperative, Wholesale, and Retail Prices for a Gallon of 2 Percent Milk in Selected Markets, 2000

Selected market	Farm price	Cooperative price	Wholesale price	Retail price
Atlanta, Ga.	$1.05	$1.25	$2.04	$2.67
Boston, Mass.	1.25	1.35	1.96	2.23
Charlotte, N.C.	1.09	1.25	2.06	2.58
Cincinnati, Ohio	1.03	1.21	[a]	2.24
Dallas, Tex.	1.08	1.20	2.05	1.74
Denver, Colo.	0.99	1.11	1.73	2.45
Miami, Fla.	1.22	1.44	2.50	2.33
Milwaukee, Wisc.	1.05	1.18	1.79	1.94
Minneapolis, Minn.	1.01	1.12	2.05	1.77
New Orleans, La.	1.02	1.22	2.25	2.61
Phoenix, Ariz.	1.01	1.09	1.83	2.09
Salt Lake City, Utah	0.98	1.06	1.97	2.25
San Diego, Calif.	0.92	1.16	1.90	2.54
Seattle, Wash.	1.02	1.10	1.47	2.56
Washington, D.C.	1.21	1.28	1.51	2.11

Source: GAO's analysis of farm and cooperative price data provided by USDA (for the San Diego market, the mailbox and Southern California Class I price data were provided by the California Department of Food and Agriculture), wholesale price data provided by the Defense Commissary Agency, and retail price data provided by Information Resources, Inc.

Note: Averages for 2000 were calculated using data from October through December, the portion of 2000 included in our analysis.

[a]We were unable to obtain data from the Defense Commissary Agency to represent wholesale prices for 2 percent milk in the Cincinnati market during 2000.

Table 7: Average Annual Farm, Cooperative, Wholesale, and Retail Prices for a Gallon of 2 Percent Milk in Selected Markets, 2001

Selected market	Farm price	Cooperative price	Wholesale price	Retail price
Atlanta, Ga.	$1.14	$1.34	$2.50	$2.68
Boston, Mass.	1.29	1.39	1.95	2.32
Charlotte, N.C.	1.18	1.34	2.32	2.62
Cincinnati, Ohio	1.15	1.32	2.24	2.28
Dallas, Tex.	1.17	1.28	2.15	1.98
Denver, Colo.	1.12	1.23	1.93	2.54
Miami, Fla.	1.31	1.53	2.56	2.40

(Continued From Previous Page)

Selected market	Farm price	Cooperative price	Wholesale price	Retail price
Milwaukee, Wisc.	1.17	1.32	2.17	2.07
Minneapolis, Minn.	1.14	1.27	2.21	1.73
New Orleans, La.	1.11	1.31	2.32	2.68
Phoenix, Ariz.	1.14	1.21	1.91	2.42
Salt Lake City, Utah	1.10	1.18	2.11	2.24
San Diego, Calif.	1.05	1.25	2.04	2.84
Seattle, Wash.	1.11	1.20	1.66	2.73
Washington, D.C.	1.34	1.42	1.71	2.30

Source: GAO's analysis of farm and cooperative price data provided by USDA (for the San Diego market, the mailbox and Southern California Class I price data were provided by the California Department of Food and Agriculture), wholesale price data provided by the Defense Commissary Agency, and retail price data provided by Information Resources, Inc.

Table 8: Average Annual Farm, Cooperative, Wholesale, and Retail Prices for a Gallon of 2 Percent Milk in Selected Markets, 2002

Selected market	Farm price	Cooperative price	Wholesale price	Retail price
Atlanta, Ga.	$1.04	$1.22	$2.01	$2.47
Boston, Mass.	1.11	1.21	1.77	2.33
Charlotte, N.C.	1.01	1.22	2.55	2.59
Cincinnati, Ohio	0.95	1.11	1.98	2.34
Dallas, Tex.	1.08	1.17	2.19	2.03
Denver, Colo.	0.93	1.05	1.66	2.56
Miami, Fla.	1.17	1.41	2.56	2.36
Milwaukee, Wisc.	0.98	1.14	1.81	2.01
Minneapolis, Minn.	0.95	1.10	2.38	1.95
New Orleans, La.	0.92	1.19	2.22	2.70
Phoenix, Ariz.	0.94	1.02	1.88	2.59
Salt Lake City, Utah	0.91	0.99	1.92	2.29
San Diego, Calif.	0.88	1.06	1.84	2.66
Seattle, Wash.	0.93	1.01	1.39	2.74
Washington, D.C.	1.16	1.23	1.44	2.28

Source: GAO's analysis of farm and cooperative price data provided by USDA (for the San Diego market, the mailbox and Southern California Class I price data were provided by the California Department of Food and Agriculture), wholesale price data provided by the Defense Commissary Agency, and retail price data provided by Information Resources, Inc.

Table 9: Average Annual Farm, Cooperative, Wholesale, and Retail Prices for a Gallon of 2 Percent Milk in Selected Markets, 2003

Selected market	Farm price	Cooperative price	Wholesale price	Retail price
Atlanta, Ga.	$1.07	$1.25	$2.02	$2.49
Boston, Mass.	1.14	1.25	1.79	2.33
Charlotte, N.C.	1.05	1.27	2.65	2.63
Cincinnati, Ohio	0.98	1.16	2.00	2.34
Dallas, Tex.	1.09	1.19	2.26	2.02
Denver, Colo.	0.97	1.08	1.68	2.55
Miami, Fla.	1.20	1.43	2.56	2.47
Milwaukee, Wisc.	1.01	1.19	1.87	2.00
Minneapolis, Minn.	0.99	1.13	2.36	1.62
New Orleans, La.	0.94	1.24	2.22	2.68
Phoenix, Ariz.	0.97	1.05	1.97	2.45
Salt Lake City, Utah	0.95	1.03	1.99	2.14
San Diego, Calif.	0.93	1.12	1.84	2.69
Seattle, Wash.	0.95	1.04	1.46	2.88
Washington, D.C.	1.19	1.27	1.46	2.33

Source: GAO's analysis of farm and cooperative price data provided by USDA (for the San Diego market, the mailbox and Southern California Class I price data were provided by the California Department of Food and Agriculture), wholesale price data provided by the Defense Commissary Agency, and retail price data provided by Information Resources, Inc.

Table 10: Average Annual Farm, Cooperative, Wholesale, and Retail Prices for a Gallon of 2 Percent Milk in Selected Markets, 2004

Selected market	Farm price	Cooperative price	Wholesale price	Retail price
Atlanta, Ga.	$1.18	$1.35	$2.21	$2.54
Boston, Mass.	1.27	1.38	1.90	2.43
Charlotte, N.C.	1.13	1.35	2.84	2.87
Cincinnati, Ohio	1.09	1.27	2.21	1.95
Dallas, Tex.	1.20	1.30	2.47	2.13
Denver, Colo.	1.06	1.20	2.04	2.72
Miami, Fla.	1.30	1.52	2.56	2.63
Milwaukee, Wisc.	1.15	1.31	2.13	2.13
Minneapolis, Minn.	1.14	1.29	2.43	1.93
New Orleans, La.	1.03	1.33	2.15	2.87
Phoenix, Ariz.	1.08	1.17	2.17	2.25

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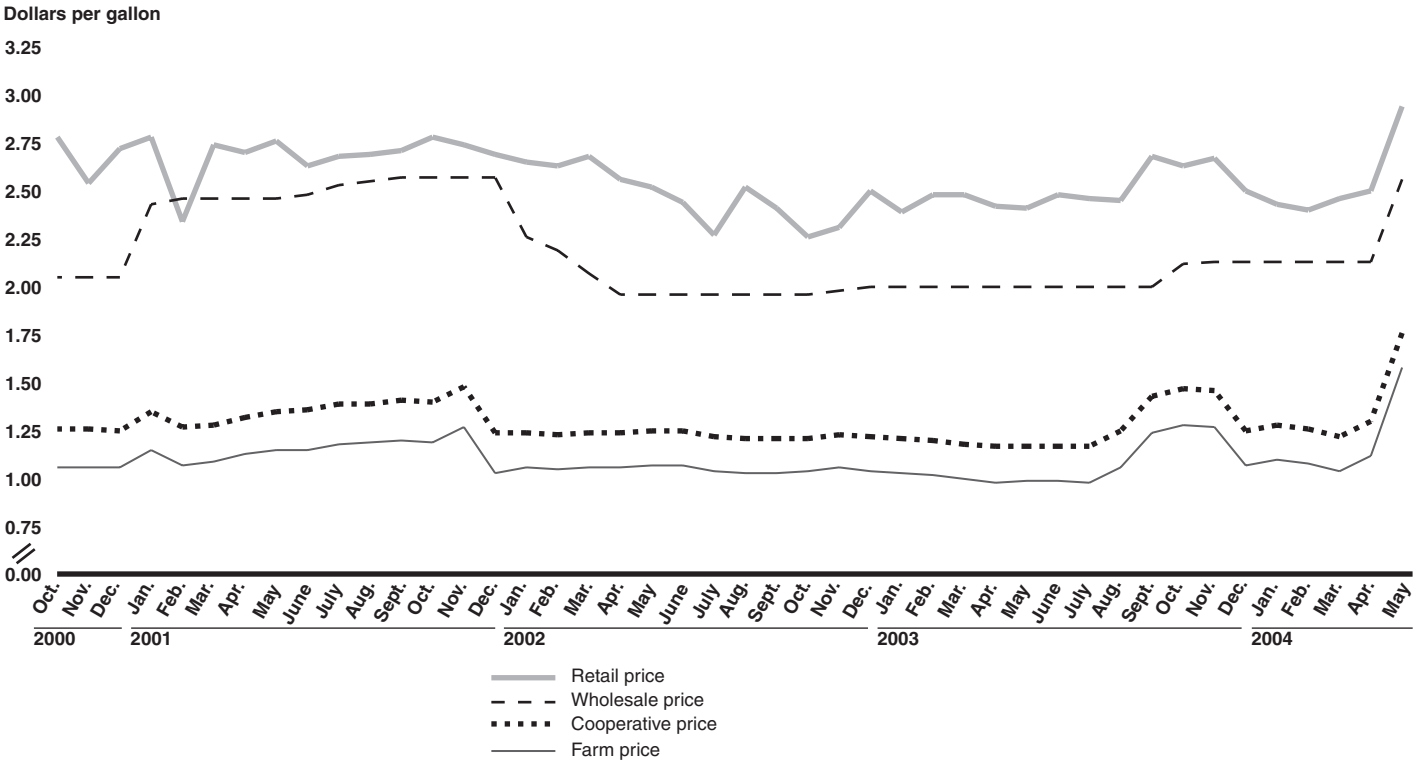
Selected market	Farm price	Cooperative price	Wholesale price	Retail price
Salt Lake City, Utah	1.07	1.14	2.16	2.19
San Diego, Calif.	1.12	1.22	1.92	2.50
Seattle, Wash.	1.06	1.15	1.74	2.59
Washington, D.C.	1.31	1.39	1.66	2.56

Source: GAO's analysis of farm and cooperative price data provided by USDA (for the San Diego market, the mailbox and Southern California Class I price data were provided by the California Department of Food and Agriculture), wholesale price data provided by the Defense Commissary Agency, and retail price data provided by Information Resources, Inc.

Note: The 2004 averages were calculated using data from January through May of that year, the portion of 2004 included in our analysis.

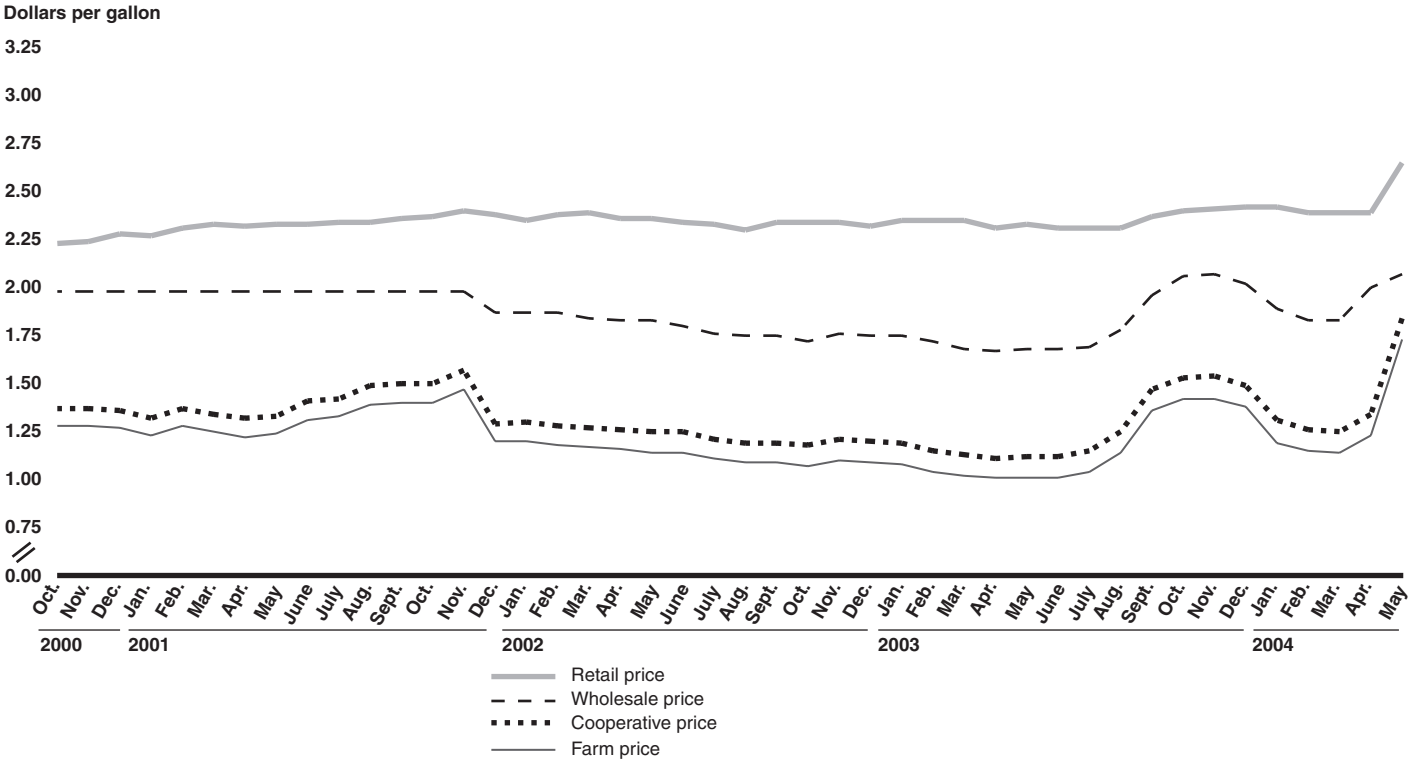
Figure 2: Farm, Cooperative, Wholesale, and Retail Prices for a Gallon of 2 Percent Milk for Atlanta, Georgia, October 2000 through May 2004



Source: GAO analysis of data provided by USDA, the Defense Commissary Agency, and Information Resources, Inc.

Note: For Atlanta, Georgia, the farm price is the USDA estimated farm Class I price adjusted to 2 percent milkfat content; the cooperative price is the announced cooperative Class I price for Atlanta adjusted to 2 percent milkfat content; the wholesale price is the average of the prices paid by the commissaries at Fort Gillem and Fort McPherson, adjusted for a 5 percent markup; and the retail price is the price collected by Information Resources, Inc., for the Atlanta market.

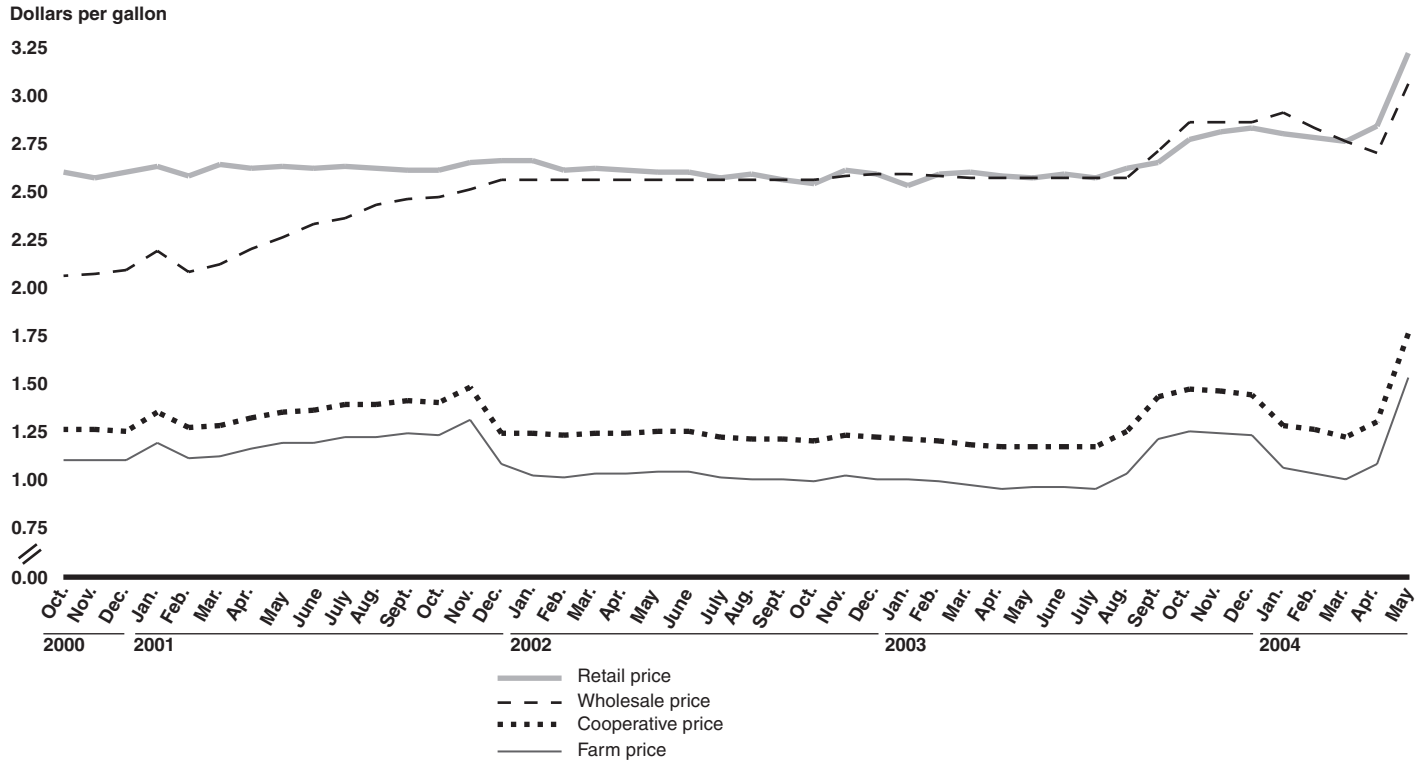
Figure 3: Farm, Cooperative, Wholesale, and Retail Prices for a Gallon of 2 Percent Milk for Boston, Massachusetts, October 2000 through May 2004



Source: GAO analysis of data provided by USDA, the Defense Commissary Agency, and Information Resources, Inc.

Note: For Boston, Massachusetts, the farm price is the USDA estimated farm Class I price adjusted to 2 percent milkfat content; the cooperative price is the effective cooperative Class I price for Boston adjusted to 2 percent milkfat content during the period that the Northeast Interstate Dairy Compact was effective (July 1997 through September 2001); the cooperative price after September 2001 is the announced cooperative Class I price for Boston adjusted to 2 percent milkfat content; the wholesale price is the price paid by the commissary at Hanscom Air Force Base, adjusted for a 5 percent markup; and the retail price is the price collected by Information Resources, Inc., for the Boston market.

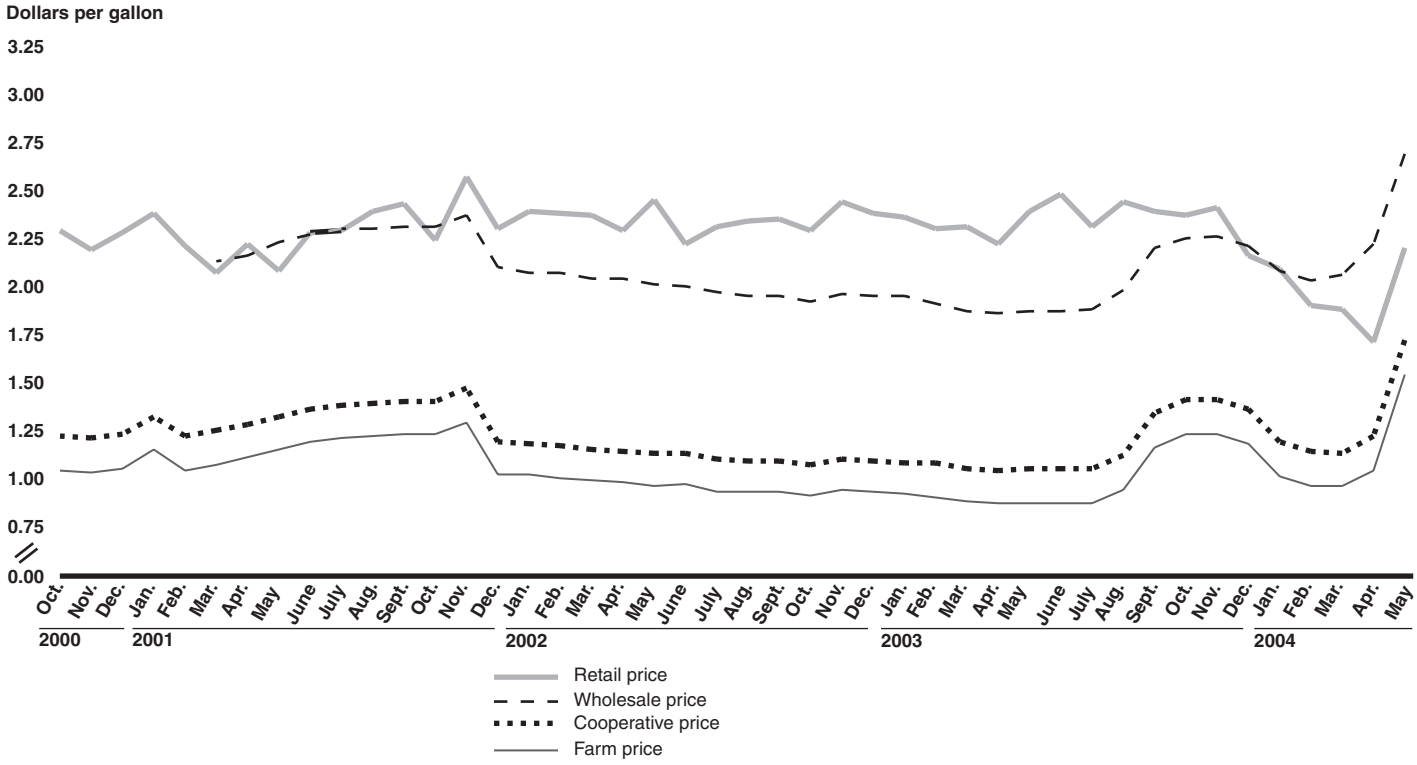
Figure 4: Farm, Cooperative, Wholesale, and Retail Prices for a Gallon of 2 Percent Milk for Charlotte, North Carolina, October 2000 through May 2004



Source: GAO analysis of data provided by USDA, the Defense Commissary Agency, and Information Resources, Inc.

Note: For Charlotte, North Carolina, the farm price is the USDA estimated farm Class I price adjusted to 2 percent milkfat content; the cooperative price is the announced cooperative Class I price for Charlotte adjusted to 2 percent milkfat content; the wholesale price is the price paid by the Fort Bragg North Post Store, adjusted for a 5 percent markup; and the retail price is the price collected by Information Resources, Inc., for the Charlotte market.

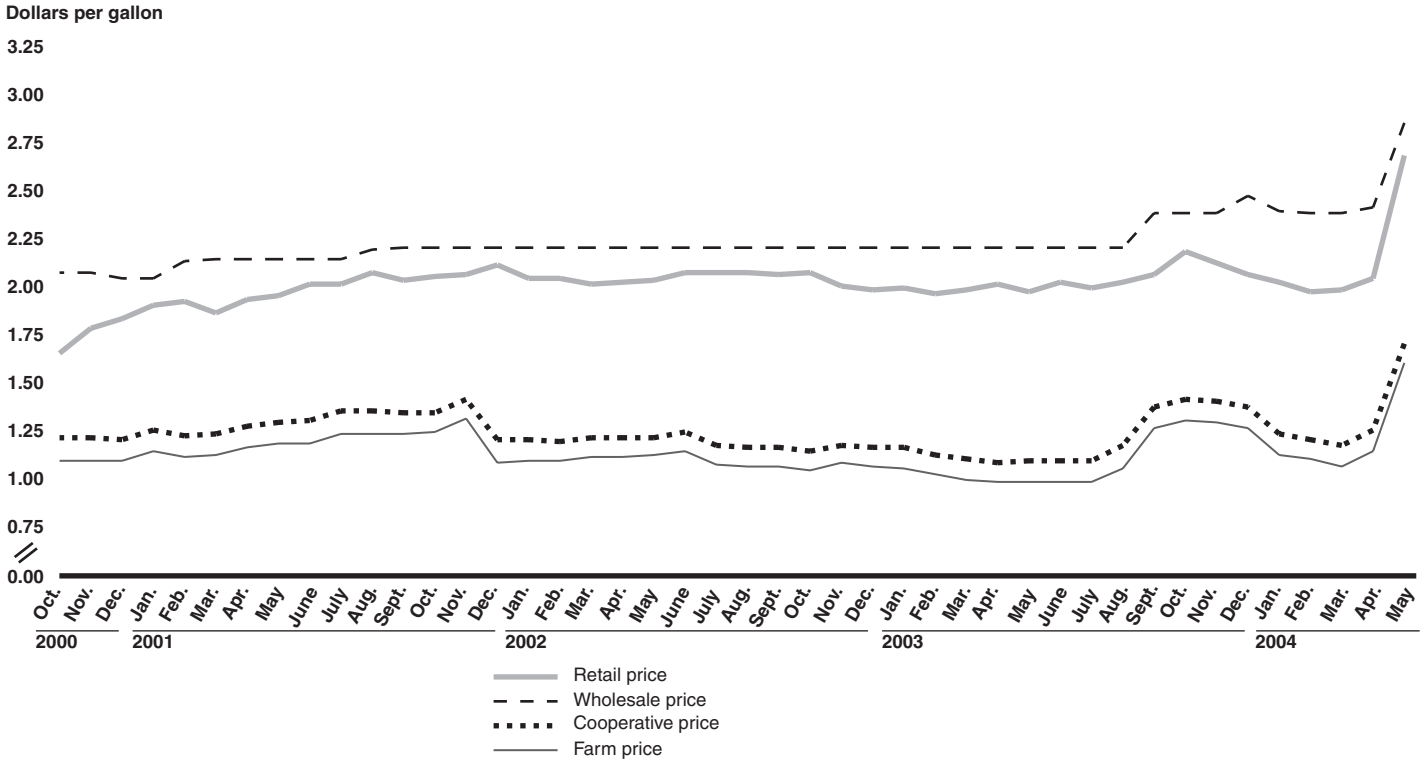
Figure 5: Farm, Cooperative, Wholesale, and Retail Prices for a Gallon of 2 Percent Milk for Cincinnati, Ohio, October 2000 through May 2004



Source: GAO analysis of data provided by USDA, the Defense Commissary Agency, and Information Resources, Inc.

Note: For Cincinnati, Ohio, the farm price is the USDA estimated farm Class I price adjusted to 2 percent milkfat content; the cooperative price is the announced cooperative Class I price for Cincinnati adjusted to 2 percent milkfat content; the wholesale price is the price paid by the commissary at Wright-Patterson Air Force Base, adjusted for a 5 percent markup; and the retail price is the price collected by Information Resources, Inc., for the Cincinnati market. We were unable to obtain data from the Defense Commissary Agency to represent wholesale prices for 2 percent milk in the Cincinnati market during 2000 and for January and February 2001.

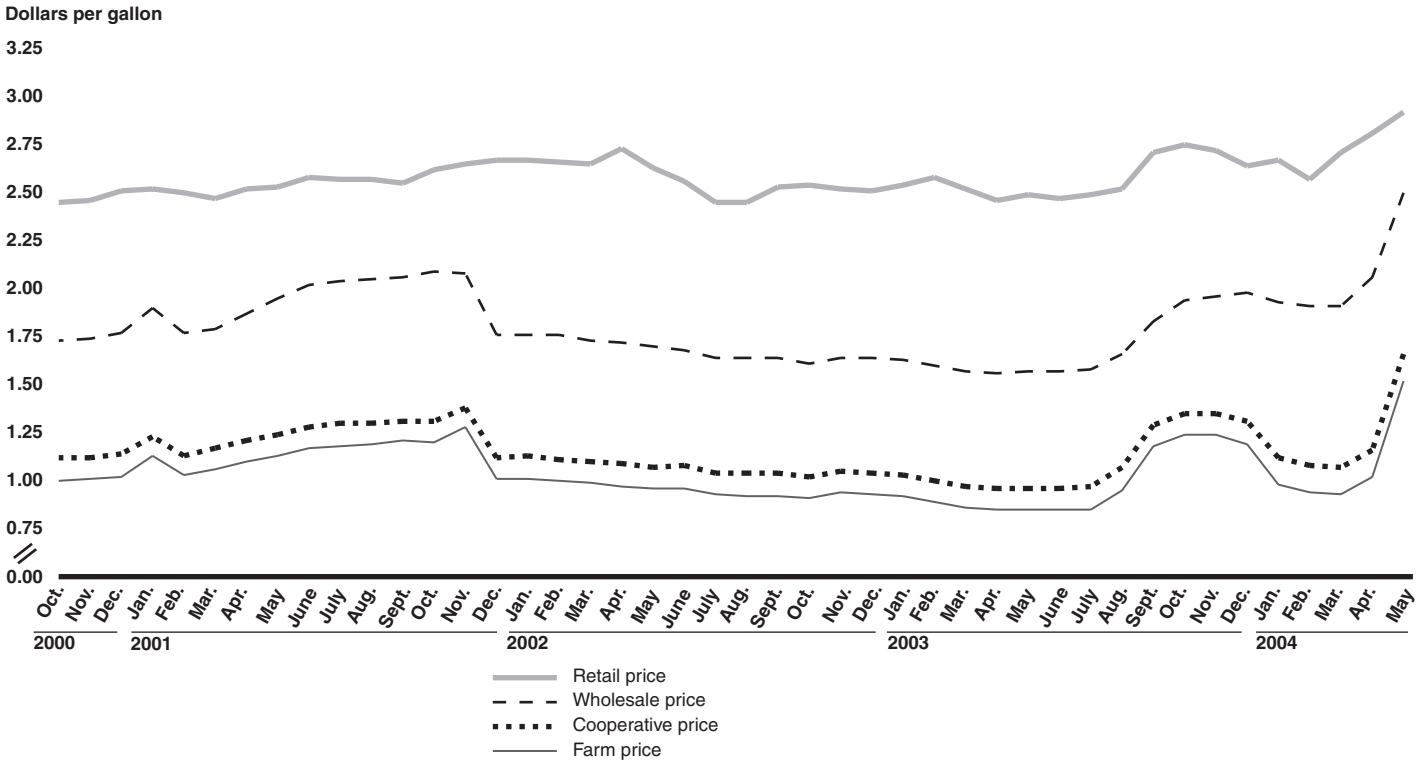
Figure 6: Farm, Cooperative, Wholesale, and Retail Prices for a Gallon of 2 Percent Milk for Dallas, Texas, October 2000 through May 2004



Source: GAO analysis of data provided by USDA, the Defense Commissary Agency, and Information Resources, Inc.

Note: For Dallas, Texas, the farm price is the USDA estimated farm Class I price adjusted to 2 percent milkfat content; the cooperative price is the announced cooperative Class I price for Dallas adjusted to 2 percent milkfat content; the wholesale price is the average of the prices paid by the two commissaries at Fort Hood, adjusted for a 5 percent markup; and the retail price is the price collected by Information Resources, Inc., for the Dallas market.

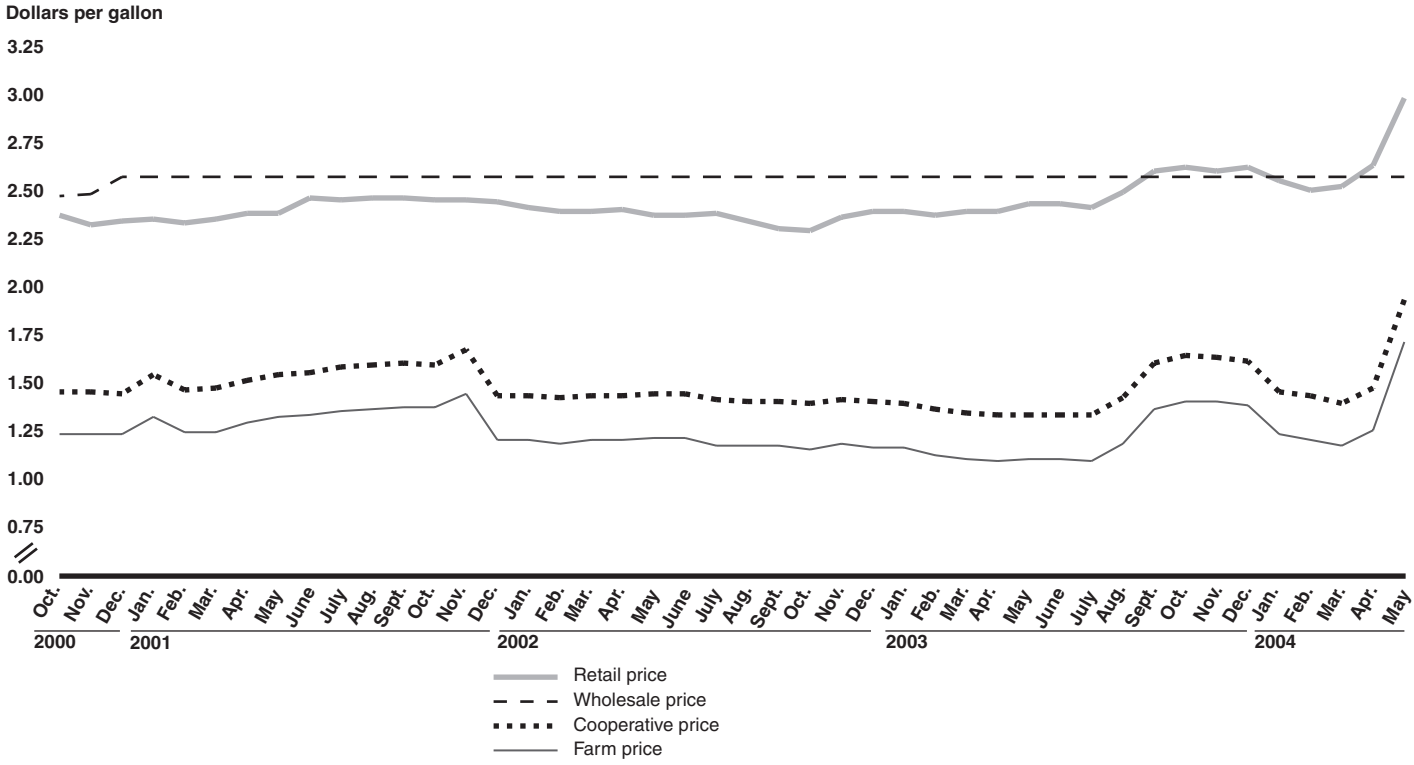
Figure 7: Farm, Cooperative, Wholesale, and Retail Prices for a Gallon of 2 Percent Milk for Denver, Colorado, October 2000 through May 2004



Source: GAO analysis of data provided by USDA, the Defense Commissary Agency, and Information Resources, Inc.

Note: For Denver, Colorado, the farm price is the USDA estimated farm Class I price adjusted to 2 percent milkfat content; the cooperative price is the announced cooperative Class I price for Denver adjusted to 2 percent milkfat content; the wholesale price is the average of the prices paid by the commissaries at Fort Carson, Peterson Air Force Base, Buckley Air Force Base, and the U.S. Air Force Academy, adjusted for a 5 percent markup; and the retail price is the price collected by Information Resources, Inc., for the Denver market.

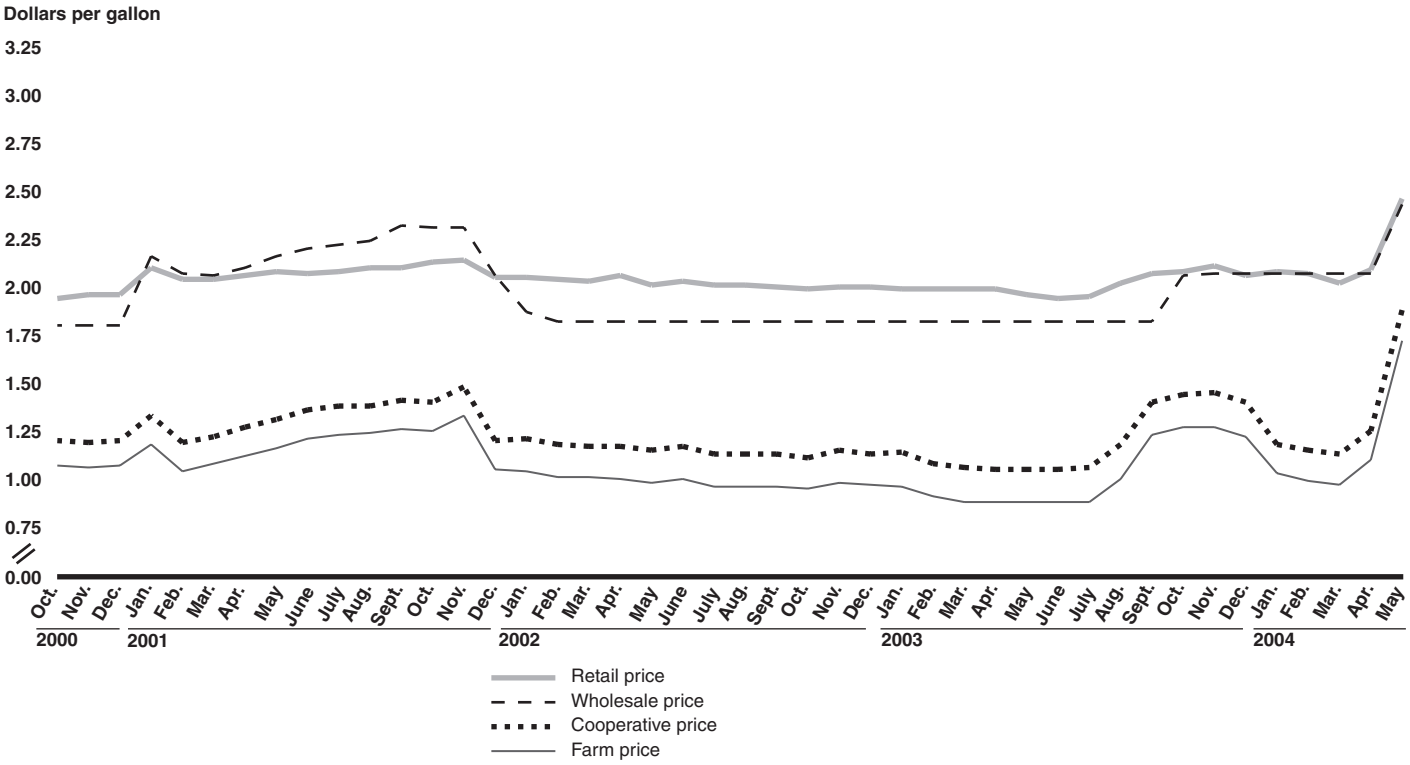
Figure 8: Farm, Cooperative, Wholesale, and Retail Prices for a Gallon of 2 Percent Milk for Miami, Florida, October 2000 through May 2004



Source: GAO analysis of data provided by USDA, the Defense Commissary Agency, and Information Resources, Inc.

Note: For Miami, Florida, the farm price is the USDA estimated farm Class I price adjusted to 2 percent milkfat content; the cooperative price is the announced cooperative Class I price for Miami adjusted to 2 percent milkfat content; the wholesale price is the price paid by the commissary at the Naval Air Station, Key West, adjusted for a 5 percent markup; and the retail price is the price collected by Information Resources, Inc., for the Miami market.

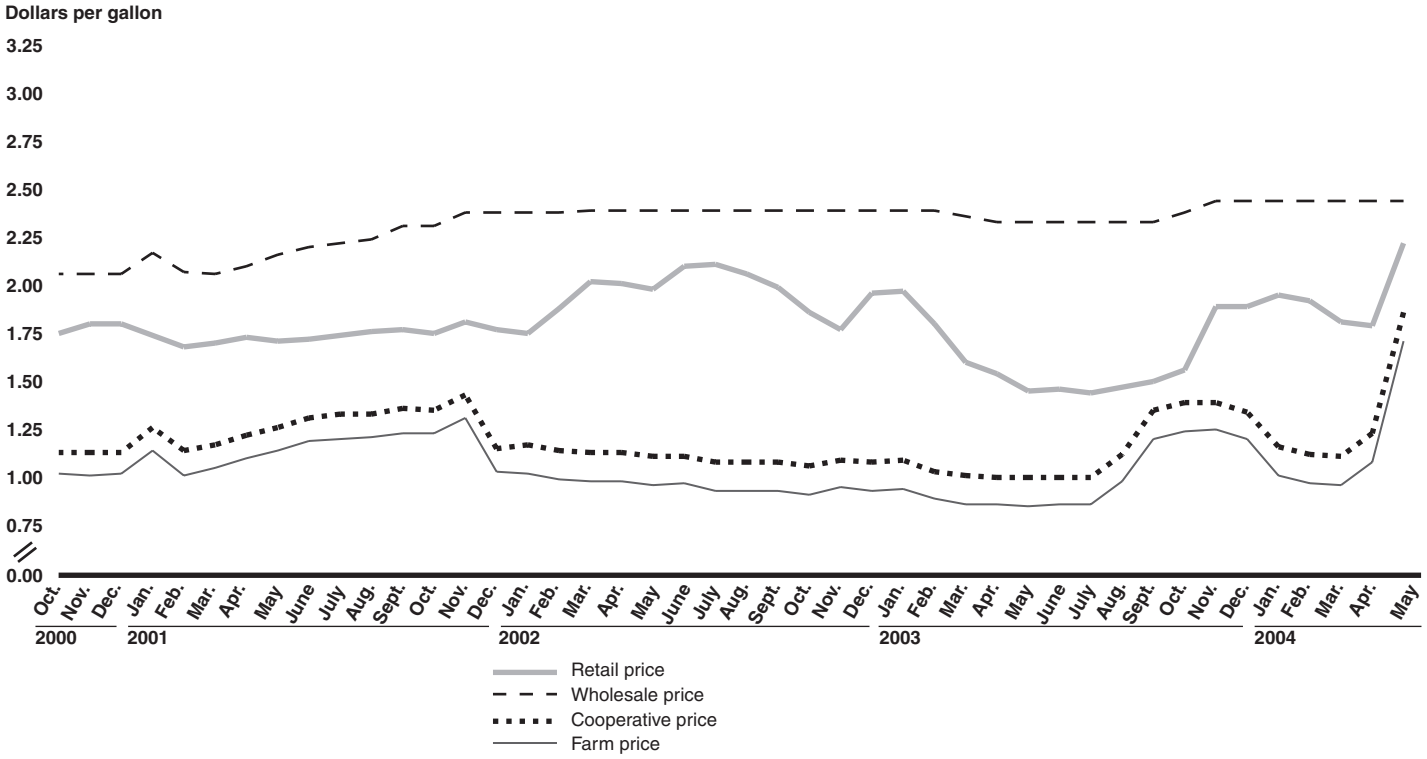
Figure 9: Farm, Cooperative, Wholesale, and Retail Prices for a Gallon of 2 Percent Milk for Milwaukee, Wisconsin, October 2000 through May 2004



Source: GAO analysis of data provided by USDA, the Defense Commissary Agency, and Information Resources, Inc.

Note: For Milwaukee, Wisconsin, the farm price is the USDA estimated farm Class I price adjusted to 2 percent milkfat content; the cooperative price is the announced cooperative Class I price for Milwaukee adjusted to 2 percent milkfat content; the wholesale price is the price paid by the commissary at the Naval Station Great Lakes, adjusted for a 5 percent markup; and the retail price is the price collected by Information Resources, Inc., for the Milwaukee market.

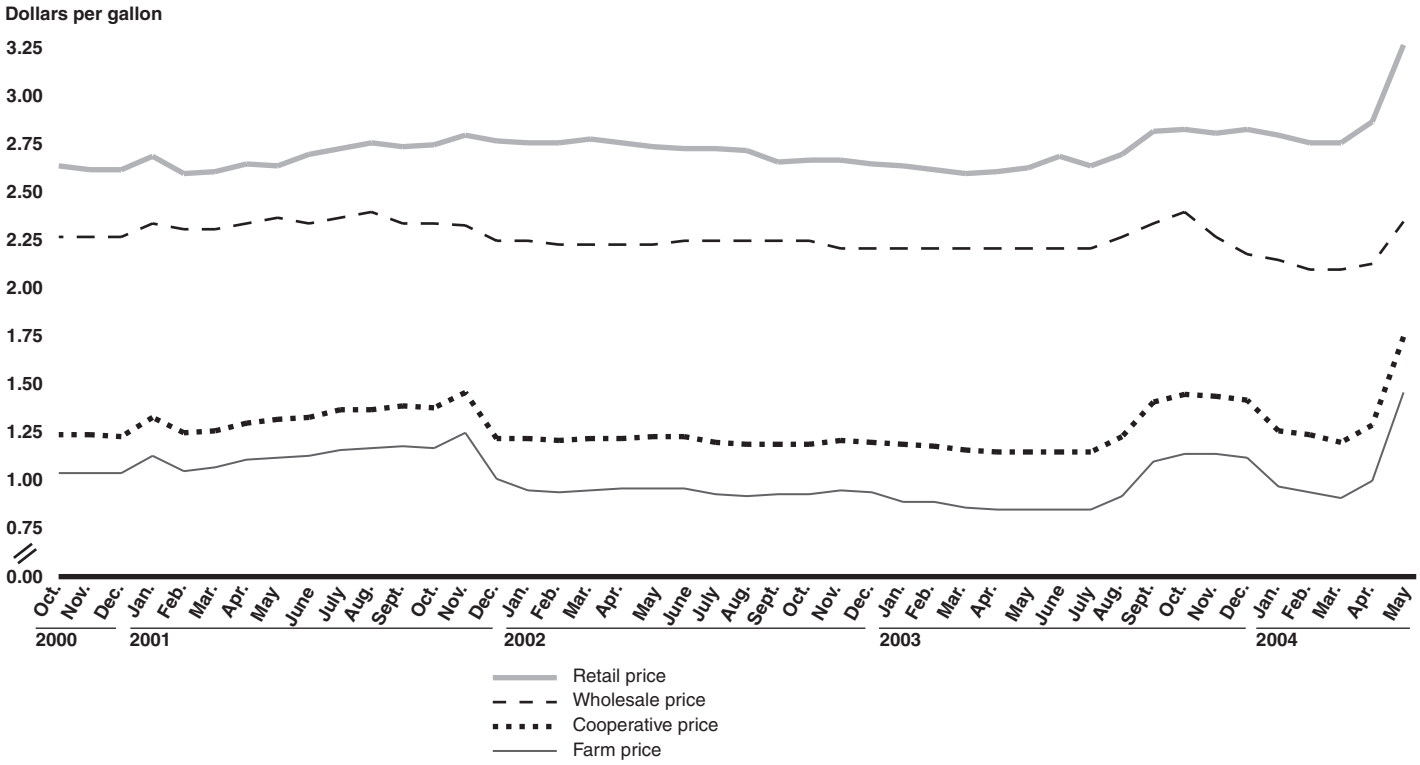
Figure 10: Farm, Cooperative, Wholesale, and Retail Prices for a Gallon of 2 Percent Milk for Minneapolis, Minnesota, October 2000 through May 2004



Source: GAO analysis of data provided by USDA, the Defense Commissary Agency, and Information Resources, Inc.

Note: For Minneapolis, Minnesota, the farm price is the USDA estimated farm Class I price adjusted to 2 percent milkfat content; the cooperative price is the announced cooperative Class I price for Minneapolis adjusted to 2 percent milkfat content; the wholesale price is the price paid by the commissary at Fort McCoy, adjusted for a 5 percent markup; and the retail price is the price collected by Information Resources, Inc., for the Minneapolis market.

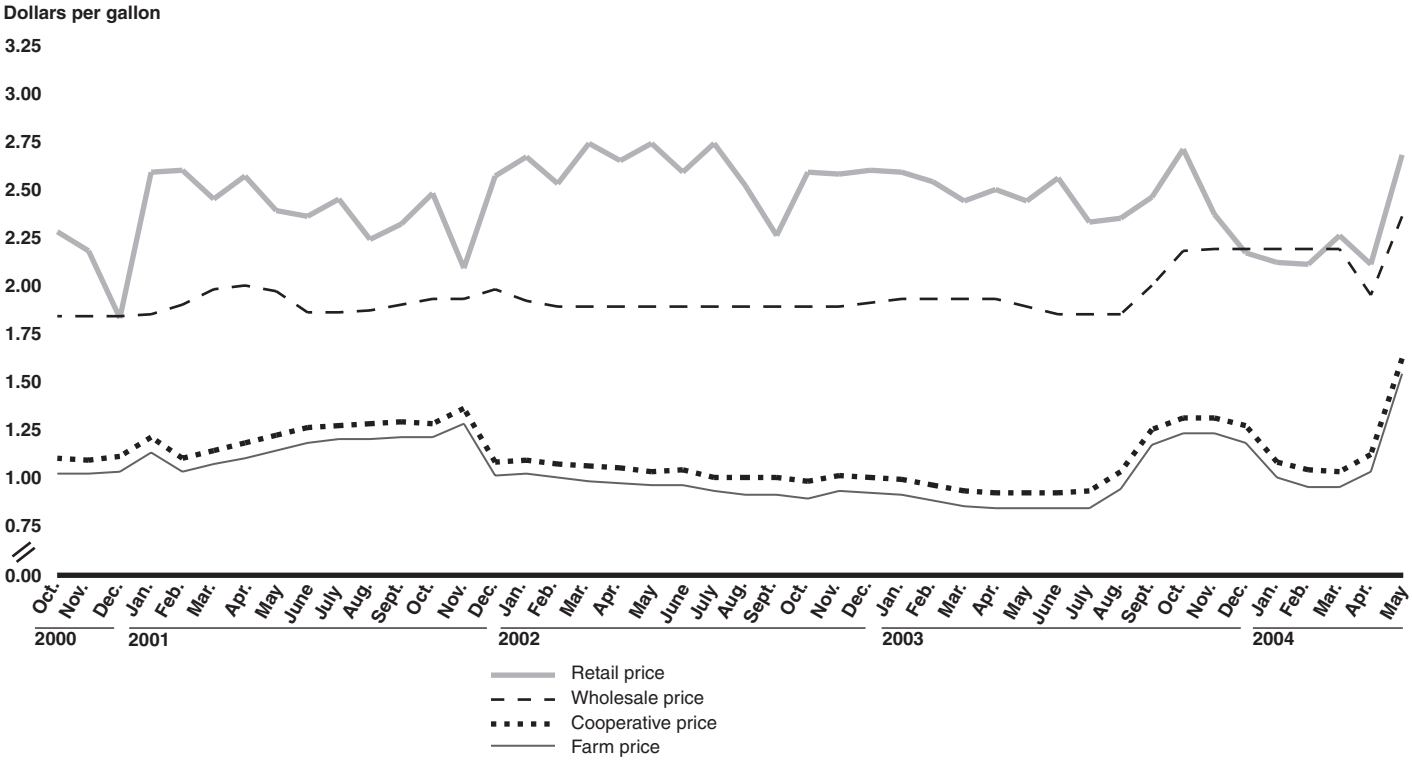
Figure 11: Farm, Cooperative, Wholesale, and Retail Prices for a Gallon of 2 Percent Milk for New Orleans, Louisiana, October 2000 through May 2004



Source: GAO analysis of data provided by USDA, the Defense Commissary Agency, and Information Resources, Inc.

Note: For New Orleans, Louisiana, the farm price is the USDA estimated farm Class I price adjusted to 2 percent milkfat content; the cooperative price is the announced cooperative Class I price for New Orleans adjusted to 2 percent milkfat content; the wholesale price is the average of the prices paid by the Naval Support Activities, New Orleans; the Naval Construction Battalion Center, Gulfport; and Keesler Air Force Base commissaries, adjusted for a 5 percent markup; and the retail price is the price collected by Information Resources, Inc., for the New Orleans market.

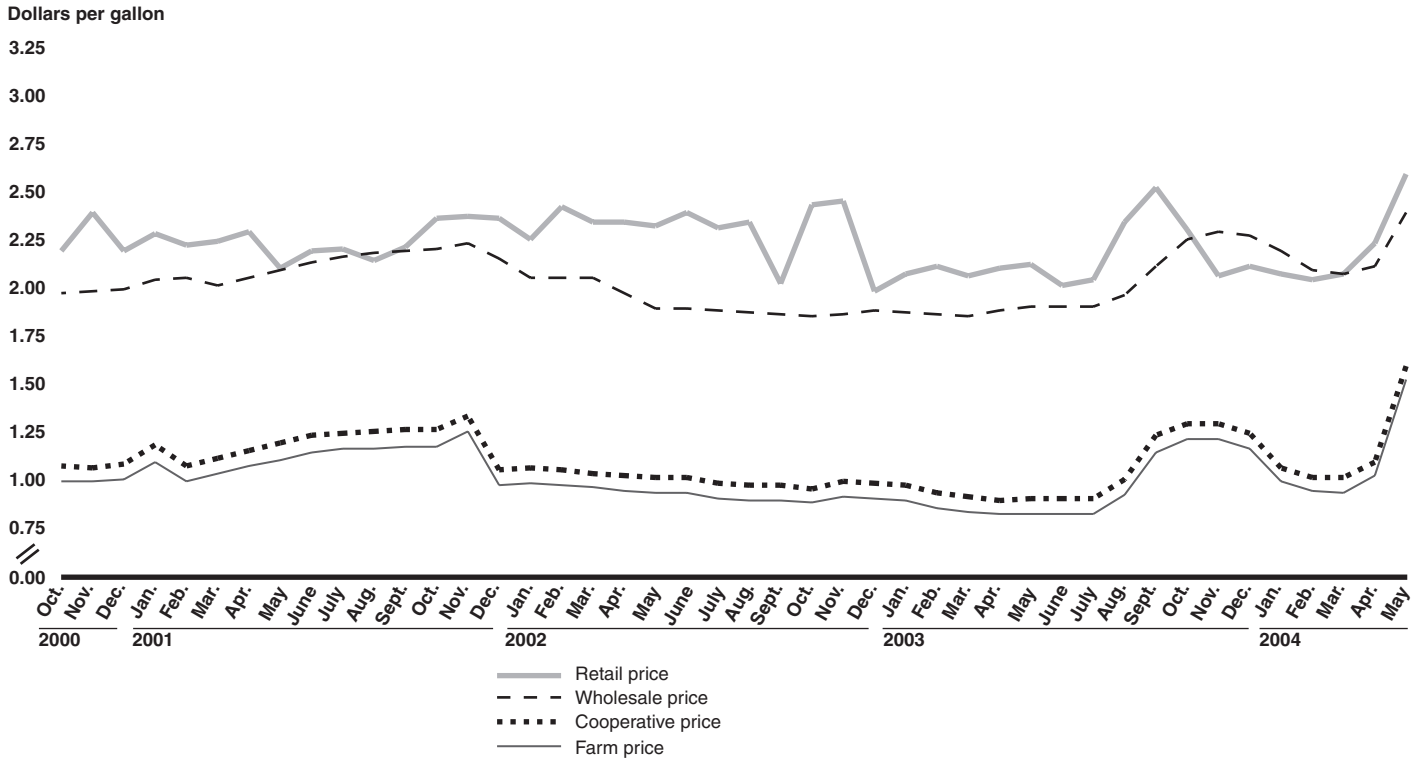
Figure 12: Farm, Cooperative, Wholesale, and Retail Prices for a Gallon of 2 Percent Milk for Phoenix, Arizona, October 2000 through May 2004



Source: GAO analysis of data provided by USDA, the Defense Commissary Agency, and Information Resources, Inc.

Note: For Phoenix, Arizona, the farm price is the USDA estimated farm Class I price adjusted to 2 percent milkfat content; the cooperative price is the announced cooperative Class I price for Phoenix adjusted to 2 percent milkfat content; the wholesale price is the average of the prices paid by the commissaries at Luke Air Force Base and Davis-Monthan Air Force Base, adjusted for a 5 percent markup; and the retail price is the price collected by Information Resources, Inc., for the Phoenix market.

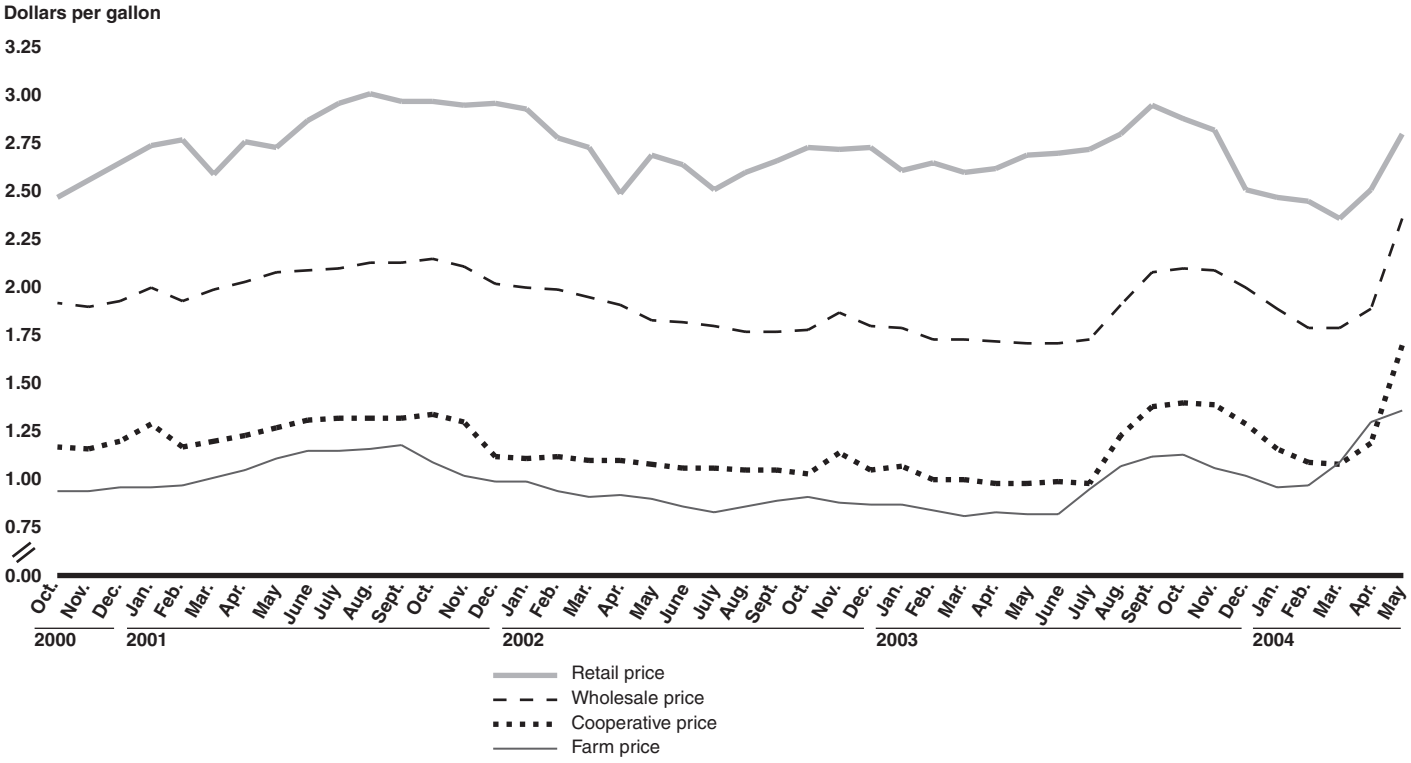
Figure 13: Farm, Cooperative, Wholesale, and Retail Prices for a Gallon of 2 Percent Milk for Salt Lake City, Utah, October 2000 through May 2004



Source: GAO analysis of data provided by USDA, the Defense Commissary Agency, and Information Resources, Inc.

Note: For Salt Lake City, Utah, the farm price is the USDA estimated farm Class I price adjusted to 2 percent milkfat content; the cooperative price is the announced cooperative Class I price for Salt Lake City adjusted to 2 percent milkfat content; the wholesale price is the price paid by the commissary at Hill Air Force Base, adjusted for a 5 percent markup; and the retail price is the price collected by Information Resources, Inc., for the Salt Lake City market.

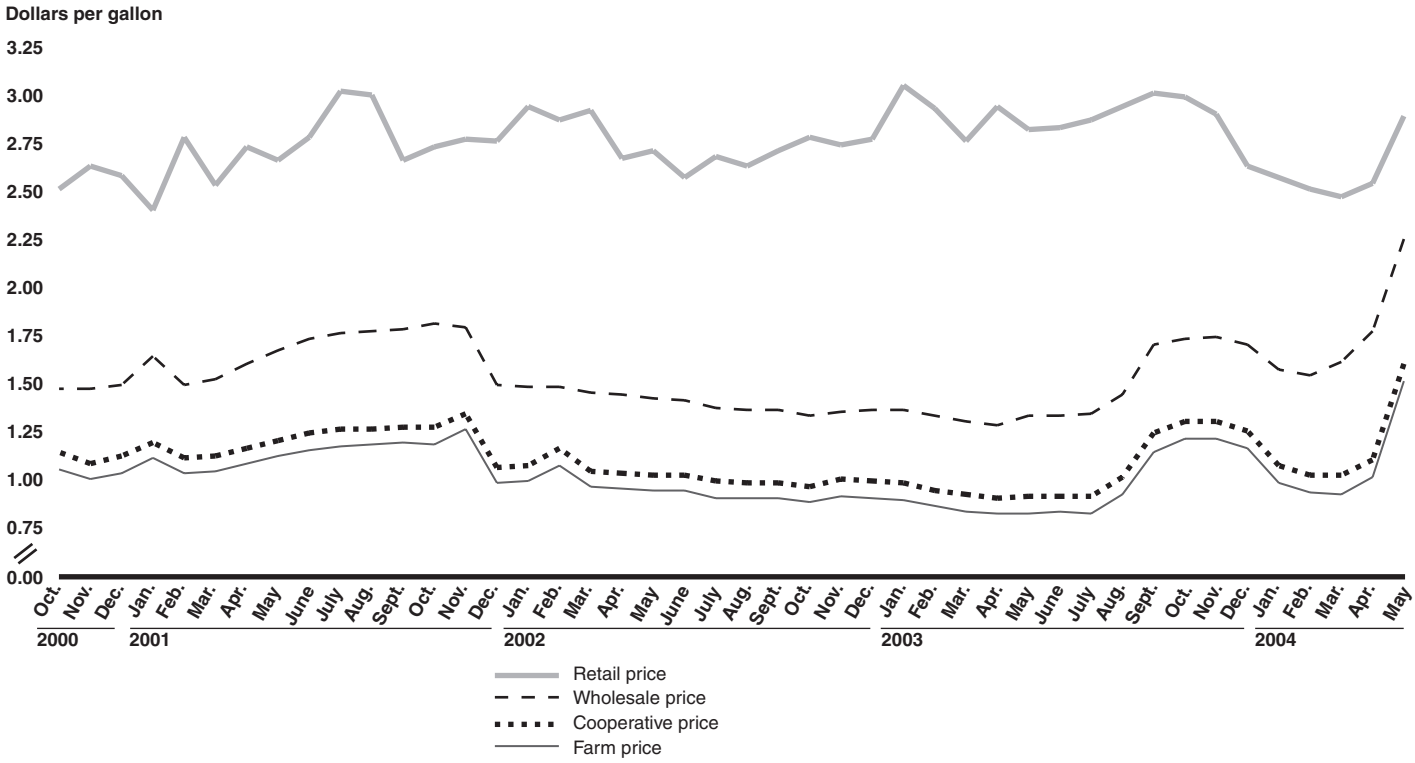
Figure 14: Farm, Cooperative, Wholesale, and Retail Prices for a Gallon of 2 Percent Milk for San Diego, California, October 2000 through May 2004



Source: GAO analysis of data provided by the California Department of Food and Agriculture, the Defense Commissary Agency, and Information Resources, Inc.

Note: For San Diego, California, the farm price is the California Department of Food and Agriculture mailbox price adjusted to 2 percent milkfat content; the cooperative price is the Southern California Class I price adjusted to 2 percent milkfat content; the wholesale price is the average of the prices paid by the commissaries at the Naval Base, San Diego; Marine Corps Base, Camp Pendleton; Naval Outlying Landing Field, Imperial Beach; Marine Corps Air Station, Miramar; Naval Air Station, North Island; and by the San Onofre Commissary, Camp Pendleton, adjusted for a 5 percent markup; and the retail price is the price collected by Information Resources, Inc., for the San Diego market.

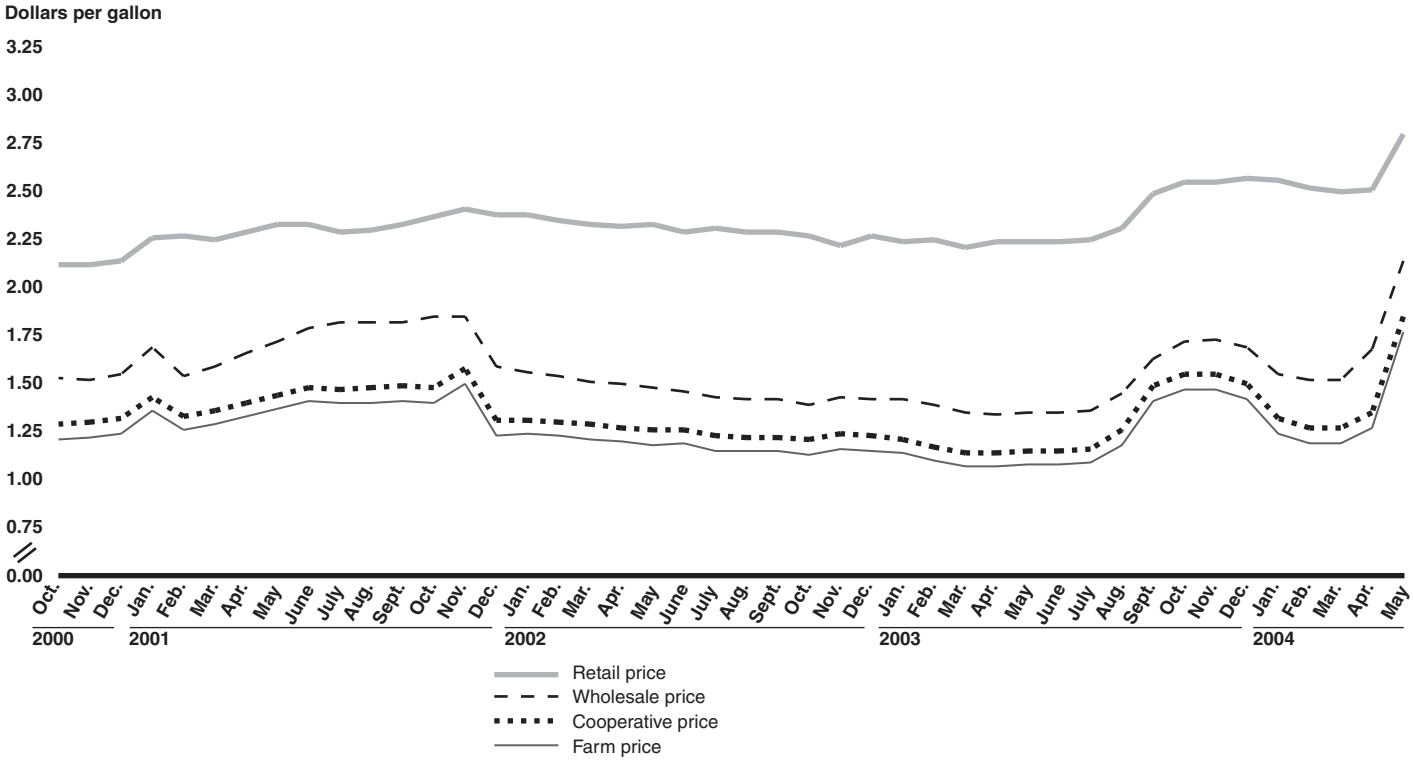
Figure 15: Farm, Cooperative, Wholesale, and Retail Prices for a Gallon of 2 Percent Milk for Seattle, Washington, October 2000 through May 2004



Source: GAO analysis of data provided by USDA, the Defense Commissary Agency, and Information Resources, Inc.

Note: For Seattle, Washington, the farm price is the USDA estimated farm Class I price adjusted to 2 percent milkfat content; the cooperative price is the announced cooperative Class I price for Seattle adjusted to 2 percent milkfat content; the wholesale price is the average of the prices paid by the commissaries at the Naval Station Everett, Smokey Point Support Center; Fort Lewis; and McChord Air Force Base, adjusted for a 5 percent markup; and the retail price is the price collected by Information Resources, Inc., for the Seattle market.

Figure 16: Farm, Cooperative, Wholesale, and Retail Prices for a Gallon of 2 Percent Milk for Washington, D.C., October 2000 through May 2004



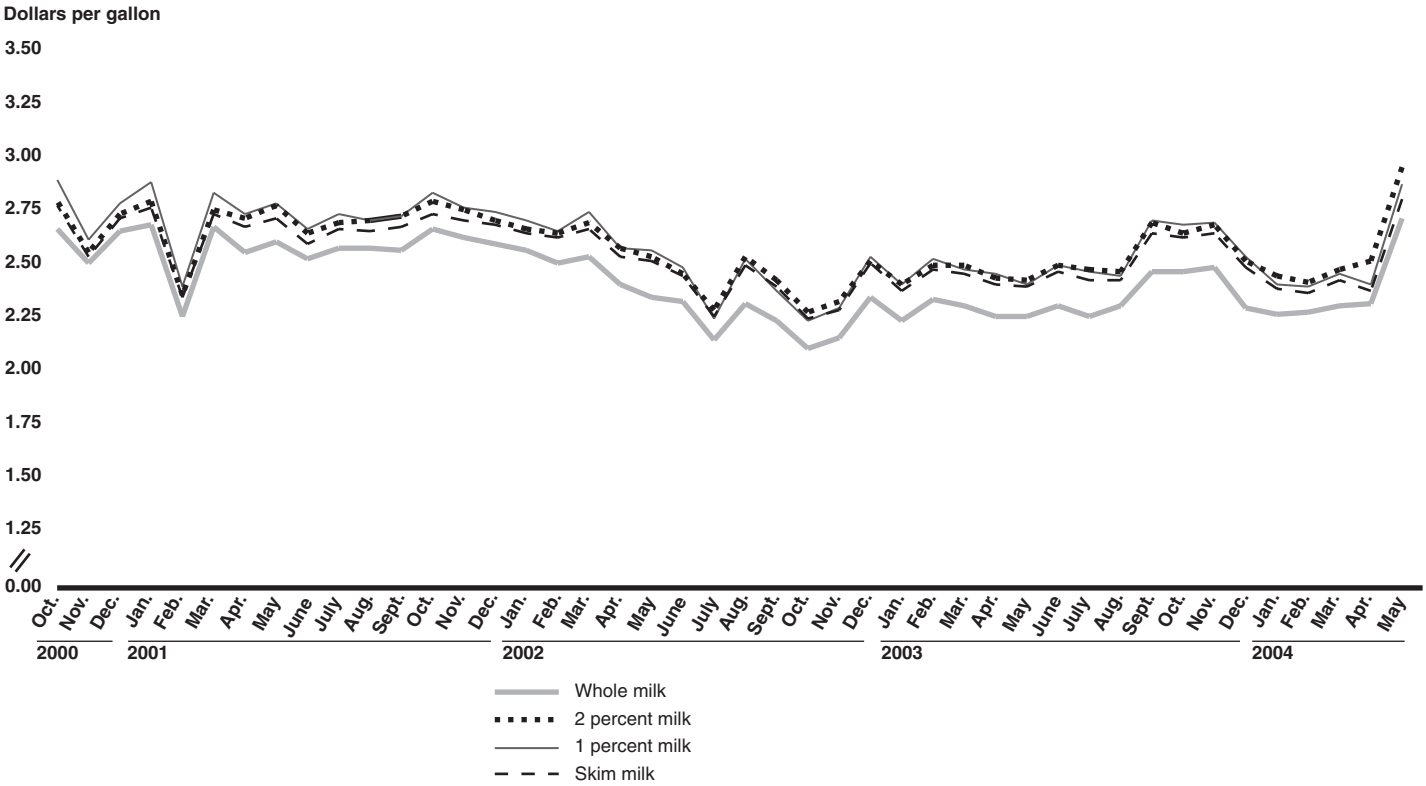
Source: GAO analysis of data provided by USDA, the Defense Commissary Agency, and Information Resources, Inc.

Note: For Washington, D.C., the farm price is the USDA estimated farm Class I price adjusted to 2 percent milkfat content; the cooperative price is the announced cooperative Class I price for Washington, D.C., adjusted to 2 percent milkfat content; the wholesale price is the average of the prices paid by the commissaries at Bolling Air Force Base; Walter Reed Army Medical Center; Fort Myer; Fort Belvoir; the Marine Corps Base, Quantico; Andrews Air Force Base; Aberdeen Proving Ground; the Naval Station, Annapolis; Fort Meade; and Fort Detrick, adjusted for a 5 percent markup; and the retail price is the price collected by Information Resources, Inc., for the Washington, D.C., market.

Retail Prices for Four Kinds of Milk in Selected Markets

This appendix updates information provided in our June 2001 report on the average retail prices for whole, 2 percent, 1 percent, and skim milk in 15 selected markets for October 2000 through May 2004. We found that retail pricing patterns varied significantly across markets. For example, in the Boston market from October 2000 through May 2004, the average price for 2 percent milk was generally the same as the average price for 1 percent milk; however, whole and skim milk prices were generally lower. On the other hand, for this period in the San Diego market, the average price of 2 percent milk was generally lower than the prices of whole and 1 percent milk, but higher than skim milk prices. Figures 17 through 31 provide information on the average retail price for the four kinds of milk in the 15 selected markets for October 2000 through May 2004.

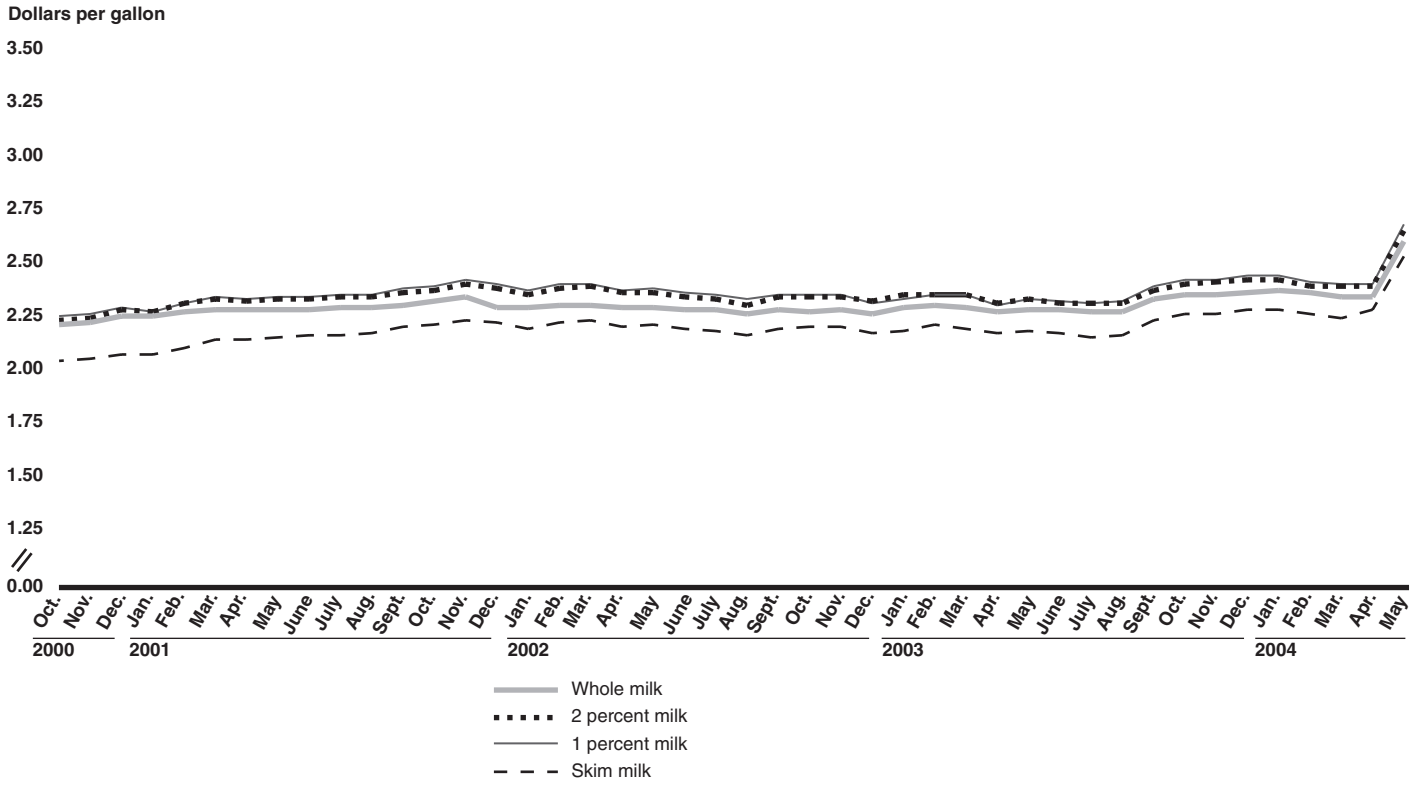
Figure 17: Retail Prices in Atlanta, Georgia, for Whole, 2 Percent, 1 Percent, and Skim Milk, October 2000 through May 2004



Source: GAO analysis of data provided by Information Resources, Inc.

Note: The retail price is the price collected by Information Resources, Inc., for the Atlanta market.

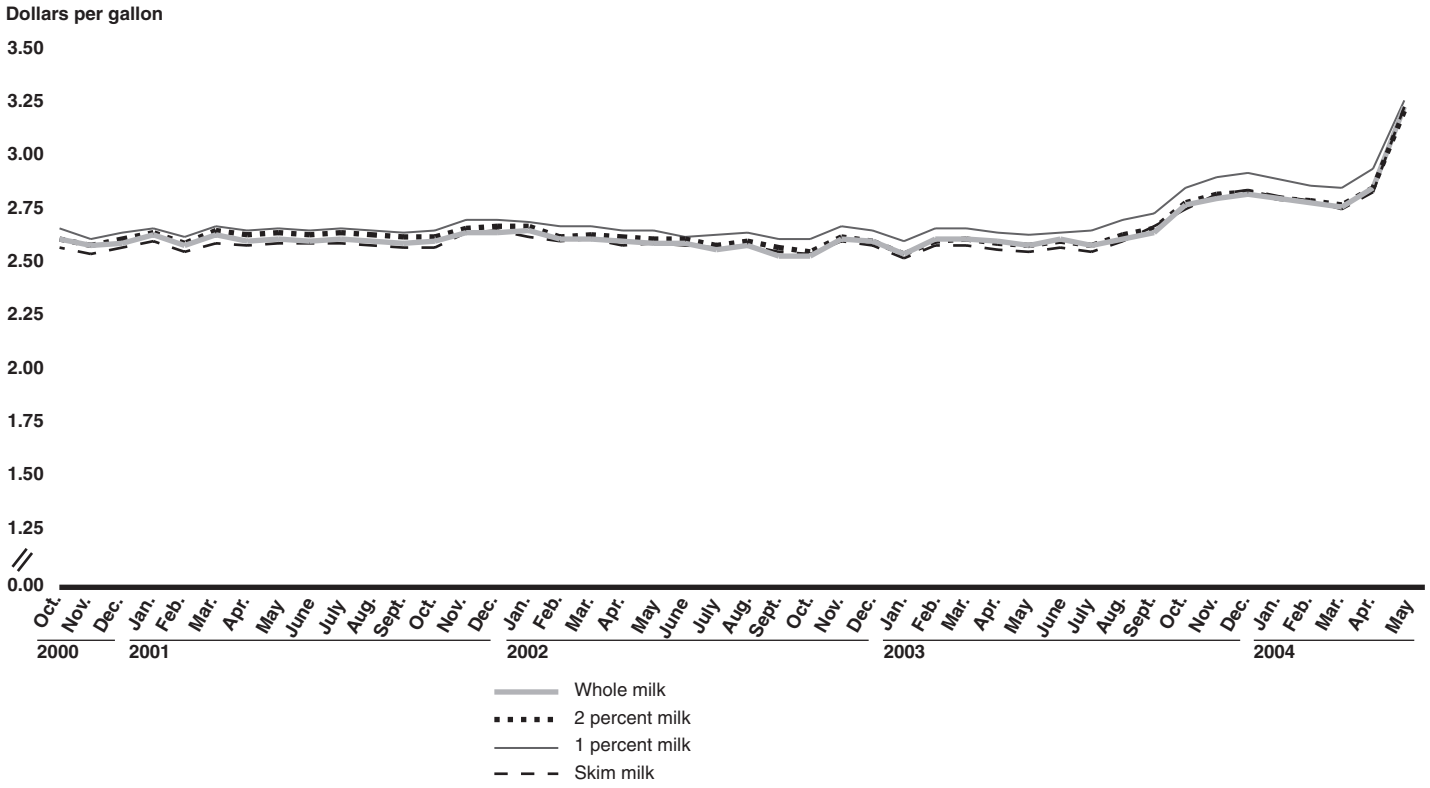
Figure 18: Retail Prices in Boston, Massachusetts, for Whole, 2 Percent, 1 Percent, and Skim Milk, October 2000 through May 2004



Source: GAO analysis of data provided by Information Resources, Inc.

Note: The retail price is the price collected by Information Resources, Inc., for the Boston market.

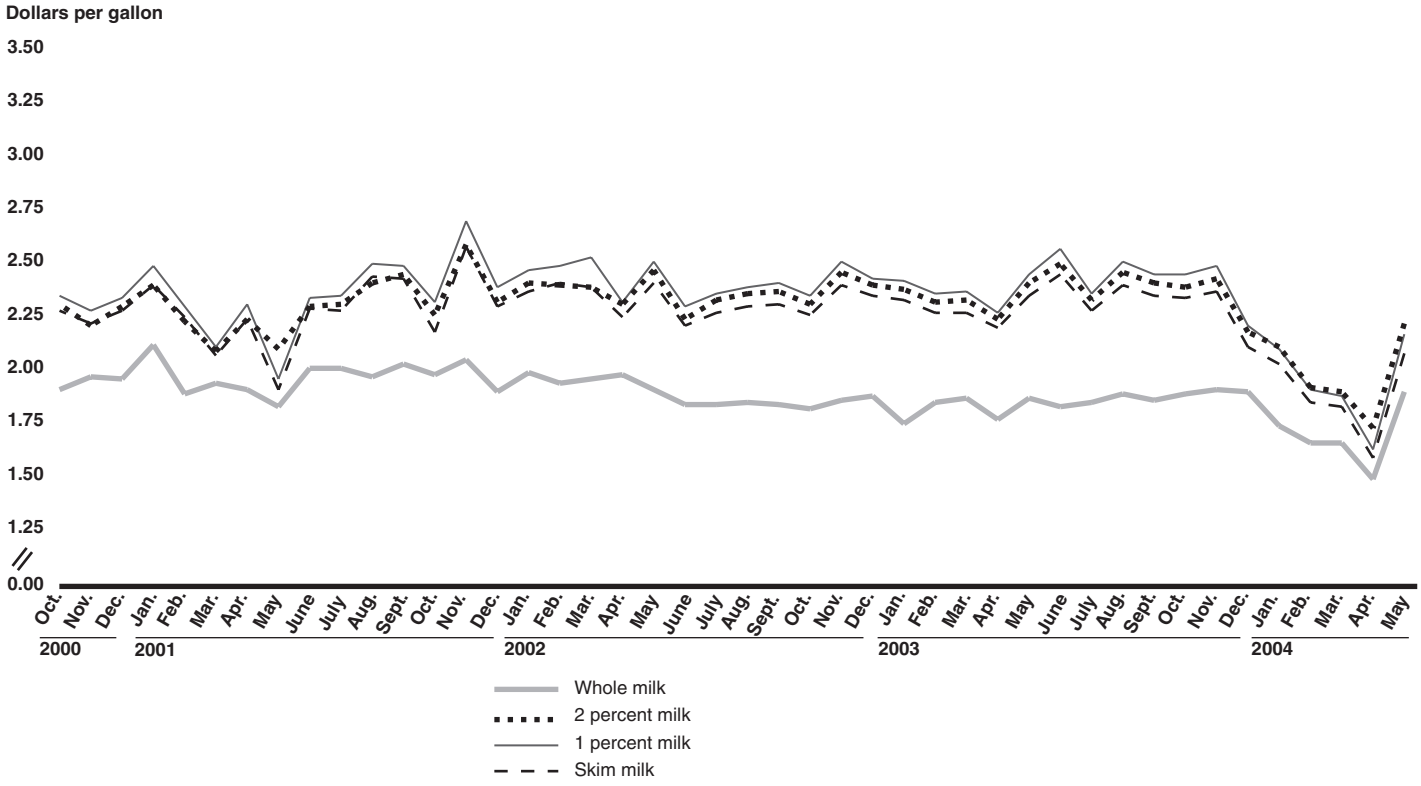
Figure 19: Retail Prices in Charlotte, North Carolina, for Whole, 2 Percent, 1 Percent, and Skim Milk, October 2000 through May 2004



Source: GAO analysis of data provided by Information Resources, Inc.

Note: The retail price is the price collected by Information Resources, Inc., for the Charlotte market.

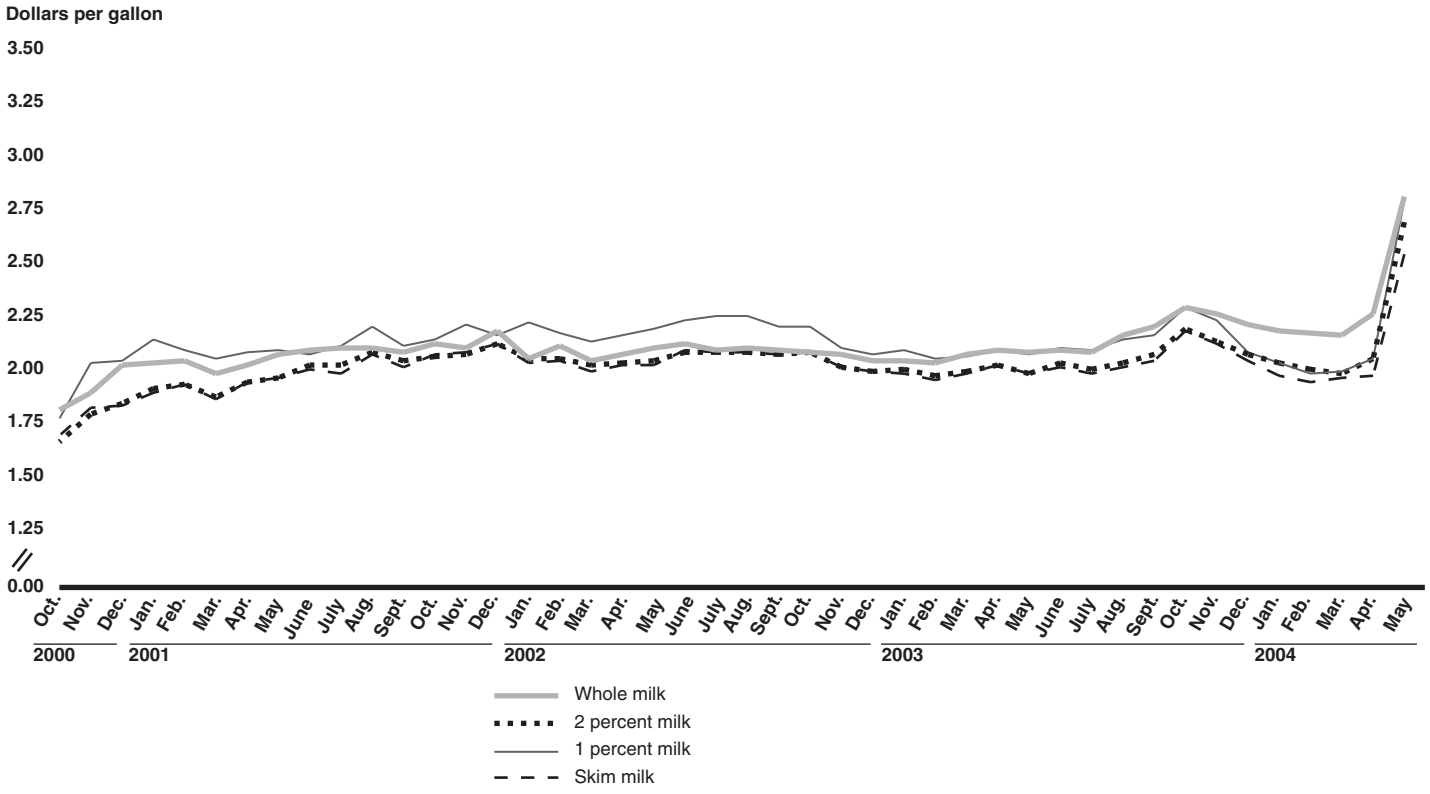
Figure 20: Retail Prices in Cincinnati, Ohio, for Whole, 2 Percent, 1 Percent, and Skim Milk, October 2000 through May 2004



Source: GAO analysis of data provided by Information Resources, Inc.

Note: The retail price is the price collected by Information Resources, Inc., for the Cincinnati market.

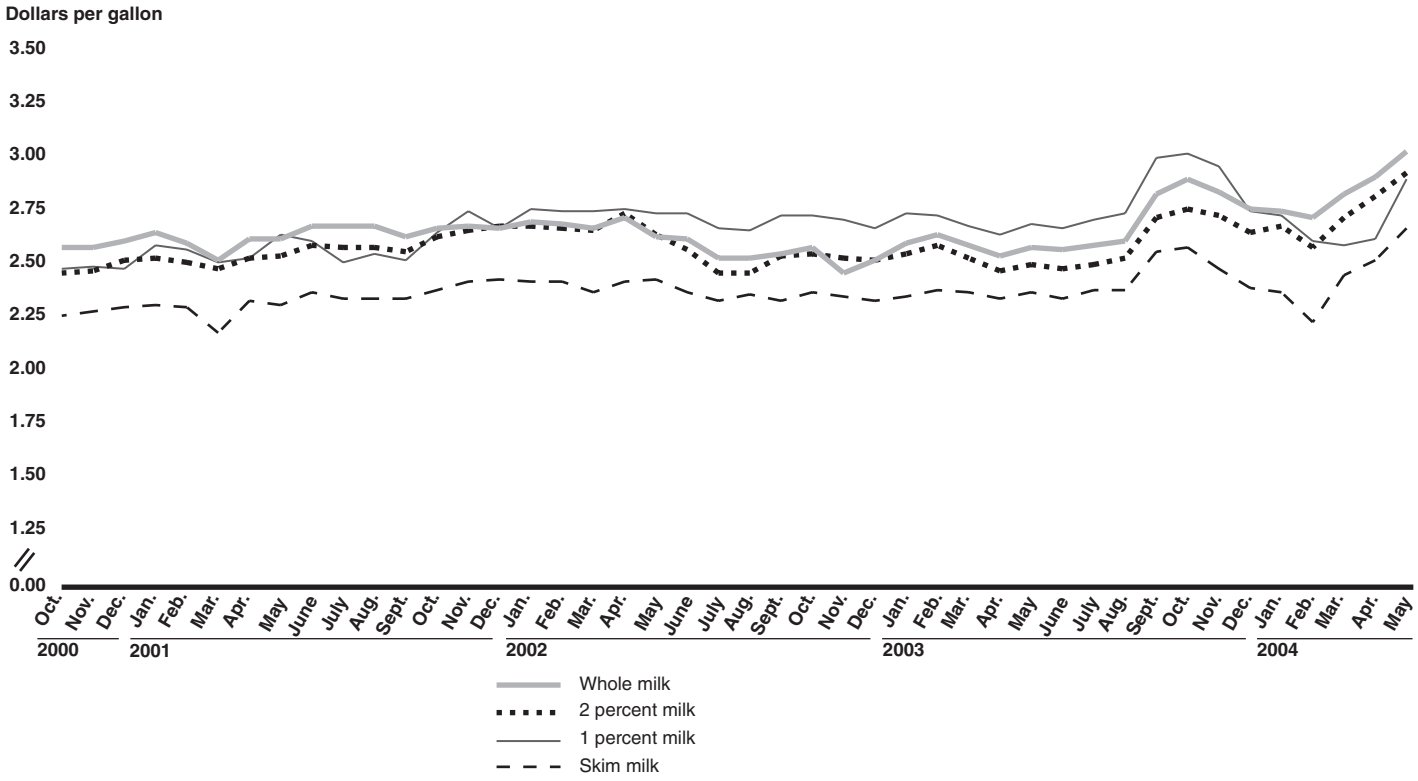
Figure 21: Retail Prices in Dallas, Texas, for Whole, 2 Percent, 1 Percent, and Skim Milk, October 2000 through May 2004



Source: GAO analysis of data provided by Information Resources, Inc.

Note: The retail price is the price collected by Information Resources, Inc., for the Dallas market.

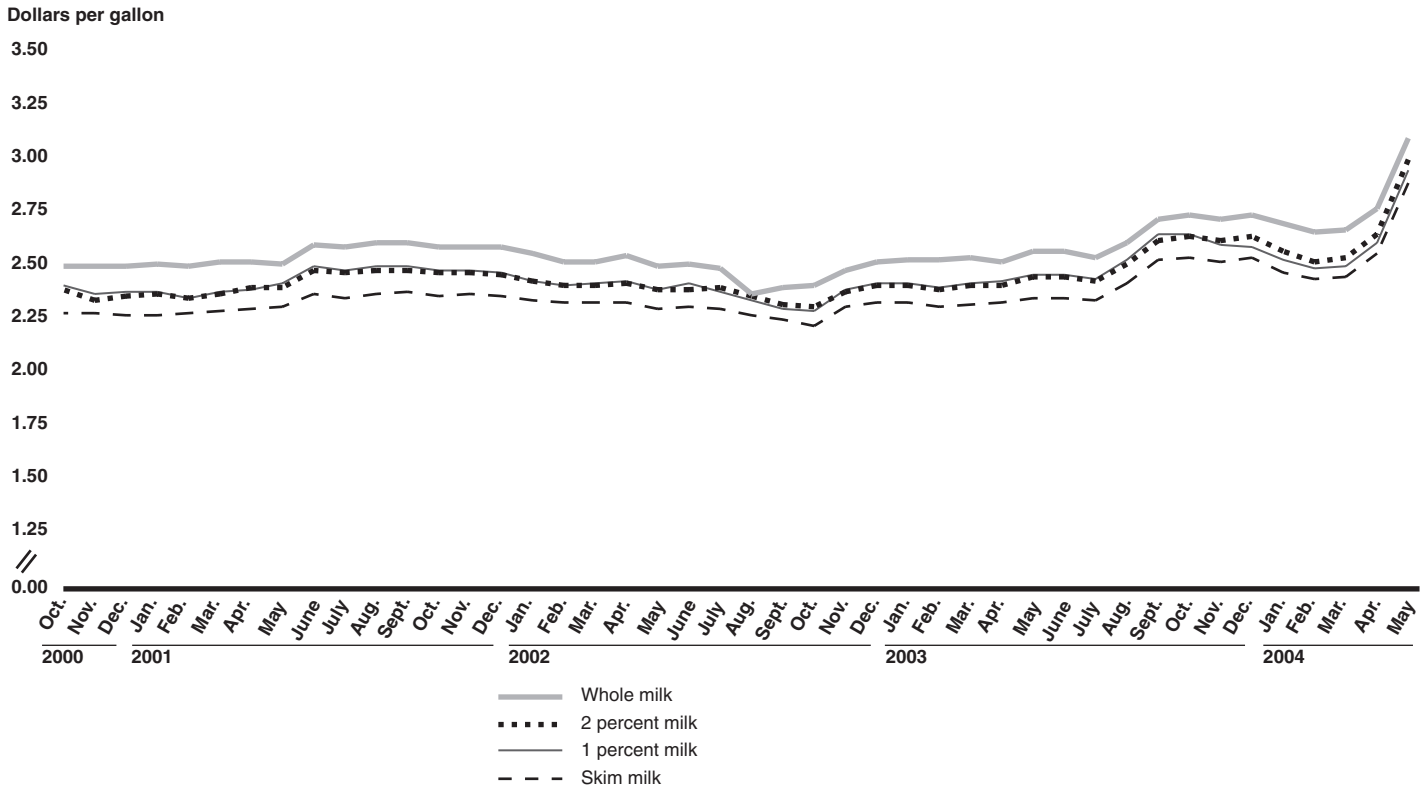
Figure 22: Retail Prices in Denver, Colorado, for Whole, 2 Percent, 1 Percent, and Skim Milk, October 2000 through May 2004



Source: GAO analysis of data provided by Information Resources, Inc.

Note: The retail price is the price collected by Information Resources, Inc., for the Denver market.

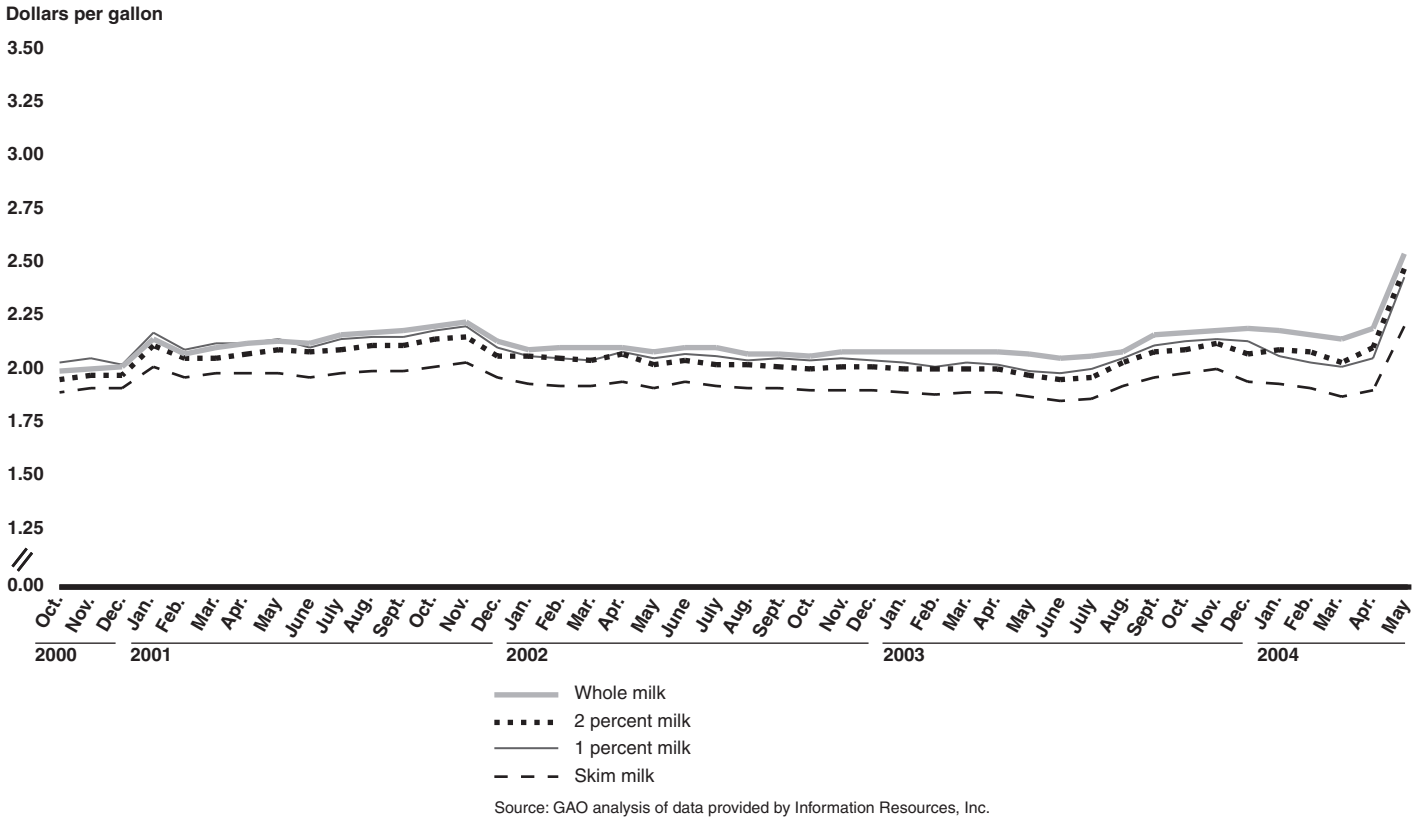
Figure 23: Retail Prices in Miami, Florida, for Whole, 2 Percent, 1 Percent, and Skim Milk, October 2000 through May 2004



Source: GAO analysis of data provided by Information Resources, Inc.

Note: The retail price is the price collected by Information Resources, Inc., for the Miami market.

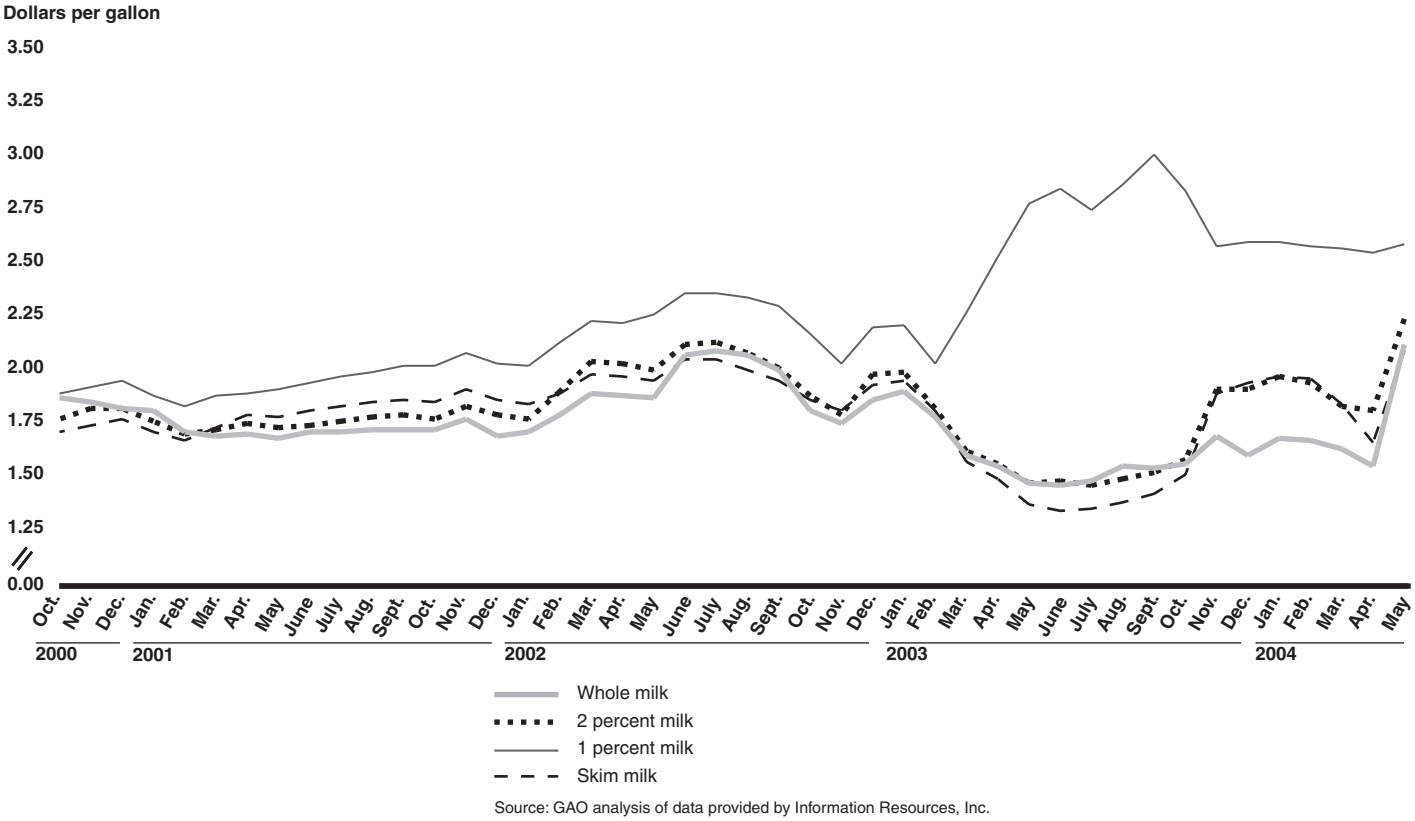
Figure 24: Retail Prices in Milwaukee, Wisconsin, for Whole, 2 Percent, 1 Percent, and Skim Milk, October 2000 through May 2004



Source: GAO analysis of data provided by Information Resources, Inc.

Note: The retail price is the price collected by Information Resources, Inc., for the Milwaukee market.

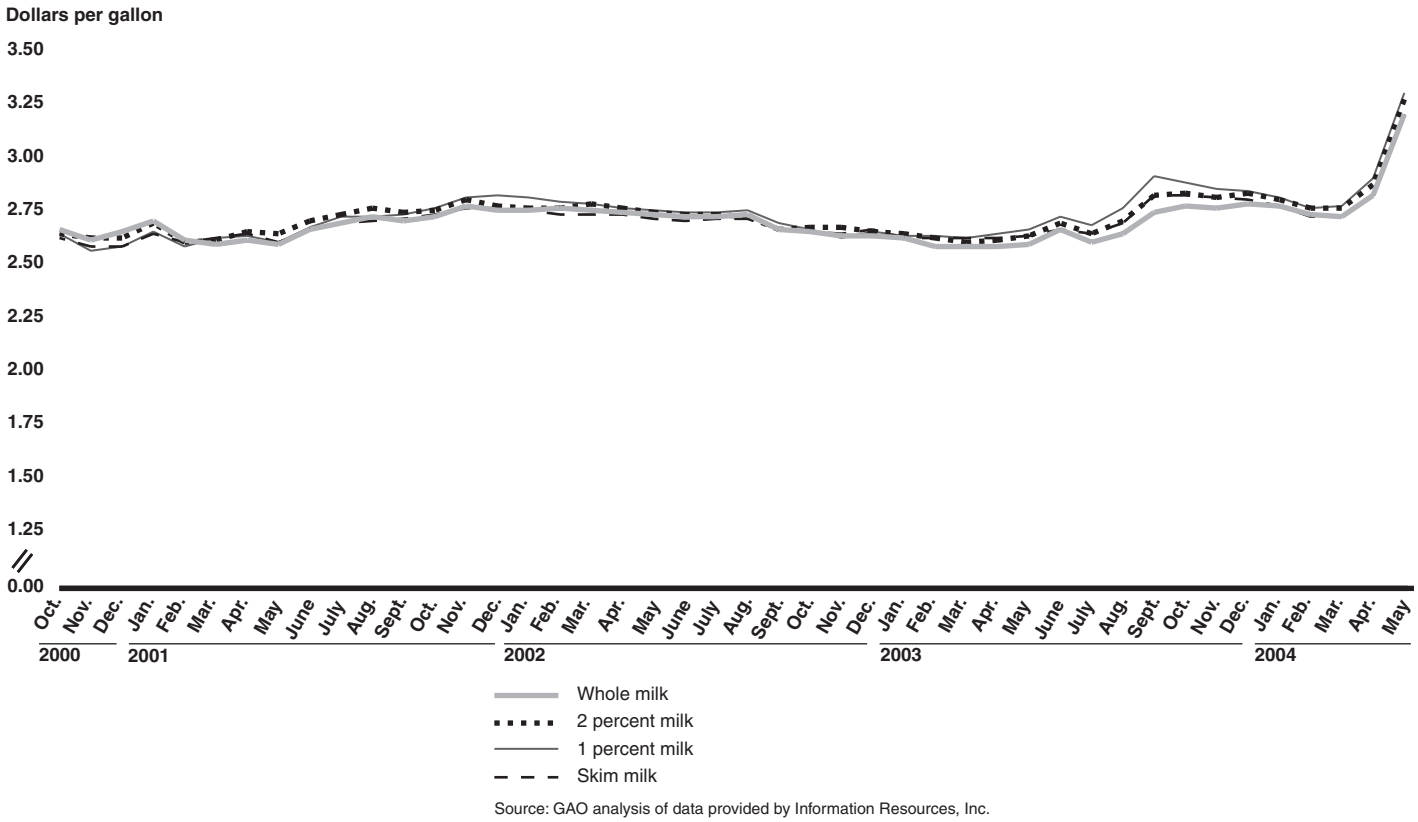
Figure 25: Retail Prices in Minneapolis, Minnesota, for Whole, 2 Percent, 1 Percent, and Skim Milk, October 2000 through May 2004



Source: GAO analysis of data provided by Information Resources, Inc.

Note: The retail price is the price collected by Information Resources, Inc., for the Minneapolis market.

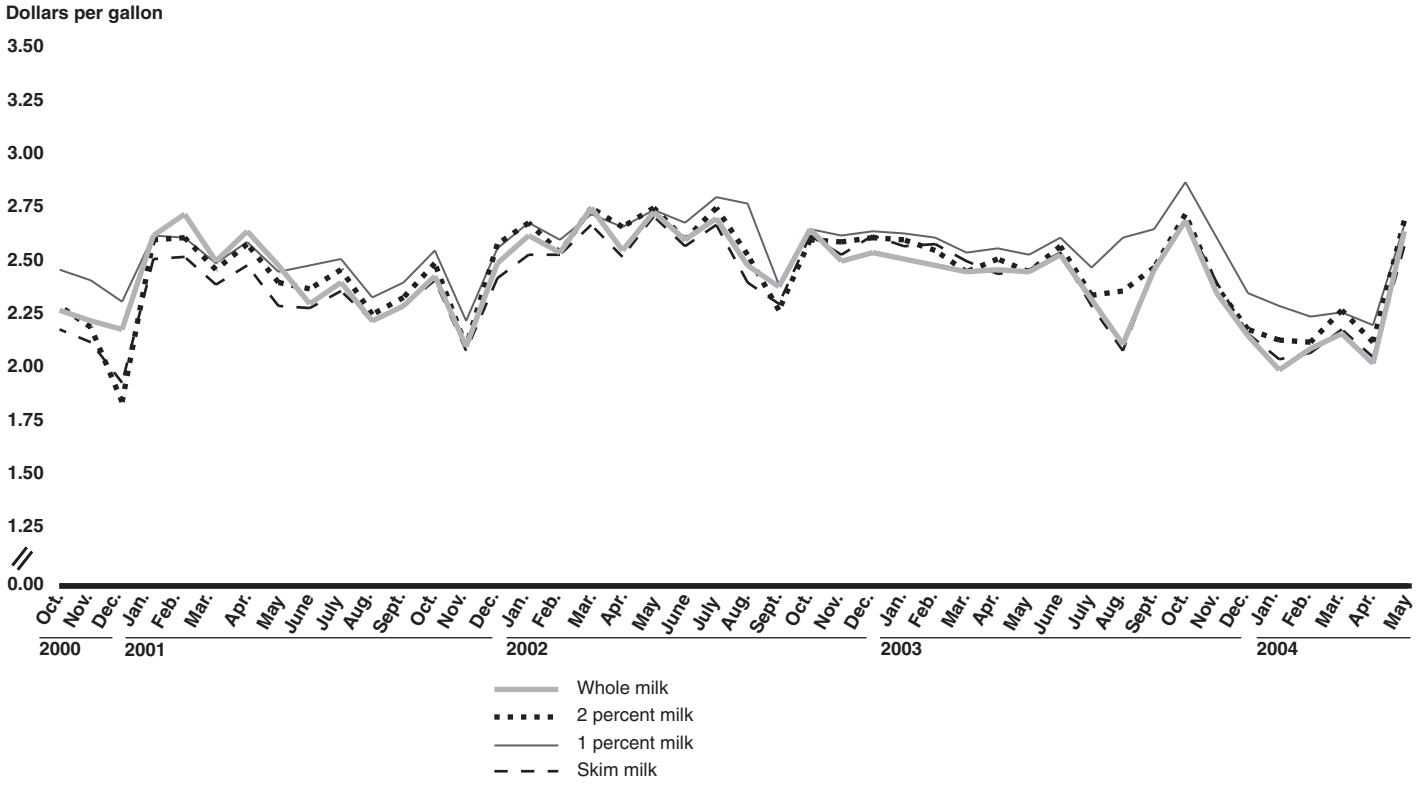
Figure 26: Retail Prices in New Orleans, Louisiana, for Whole, 2 Percent, 1 Percent, and Skim Milk, October 2000 through May 2004



Source: GAO analysis of data provided by Information Resources, Inc.

Note: The retail price is the price collected by Information Resources, Inc., for the New Orleans market.

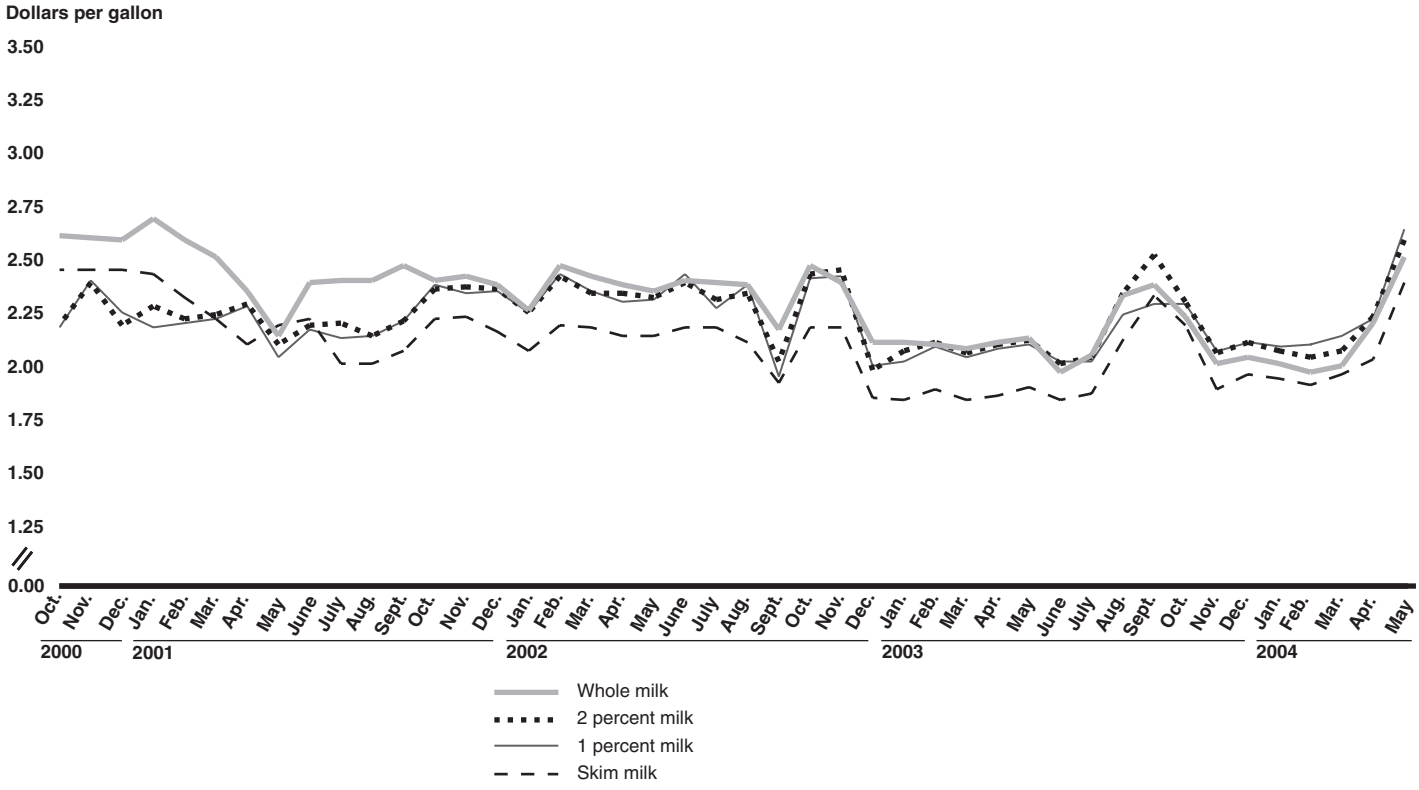
Figure 27: Retail Prices in Phoenix, Arizona, for Whole, 2 Percent, 1 Percent, and Skim Milk, October 2000 through May 2004



Source: GAO analysis of data provided by Information Resources, Inc.

Note: The retail price is the price collected by Information Resources, Inc., for the Phoenix market.

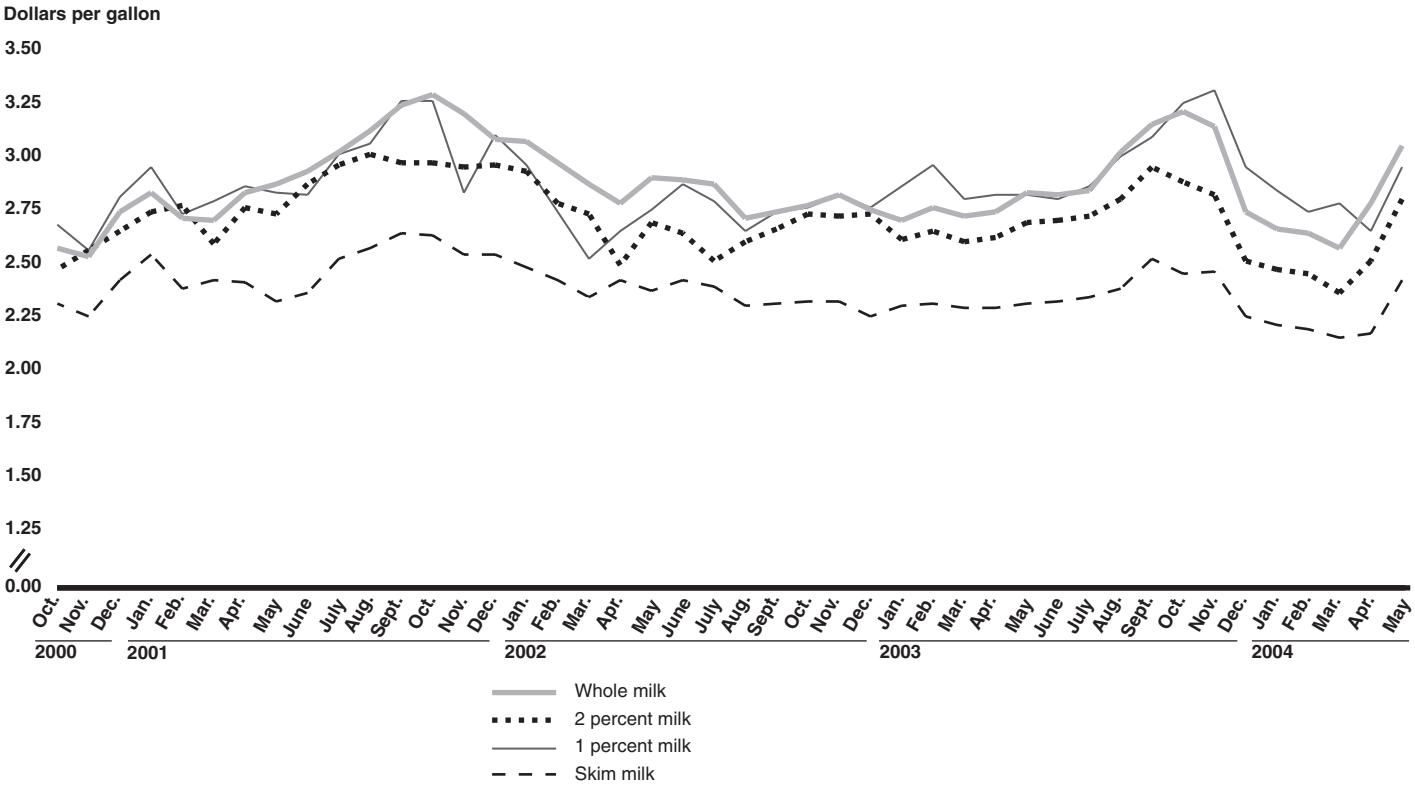
Figure 28: Retail Prices in Salt Lake City, Utah, for Whole, 2 Percent, 1 Percent, and Skim Milk, October 2000 through May 2004



Source: GAO analysis of data provided by Information Resources, Inc.

Note: The retail price is the price collected by Information Resources, Inc., for the Salt Lake City market.

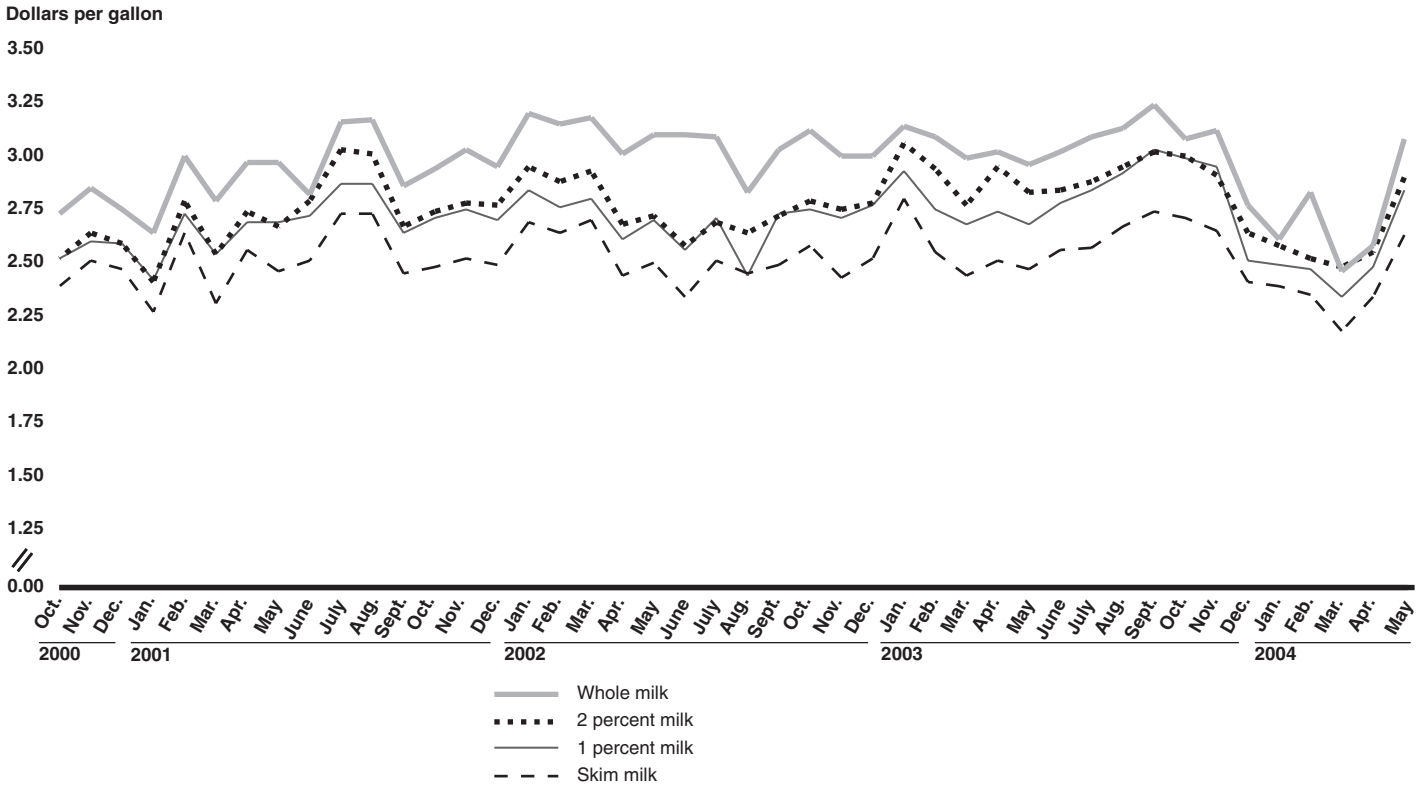
Figure 29: Retail Prices in San Diego, California, for Whole, 2 Percent, 1 Percent, and Skim Milk, October 2000 through May 2004



Source: GAO analysis of data provided by Information Resources, Inc.

Note: The retail price is the price collected by Information Resources, Inc., for the San Diego market.

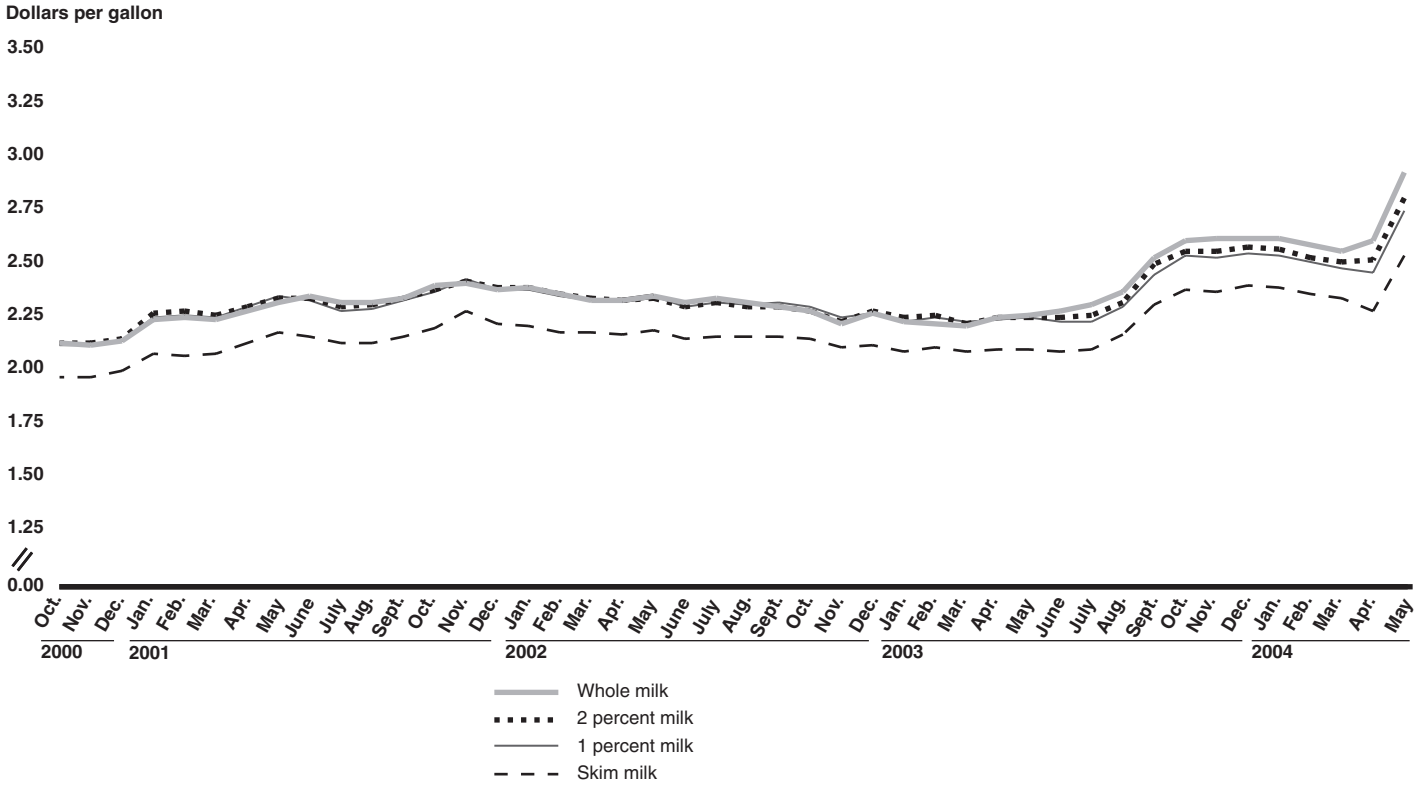
Figure 30: Retail Prices in Seattle, Washington, for Whole, 2 Percent, 1 Percent, and Skim Milk, October 2000 through May 2004



Source: GAO analysis of data provided by Information Resources, Inc.

Note: The retail price is the price collected by Information Resources, Inc., for the Seattle market.

Figure 31: Retail Prices in Washington, D.C., for Whole, 2 Percent, 1 Percent, and Skim Milk, October 2000 through May 2004



Source: GAO analysis of data provided by Information Resources, Inc.

Note: The retail price is the price collected by Information Resources, Inc., for the Washington, D.C., market.

Average Monthly and Annual Farm, Cooperative, Wholesale and Retail Milk Prices in Selected Markets

This appendix updates information provided in our June 2001 report on average monthly and annual farm and cooperative prices of raw milk and on the average monthly and annual wholesale and retail prices for a gallon of whole, 2 percent, 1 percent, and skim milk. Tables 11 through 25 provide these data for 15 selected markets over the period October 2000 through May 2004.

Table 11: Prices for a Gallon of Milk in Atlanta, Georgia, October 2000 through May 2004

				Wholesale				Retail			
Year	**Month**	**Farm**	**Cooperative**	**Whole**	**2%**	**1%**	**Skim**	**Whole**	**2%**	**1%**	**Skim**
2000	Oct.	$1.20	$1.41	$2.16	$2.04	$2.01	$1.99	$2.64	$2.77	$2.87	$2.75
	Nov.	1.20	1.40	2.16	2.04	2.01	1.99	2.48	2.53	2.59	2.51
	Dec.	1.21	1.41	2.16	2.04	2.01	1.99	2.63	2.71	2.76	2.69
	Avg.	1.20	1.41	2.16	2.04	2.01	1.99	2.58	2.67	2.74	2.65
2001	Jan.	1.37	1.57	2.21	2.42	N/A	2.04	2.66	2.77	2.86	2.74
	Feb.	1.21	1.41	2.17	2.45	N/A	2.07	2.23	2.33	2.37	2.32
	Mar.	1.25	1.45	2.17	2.45	N/A	2.07	2.65	2.73	2.81	2.71
	Apr.	1.32	1.52	2.17	2.45	N/A	2.07	2.53	2.69	2.71	2.65
	May	1.37	1.58	2.17	2.45	2.05	2.07	2.58	2.75	2.76	2.69
	June	1.41	1.61	2.20	2.47	2.05	2.10	2.50	2.62	2.64	2.57
	July	1.45	1.66	2.22	2.52	2.05	2.13	2.55	2.67	2.71	2.64
	Aug.	1.46	1.66	2.22	2.54	2.05	2.13	2.55	2.68	2.68	2.63
	Sept.	1.47	1.68	2.22	2.56	2.05	2.13	2.54	2.70	2.70	2.65
	Oct.	1.50	1.71	2.22	2.56	2.05	2.13	2.64	2.77	2.81	2.71
	Nov.	1.49	1.69	2.22	2.56	2.08	2.13	2.60	2.73	2.74	2.68
	Dec.	1.20	1.41	2.22	2.56	2.08	2.13	2.57	2.68	2.72	2.66
	Avg.	1.38	1.58	2.20	2.50	2.06	2.10	2.55	2.68	2.71	2.64
2002	Jan.	1.22	1.40	2.22	2.25	2.08	2.13	2.54	2.64	2.68	2.62
	Feb.	1.22	1.40	2.22	2.18	2.08	2.13	2.48	2.62	2.63	2.60
	Mar.	1.22	1.40	2.13	2.06	1.99	1.99	2.51	2.67	2.72	2.64
	Apr.	1.22	1.40	2.04	1.95	1.89	1.84	2.38	2.55	2.55	2.51
	May	1.22	1.40	2.04	1.95	1.89	1.84	2.32	2.51	2.54	2.49
	June	1.20	1.38	2.04	1.95	1.89	1.84	2.30	2.43	2.46	2.42
	July	1.17	1.35	2.04	1.95	1.89	1.84	2.12	2.26	2.22	2.23
	Aug.	1.16	1.34	2.04	1.95	1.89	1.84	2.29	2.51	2.50	2.47
	Sept.	1.15	1.34	2.04	1.95	1.89	1.84	2.21	2.40	2.35	2.37
	Oct.	1.15	1.32	2.04	1.95	1.89	1.84	2.08	2.25	2.21	2.22

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				Wholesale				Retail			
Year	Month	Farm	Cooperative	Whole	2%	1%	Skim	Whole	2%	1%	Skim
	Nov.	1.17	1.35	2.06	1.97	1.92	1.86	2.13	2.30	2.27	2.26
	Dec.	1.16	1.34	2.08	1.99	1.94	1.88	2.32	2.49	2.51	2.48
	Avg.	1.19	1.37	2.08	2.01	1.94	1.91	2.31	2.47	2.47	2.44
2003	Jan.	1.16	1.34	2.08	1.99	1.94	1.88	2.21	2.38	2.38	2.35
	Feb.	1.16	1.34	2.08	1.99	1.94	1.88	2.31	2.47	2.50	2.45
	Mar.	1.13	1.31	2.08	1.99	1.94	1.88	2.28	2.47	2.45	2.43
	Apr.	1.11	1.29	2.08	1.99	1.94	1.88	2.23	2.41	2.43	2.38
	May	1.12	1.30	2.08	1.99	1.94	1.88	2.23	2.40	2.38	2.37
	June	1.12	1.30	2.08	1.99	1.94	1.88	2.28	2.47	2.47	2.44
	July	1.12	1.30	2.08	1.99	1.94	1.88	2.23	2.45	2.44	2.40
	Aug.	1.19	1.38	2.08	1.99	1.94	1.88	2.28	2.44	2.42	2.40
	Sept.	1.39	1.57	2.08	1.99	1.94	1.88	2.44	2.67	2.68	2.62
	Oct.	1.41	1.60	2.21	2.11	2.06	2.02	2.44	2.62	2.66	2.60
	Nov.	1.41	1.60	2.21	2.12	2.07	2.02	2.46	2.66	2.67	2.62
	Dec.	1.40	1.58	2.21	2.12	2.07	2.02	2.27	2.49	2.51	2.46
	Avg.	1.23	1.41	2.11	2.02	1.97	1.92	2.31	2.49	2.50	2.46
2004	Jan.	1.25	1.43	2.21	2.12	2.07	2.02	2.24	2.42	2.38	2.36
	Feb.	1.25	1.43	2.21	2.12	2.07	2.02	2.25	2.39	2.37	2.34
	Mar.	1.26	1.43	2.21	2.12	2.07	2.02	2.28	2.45	2.43	2.40
	Apr.	1.40	1.57	2.22	2.12	2.07	2.03	2.29	2.49	2.38	2.35
	May	1.87	2.05	2.64	2.55	2.50	2.45	2.69	2.93	2.85	2.78
	Avg.	1.41	1.58	2.30	2.21	2.16	2.11	2.35	2.54	2.48	2.45

Source: GAO's analysis of price data provided by USDA, the Defense Commissary Agency, and Information Resources, Inc.

Note: For the Atlanta market, the farm price is the USDA-estimated farm Class I price for 3.5 percent milkfat content; the cooperative price is the announced cooperative Class I price for Atlanta for 3.5 percent milkfat content; the wholesale price is the average of the prices paid by the commissaries at Fort Gillem and Fort McPherson, adjusted for a 5 percent markup; and the retail price is the price collected by Information Resources, Inc., for the Atlanta market. Prices may not average due to rounding. "N/A" indicates data not available.

Table 12: Prices for a Gallon of Milk in Boston, Massachusetts, October 2000 through May 2004

				Wholesale				Retail			
Year	Month	Farm	Cooperative	Whole	2%	1%	Skim	Whole	2%	1%	Skim
2000	Oct.	$1.41	$1.50	$2.00	$1.96	$1.91	$1.90	$2.19	$2.21	$2.23	$2.02
	Nov.	1.41	1.50	2.00	1.96	1.91	1.90	2.20	2.22	2.24	2.03
	Dec.	1.41	1.50	2.00	1.96	1.91	1.90	2.23	2.26	2.27	2.05
	Avg.	1.41	1.50	2.00	1.96	1.91	1.90	2.21	2.23	2.25	2.03
2001	Jan.	1.43	1.53	2.00	1.96	1.91	1.90	2.23	2.25	2.25	2.05
	Feb.	1.41	1.50	2.00	1.96	1.91	1.90	2.25	2.29	2.29	2.08
	Mar.	1.41	1.50	2.00	1.96	1.91	1.90	2.26	2.31	2.32	2.12
	Apr.	1.41	1.50	2.00	1.96	1.91	1.90	2.26	2.30	2.31	2.12
	May	1.45	1.55	2.00	1.96	1.91	1.90	2.26	2.31	2.32	2.13
	June	1.55	1.65	2.00	1.96	1.91	1.90	2.26	2.31	2.32	2.14
	July	1.59	1.68	2.00	1.96	1.91	1.90	2.27	2.32	2.33	2.14
	Aug.	1.65	1.75	2.00	1.96	1.91	1.90	2.27	2.32	2.33	2.15
	Sept.	1.66	1.76	2.00	1.96	1.91	1.90	2.28	2.34	2.36	2.18
	Oct.	1.69	1.79	2.00	1.96	1.91	1.90	2.30	2.35	2.37	2.19
	Nov.	1.68	1.78	2.00	1.96	1.93	1.90	2.32	2.38	2.40	2.21
	Dec.	1.36	1.45	2.07	1.85	1.71	1.71	2.27	2.36	2.38	2.20
	Avg.	1.52	1.62	2.01	1.95	1.90	1.88	2.27	2.32	2.33	2.14
2002	Jan.	1.35	1.45	2.07	1.85	1.71	1.71	2.27	2.33	2.35	2.17
	Feb.	1.35	1.45	2.07	1.85	1.71	1.71	2.28	2.36	2.38	2.20
	Mar.	1.32	1.42	2.04	1.82	1.68	1.68	2.28	2.37	2.38	2.21
	Apr.	1.30	1.41	2.03	1.81	1.67	1.67	2.27	2.34	2.35	2.18
	May	1.29	1.39	2.01	1.81	1.67	1.67	2.27	2.34	2.36	2.19
	June	1.27	1.37	2.00	1.78	1.63	1.63	2.26	2.32	2.34	2.17
	July	1.23	1.33	1.96	1.74	1.60	1.60	2.26	2.31	2.33	2.16
	Aug.	1.20	1.30	1.95	1.73	1.59	1.59	2.24	2.28	2.31	2.14
	Sept.	1.20	1.30	1.95	1.73	1.59	1.59	2.26	2.32	2.33	2.17
	Oct.	1.17	1.28	1.92	1.70	1.56	1.56	2.25	2.32	2.33	2.18
	Nov.	1.21	1.31	1.96	1.74	1.60	1.60	2.26	2.32	2.33	2.18
	Dec.	1.20	1.31	1.95	1.73	1.59	1.59	2.24	2.30	2.29	2.15
	Avg.	1.26	1.36	1.99	1.77	1.63	1.63	2.26	2.33	2.34	2.18
2003	Jan.	1.20	1.31	1.95	1.73	1.59	1.59	2.27	2.33	2.31	2.16
	Feb.	1.17	1.28	1.90	1.70	1.56	1.55	2.28	2.33	2.33	2.19
	Mar.	1.14	1.25	1.87	1.66	1.52	1.52	2.27	2.33	2.33	2.17
	Apr.	1.12	1.23	1.86	1.65	1.51	1.51	2.25	2.29	2.28	2.15

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				Wholesale				Retail			
Year	**Month**	**Farm**	**Cooperative**	**Whole**	**2%**	**1%**	**Skim**	**Whole**	**2%**	**1%**	**Skim**
	May	1.13	1.24	1.87	1.66	1.52	1.52	2.26	2.31	2.31	2.16
	June	1.13	1.24	1.87	1.66	1.52	1.52	2.26	2.29	2.30	2.15
	July	1.16	1.27	1.88	1.67	1.53	1.53	2.25	2.29	2.29	2.13
	Aug.	1.26	1.37	1.98	1.76	1.62	1.62	2.25	2.29	2.30	2.14
	Sept.	1.50	1.61	2.15	1.94	1.79	1.79	2.31	2.35	2.37	2.21
	Oct.	1.54	1.66	2.25	2.04	1.89	1.89	2.33	2.38	2.40	2.24
	Nov.	1.55	1.67	2.26	2.05	1.90	1.90	2.33	2.39	2.40	2.24
	Dec.	1.51	1.62	2.21	2.00	1.85	1.85	2.34	2.40	2.42	2.26
	Avg.	1.28	1.40	2.00	1.79	1.65	1.65	2.28	2.33	2.34	2.18
2004	Jan.	1.34	1.45	2.08	1.87	1.72	1.72	2.35	2.40	2.42	2.26
	Feb.	1.31	1.43	2.03	1.81	1.67	1.67	2.34	2.37	2.39	2.24
	Mar.	1.34	1.46	2.03	1.81	1.67	1.67	2.32	2.37	2.38	2.22
	Apr.	1.49	1.60	2.20	1.98	1.83	1.83	2.32	2.37	2.38	2.26
	May	2.01	2.12	2.26	2.05	1.90	1.90	2.58	2.63	2.66	2.51
	Avg.	1.50	1.61	2.12	1.90	1.76	1.76	2.38	2.43	2.45	2.30

Source: GAO's analysis of price data provided by USDA, the Defense Commissary Agency, and Information Resources, Inc.

Note: For the Boston market, the farm price is the USDA-estimated farm Class I price for 3.5 percent milkfat content; the cooperative price is the effective cooperative Class I price for Boston for 3.5 percent milkfat content during the period that the Northeast Interstate Dairy Compact was effective (July 1997 through September 2001); the cooperative price after September 2001 is the announced cooperative Class I price for Boston for 3.5 percent milkfat content; the wholesale price is the price paid by the commissary at Hanscom Air Force Base, adjusted for a 5 percent markup; and the retail price is the price collected by Information Resources, Inc., for the Boston market. Prices may not average due to rounding.

Table 13: Prices for a Gallon of Milk in Charlotte, North Carolina, October 2000 through May 2004

				Wholesale				Retail			
Year	Month	Farm	Cooperative	Whole	2%	1%	Skim	Whole	2%	1%	Skim
2000	Oct.	$1.25	$1.41	$2.09	$2.05	$2.03	$2.00	$2.59	$2.59	$2.64	$2.55
	Nov.	1.24	1.40	2.08	2.06	2.03	2.00	2.56	2.56	2.59	2.52
	Dec.	1.25	1.41	2.11	2.08	2.03	2.00	2.57	2.59	2.62	2.55
	Avg.	1.25	1.41	2.09	2.06	2.03	2.00	2.57	2.58	2.62	2.54
2001	Jan.	1.40	1.57	2.25	2.18	2.08	2.00	2.61	2.62	2.64	2.58
	Feb.	1.25	1.41	2.10	2.07	2.03	1.98	2.56	2.57	2.60	2.53
	Mar.	1.29	1.45	2.14	2.11	2.08	2.03	2.61	2.63	2.65	2.57
	Apr.	1.36	1.52	2.21	2.19	2.15	2.10	2.58	2.61	2.63	2.56
	May	1.41	1.58	2.28	2.25	2.21	2.17	2.59	2.62	2.64	2.57
	June	1.44	1.61	2.35	2.32	2.28	2.23	2.58	2.61	2.63	2.57
	July	1.49	1.66	2.38	2.35	2.31	2.26	2.59	2.62	2.64	2.57
	Aug.	1.49	1.66	2.52	2.42	2.36	2.30	2.58	2.61	2.63	2.56
	Sept.	1.51	1.68	2.57	2.45	2.38	2.32	2.57	2.60	2.62	2.55
	Oct.	1.54	1.71	2.57	2.46	2.39	2.33	2.58	2.60	2.63	2.55
	Nov.	1.53	1.69	2.60	2.50	2.46	2.42	2.62	2.64	2.68	2.62
	Dec.	1.24	1.41	2.60	2.55	2.54	2.52	2.62	2.65	2.68	2.63
	Avg.	1.41	1.58	2.38	2.32	2.27	2.22	2.59	2.62	2.64	2.57
2002	Jan.	1.18	1.40	2.60	2.55	2.54	2.52	2.63	2.65	2.67	2.60
	Feb.	1.18	1.40	2.60	2.55	2.54	2.52	2.59	2.60	2.65	2.58
	Mar.	1.18	1.40	2.60	2.55	2.54	2.52	2.59	2.61	2.65	2.59
	Apr.	1.18	1.40	2.60	2.55	2.54	2.52	2.58	2.60	2.63	2.56
	May	1.19	1.40	2.60	2.55	2.54	2.52	2.57	2.59	2.63	2.57
	June	1.17	1.38	2.60	2.55	2.54	2.52	2.57	2.59	2.60	2.56
	July	1.14	1.35	2.60	2.55	2.54	2.52	2.54	2.56	2.61	2.55
	Aug.	1.12	1.34	2.60	2.55	2.54	2.52	2.56	2.58	2.62	2.56
	Sept.	1.12	1.34	2.60	2.55	2.54	2.52	2.51	2.55	2.59	2.53
	Oct.	1.10	1.31	2.60	2.55	2.54	2.52	2.51	2.53	2.59	2.52
	Nov.	1.14	1.35	2.63	2.57	2.56	2.54	2.59	2.60	2.65	2.58
	Dec.	1.12	1.34	2.65	2.58	2.57	2.56	2.58	2.58	2.63	2.56
	Avg.	1.15	1.37	2.61	2.55	2.54	2.53	2.57	2.59	2.63	2.56
2003	Jan.	1.13	1.34	2.65	2.58	2.57	2.56	2.52	2.52	2.58	2.50
	Feb.	1.13	1.34	2.64	2.57	2.56	2.54	2.59	2.58	2.64	2.56
	Mar.	1.10	1.31	2.62	2.56	2.55	2.52	2.59	2.59	2.64	2.56
	Apr.	1.08	1.29	2.62	2.56	2.55	2.52	2.58	2.57	2.62	2.54

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				Wholesale				Retail			
Year	**Month**	**Farm**	**Cooperative**	**Whole**	**2%**	**1%**	**Skim**	**Whole**	**2%**	**1%**	**Skim**
	May	1.09	1.30	2.62	2.56	2.55	2.52	2.56	2.56	2.61	2.53
	June	1.09	1.30	2.62	2.56	2.55	2.52	2.59	2.58	2.62	2.55
	July	1.09	1.30	2.62	2.56	2.55	2.52	2.56	2.56	2.63	2.53
	Aug.	1.16	1.38	2.62	2.56	2.55	2.52	2.59	2.61	2.68	2.58
	Sept.	1.35	1.57	2.77	2.70	2.69	2.66	2.62	2.64	2.71	2.65
	Oct.	1.38	1.60	2.95	2.85	2.87	2.85	2.75	2.76	2.83	2.73
	Nov.	1.38	1.60	2.98	2.85	2.92	2.91	2.78	2.80	2.88	2.80
	Dec.	1.37	1.58	2.98	2.85	2.92	2.91	2.80	2.82	2.90	2.81
	Avg.	1.20	1.41	2.72	2.65	2.65	2.63	2.63	2.63	2.70	2.61
2004	Jan.	1.21	1.43	2.98	2.90	2.92	2.90	2.78	2.79	2.87	2.78
	Feb.	1.21	1.43	2.88	2.82	2.81	2.80	2.76	2.77	2.84	2.77
	Mar.	1.21	1.43	2.78	2.75	2.69	2.66	2.74	2.75	2.83	2.73
	Apr.	1.35	1.57	2.70	2.69	2.57	2.52	2.83	2.83	2.92	2.81
	May	1.83	2.05	3.10	3.05	2.85	2.84	3.19	3.21	3.24	3.21
	Avg.	1.36	1.58	2.89	2.84	2.77	2.74	2.86	2.87	2.94	2.86

Source: GAO's analysis of price data provided by USDA, the Defense Commissary Agency, and Information Resources, Inc.

Note: For the Charlotte market, the farm price is the USDA-estimated farm Class I price for 3.5 percent milkfat content; the cooperative price is the announced cooperative Class I price for Charlotte for 3.5 percent milkfat content; the wholesale price is the price paid by the Fort Bragg North Post Store, adjusted for a 5 percent markup; and the retail price is the price collected by Information Resources, Inc., for the Charlotte market. Prices may not average due to rounding.

Table 14: Prices for a Gallon of Milk in Cincinnati, Ohio, October 2000 through May 2004

				Wholesale				Retail			
Year	**Month**	**Farm**	**Cooperative**	**Whole**	**2%**	**1%**	**Skim**	**Whole**	**2%**	**1%**	**Skim**
2000	Oct.	$1.20	$1.38	N/A	N/A	$1.96	$1.80	$1.88	$2.28	$2.32	$2.25
	Nov.	1.19	1.37	N/A	N/A	1.96	1.80	1.94	2.18	2.25	2.19
	Dec.	1.22	1.40	N/A	N/A	1.96	1.80	1.93	2.27	2.31	2.25
	Avg.	1.20	1.38	N/A	N/A	1.96	1.80	1.92	2.24	2.29	2.23
2001	Jan.	1.38	1.55	N/A	N/A	1.96	1.80	2.09	2.37	2.46	2.37
	Feb.	1.20	1.37	N/A	N/A	1.96	1.80	1.86	2.20	2.27	2.22
	Mar.	1.26	1.43	2.29	2.12	1.96	1.80	1.91	2.06	2.08	2.04
	Apr.	1.33	1.50	2.34	2.15	1.99	1.81	1.88	2.21	2.28	2.21
	May	1.39	1.56	2.43	2.22	2.03	1.84	1.80	2.07	1.93	1.88
	June	1.46	1.63	2.49	2.26	2.05	1.84	1.98	2.27	2.31	2.26
	July	1.50	1.67	2.53	2.29	2.07	1.85	1.98	2.28	2.32	2.25
	Aug.	1.51	1.67	2.53	2.29	2.07	1.85	1.94	2.38	2.47	2.41
	Sept.	1.52	1.69	2.54	2.30	2.08	1.86	2.00	2.42	2.46	2.40
	Oct.	1.55	1.72	2.56	2.30	2.06	1.82	1.95	2.23	2.29	2.15
	Nov.	1.52	1.70	2.39	2.36	2.15	1.96	2.02	2.56	2.67	2.55
	Dec.	1.21	1.37	2.28	2.09	2.19	2.00	1.87	2.29	2.36	2.27
	Avg.	1.40	1.57	2.44	2.24	2.05	1.85	1.94	2.28	2.33	2.25
2002	Jan.	1.19	1.36	2.26	2.06	2.19	2.00	1.96	2.38	2.44	2.34
	Feb.	1.19	1.36	2.26	2.06	2.19	2.00	1.91	2.37	2.46	2.38
	Mar.	1.17	1.33	2.23	2.03	2.19	2.00	1.93	2.36	2.50	2.36
	Apr.	1.15	1.32	2.23	2.03	N/A	N/A	1.95	2.28	2.29	2.22
	May	1.13	1.30	2.20	2.00	N/A	N/A	1.88	2.44	2.48	2.38
	June	1.11	1.28	2.19	1.99	N/A	N/A	1.81	2.21	2.27	2.18
	July	1.08	1.24	2.16	1.96	N/A	N/A	1.81	2.30	2.33	2.24
	Aug.	1.07	1.23	2.14	1.94	N/A	N/A	1.82	2.33	2.36	2.27
	Sept.	1.07	1.23	2.14	1.94	N/A	N/A	1.81	2.34	2.38	2.28
	Oct.	1.03	1.20	2.11	1.91	N/A	N/A	1.79	2.28	2.32	2.23
	Nov.	1.07	1.24	2.15	1.95	N/A	N/A	1.83	2.43	2.48	2.37
	Dec.	1.07	1.23	2.14	1.94	1.75	1.56	1.85	2.37	2.40	2.32
	Avg.	1.11	1.28	2.18	1.98	2.08	1.89	1.86	2.34	2.39	2.30
2003	Jan.	1.07	1.24	2.14	1.94	1.75	1.56	1.72	2.35	2.39	2.30
	Feb.	1.06	1.24	2.11	1.90	1.75	1.56	1.82	2.29	2.33	2.24
	Mar.	1.02	1.20	2.07	1.86	1.71	1.52	1.84	2.30	2.34	2.24
	Apr.	1.01	1.19	2.06	1.85	1.71	1.52	1.74	2.21	2.24	2.17

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				Wholesale				Retail			
Year	Month	Farm	Cooperative	Whole	2%	1%	Skim	Whole	2%	1%	Skim
	May	1.02	1.19	2.07	1.86	1.68	1.49	1.84	2.38	2.42	2.32
	June	1.02	1.20	2.07	1.86	1.68	1.49	1.80	2.47	2.54	2.42
	July	1.02	1.20	2.08	1.87	1.69	1.50	1.82	2.30	2.33	2.25
	Aug.	1.09	1.27	2.17	1.97	1.78	1.59	1.86	2.43	2.48	2.37
	Sept.	1.33	1.51	2.39	2.19	2.01	1.81	1.83	2.38	2.42	2.32
	Oct.	1.38	1.56	2.44	2.24	2.06	1.86	1.86	2.36	2.42	2.31
	Nov.	1.38	1.56	2.45	2.25	2.07	1.87	1.88	2.40	2.46	2.34
	Dec.	1.34	1.52	2.39	2.20	2.06	1.86	1.87	2.15	2.18	2.08
	Avg.	1.15	1.32	2.20	2.00	1.83	1.64	1.82	2.34	2.38	2.28
2004	Jan.	1.18	1.36	2.27	2.07	1.89	1.70	1.71	2.08	2.07	2.00
	Feb.	1.15	1.33	2.22	2.02	1.83	1.64	1.63	1.89	1.88	1.82
	Mar.	1.18	1.36	2.25	2.05	1.86	1.67	1.63	1.87	1.85	1.80
	Apr.	1.33	1.51	2.41	2.21	2.03	1.83	1.46	1.70	1.60	1.56
	May	1.85	2.03	2.88	2.68	2.50	2.31	1.87	2.19	2.14	2.05
	Avg.	1.34	1.52	2.41	2.21	2.02	1.83	1.66	1.95	1.91	1.85

Source: GAO's analysis of price data provided by USDA, the Defense Commissary Agency, and Information Resources, Inc.

Note: For the Cincinnati market, the farm price is the USDA-estimated farm Class I price for 3.5 percent milkfat content; the cooperative price is the announced cooperative Class I price for Cincinnati for 3.5 percent milkfat content; the wholesale price is the price paid by the commissary at Wright-Patterson Air Force Base, adjusted for a 5 percent markup; and the retail price is the price collected by Information Resources, Inc., for the Cincinnati market. Prices may not average due to rounding. “N/A” indicates data not available.

Table 15: Prices for a Gallon of Milk in Dallas, Texas, October 2000 through May 2004

				Wholesale				Retail			
Year	Month	Farm	Cooperative	Whole	2%	1%	Skim	Whole	2%	1%	Skim
2000	Oct.	$1.24	$1.35	$2.06	$2.06	$2.02	$1.95	$1.79	$1.64	$1.75	$1.67
	Nov.	1.23	1.35	2.06	2.06	2.02	1.95	1.87	1.77	2.01	1.80
	Dec.	1.24	1.35	2.06	2.03	2.02	1.95	2.00	1.82	2.02	1.81
	Avg.	1.24	1.35	2.06	2.05	2.02	1.95	1.89	1.74	1.93	1.76
2001	Jan.	1.35	1.46	2.06	2.03	2.02	1.95	2.01	1.89	2.12	1.87
	Feb.	1.25	1.36	2.15	2.12	2.11	2.04	2.02	1.91	2.07	1.91
	Mar.	1.29	1.40	2.16	2.13	2.12	2.04	1.96	1.85	2.03	1.84
	Apr.	1.35	1.46	2.16	2.13	2.12	2.04	2.00	1.92	2.06	1.92
	May	1.40	1.51	2.16	2.13	2.12	2.04	2.05	1.94	2.07	1.94
	June	1.43	1.55	2.16	2.13	2.12	2.04	2.07	2.00	2.05	1.98
	July	1.50	1.61	2.16	2.13	2.12	2.04	2.08	2.00	2.09	1.96
	Aug.	1.50	1.62	2.21	2.18	2.15	2.10	2.08	2.06	2.18	2.05
	Sept.	1.50	1.61	2.21	2.19	2.18	2.10	2.06	2.02	2.09	1.99
	Oct.	1.54	1.64	2.21	2.19	2.18	2.10	2.10	2.04	2.12	2.05
	Nov.	1.53	1.63	2.21	2.19	2.18	2.10	2.08	2.05	2.19	2.06
	Dec.	1.25	1.36	2.21	2.19	2.18	2.10	2.16	2.10	2.14	2.10
	Avg.	1.41	1.52	2.17	2.15	2.13	2.06	2.06	1.98	2.10	1.97
2002	Jan.	1.25	1.36	2.21	2.19	2.18	2.10	2.03	2.03	2.20	2.01
	Feb.	1.26	1.36	2.21	2.19	2.18	2.10	2.09	2.03	2.15	2.02
	Mar.	1.27	1.37	2.21	2.19	2.18	2.10	2.02	2.00	2.11	1.97
	Apr.	1.27	1.37	2.21	2.19	2.18	2.10	2.05	2.01	2.14	2.00
	May	1.27	1.37	2.21	2.19	2.18	2.10	2.08	2.02	2.17	2.00
	June	1.27	1.37	2.21	2.19	2.18	2.10	2.10	2.06	2.21	2.07
	July	1.20	1.29	2.21	2.19	2.18	2.10	2.07	2.06	2.23	2.06
	Aug.	1.18	1.28	2.21	2.19	2.18	2.10	2.08	2.06	2.23	2.06
	Sept.	1.18	1.28	2.21	2.19	2.18	2.10	2.07	2.05	2.18	2.05
	Oct.	1.15	1.25	2.21	2.19	2.18	2.10	2.06	2.06	2.18	2.06
	Nov.	1.20	1.28	2.21	2.19	2.18	2.10	2.05	1.99	2.08	1.99
	Dec.	1.18	1.28	2.21	2.19	2.18	2.10	2.02	1.97	2.05	1.97
	Avg.	1.22	1.32	2.21	2.19	2.18	2.10	2.06	2.03	2.16	2.02
2003	Jan.	1.19	1.29	2.21	2.19	2.18	2.10	2.02	1.98	2.07	1.96
	Feb.	1.16	1.26	2.21	2.19	2.18	2.10	2.01	1.95	2.03	1.93
	Mar.	1.12	1.22	2.21	2.19	2.18	2.10	2.05	1.97	2.04	1.96
	Apr.	1.11	1.21	2.21	2.19	2.18	2.10	2.07	2.00	2.07	2.00

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				Wholesale				Retail			
Year	Month	Farm	Cooperative	Whole	2%	1%	Skim	Whole	2%	1%	Skim
	May	1.11	1.22	2.21	2.19	2.18	2.10	2.06	1.96	2.05	1.96
	June	1.11	1.22	2.21	2.19	2.18	2.10	2.07	2.01	2.08	1.99
	July	1.11	1.22	2.21	2.19	2.18	2.10	2.06	1.98	2.07	1.96
	Aug.	1.19	1.30	2.21	2.19	2.18	2.10	2.14	2.01	2.12	1.99
	Sept.	1.41	1.52	2.39	2.37	2.26	2.27	2.18	2.05	2.14	2.02
	Oct.	1.43	1.54	2.39	2.37	2.43	2.27	2.27	2.17	2.27	2.16
	Nov.	1.43	1.54	2.39	2.37	2.45	2.27	2.24	2.11	2.21	2.10
	Dec.	1.42	1.53	2.49	2.46	2.44	2.37	2.19	2.05	2.06	2.02
	Avg.	1.23	1.34	2.28	2.26	2.25	2.17	2.11	2.02	2.10	2.00
2004	Jan.	1.27	1.38	2.41	2.38	2.37	2.28	2.16	2.01	2.01	1.95
	Feb.	1.27	1.38	2.39	2.37	2.35	2.26	2.15	1.96	1.98	1.92
	Mar.	1.28	1.38	2.39	2.37	2.35	2.26	2.14	1.97	1.96	1.94
	Apr.	1.42	1.52	2.43	2.40	2.38	2.29	2.24	2.03	2.03	1.95
	May	1.89	2.00	2.87	2.84	2.82	2.74	2.79	2.67	2.77	2.52
	Avg.	1.43	1.53	2.50	2.47	2.45	2.37	2.30	2.13	2.15	2.06

Source: GAO's analysis of price data provided by USDA, the Defense Commissary Agency, and Information Resources, Inc.

Note: For the Dallas market, the farm price is the USDA-estimated farm Class I price for 3.5 percent milkfat content; the cooperative price is the announced cooperative Class I price for Dallas for 3.5 percent milkfat content; the wholesale price is the average of the prices paid by the two commissaries at Fort Hood, adjusted for a 5 percent markup; and the retail price is the price collected by Information Resources, Inc., for the Dallas market. Prices may not average due to rounding.

Table 16: Prices for a Gallon of Milk in Denver, Colorado, October 2000 through May 2004

				Wholesale				Retail			
Year	Month	Farm	Cooperative	Whole	2%	1%	Skim	Whole	2%	1%	Skim
2000	Oct.	$1.18	$1.31	$1.94	$1.71	$1.62	$1.52	$2.55	$2.43	$2.45	$2.23
	Nov.	1.19	1.30	1.94	1.72	1.63	1.53	2.55	2.44	2.46	2.25
	Dec.	1.21	1.33	1.97	1.75	1.65	1.56	2.58	2.49	2.45	2.27
	Avg.	1.19	1.31	1.95	1.73	1.63	1.54	2.56	2.45	2.45	2.25
2001	Jan.	1.38	1.49	2.10	1.88	1.79	1.70	2.62	2.50	2.56	2.28
	Feb.	1.21	1.31	1.97	1.75	1.54	1.57	2.57	2.48	2.54	2.27
	Mar.	1.27	1.37	1.99	1.77	1.55	1.59	2.49	2.45	2.48	2.15
	Apr.	1.33	1.44	2.07	1.85	1.63	1.67	2.59	2.50	2.50	2.30
	May	1.40	1.51	2.14	1.93	1.70	1.74	2.59	2.51	2.61	2.28
	June	1.46	1.57	2.20	2.00	1.76	1.81	2.65	2.56	2.58	2.34
	July	1.49	1.60	2.23	2.02	1.79	1.83	2.65	2.55	2.48	2.31
	Aug.	1.49	1.61	2.24	2.03	1.80	1.84	2.65	2.55	2.52	2.31
	Sept.	1.51	1.62	2.25	2.04	1.81	1.85	2.60	2.53	2.49	2.31
	Oct.	1.55	1.65	2.28	2.07	1.82	1.88	2.64	2.60	2.62	2.35
	Nov.	1.53	1.64	2.27	2.06	1.83	1.87	2.65	2.63	2.72	2.39
	Dec.	1.22	1.33	1.96	1.74	1.64	1.56	2.64	2.65	2.64	2.40
	Avg.	1.40	1.51	2.14	1.93	1.72	1.74	2.61	2.54	2.56	2.31
2002	Jan.	1.21	1.32	1.96	1.74	1.64	1.56	2.67	2.65	2.73	2.39
	Feb.	1.21	1.32	1.95	1.74	1.64	1.56	2.66	2.64	2.72	2.39
	Mar.	1.18	1.29	1.92	1.71	1.62	1.53	2.64	2.63	2.72	2.34
	Apr.	1.17	1.28	1.91	1.70	1.61	1.52	2.69	2.71	2.73	2.39
	May	1.15	1.26	1.89	1.68	1.59	1.50	2.60	2.61	2.71	2.40
	June	1.13	1.24	1.87	1.66	1.57	1.48	2.59	2.54	2.71	2.34
	July	1.09	1.21	1.83	1.62	1.53	1.44	2.50	2.43	2.64	2.30
	Aug.	1.08	1.20	1.82	1.62	1.52	1.43	2.50	2.43	2.63	2.33
	Sept.	1.08	1.19	1.82	1.62	1.52	1.43	2.52	2.51	2.70	2.30
	Oct.	1.05	1.17	1.80	1.59	1.49	1.41	2.55	2.52	2.70	2.34
	Nov.	1.09	1.21	1.83	1.62	1.53	1.44	2.43	2.50	2.68	2.32
	Dec.	1.09	1.20	1.82	1.62	1.52	1.43	2.49	2.49	2.64	2.30
	Avg.	1.13	1.24	1.87	1.66	1.57	1.48	2.57	2.56	2.69	2.35
2003	Jan.	1.09	1.20	1.82	1.61	1.52	1.43	2.57	2.52	2.71	2.32
	Feb.	1.06	1.17	1.79	1.58	1.49	1.40	2.61	2.56	2.70	2.35
	Mar.	1.03	1.14	1.77	1.55	1.46	1.38	2.56	2.50	2.65	2.34
	Apr.	1.01	1.12	1.75	1.54	1.44	1.36	2.51	2.44	2.61	2.31

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				Wholesale				Retail			
Year	Month	Farm	Cooperative	Whole	2%	1%	Skim	Whole	2%	1%	Skim
	May	1.02	1.13	1.76	1.55	1.45	1.37	2.55	2.47	2.66	2.34
	June	1.02	1.13	1.76	1.55	1.45	1.37	2.54	2.45	2.64	2.31
	July	1.02	1.14	1.77	1.56	1.46	1.38	2.56	2.47	2.68	2.35
	Aug.	1.12	1.24	1.85	1.64	1.55	1.46	2.58	2.50	2.71	2.35
	Sept.	1.36	1.47	2.03	1.81	1.72	1.63	2.80	2.69	2.97	2.53
	Oct.	1.41	1.52	2.13	1.92	1.82	1.73	2.87	2.73	2.99	2.55
	Nov.	1.42	1.53	2.15	1.94	1.84	1.75	2.81	2.70	2.93	2.45
	Dec.	1.37	1.49	2.14	1.96	1.82	1.72	2.73	2.62	2.72	2.36
	Avg.	1.16	1.27	1.89	1.68	1.59	1.50	2.64	2.55	2.75	2.38
2004	Jan.	1.17	1.31	2.10	1.91	1.78	1.68	2.72	2.65	2.70	2.34
	Feb.	1.15	1.29	2.07	1.89	1.75	1.65	2.69	2.55	2.58	2.20
	Mar.	1.18	1.32	2.07	1.89	1.75	1.64	2.80	2.69	2.56	2.42
	Apr.	1.33	1.47	2.21	2.04	1.89	1.78	2.88	2.79	2.59	2.49
	May	1.85	1.99	2.66	2.48	2.34	2.23	3.00	2.90	2.87	2.64
	Avg.	1.34	1.48	2.22	2.04	1.90	1.80	2.82	2.72	2.66	2.42

Source: GAO's analysis of price data provided by USDA, the Defense Commissary Agency, and Information Resources, Inc.

Note: For the Denver market, the farm price is the USDA-estimated farm Class I price for 3.5 percent milkfat content; the cooperative price is the announced cooperative Class I price for Denver for 3.5 percent milkfat content; the wholesale price is the average of the prices paid by the commissaries at Fort Carson, Peterson Air Force Base, Buckley Air Force Base, and the U.S. Air Force Academy, adjusted for a 5 percent markup; and the retail price is the price collected by Information Resources, Inc., for the Denver market. Prices may not average due to rounding.

Table 17: Prices for a Gallon of Milk in Miami, Florida, October 2000 through May 2004

				Wholesale				Retail			
Year	Month	Farm	Cooperative	Whole	2%	1%	Skim	Whole	2%	1%	Skim
2000	Oct.	$1.40	$1.62	$2.46	$2.46	N/A	$2.46	$2.47	$2.36	$2.38	$2.25
	Nov.	1.39	1.62	2.47	2.47	N/A	2.47	2.47	2.31	2.34	2.25
	Dec.	1.40	1.62	2.56	2.56	N/A	2.56	2.47	2.33	2.35	2.24
	Avg.	1.40	1.62	2.50	2.50	N/A	2.50	2.47	2.33	2.36	2.25
2001	Jan.	1.56	1.78	2.56	2.56	N/A	2.56	2.48	2.34	2.35	2.24
	Feb.	1.40	1.63	2.56	2.56	N/A	2.56	2.47	2.32	2.32	2.25
	Mar.	1.43	1.66	2.56	2.56	N/A	2.56	2.49	2.34	2.35	2.26
	Apr.	1.51	1.74	2.56	2.56	N/A	2.56	2.49	2.37	2.36	2.27
	May	1.57	1.79	2.56	2.56	N/A	2.56	2.48	2.37	2.39	2.28
	June	1.60	1.83	2.56	2.56	N/A	2.56	2.57	2.45	2.47	2.34
	July	1.65	1.87	2.56	2.56	N/A	2.56	2.56	2.44	2.45	2.32
	Aug.	1.65	1.88	2.56	2.56	N/A	2.56	2.58	2.45	2.47	2.34
	Sept.	1.67	1.89	2.56	2.56	N/A	2.56	2.58	2.45	2.47	2.35
	Oct.	1.70	1.92	2.56	2.56	N/A	2.56	2.56	2.44	2.45	2.33
	Nov.	1.68	1.91	2.56	2.56	N/A	2.56	2.56	2.44	2.45	2.34
	Dec.	1.40	1.62	2.56	2.56	N/A	2.56	2.56	2.43	2.44	2.33
	Avg.	1.57	1.79	2.56	2.56	N/A	2.56	2.53	2.40	2.41	2.30
2002	Jan.	1.38	1.62	2.56	2.56	N/A	2.56	2.53	2.40	2.40	2.31
	Feb.	1.38	1.62	2.56	2.56	N/A	2.56	2.49	2.38	2.38	2.30
	Mar.	1.38	1.62	2.56	2.56	N/A	2.56	2.49	2.38	2.39	2.30
	Apr.	1.39	1.62	2.56	2.56	N/A	2.56	2.52	2.39	2.40	2.30
	May	1.39	1.62	2.56	2.56	N/A	2.56	2.47	2.36	2.36	2.27
	June	1.37	1.60	2.56	2.56	N/A	2.56	2.48	2.36	2.39	2.28
	July	1.33	1.57	2.56	2.56	N/A	2.56	2.46	2.37	2.35	2.27
	Aug.	1.32	1.55	2.56	2.56	N/A	2.56	2.34	2.33	2.31	2.24
	Sept.	1.32	1.55	2.56	2.56	N/A	2.56	2.37	2.29	2.27	2.22
	Oct.	1.29	1.52	2.56	2.56	1.86	2.56	2.38	2.28	2.26	2.19
	Nov.	1.32	1.56	2.56	2.56	1.88	2.56	2.45	2.35	2.36	2.28
	Dec.	1.31	1.55	2.56	2.56	1.88	2.56	2.49	2.38	2.39	2.30
	Avg.	1.35	1.58	2.56	2.56	1.87	2.56	2.46	2.36	2.36	2.27
2003	Jan.	1.31	1.55	2.56	2.56	1.90	2.56	2.50	2.38	2.39	2.30
	Feb.	1.29	1.52	2.56	2.56	1.90	2.56	2.50	2.36	2.37	2.28
	Mar.	1.26	1.49	2.56	2.56	1.90	2.56	2.51	2.38	2.39	2.29
	Apr.	1.25	1.48	2.56	2.56	1.90	2.56	2.49	2.38	2.40	2.30

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				Wholesale				Retail			
Year	Month	Farm	Cooperative	Whole	2%	1%	Skim	Whole	2%	1%	Skim
	May	1.26	1.49	2.56	2.56	1.90	2.56	2.54	2.42	2.43	2.32
	June	1.26	1.49	2.56	2.56	1.90	2.56	2.54	2.42	2.43	2.32
	July	1.25	1.49	2.56	2.56	1.91	2.56	2.51	2.40	2.41	2.31
	Aug.	1.34	1.57	2.56	2.56	2.08	2.56	2.58	2.48	2.50	2.39
	Sept.	1.53	1.77	2.56	2.56	2.27	2.56	2.69	2.59	2.62	2.50
	Oct.	1.56	1.79	2.56	2.56	2.27	2.56	2.71	2.61	2.62	2.51
	Nov.	1.56	1.79	2.56	2.56	2.27	2.56	2.69	2.59	2.57	2.49
	Dec.	1.55	1.78	2.56	2.56	2.27	2.56	2.71	2.61	2.56	2.51
	Avg.	1.37	1.60	2.56	2.56	2.04	2.56	2.58	2.47	2.47	2.38
2004	Jan.	1.41	1.63	2.56	2.56	2.18	2.56	2.67	2.54	2.50	2.44
	Feb.	1.41	1.63	2.56	2.56	2.08	2.56	2.63	2.49	2.46	2.41
	Mar.	1.41	1.63	2.56	2.56	2.08	2.56	2.64	2.51	2.47	2.42
	Apr.	1.55	1.77	2.56	2.56	2.09	2.56	2.74	2.62	2.58	2.53
	May	2.02	2.25	2.56	2.56	2.66	2.56	3.07	2.97	2.92	2.86
	Avg.	1.56	1.78	2.56	2.56	2.22	2.56	2.75	2.63	2.59	2.53

Source: GAO's analysis of price data provided by USDA, the Defense Commissary Agency, and Information Resources, Inc.

Note: For the Miami market, the farm price is the USDA-estimated farm Class I price for 3.5 percent milkfat content; the cooperative price is the announced cooperative Class I price for Miami for 3.5 percent milkfat content; the wholesale price is the price paid by the commissary at the Naval Air Station, Key West, adjusted for a 5 percent markup; and the retail price is the price collected by Information Resources, Inc., for the Miami market. Prices may not average due to rounding. "N/A" indicates data not available.

Table 18: Prices for a Gallon of Milk in Milwaukee, Wisconsin, October 2000 through May 2004

				Wholesale				Retail			
Year	Month	Farm	Cooperative	Whole	2%	1%	Skim	Whole	2%	1%	Skim
2000	Oct.	$1.20	$1.34	$1.87	$1.79	$1.76	$1.72	$1.97	$1.93	$2.01	$1.87
	Nov.	1.20	1.33	1.87	1.79	1.76	1.72	1.98	1.95	2.03	1.89
	Dec.	1.21	1.34	1.87	1.79	1.76	1.72	1.99	1.95	2.00	1.89
	Avg.	1.20	1.34	1.87	1.79	1.76	1.72	1.98	1.94	2.01	1.88
2001	Jan.	1.39	1.54	2.24	2.15	2.10	2.04	2.12	2.09	2.15	1.99
	Feb.	1.17	1.32	2.09	2.06	2.05	2.04	2.05	2.03	2.07	1.94
	Mar.	1.24	1.39	2.07	2.05	2.05	2.04	2.08	2.03	2.10	1.96
	Apr.	1.31	1.46	2.14	2.09	2.07	2.04	2.10	2.05	2.10	1.96
	May	1.38	1.53	2.23	2.15	2.12	2.07	2.11	2.07	2.12	1.96
	June	1.46	1.61	2.29	2.19	2.15	2.09	2.10	2.06	2.08	1.94
	July	1.49	1.64	2.32	2.21	2.16	2.09	2.14	2.07	2.12	1.96
	Aug.	1.50	1.65	2.34	2.23	2.17	2.11	2.15	2.09	2.13	1.97
	Sept.	1.53	1.67	2.42	2.31	2.25	2.18	2.16	2.09	2.13	1.97
	Oct.	1.55	1.70	2.44	2.30	2.23	2.15	2.18	2.12	2.16	1.99
	Nov.	1.55	1.69	2.40	2.30	2.26	2.21	2.20	2.13	2.18	2.01
	Dec.	1.22	1.36	2.19	2.05	2.00	1.98	2.11	2.04	2.08	1.94
	Avg.	1.40	1.55	2.26	2.17	2.13	2.09	2.13	2.07	2.12	1.97
2002	Jan.	1.20	1.36	1.97	1.86	1.84	1.84	2.07	2.04	2.04	1.91
	Feb.	1.18	1.35	1.92	1.81	1.81	1.81	2.08	2.03	2.03	1.90
	Mar.	1.16	1.32	1.92	1.81	1.81	1.81	2.08	2.02	2.02	1.90
	Apr.	1.16	1.32	1.92	1.81	1.81	1.81	2.08	2.05	2.06	1.92
	May	1.13	1.30	1.92	1.81	1.81	1.81	2.06	2.00	2.03	1.89
	June	1.13	1.29	1.92	1.81	1.81	1.81	2.08	2.02	2.05	1.92
	July	1.09	1.25	1.92	1.81	1.81	1.81	2.08	2.00	2.04	1.90
	Aug.	1.08	1.25	1.92	1.81	1.81	1.81	2.05	2.00	2.02	1.89
	Sept.	1.08	1.25	1.92	1.81	1.81	1.81	2.05	1.99	2.03	1.89
	Oct.	1.05	1.22	1.92	1.81	1.81	1.81	2.04	1.98	2.02	1.88
	Nov.	1.09	1.26	1.92	1.81	1.81	1.81	2.06	1.99	2.03	1.88
	Dec.	1.08	1.25	1.92	1.81	1.81	1.81	2.06	1.99	2.02	1.88
	Avg.	1.12	1.29	1.92	1.81	1.81	1.81	2.07	2.01	2.03	1.90
2003	Jan.	1.09	1.27	1.92	1.81	1.81	1.81	2.06	1.98	2.01	1.87
	Feb.	1.05	1.22	1.92	1.81	1.81	1.81	2.06	1.98	1.99	1.86
	Mar.	1.01	1.18	1.92	1.81	1.81	1.81	2.06	1.98	2.01	1.87
	Apr.	1.00	1.18	1.92	1.81	1.81	1.81	2.06	1.98	2.00	1.87

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				Wholesale				Retail			
Year	**Month**	**Farm**	**Cooperative**	**Whole**	**2%**	**1%**	**Skim**	**Whole**	**2%**	**1%**	**Skim**
	May	1.01	1.18	1.92	1.81	1.81	1.81	2.05	1.95	1.97	1.85
	June	1.01	1.18	1.92	1.81	1.81	1.81	2.03	1.93	1.96	1.83
	July	1.01	1.18	1.92	1.81	1.81	1.81	2.04	1.94	1.98	1.84
	Aug.	1.13	1.31	1.92	1.81	1.81	1.81	2.06	2.01	2.03	1.90
	Sept.	1.37	1.54	1.92	1.81	1.81	1.81	2.14	2.06	2.09	1.94
	Oct.	1.39	1.57	2.16	2.05	2.04	2.04	2.15	2.07	2.11	1.96
	Nov.	1.40	1.58	2.17	2.06	2.05	2.05	2.16	2.10	2.12	1.98
	Dec.	1.36	1.53	2.17	2.06	2.05	2.05	2.17	2.05	2.11	1.92
	Avg.	1.15	1.33	1.98	1.87	1.87	1.87	2.09	2.00	2.03	1.89
2004	Jan.	1.18	1.33	2.17	2.06	2.05	2.05	2.16	2.07	2.04	1.91
	Feb.	1.16	1.32	2.17	2.06	2.05	2.05	2.14	2.06	2.01	1.89
	Mar.	1.18	1.34	2.17	2.06	2.05	2.05	2.12	2.01	1.99	1.85
	Apr.	1.37	1.52	2.17	2.06	2.05	2.05	2.17	2.08	2.03	1.88
	May	2.01	2.17	2.53	2.42	2.28	2.19	2.52	2.45	2.41	2.18
	Avg.	1.38	1.54	2.24	2.13	2.10	2.08	2.22	2.13	2.10	1.94

Source: GAO's analysis of price data provided by USDA, the Defense Commissary Agency, and Information Resources, Inc.

Note: For the Milwaukee market, the farm price is the USDA-estimated farm Class I price for 3.5 percent milkfat content; the cooperative price is the announced cooperative Class I price for Milwaukee for 3.5 percent milkfat content; the wholesale price is the price paid by the commissary at the Naval Station Great Lakes, adjusted for a 5 percent markup; and the retail price is the price collected by Information Resources, Inc., for the Milwaukee market. Prices may not average due to rounding.

Table 19: Prices for a Gallon of Milk in Minneapolis, Minnesota, October 2000 through May 2004

				Wholesale				Retail			
Year	Month	Farm	Cooperative	Whole	2%	1%	Skim	Whole	2%	1%	Skim
2000	Oct.	$1.16	$1.27	$2.07	$2.05	$2.03	$2.01	$1.84	$1.74	$1.86	$1.68
	Nov.	1.15	1.26	2.07	2.05	2.03	2.01	1.82	1.79	1.89	1.71
	Dec.	1.16	1.27	2.07	2.05	2.03	2.01	1.79	1.79	1.92	1.74
	Avg.	1.16	1.27	2.07	2.05	2.03	2.01	1.82	1.77	1.89	1.71
2001	Jan.	1.35	1.47	2.24	2.16	2.10	2.04	1.78	1.73	1.85	1.68
	Feb.	1.14	1.27	2.08	2.06	2.06	2.04	1.68	1.67	1.80	1.64
	Mar.	1.21	1.33	2.07	2.05	2.05	2.04	1.66	1.69	1.85	1.70
	Apr.	1.28	1.41	2.14	2.09	2.07	2.04	1.67	1.72	1.86	1.76
	May	1.35	1.48	2.23	2.15	2.12	2.07	1.65	1.70	1.88	1.75
	June	1.43	1.56	2.29	2.19	2.15	2.09	1.68	1.71	1.91	1.78
	July	1.46	1.58	2.32	2.21	2.16	2.09	1.68	1.73	1.94	1.80
	Aug.	1.47	1.59	2.34	2.23	2.18	2.11	1.69	1.75	1.96	1.82
	Sept.	1.50	1.62	2.42	2.30	2.25	2.18	1.69	1.76	1.99	1.83
	Oct.	1.53	1.64	2.44	2.30	2.23	2.15	1.69	1.74	1.99	1.82
	Nov.	1.51	1.64	2.43	2.37	2.34	2.30	1.74	1.80	2.05	1.88
	Dec.	1.19	1.31	2.40	2.37	2.34	2.29	1.66	1.76	2.00	1.83
	Avg.	1.37	1.49	2.28	2.21	2.17	2.12	1.69	1.73	1.92	1.77
2002	Jan.	1.17	1.32	2.40	2.37	2.34	2.29	1.68	1.74	1.99	1.81
	Feb.	1.16	1.31	2.40	2.37	2.34	2.29	1.76	1.87	2.10	1.86
	Mar.	1.13	1.28	2.40	2.38	2.35	2.30	1.86	2.01	2.20	1.95
	Apr.	1.13	1.28	2.40	2.38	2.35	2.30	1.85	2.00	2.19	1.94
	May	1.11	1.26	2.40	2.38	2.35	2.30	1.84	1.97	2.23	1.92
	June	1.09	1.24	2.40	2.38	2.35	2.30	2.04	2.09	2.33	2.02
	July	1.05	1.20	2.40	2.38	2.35	2.30	2.06	2.10	2.33	2.02
	Aug.	1.04	1.19	2.40	2.38	2.35	2.30	2.04	2.05	2.31	1.97
	Sept.	1.04	1.19	2.40	2.38	2.35	2.30	1.97	1.98	2.27	1.92
	Oct.	1.02	1.16	2.40	2.38	2.35	2.30	1.78	1.85	2.14	1.83
	Nov.	1.05	1.20	2.40	2.38	2.35	2.30	1.72	1.76	2.00	1.78
	Dec.	1.05	1.19	2.40	2.38	2.35	2.30	1.83	1.95	2.17	1.90
	Avg.	1.09	1.24	2.40	2.38	2.35	2.30	1.87	1.95	2.19	1.91
2003	Jan.	1.07	1.21	2.40	2.38	2.35	2.30	1.87	1.96	2.18	1.92
	Feb.	1.02	1.16	2.40	2.38	2.35	2.30	1.75	1.79	2.00	1.78
	Mar.	0.98	1.13	2.38	2.35	2.32	2.27	1.57	1.59	2.24	1.54
	Apr.	0.97	1.12	2.35	2.32	2.29	2.24	1.52	1.53	2.50	1.46

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				Wholesale				Retail			
Year	**Month**	**Farm**	**Cooperative**	**Whole**	**2%**	**1%**	**Skim**	**Whole**	**2%**	**1%**	**Skim**
	May	0.98	1.12	2.35	2.32	2.29	2.24	1.44	1.44	2.75	1.34
	June	0.98	1.13	2.35	2.32	2.29	2.24	1.43	1.45	2.82	1.31
	July	0.98	1.13	2.35	2.32	2.29	2.24	1.45	1.43	2.72	1.32
	Aug.	1.10	1.25	2.35	2.32	2.29	2.24	1.52	1.46	2.84	1.35
	Sept.	1.34	1.49	2.35	2.32	2.29	2.24	1.51	1.49	2.98	1.39
	Oct.	1.37	1.51	2.41	2.37	2.34	2.27	1.53	1.55	2.81	1.48
	Nov.	1.38	1.53	2.49	2.43	2.38	2.31	1.66	1.88	2.55	1.86
	Dec.	1.33	1.48	2.49	2.43	2.38	2.31	1.57	1.88	2.57	1.91
	Avg.	1.13	1.27	2.39	2.36	2.32	2.27	1.57	1.62	2.58	1.56
2004	Jan.	1.15	1.30	2.49	2.43	2.38	2.31	1.65	1.94	2.57	1.94
	Feb.	1.14	1.29	2.49	2.43	2.38	2.31	1.64	1.91	2.55	1.93
	Mar.	1.16	1.31	2.49	2.43	2.38	2.31	1.60	1.80	2.54	1.81
	Apr.	1.35	1.49	2.49	2.43	2.38	2.31	1.52	1.78	2.52	1.63
	May	1.99	2.14	2.49	2.43	2.38	2.31	2.09	2.21	2.56	2.06
	Avg.	1.36	1.51	2.49	2.43	2.38	2.31	1.70	1.93	2.55	1.87

Source: GAO's analysis of price data provided by USDA, the Defense Commissary Agency, and Information Resources, Inc.

Note: For the Minneapolis market, the farm price is the USDA-estimated farm Class I price for 3.5 percent milkfat content; the cooperative price is the announced cooperative Class I price for Minneapolis for 3.5 percent milkfat content; the wholesale price is the price paid by the commissary at Fort McCoy, adjusted for a 5 percent markup; and the retail price is the price collected by Information Resources, Inc., for the Minneapolis market. Prices may not average due to rounding.

Table 20: Prices for a Gallon of Milk in New Orleans, Louisiana, October 2000 through May 2004

				Wholesale				Retail			
Year	Month	Farm	Cooperative	Whole	2%	1%	Skim	Whole	2%	1%	Skim
2000	Oct.	$1.22	$1.42	$2.36	$2.25	$2.25	$2.25	$2.64	$2.62	$2.62	$2.60
	Nov.	1.22	1.41	2.32	2.25	2.25	2.25	2.59	2.60	2.54	2.56
	Dec.	1.22	1.42	2.32	2.25	2.25	2.19	2.63	2.60	2.56	2.56
	Avg.	1.22	1.42	2.33	2.25	2.25	2.23	2.62	2.61	2.57	2.57
2001	Jan.	1.38	1.58	2.40	2.32	2.32	2.25	2.68	2.67	2.63	2.62
	Feb.	1.23	1.42	2.34	2.29	2.29	2.19	2.59	2.58	2.56	2.58
	Mar.	1.27	1.46	2.34	2.29	2.29	2.19	2.57	2.59	2.60	2.60
	Apr.	1.34	1.53	2.38	2.32	2.32	2.19	2.59	2.63	2.61	2.62
	May	1.38	1.58	2.42	2.35	2.35	2.25	2.57	2.62	2.58	2.58
	June	1.41	1.62	2.38	2.32	2.32	2.19	2.64	2.68	2.65	2.64
	July	1.46	1.67	2.41	2.35	2.35	2.22	2.67	2.71	2.70	2.67
	Aug.	1.47	1.67	2.44	2.38	2.38	2.25	2.70	2.74	2.70	2.68
	Sept.	1.48	1.69	2.38	2.32	2.32	2.19	2.68	2.72	2.71	2.69
	Oct.	1.51	1.72	2.38	2.32	2.32	2.19	2.70	2.73	2.74	2.71
	Nov.	1.50	1.71	2.38	2.31	2.31	2.19	2.75	2.78	2.79	2.74
	Dec.	1.21	1.42	2.29	2.23	2.23	2.19	2.73	2.75	2.80	2.74
	Avg.	1.39	1.59	2.38	2.32	2.32	2.21	2.66	2.68	2.67	2.66
2002	Jan.	1.15	1.41	2.29	2.23	2.23	2.18	2.73	2.74	2.79	2.73
	Feb.	1.15	1.41	2.27	2.21	2.21	2.15	2.74	2.74	2.77	2.71
	Mar.	1.14	1.41	2.27	2.21	2.21	2.15	2.73	2.76	2.76	2.71
	Apr.	1.15	1.41	2.27	2.21	2.21	2.15	2.72	2.74	2.74	2.71
	May	1.15	1.42	2.25	2.21	2.21	2.17	2.71	2.72	2.73	2.69
	June	1.13	1.40	2.30	2.23	2.23	2.19	2.70	2.71	2.72	2.68
	July	1.09	1.36	2.31	2.23	2.24	2.19	2.70	2.71	2.72	2.69
	Aug.	1.08	1.35	2.31	2.23	2.24	2.19	2.71	2.70	2.73	2.69
	Sept.	1.08	1.35	2.31	2.23	2.24	2.19	2.64	2.64	2.67	2.64
	Oct.	1.07	1.34	2.30	2.23	2.24	2.18	2.63	2.65	2.64	2.63
	Nov.	1.10	1.36	2.27	2.19	2.22	2.16	2.61	2.65	2.60	2.62
	Dec.	1.09	1.35	2.27	2.19	2.22	2.16	2.61	2.63	2.63	2.64
	Avg.	1.12	1.38	2.29	2.22	2.23	2.17	2.69	2.70	2.71	2.68
2003	Jan.	1.06	1.36	2.27	2.19	2.22	2.16	2.60	2.62	2.61	2.60
	Feb.	1.06	1.36	2.27	2.19	2.22	2.16	2.56	2.60	2.61	2.60
	Mar.	1.02	1.32	2.27	2.19	2.22	2.16	2.56	2.58	2.60	2.60
	Apr.	1.01	1.31	2.27	2.19	2.22	2.16	2.56	2.59	2.62	2.60

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				Wholesale				Retail			
Year	Month	Farm	Cooperative	Whole	2%	1%	Skim	Whole	2%	1%	Skim
	May	1.01	1.31	2.27	2.19	2.22	2.16	2.57	2.61	2.64	2.61
	June	1.02	1.31	2.27	2.19	2.22	2.16	2.64	2.67	2.70	2.64
	July	1.01	1.32	2.28	2.19	2.22	2.16	2.58	2.62	2.66	2.62
	Aug.	1.09	1.39	2.32	2.25	2.24	2.19	2.62	2.68	2.74	2.67
	Sept.	1.28	1.59	2.38	2.32	2.31	2.22	2.72	2.80	2.89	2.80
	Oct.	1.31	1.61	2.44	2.38	2.37	2.25	2.75	2.81	2.86	2.80
	Nov.	1.31	1.61	2.34	2.25	2.24	2.10	2.74	2.79	2.83	2.79
	Dec.	1.29	1.60	2.25	2.16	2.14	1.97	2.76	2.81	2.82	2.78
	Avg.	1.12	1.42	2.30	2.22	2.24	2.15	2.64	2.68	2.72	2.68
2004	Jan.	1.15	1.45	2.20	2.13	2.11	1.91	2.75	2.78	2.79	2.75
	Feb.	1.15	1.45	2.14	2.08	2.05	1.85	2.71	2.74	2.74	2.70
	Mar.	1.15	1.45	2.14	2.08	2.05	1.85	2.70	2.74	2.75	2.70
	Apr.	1.31	1.60	2.18	2.11	2.07	1.86	2.80	2.85	2.88	2.80
	May	1.78	2.08	2.44	2.33	2.27	2.04	3.18	3.25	3.28	3.18
	Avg.	1.31	1.61	2.22	2.15	2.11	1.90	2.83	2.87	2.89	2.83

Source: GAO's analysis of price data provided by USDA, the Defense Commissary Agency, and Information Resources, Inc.

Note: For the New Orleans market, the farm price is the USDA-estimated farm Class I price for 3.5 percent milkfat content; the cooperative price is the announced cooperative Class I price for New Orleans for 3.5 percent milkfat content; the wholesale price is the average of the prices paid by the Naval Support Activities, New Orleans; the Naval Construction Battalion Center, Gulfport; and Keesler Air Force Base commissaries, adjusted for a 5 percent markup; and the retail price is the price collected by Information Resources, Inc., for the New Orleans market. Prices may not average due to rounding.

Table 21: Prices for a Gallon of Milk in Phoenix, Arizona, October 2000 through May 2004

				Wholesale				Retail			
Year	Month	Farm	Cooperative	Whole	2%	1%	Skim	Whole	2%	1%	Skim
2000	Oct.	$1.17	$1.24	$1.97	$1.83	$1.73	$1.63	$2.25	$2.27	$2.44	$2.16
	Nov.	1.16	1.23	1.98	1.83	1.74	1.63	2.20	2.17	2.39	2.10
	Dec.	1.19	1.26	1.98	1.83	1.74	1.63	2.16	1.82	2.29	1.91
	Avg.	1.17	1.24	1.98	1.83	1.74	1.63	2.20	2.09	2.37	2.06
2001	Jan.	1.35	1.42	1.99	1.84	1.74	1.62	2.60	2.58	2.60	2.49
	Feb.	1.17	1.24	2.04	1.89	1.76	1.64	2.70	2.59	2.59	2.50
	Mar.	1.23	1.31	2.15	1.97	1.81	1.66	2.48	2.44	2.47	2.37
	Apr.	1.30	1.37	2.18	1.99	1.81	1.66	2.62	2.56	2.57	2.46
	May	1.37	1.44	2.08	1.96	1.80	1.64	2.46	2.38	2.43	2.27
	June	1.43	1.51	2.04	1.85	1.72	1.60	2.28	2.35	2.46	2.26
	July	1.46	1.54	2.04	1.85	1.72	1.60	2.38	2.44	2.49	2.34
	Aug.	1.47	1.54	2.05	1.86	1.72	1.60	2.20	2.23	2.31	2.20
	Sept.	1.48	1.56	2.07	1.89	1.74	1.62	2.27	2.31	2.38	2.27
	Oct.	1.52	1.59	2.10	1.92	1.74	1.61	2.41	2.47	2.53	2.39
	Nov.	1.50	1.57	2.11	1.92	1.74	1.60	2.08	2.08	2.20	2.06
	Dec.	1.18	1.25	2.11	1.97	1.85	1.76	2.47	2.56	2.54	2.40
	Avg.	1.37	1.45	2.08	1.91	1.76	1.63	2.41	2.42	2.46	2.33
2002	Jan.	1.18	1.25	2.07	1.91	1.79	1.70	2.60	2.66	2.66	2.51
	Feb.	1.17	1.25	2.09	1.88	1.78	1.69	2.52	2.52	2.58	2.51
	Mar.	1.14	1.22	2.09	1.88	1.78	1.69	2.73	2.73	2.70	2.65
	Apr.	1.13	1.20	2.06	1.88	1.78	1.69	2.53	2.64	2.64	2.50
	May	1.11	1.19	1.97	1.88	1.78	1.69	2.71	2.73	2.72	2.69
	June	1.09	1.17	1.97	1.88	1.78	1.69	2.58	2.58	2.66	2.55
	July	1.06	1.13	1.97	1.88	1.78	1.69	2.68	2.73	2.78	2.65
	Aug.	1.04	1.12	1.97	1.88	1.78	1.69	2.46	2.51	2.75	2.38
	Sept.	1.03	1.12	1.97	1.88	1.78	1.69	2.36	2.25	2.37	2.28
	Oct.	1.00	1.09	1.97	1.88	1.78	1.69	2.63	2.58	2.63	2.60
	Nov.	1.05	1.13	1.97	1.88	1.78	1.69	2.48	2.57	2.60	2.51
	Dec.	1.04	1.12	1.98	1.90	1.80	1.71	2.52	2.59	2.62	2.60
	Avg.	1.09	1.17	2.01	1.88	1.78	1.69	2.57	2.59	2.64	2.54
2003	Jan.	1.04	1.13	1.99	1.92	1.81	1.73	2.49	2.58	2.61	2.55
	Feb.	1.01	1.10	1.99	1.92	1.81	1.73	2.46	2.53	2.59	2.56
	Mar.	0.98	1.06	1.99	1.92	1.81	1.73	2.43	2.43	2.52	2.48
	Apr.	0.97	1.05	1.99	1.92	1.81	1.73	2.44	2.49	2.54	2.42

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				Wholesale				Retail			
Year	Month	Farm	Cooperative	Whole	2%	1%	Skim	Whole	2%	1%	Skim
	May	0.97	1.05	1.94	1.88	1.81	1.73	2.43	2.43	2.51	2.44
	June	0.98	1.06	1.89	1.84	1.80	1.73	2.51	2.55	2.59	2.52
	July	0.97	1.06	1.89	1.84	1.80	1.73	2.30	2.32	2.45	2.27
	Aug.	1.08	1.16	1.89	1.84	1.80	1.73	2.09	2.34	2.59	2.06
	Sept.	1.31	1.40	2.08	1.99	1.88	1.79	2.44	2.45	2.63	2.45
	Oct.	1.36	1.45	2.26	2.17	2.06	1.97	2.67	2.70	2.85	2.67
	Nov.	1.37	1.45	2.27	2.18	2.07	1.98	2.33	2.36	2.59	2.38
	Dec.	1.33	1.41	2.27	2.18	2.07	1.98	2.13	2.16	2.33	2.14
	Avg.	1.11	1.20	2.04	1.97	1.88	1.80	2.39	2.45	2.57	2.41
2004	Jan.	1.15	1.24	2.27	2.18	2.07	1.98	1.97	2.11	2.27	2.02
	Feb.	1.13	1.21	2.27	2.18	2.07	1.98	2.07	2.10	2.22	2.05
	Mar.	1.16	1.24	2.27	2.18	2.07	1.98	2.14	2.25	2.24	2.16
	Apr.	1.31	1.39	2.23	1.94	1.91	1.76	2.00	2.10	2.18	2.03
	May	1.83	1.91	2.77	2.35	2.33	2.14	2.62	2.67	2.65	2.55
	Avg.	1.32	1.40	2.36	2.17	2.09	1.97	2.16	2.25	2.31	2.16

Source: GAO's analysis of price data provided by USDA, the Defense Commissary Agency, and Information Resources, Inc.

Note: For the Phoenix market, the farm price is the USDA-estimated farm Class I price for 3.5 percent milkfat content; the cooperative price is the announced cooperative Class I price for Phoenix for 3.5 percent milkfat content; the wholesale price is the average of the prices paid by the commissaries at Luke Air Force Base and Davis-Monthan Air Force Base, adjusted for a 5 percent markup; and the retail price is the price collected by Information Resources, Inc., for the Phoenix market. Prices may not average due to rounding.

Table 22: Prices for a Gallon of Milk in Salt Lake City, Utah, October 2000 through May 2004

				Wholesale				Retail			
Year	Month	Farm	Cooperative	Whole	2%	1%	Skim	Whole	2%	1%	Skim
2000	Oct.	$1.13	$1.21	$2.03	$1.96	$1.84	$1.80	$2.60	$2.18	$2.17	$2.44
	Nov.	1.13	1.20	2.04	1.97	1.85	1.81	2.59	2.38	2.39	2.44
	Dec.	1.15	1.23	2.06	1.98	1.86	1.81	2.58	2.18	2.24	2.44
	Avg.	1.14	1.21	2.04	1.97	1.85	1.81	2.59	2.25	2.27	2.44
2001	Jan.	1.31	1.39	2.14	2.03	1.89	1.81	2.68	2.27	2.17	2.42
	Feb.	1.13	1.21	2.15	2.04	1.89	1.82	2.58	2.21	2.19	2.31
	Mar.	1.19	1.28	2.09	2.00	1.87	1.82	2.50	2.23	2.21	2.21
	Apr.	1.26	1.34	2.15	2.04	1.89	1.82	2.34	2.28	2.27	2.09
	May	1.33	1.41	2.22	2.08	1.91	1.82	2.13	2.09	2.03	2.18
	June	1.39	1.48	2.28	2.12	1.93	1.83	2.38	2.18	2.16	2.21
	July	1.42	1.51	2.34	2.15	1.96	1.84	2.39	2.19	2.12	2.00
	Aug.	1.43	1.51	2.36	2.17	1.97	1.84	2.39	2.13	2.13	2.00
	Sept.	1.44	1.53	2.37	2.18	1.97	1.85	2.46	2.20	2.20	2.06
	Oct.	1.48	1.56	2.39	2.19	1.97	1.83	2.39	2.35	2.37	2.21
	Nov.	1.47	1.55	2.41	2.22	2.02	1.91	2.41	2.36	2.33	2.22
	Dec.	1.14	1.22	2.28	2.14	1.98	1.90	2.37	2.35	2.34	2.15
	Avg.	1.33	1.42	2.27	2.11	1.94	1.84	2.42	2.24	2.21	2.17
2002	Jan.	1.14	1.22	2.16	2.04	1.89	1.83	2.25	2.24	2.24	2.06
	Feb.	1.14	1.22	2.16	2.04	1.89	1.83	2.46	2.41	2.42	2.18
	Mar.	1.11	1.19	2.15	2.04	1.89	1.83	2.41	2.33	2.34	2.17
	Apr.	1.10	1.18	2.02	1.96	1.88	1.75	2.37	2.33	2.29	2.13
	May	1.08	1.16	1.89	1.88	1.86	1.67	2.34	2.31	2.30	2.13
	June	1.06	1.14	1.88	1.88	1.85	1.66	2.39	2.38	2.42	2.17
	July	1.03	1.11	1.85	1.87	1.86	1.68	2.38	2.30	2.26	2.17
	Aug.	1.01	1.09	1.84	1.86	1.85	1.67	2.37	2.33	2.37	2.10
	Sept.	1.01	1.09	1.84	1.85	1.85	1.68	2.16	2.01	1.94	1.91
	Oct.	0.99	1.06	1.84	1.84	1.84	1.68	2.46	2.42	2.40	2.17
	Nov.	1.02	1.10	1.85	1.85	1.85	1.70	2.38	2.44	2.41	2.17
	Dec.	1.02	1.10	1.87	1.87	1.86	1.71	2.10	1.97	1.99	1.84
	Avg.	1.06	1.14	1.95	1.92	1.86	1.72	2.34	2.29	2.28	2.10
2003	Jan.	1.02	1.10	1.87	1.86	1.85	1.70	2.10	2.06	2.01	1.83
	Feb.	0.99	1.07	1.86	1.85	1.84	1.68	2.09	2.10	2.08	1.88
	Mar.	0.96	1.04	1.85	1.84	1.82	1.66	2.07	2.05	2.03	1.83
	Apr.	0.94	1.02	1.88	1.87	1.85	1.69	2.10	2.09	2.07	1.85

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				Wholesale				Retail			
Year	Month	Farm	Cooperative	Whole	2%	1%	Skim	Whole	2%	1%	Skim
	May	0.95	1.03	1.90	1.89	1.87	1.71	2.12	2.11	2.09	1.89
	June	0.95	1.03	1.90	1.89	1.87	1.71	1.96	2.00	2.01	1.83
	July	0.95	1.03	1.90	1.89	1.87	1.71	2.04	2.03	2.01	1.86
	Aug.	1.05	1.14	1.96	1.95	1.94	1.77	2.32	2.33	2.23	2.11
	Sept.	1.29	1.37	2.13	2.10	2.09	1.92	2.37	2.51	2.28	2.32
	Oct.	1.34	1.42	2.27	2.24	2.23	2.07	2.22	2.29	2.28	2.18
	Nov.	1.35	1.43	2.29	2.28	2.26	2.09	2.00	2.05	2.06	1.88
	Dec.	1.30	1.38	2.28	2.26	2.24	2.07	2.03	2.10	2.10	1.95
	Avg.	1.09	1.17	2.01	1.99	1.98	1.82	2.12	2.14	2.10	1.95
2004	Jan.	1.14	1.21	2.21	2.18	2.16	1.99	2.00	2.06	2.08	1.93
	Feb.	1.12	1.19	2.12	2.08	2.04	1.86	1.96	2.03	2.09	1.90
	Mar.	1.14	1.22	2.13	2.06	2.00	1.80	1.99	2.06	2.13	1.95
	Apr.	1.29	1.37	2.20	2.10	2.01	1.78	2.19	2.22	2.21	2.02
	May	1.81	1.88	2.52	2.38	2.28	2.03	2.50	2.58	2.63	2.38
	Avg.	1.30	1.37	2.24	2.16	2.10	1.89	2.13	2.19	2.23	2.04

Source: GAO's analysis of price data provided by USDA, the Defense Commissary Agency, and Information Resources, Inc.

Note: For the Salt Lake City market, the farm price is the USDA-estimated farm Class I price for 3.5 percent milkfat content; the cooperative price is the announced cooperative Class I price for Salt Lake City for 3.5 percent milkfat content; the wholesale price is the price paid by the commissary at Hill Air Force Base, adjusted for a 5 percent markup; and the retail price is the price collected by Information Resources, Inc., for the Salt Lake City market. Prices may not average due to rounding.

Table 23: Prices for a Gallon of Milk in San Diego, California, October 2000 through May 2004

				Wholesale				Retail			
Year	Month	Farm	Cooperative	Whole	2%	1%	Skim	Whole	2%	1%	Skim
2000	Oct.	$0.99	$1.21	$1.90	$1.90	$1.87	$1.69	$2.55	$2.45	$2.66	$2.29
	Nov.	1.04	1.21	1.88	1.88	1.85	1.66	2.51	2.54	2.54	2.23
	Dec.	1.06	1.28	1.95	1.91	1.88	1.67	2.72	2.63	2.79	2.40
	Avg.	1.03	1.23	1.91	1.90	1.87	1.67	2.59	2.54	2.66	2.31
2001	Jan.	1.03	1.43	2.03	1.98	1.95	1.68	2.81	2.72	2.93	2.52
	Feb.	1.05	1.21	1.92	1.91	1.91	1.66	2.69	2.75	2.71	2.36
	Mar.	1.11	1.26	1.98	1.97	1.94	1.67	2.68	2.57	2.77	2.40
	Apr.	1.18	1.33	2.05	2.01	1.96	1.67	2.81	2.74	2.84	2.39
	May	1.25	1.39	2.11	2.06	1.98	1.67	2.85	2.71	2.81	2.30
	June	1.31	1.46	2.13	2.07	1.98	1.67	2.91	2.85	2.80	2.34
	July	1.30	1.49	2.15	2.08	1.99	1.67	3.00	2.94	2.99	2.50
	Aug.	1.34	1.49	2.19	2.11	2.00	1.67	3.10	2.99	3.04	2.55
	Sept.	1.37	1.49	2.19	2.11	2.00	1.67	3.22	2.95	3.24	2.62
	Oct.	1.21	1.55	2.23	2.13	2.00	1.65	3.27	2.95	3.24	2.61
	Nov.	1.11	1.41	2.11	2.09	2.02	1.71	3.18	2.93	2.81	2.52
	Dec.	1.06	1.19	2.01	2.00	2.00	1.64	3.06	2.94	3.08	2.52
	Avg.	1.19	1.39	2.09	2.04	1.98	1.67	2.97	2.84	2.94	2.47
2002	Jan.	1.07	1.18	1.99	1.98	1.99	1.64	3.05	2.91	2.94	2.46
	Feb.	1.01	1.20	1.97	1.97	1.97	1.64	2.95	2.76	2.72	2.40
	Mar.	0.99	1.16	1.92	1.93	1.96	1.63	2.85	2.71	2.50	2.32
	Apr.	0.98	1.16	1.88	1.89	1.88	1.61	2.76	2.47	2.63	2.40
	May	0.94	1.14	1.82	1.81	1.79	1.58	2.88	2.67	2.73	2.35
	June	0.90	1.10	1.79	1.80	1.78	1.58	2.87	2.62	2.85	2.40
	July	0.87	1.10	1.77	1.78	1.77	1.57	2.85	2.49	2.77	2.37
	Aug.	0.89	1.08	1.75	1.75	1.76	1.57	2.69	2.58	2.63	2.28
	Sept.	0.91	1.08	1.75	1.75	1.76	1.57	2.72	2.64	2.72	2.29
	Oct.	0.94	1.05	1.75	1.76	1.77	1.58	2.75	2.71	2.74	2.30
	Nov.	0.92	1.16	1.83	1.85	1.86	1.65	2.80	2.70	2.80	2.30
	Dec.	0.92	1.08	1.77	1.78	1.78	1.58	2.73	2.71	2.74	2.23
	Avg.	0.95	1.12	1.83	1.84	1.84	1.60	2.83	2.66	2.73	2.34
2003	Jan.	0.92	1.11	1.77	1.77	1.77	1.57	2.68	2.59	2.84	2.28
	Feb.	0.89	1.06	1.74	1.71	1.71	1.50	2.74	2.63	2.94	2.29
	Mar.	0.87	1.05	1.72	1.71	1.69	1.44	2.70	2.58	2.78	2.27
	Apr.	0.88	1.02	1.70	1.70	1.67	1.43	2.72	2.60	2.80	2.27

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				Wholesale				Retail			
Year	Month	Farm	Cooperative	Whole	2%	1%	Skim	Whole	2%	1%	Skim
	May	0.87	1.03	1.68	1.69	1.65	1.42	2.81	2.67	2.80	2.29
	June	0.87	1.04	1.68	1.69	1.65	1.42	2.80	2.68	2.78	2.30
	July	0.99	1.03	1.70	1.71	1.68	1.44	2.82	2.70	2.84	2.32
	Aug.	1.10	1.27	1.86	1.89	1.87	1.60	3.00	2.78	2.98	2.36
	Sept.	1.14	1.41	2.03	2.06	2.04	1.73	3.13	2.93	3.07	2.50
	Oct.	1.16	1.42	2.03	2.08	2.07	1.76	3.19	2.86	3.23	2.43
	Nov.	1.10	1.42	2.03	2.07	2.06	1.75	3.12	2.80	3.29	2.44
	Dec.	1.08	1.32	1.94	1.98	1.97	1.65	2.72	2.49	2.93	2.23
	Avg.	0.99	1.18	1.82	1.84	1.82	1.56	2.87	2.69	2.94	2.33
2004	Jan.	1.04	1.22	1.85	1.87	1.85	1.55	2.64	2.45	2.82	2.19
	Feb.	1.09	1.17	1.77	1.77	1.74	1.44	2.62	2.43	2.72	2.17
	Mar.	1.26	1.21	1.80	1.77	1.71	1.40	2.55	2.34	2.76	2.13
	Apr.	1.48	1.38	1.99	1.87	1.76	1.43	2.76	2.49	2.63	2.15
	May	1.52	1.85	2.41	2.34	2.25	1.83	3.03	2.78	2.93	2.40
	Avg.	1.28	1.37	1.96	1.92	1.86	1.53	2.72	2.50	2.77	2.21

Source: GAO's analysis of price data provided by the California Department of Food and Agriculture, the Defense Commissary Agency, and Information Resources, Inc.

Note: For the San Diego market, the farm price is the California mailbox price for 3.5 percent milkfat content; the cooperative price is the Southern California Class I price for 3.5 percent milkfat content; the wholesale price is the average of the prices paid by the commissaries at the Naval Base, San Diego; Marine Corps Base, Camp Pendleton; Naval Outlying Landing Field, Imperial Beach; Marine Corps Air Station, Miramar; Naval Air Station, North Island; and by the San Onofre Commissary, Camp Pendleton, adjusted for a 5 percent markup; and the retail price is the price collected by Information Resources, Inc., for the San Diego market. Prices may not average due to rounding.

Table 24: Prices for a Gallon of Milk in Seattle, Washington, October 2000 through May 2004

				Wholesale				Retail			
Year	Month	Farm	Cooperative	Whole	2%	1%	Skim	Whole	2%	1%	Skim
2000	Oct.	$1.20	$1.28	$1.59	$1.46	$1.38	$1.31	$2.71	$2.50	$2.50	$2.37
	Nov.	1.14	1.22	1.58	1.46	1.37	1.30	2.83	2.62	2.58	2.49
	Dec.	1.18	1.27	1.61	1.48	1.40	1.33	2.73	2.57	2.57	2.45
	Avg.	1.17	1.26	1.59	1.47	1.38	1.31	2.76	2.56	2.55	2.44
2001	Jan.	1.32	1.41	1.76	1.63	1.55	1.48	2.62	2.39	2.40	2.25
	Feb.	1.17	1.25	1.60	1.48	1.39	1.33	2.98	2.77	2.71	2.62
	Mar.	1.21	1.29	1.64	1.51	1.43	1.36	2.77	2.52	2.52	2.29
	Apr.	1.27	1.36	1.71	1.59	1.50	1.43	2.95	2.72	2.67	2.54
	May	1.34	1.42	1.78	1.66	1.57	1.51	2.95	2.65	2.67	2.44
	June	1.41	1.49	1.84	1.72	1.63	1.57	2.80	2.77	2.70	2.49
	July	1.44	1.52	1.87	1.75	1.66	1.60	3.14	3.01	2.85	2.71
	Aug.	1.44	1.53	1.88	1.76	1.67	1.61	3.15	2.99	2.85	2.71
	Sept.	1.46	1.54	1.89	1.77	1.68	1.62	2.84	2.65	2.62	2.43
	Oct.	1.49	1.57	1.92	1.80	1.71	1.64	2.92	2.72	2.69	2.46
	Nov.	1.47	1.56	1.91	1.78	1.70	1.63	3.01	2.76	2.73	2.50
	Dec.	1.15	1.23	1.60	1.48	1.39	1.32	2.93	2.75	2.68	2.47
	Avg.	1.35	1.43	1.78	1.66	1.57	1.51	2.92	2.73	2.67	2.49
2002	Jan.	1.15	1.23	1.60	1.47	1.39	1.32	3.18	2.93	2.82	2.67
	Feb.	1.25	1.33	1.60	1.47	1.39	1.32	3.13	2.86	2.74	2.62
	Mar.	1.12	1.20	1.57	1.44	1.36	1.29	3.16	2.91	2.78	2.68
	Apr.	1.11	1.19	1.56	1.43	1.35	1.28	2.99	2.66	2.59	2.42
	May	1.09	1.17	1.54	1.41	1.33	1.26	3.08	2.70	2.68	2.48
	June	1.07	1.15	1.52	1.40	1.31	1.24	3.08	2.56	2.54	2.32
	July	1.03	1.12	1.48	1.36	1.27	1.21	3.07	2.67	2.69	2.49
	Aug.	1.02	1.10	1.47	1.35	1.26	1.20	2.81	2.62	2.42	2.43
	Sept.	1.02	1.10	1.47	1.35	1.26	1.20	3.01	2.70	2.71	2.47
	Oct.	0.99	1.07	1.45	1.32	1.24	1.17	3.10	2.77	2.73	2.56
	Nov.	1.03	1.11	1.47	1.34	1.26	1.19	2.98	2.73	2.69	2.41
	Dec.	1.02	1.11	1.47	1.35	1.26	1.20	2.98	2.76	2.75	2.50
	Avg.	1.08	1.16	1.52	1.39	1.31	1.24	3.05	2.74	2.68	2.50
2003	Jan.	1.03	1.11	1.47	1.35	1.26	1.19	3.12	3.04	2.91	2.78
	Feb.	1.00	1.08	1.44	1.32	1.23	1.17	3.07	2.92	2.73	2.53
	Mar.	0.96	1.05	1.42	1.29	1.21	1.14	2.97	2.75	2.66	2.42
	Apr.	0.95	1.03	1.40	1.27	1.19	1.12	3.00	2.93	2.72	2.49

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				Wholesale				Retail			
Year	**Month**	**Farm**	**Cooperative**	**Whole**	**2%**	**1%**	**Skim**	**Whole**	**2%**	**1%**	**Skim**
	May	0.95	1.04	1.44	1.32	1.23	1.16	2.94	2.81	2.66	2.45
	June	0.96	1.04	1.44	1.32	1.24	1.17	3.00	2.82	2.76	2.54
	July	0.95	1.04	1.45	1.33	1.24	1.18	3.07	2.86	2.82	2.55
	Aug.	1.05	1.15	1.55	1.43	1.36	1.28	3.11	2.93	2.90	2.65
	Sept.	1.29	1.38	1.81	1.69	1.63	1.54	3.22	3.00	3.01	2.72
	Oct.	1.34	1.43	1.85	1.72	1.88	1.58	3.06	2.98	2.97	2.69
	Nov.	1.35	1.44	1.86	1.73	1.82	1.59	3.10	2.89	2.93	2.63
	Dec.	1.30	1.39	1.82	1.69	1.99	1.55	2.75	2.62	2.49	2.39
	Avg.	1.09	1.18	1.58	1.46	1.44	1.31	3.03	2.88	2.80	2.57
2004	Jan.	1.13	1.22	1.69	1.56	1.92	1.42	2.59	2.56	2.47	2.37
	Feb.	1.10	1.20	1.65	1.53	1.72	1.38	2.81	2.50	2.45	2.33
	Mar.	1.13	1.23	1.73	1.60	1.67	1.44	2.44	2.46	2.32	2.16
	Apr.	1.28	1.38	1.90	1.76	1.68	1.64	2.56	2.53	2.46	2.32
	May	1.80	1.89	2.38	2.24	1.96	2.13	3.06	2.88	2.82	2.61
	Avg.	1.29	1.38	1.87	1.74	1.79	1.60	2.69	2.59	2.50	2.36

Source: GAO's analysis of price data provided by USDA, the Defense Commissary Agency, and Information Resources, Inc.

Note: For the Seattle market, the farm price is the USDA-estimated farm Class I price for 3.5 percent milkfat content; the cooperative price is the announced cooperative Class I price for Seattle for 3.5 percent milkfat content; the wholesale price is the average of the prices paid by the commissaries at the Naval Station Everett, Smokey Point Support Center; Fort Lewis; and McChord Air Force Base, adjusted for a 5 percent markup; and the retail price is the price collected by Information Resources, Inc., for the Seattle market. Prices may not average due to rounding.

Table 25: Prices for a Gallon of Milk in Washington, D.C., October 2000 through May 2004

				Wholesale				Retail			
Year	Month	Farm	Cooperative	Whole	2%	1%	Skim	Whole	2%	1%	Skim
2000	Oct.	$1.32	$1.40	$1.66	$1.51	$1.49	$1.42	$2.10	$2.10	$2.09	$1.94
	Nov.	1.33	1.41	1.66	1.50	1.49	1.42	2.09	2.10	2.09	1.94
	Dec.	1.36	1.44	1.68	1.53	1.51	1.43	2.11	2.12	2.11	1.97
	Avg.	1.34	1.42	1.67	1.51	1.50	1.42	2.10	2.11	2.10	1.95
2001	Jan.	1.54	1.62	1.83	1.67	1.62	1.54	2.21	2.24	2.22	2.05
	Feb.	1.36	1.44	1.67	1.52	1.53	1.44	2.22	2.25	2.23	2.04
	Mar.	1.43	1.50	1.73	1.57	1.57	1.48	2.21	2.23	2.22	2.05
	Apr.	1.49	1.57	1.79	1.64	1.61	1.52	2.25	2.27	2.27	2.10
	May	1.56	1.63	1.86	1.70	1.66	1.58	2.29	2.31	2.32	2.15
	June	1.63	1.70	1.93	1.77	1.72	1.65	2.32	2.31	2.30	2.13
	July	1.63	1.71	1.96	1.80	1.74	1.68	2.29	2.27	2.25	2.10
	Aug.	1.64	1.71	1.96	1.80	1.74	1.68	2.29	2.28	2.26	2.10
	Sept.	1.65	1.72	1.97	1.80	1.75	1.69	2.31	2.31	2.30	2.13
	Oct.	1.68	1.76	1.99	1.83	1.78	1.71	2.37	2.35	2.34	2.17
	Nov.	1.69	1.77	1.99	1.83	1.79	1.74	2.38	2.39	2.40	2.25
	Dec.	1.37	1.44	1.73	1.57	1.60	1.60	2.35	2.36	2.35	2.19
	Avg.	1.56	1.63	1.87	1.71	1.68	1.61	2.29	2.30	2.29	2.12
2002	Jan.	1.37	1.44	1.71	1.54	1.53	1.55	2.36	2.36	2.35	2.18
	Feb.	1.37	1.44	1.68	1.52	1.52	1.52	2.33	2.33	2.32	2.15
	Mar.	1.34	1.41	1.65	1.49	1.50	1.50	2.30	2.31	2.30	2.15
	Apr.	1.33	1.40	1.64	1.48	1.43	1.49	2.30	2.30	2.30	2.14
	May	1.31	1.38	1.63	1.46	1.42	1.48	2.32	2.31	2.32	2.16
	June	1.29	1.36	1.61	1.44	1.40	1.46	2.29	2.27	2.27	2.12
	July	1.25	1.32	1.57	1.41	1.37	1.44	2.31	2.29	2.29	2.13
	Aug.	1.24	1.31	1.56	1.40	1.36	1.43	2.29	2.27	2.28	2.13
	Sept.	1.24	1.31	1.56	1.40	1.36	1.43	2.27	2.27	2.29	2.13
	Oct.	1.21	1.28	1.54	1.37	1.34	1.41	2.25	2.25	2.27	2.12
	Nov.	1.25	1.32	1.57	1.41	1.37	1.44	2.19	2.20	2.22	2.08
	Dec.	1.24	1.32	1.56	1.40	1.36	1.43	2.24	2.25	2.24	2.09
	Avg.	1.29	1.36	1.61	1.44	1.41	1.47	2.29	2.28	2.29	2.13
2003	Jan.	1.24	1.32	1.56	1.40	1.36	1.43	2.20	2.22	2.20	2.06
	Feb.	1.20	1.28	1.53	1.37	1.33	1.41	2.19	2.23	2.22	2.08
	Mar.	1.17	1.24	1.50	1.33	1.30	1.38	2.18	2.19	2.20	2.06
	Apr.	1.17	1.24	1.48	1.32	1.29	1.38	2.22	2.22	2.21	2.07

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				Wholesale				Retail			
Year	Month	Farm	Cooperative	Whole	2%	1%	Skim	Whole	2%	1%	Skim
	May	1.17	1.25	1.49	1.33	1.30	1.38	2.23	2.22	2.22	2.07
	June	1.18	1.25	1.49	1.33	1.30	1.38	2.25	2.22	2.20	2.06
	July	1.19	1.26	1.50	1.34	1.30	1.39	2.28	2.23	2.20	2.07
	Aug.	1.29	1.36	1.58	1.43	1.38	1.45	2.34	2.29	2.27	2.14
	Sept.	1.52	1.60	1.74	1.61	1.55	1.59	2.50	2.47	2.42	2.28
	Oct.	1.57	1.65	1.86	1.70	1.65	1.71	2.58	2.53	2.51	2.35
	Nov.	1.58	1.66	1.87	1.71	1.66	1.72	2.59	2.53	2.50	2.34
	Dec.	1.53	1.61	1.83	1.67	1.63	1.70	2.59	2.55	2.52	2.37
	Avg.	1.32	1.39	1.62	1.46	1.42	1.49	2.35	2.33	2.31	2.16
2004	Jan.	1.36	1.44	1.69	1.53	1.49	1.58	2.59	2.54	2.51	2.36
	Feb.	1.34	1.42	1.66	1.50	1.46	1.55	2.56	2.50	2.48	2.33
	Mar.	1.37	1.45	1.66	1.50	1.45	1.54	2.53	2.48	2.45	2.31
	Apr.	1.51	1.59	1.82	1.66	1.61	1.66	2.58	2.49	2.43	2.25
	May	2.03	2.11	2.28	2.12	2.05	2.04	2.90	2.78	2.72	2.51
	Avg.	1.52	1.60	1.82	1.66	1.61	1.67	2.63	2.56	2.52	2.35

Source: GAO's analysis of price data provided by USDA, the Defense Commissary Agency, and Information Resources, Inc.

Note: For the Washington, D.C., market, the farm price is the USDA-estimated farm Class I price for 3.5 percent milkfat content; the cooperative price is the announced cooperative Class I price for Washington, D.C., for 3.5 percent milkfat content; the wholesale price is the average of the prices paid by the commissaries at Bolling Air Force Base; Walter Reed Army Medical Center; Fort Myer; Fort Belvoir; the Marine Corps Base, Quantico; Andrews Air Force Base; Aberdeen Proving Ground; the Naval Station, Annapolis; Fort Meade; and Fort Detrick, adjusted for a 5 percent markup; and the retail price is the price collected by Information Resources, Inc., for the Washington, D.C., market. Prices may not average due to rounding.

Factors That Influence the Price of Milk as It Moves from the Farm to the Consumer

The prices that farmers, cooperatives, wholesale processors, and retailers receive are determined by the interaction of many factors, such as forces affecting the supply of raw milk and manufactured and fluid milk products, consumer demand for manufactured and fluid milk products, federal and state dairy programs, the level of services provided by dairy cooperatives, market structure at various levels of the marketing chain, and other input costs of processing and retailing. Dairy farmers receive a price for raw milk, and each entity involved in the processing and marketing of fluid milk adds value to the product and retains a portion of the difference between the farm and retail prices. (This difference is known as the price spread.) This appendix examines the key factors that influence milk prices at the different levels of the marketing chain.

Market Forces, in Addition to Federal and State Policies, Influence Milk Prices at the Farm Level

Supply and demand forces, which in turn are influenced by federal and state dairy programs, determine farm prices for the raw milk that is sold for use in fluid milk and other dairy products.[1] For example, in recent months, a variety of supply and demand forces have come together to significantly increase farm milk prices. On the supply side, the available supply of raw milk has been reduced by farmers cutting back production due to a previous period of low prices and by the closing of the Canadian border to replacement cows as a result of concerns about mad cow disease.[2] On the demand side, consumer demand for nonfluid dairy products has increased as consumers resumed eating out following the attacks of September 11, 2001, and as dietary trends, such as the rising popularity of low-carbohydrate diets, have changed. While these forces have been driving recent price trends, federal and state dairy programs continue to influence milk prices. For example, major domestic programs such as federal milk marketing orders (FMMOs) and price supports help individual farmers who lack market power compared to other entities such as wholesale processors and retailers and help to ensure that farm prices do not fall below a minimum level. At the same time, U.S. import restrictions maintain domestic dairy prices at levels higher than average international market

[1]Each year the United States processes about 7 billion gallons of the approximately 20 billion gallons of raw milk into fluid milk products, such as flavored milks, buttermilk, whole, 2 percent, 1 percent, and skim milk. The rest of the raw milk supply is used to produce manufactured products, such as butter, ice cream, yogurt, powdered milk, and cheese.

[2]Bovine spongiform encephalopathy (BSE), commonly referred to as mad cow disease, is a degenerative neurological disease affecting the central nervous system in cattle.

prices by limiting the quantities of milk products that are imported into the country.

Supply and Demand Forces Affect Farm Milk Prices

The quantity of raw milk that dairy farmers supply (production) is determined by the operating costs of producing that milk, such as feed and fuel,[3] ownership costs for dairying equipment,[4] land costs, and labor costs, as well as the price that farmers expect to receive for milk (as based on demand). Of these costs, the 2002 annual report on the costs of milk production in California, the largest milk producing state, showed that the highest cost is feed, at 44 percent of milk production costs. Other major costs include replacement cows (14 percent), other operating expenses (13 percent), and labor (11 percent).[5] Milk production can also vary seasonally, according to weather, and is affected by farmers' management practices.

In February 2004, the U.S. Department of Agriculture (USDA) published a report on the characteristics and costs of milk production in the United States, which found that dairy farmers in the West had a cost advantage over farmers in other regions because western operations were appreciably larger.[6] Farms with 500 or more milk cows had substantially lower total operating and ownership costs, averaging $11.60 per hundredweight of milk sold. This cost advantage arises because as herd size increases, associated increases in fixed costs, such as capital investments, are spread proportionally over a larger amount of production, thereby lowering the fixed costs per hundredweight of milk produced. USDA found that the average herd size of low-cost operations was more than three times the size

[3]Operating costs include major inputs such as feed, veterinary services and medicine, bedding and litter, marketing, fuel, lubricant, electricity, repairs, and interest on operating expenses.

[4]Ownership costs include the annualized cost of maintaining the capital investment (depreciation and interest) in dairy facilities and equipment, and costs for non-real estate property taxes and insurance.

[5]This labor estimate includes salary, benefits, and all employer taxes for hired labor. If family labor were also included, labor would represent over 12 percent of total production costs.

[6]S.D. Short, U.S. Department of Agriculture, *Characteristics and Production Costs of U.S. Dairy Operations*. Resource Economics Division, Economic Research Service, Statistical Bulletin Number 974-6, February 2004.

of high-cost operations.[7] Table 26 shows the average ownership and operating costs by region and herd size in 2000.

Table 26: Average Ownership and Operating Costs by Region and Herd Size, 2000

Region	Ownership and operating costs per hundredweight
Arizona/Las Vegas, Pacific Northwest, California[a]	$11.58
Upper Midwest[b]	$14.40
Northeast[c]	$14.44
Central[d]	$18.09
Mideast/Southeast[e]	$18.23
Herd size	
Small (<50)	$17.98
Medium (50-199)	$15.16
Large (200-499)	$13.32
Industrial (≥500)	$11.60

Source: USDA.

[a]States in this survey region included parts of Arizona, California, Idaho, Oregon, and Washington.

[b]States in this survey region included Michigan and Wisconsin and part of Minnesota.

[c]States in this survey region included Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, and Vermont and parts of Maryland, Ohio, and Pennsylvania.

[d]States in this survey region included Illinois, Indiana, and Iowa and parts of Kentucky, Minnesota, Missouri, Nebraska, Ohio, and South Dakota.

[e]States in this survey region included West Virginia and parts of Alabama, Arkansas, Georgia, Kentucky, Missouri, North Carolina, Ohio, Oklahoma, Pennsylvania, Tennessee, and Virginia.

The USDA study also reported that while milk is produced in all 50 states, the top 5 milk-producing states in 2000—California, Wisconsin, New York, Pennsylvania, and Minnesota—accounted for 53 percent of total milk produced. Growth in the importance of western regions as major sources of milk over the past 25 years is a significant feature of the United States dairy industry. For example, in 1975, midwestern states such as Iowa, Ohio, and Missouri were prominent among the top 10 dairy producing states. By 2000, production in Idaho, New Mexico, and Washington State surpassed

[7]The USDA study defined low-cost producers as the 25 percent of milk producers with costs of $12.17 or less per hundredweight of milk sold. High-cost producers were defined as the 25 percent of milk producers with costs of $18.79 or more per hundredweight of milk sold.

production in these traditional dairy states. Milk production is consolidating so that farms with larger numbers of cows account for a growing share of production. In 1993, farms with 100 or more cows accounted for 14 percent of all U.S. dairy farms, over half of all cows, and over 55 percent of the milk produced. As of 2000, these numbers had grown to 20 percent of all dairy farms, 66 percent of all cows, and more than 70 percent of milk produced. Significantly, farms with 500 or more cows accounted for 3 percent of all dairy farms, but 35 percent of cows and 31 percent of milk produced in 2000.

The production of milk has unique characteristics that distinguish it from other agricultural products and that cause relatively small changes in supply or demand to result in relatively large changes in price, particularly at the farm level. Farmers employ specialized assets or equipment to produce milk, and they have limited ability to use their farms, cows, and equipment for other purposes during periods of low prices. This limited flexibility creates a relatively inelastic supply of milk with respect to price.[8]

Demand for raw milk is mainly derived from consumer demand for fluid milk and manufactured milk products.[9] Consumer demand for different fluid or manufactured milk products affects the price of raw milk used for other products because increased consumer demand for one particular product–causing more of that product to be produced–reduces the supply of raw milk available for other products, thus increasing the price that manufacturers of other products must pay to acquire raw milk. Over the long term, per capita demand for fluid milk products has been steadily declining, in large part because consumers have substituted carbonated soft drinks and other beverages for fluid milk. On the other hand, consumer demand for milk products has varied based on dietary considerations, such as the rising popularity of low-carbohydrate diets and changes in food consumption patterns, such as an increase in the amount of food consumed away from the home. Despite some evidence that consumer demand for

[8]Price elasticity of supply refers to the percentage change in the quantity supplied relative to a percentage change in the price received for a product, in this case raw milk. Supply is price elastic when a proportional change in the quantity supplied of a product exceeds the proportional change in its price; supply is price inelastic when a proportional change in the quantity supplied of a product is less than a proportional change in its price.

[9]Demand for raw milk is also influenced by the costs of transporting, processing, and marketing raw milk to produce dairy products for retail sale.

fluid milk has become more price elastic, it remains relatively price inelastic compared to the demand for many other products.[10]

Given the relative inelasticities of milk supply and demand with respect to price, a number of sources indicated that recent changes in the amount of raw milk produced, when combined with changes in demand, have affected farm prices. After late 1999, farm prices began falling in response to the production surplus that existed at that time. In addition, a number of dairy experts indicated that following the terrorist attacks of September 11, 2001, prices began to fall even further as people stopped eating out as much, thereby reducing the demand for manufactured milk products such as cheese.[11] This reduced consumption compounded the long-term decline in demand for fluid milk products. USDA reported that the combination of these supply and demand factors was responsible for the low farm prices that occurred during 2002 and 2003.

More recently, however, supply and demand conditions have changed to produce record high farm prices in 2004. For example, in response to low prices during 2002 and 2003, some farmers began to cut back on production by reducing the sizes of their herds. However, with the relative price inelasticity of milk supplies, one academic expert noted that it can take 12 to 18 months to achieve a supply response to low prices. During this time, the identification of a cow infected with mad cow disease in Alberta, Canada, in May 2003, led to a temporary U.S. ban on imports of Canadian beef and cattle. This ban included live animals, some of which would have been used as replacement cows in U.S. dairy herds. While some beef imports have resumed, USDA has not lifted restrictions on imports of live cattle.[12] Consequently, in June 2004, a report by USDA's Economic Research Service noted that with relatively few expansions in late 2003 and the tight supplies of replacement cows, few dairy farmers could increase production

[10]Price elasticity of demand refers to the percentage change in the quantity demanded relative to a percentage change in the price of a product, in this case fluid milk products. Demand is price elastic when a proportional change in the quantity demanded of a product exceeds the proportional change in its price; demand is price inelastic when a proportional change in the quantity demanded of a product is less than a proportional change in its price.

[11]According to USDA officials, a decline in the restaurant business began in mid-2001 and may have been related to other economic factors, such as falling stock market values and corporate scandals.

[12]Canadian feedlot operators have filed a class-action lawsuit against the United States under the North American Free Trade Agreement.

in response to rising milk prices, a response that usually limits price increases.[13]

Another factor in reducing milk production has been the lower amount of bST—a hormone used in milk production—available to U.S. farmers.[14] USDA reported that about 2 percent of the U.S. milk supply can be attributed to the use of bST.[15] However, in January 2004, Monsanto, the maker of the hormone, announced that its customers would receive only half their normal supply. This reduced availability began March 1 and is expected to continue through the end of 2004. Additionally, drought conditions in recent years have led to higher feed costs and have negatively affected the quality of the feed.[16] Finally, some sources identified the National Milk Producers Federation's Cooperatives Working Together program as another factor leading to reduced raw milk supplies.[17] Since the program began in July 2003, cooperatives have tried to reduce raw milk supplies by eliminating some dairy herds, decreasing production, and increasing exports. USDA estimates indicate that from January through June 2004, milk production in the top 20 dairy producing states averaged about 1 percent below production levels during the same period in 2003.

While these factors combined to reduce the available supply of raw milk, dairy experts indicated that demand for manufactured milk products has recovered during 2004. In part, they cited a general economic recovery as contributing to this increased demand. They also indicated that people have returned to consuming more food away from home, as they did prior

[13]"Dairy Markets Adjust, But Are Expected to Remain Tight," *Livestock, Dairy, and Poultry Outlook*, ERS, LDP-M-120, June 2004.

[14]USDA's Animal and Plant Health Inspection Service indicated that use of bovine somatotropin (bST) typically increases average milk yield by 10 pounds per cow per day over the course of the cow's entire lactation, or as long as bST continues to be used.

[15]"Meat Markets Roiled by Disease Outbreaks," *Livestock, Dairy, and Poultry Outlook*, ERS, LDP-M-116, February 2004.

[16]Poor quality feed can reduce milk production and may require farmers to supplement their feed, thereby raising overall feed costs.

[17]This initiative is funded by an assessment of $0.05 per hundredweight of milk that participating farmers market. The National Milk Producers Federation estimates a $0.59 per hundredweight increase in farm income from the program through September 2004. However, while some dairy experts indicated that the program has reduced raw milk supplies and thus benefited farmers' income, they also indicated that this estimate could be overstated.

to September 11, 2001. This recovery in demand, coming at a time of reduced milk supplies, pushed farm prices to record high levels in April and May of 2004. For example, USDA's market-based announced minimum price for milk to be used in manufactured products, such as cheese, was $19.66 and $20.58 per hundredweight in April and May of 2004, respectively. These prices compare with $9.41 and $9.71 per hundredweight for April and May of 2003. More recently, these high prices have started to moderate; the comparable announced minimum price for June 2004 was $17.68. However, USDA has estimated that average 2004 farm-level prices will be more than $3 per hundredweight higher than they were in 2003.

Federal and State Dairy Programs and Policies Influence Farm Prices

A complex system of programs and policies influences the price of raw milk used to produce fluid milk and manufactured products. USDA's milk marketing orders, as well as some states' dairy programs, attempt to stabilize milk marketing conditions by establishing minimum raw milk prices and other marketing rules, thus, these programs assist individual farmers and dairy cooperatives, which lack the market power of other entities such as wholesale milk processors.[18] USDA's price support program attempts to ensure that farm prices do not fall below a minimum level, and, together with the Milk Income Loss Contract (MILC) program, provides a safety net for individual farmers during periods of low prices. These programs and other federal dairy policies operate in a broader context of trade restrictions, which can limit competition from imported dairy products and maintain U.S. prices above average international market prices.

Federal and State Milk Marketing Orders

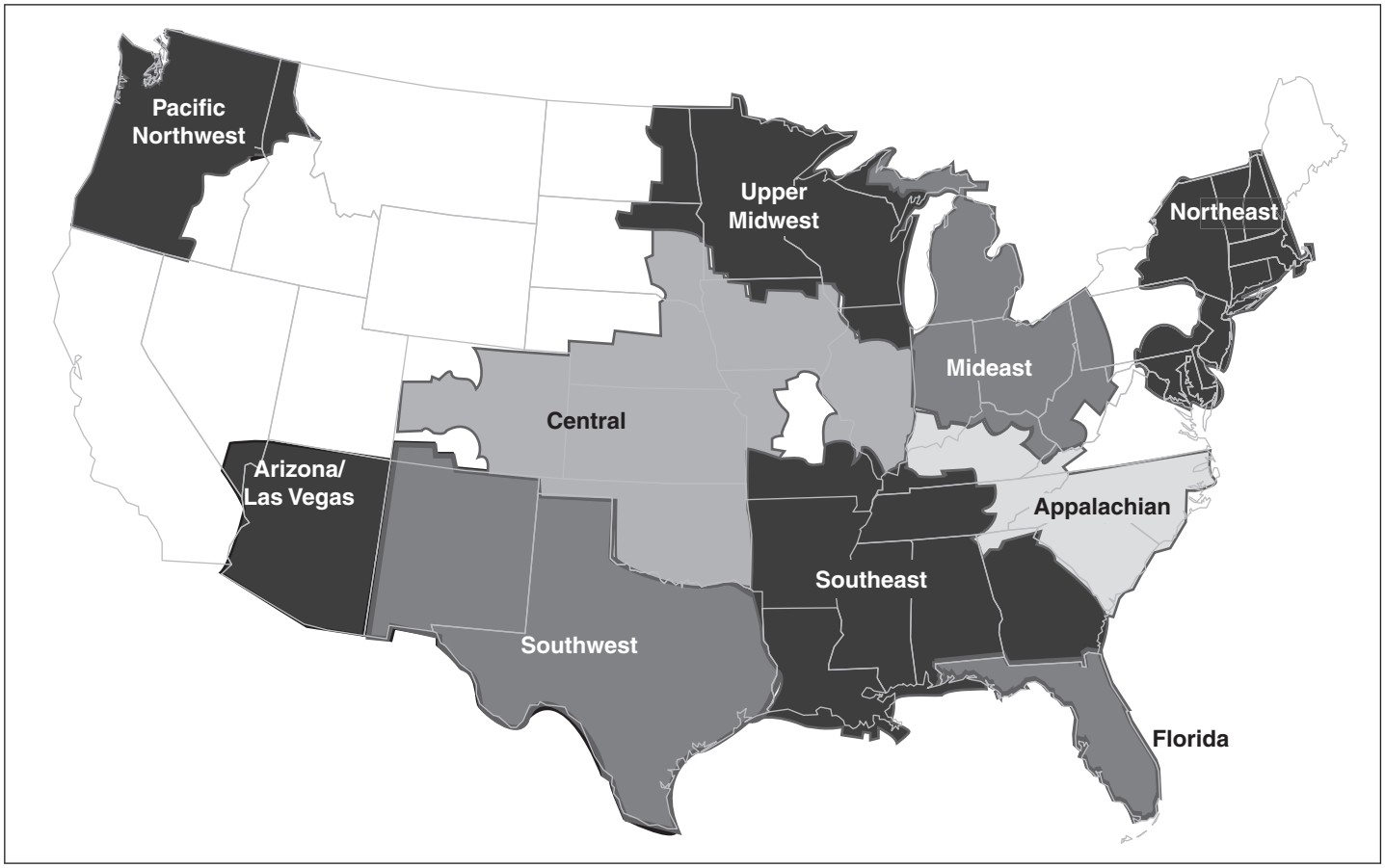
In 2003, the price of about 67 percent of the fluid grade milk marketed by dairy farmers in the United States was regulated under the FMMO program, created in 1933 and administered by USDA.[19] Under this program, USDA uses national dairy market price information to set the minimum prices that must be paid by processors for raw fluid grade milk in specified

[18]According to USDA, the objectives of FMMOs are to promote orderly marketing conditions in fluid milk markets, to improve the income situation of dairy farmers by establishing minimum milk prices, to supervise the terms of trade in milk markets in such manner as to achieve more equality of bargaining between farmers and processors, and to assure consumers adequate supplies of good quality milk at reasonable prices.

[19]The 1933 Agricultural Adjustment Act, as amended and reenacted in the Agricultural Marketing Agreement Act of 1937, established the federal marketing order agreements.

marketing areas, or orders.[20] Figure 32 shows a map of the current 10 FMMOs.

Figure 32: Map of Federal Milk Marketing Orders



Source: GAO, based on USDA Agricultural Marketing Service Dairy Programs.

[20]Dairy farmers sell two grades of milk. Grade A may be used for fluid consumption or in manufactured products. Grade B may be used only for manufactured products. Farmers producing Grade A milk must adhere to higher sanitation requirements than for Grade B milk. Prior to World War I, much of the milk marketed by farmers did not meet Grade A standards. However, by 1999, only about 3 percent of all milk marketed in the United States did not meet Grade A standards.

Under the FMMO program, USDA has a classified pricing system for setting minimum prices for milk on a monthly basis, based upon the intended use of the milk, as shown in table 27. While there is some variation among the methods used for setting prices in different orders, in general, FMMO class prices are determined by formulas with milk component values derived from wholesale dairy product prices. For example, Class III formulas use weekly average butter, cheese, and dry whey prices to determine values on a monthly basis for butterfat, protein, and nonfat solids. The Class IV formulas use weekly average butter and nonfat dry milk prices to determine values on a monthly basis for butterfat and nonfat solids, respectively. The Class II price is determined by adding a fixed amount—a Class II differential of $0.70 per hundredweight—to the advanced Class IV skim milk value, while the Class I price is determined by adding a Class I differential to the higher of the advanced Class III or IV skim milk values.[21] The Class I differentials vary by order. These differentials were, and to some extent remain, designed to represent the cost of transporting milk from areas with a surplus—traditionally the Upper Midwest region—to areas with a deficit, when necessary to meet the demands for fluid milk products. Because these differentials vary among orders, Class I prices differ from one marketing order to another.

Table 27: USDA's Milk Classes Used for Setting Milk Prices

Class	Usage (examples)
I	Fluid milk for drinking purposes
II	Soft manufactured products, such as cream products, cottage cheese, ice cream, and yogurt
III	Cream cheese, other spreadable cheeses, and hard cheese
IV	Butter and dried milk products, such as nonfat dry milk

Source: GAO presentation of USDA data.

Dairy farmers selling raw milk to manufactured or fluid milk processors regulated by an FMMO receive an average, or "blend," price that is the weighted average of the prices of Class I through IV milk. The weights are determined by the amount of milk sold in each class in the marketing order.

[21]Basing Class I and II prices on the advanced Class III and IV skim milk values ensures that minimum prices of raw milk used in these products will be known in the month preceding the month to which they apply.

The average price farmers receive, therefore, depends in part on the extent to which the total raw milk supply in a specific order is used to make fluid milk, as opposed to the three classes of manufactured products. Dairy farmers located in a milk marketing order sometimes ship their milk to another order to obtain a higher price.[22] If the farmer meets the receiving milk marketing order's shipping requirements, all of that farmer's milk, not only the shipped milk, can qualify for that order's blend price.[23] However, farmers must consider whether the benefit of receiving a higher blend price outweighs the cost of transporting a sufficient amount of milk to qualify for the receiving order's blend price.

To generate the money paid to farmers, processors pay into, or draw from, a federal order "pool" based on the value of the use for which they are buying the raw milk.[24] Fluid milk processors are required to participate in the federal order pool if they are covered by one of the federal milk marketing orders. Processors of manufactured products are not required to participate in the pool. Under the classified pricing system, raw milk used in fluid products is valued more highly. Therefore, the fluid milk processors typically pay money to the pool, while those producing other products typically draw money from the pool. This draw represents a benefit to processors of manufactured milk products for serving as a reserve supply plant for that order's Class I market. In part, a processor's payment or draw depends on the producer price differential, a measure of the difference between the value of that processor's use of raw milk as determined by the market and the value if all of that processor's raw milk were used in Class III products. In times of significant price volatility, it is possible for the producer price differential to be negative, so that some processors of manufactured products would have to pay into the pool. In such cases,

[22]Farmers not located in a federal order can also ship their milk into a federal order. While farmers can ship milk independently, generally it is dairy cooperatives acting on behalf of their farmer members that assemble and ship milk to processors.

[23]Each order has its own requirements, such as the minimum amount of raw milk required to be shipped to processing plants participating in that order to qualify for its blend price. Entities regulated by the FMMO program have the ability to petition USDA for a hearing to amend order regulations, including the requirements that outside farmers must meet when shipping their milk to another order.

[24]The term "pool" is used interchangeably to refer to both the amount of money generated by applying the minimum federal order class prices to the amount of milk used in each class within an order and the raw milk associated with the order for which farmers and processors are able to share payments from the amount of money generated by the order system.

some of these processors choose not to participate in the pool, or de-pool their milk, because they would be required to pay into the pool instead of receiving a draw.

Some states, such as California, Maine, Nevada, New York, Pennsylvania, and Virginia, have established their own minimum farm-level milk pricing programs that cover all or portions of their states. These states have established commissions or boards to perform functions similar to those of USDA. For example, Virginia's milk commission, created in 1934, establishes monthly farm prices to ensure dairy farmers an adequate return on their investment and to preserve market stability. Similarly, Nevada's dairy commission, established in 1955, sets minimum prices for raw milk sold to processing facilities located within that state.

Dairy Price Support Program

The dairy price support program, established in 1949, supports farm prices by providing a standing offer from USDA's Commodity Credit Corporation (CCC) to purchase butter, cheese, and nonfat dry milk at specified prices.[25] The prices offered for these dairy products are intended to provide sufficient revenue so that processors of these products can pay farmers, on average, a legislatively set support price for raw milk. Since 1999, the support price has been set at $9.90 per hundredweight.[26]

By offering to purchase as much butter, cheese, and nonfat dry milk as processors offer to sell at specified prices, the price support program sets a floor on the price of these commodities and, thus, indirectly on the raw milk used to produce them. Because processors are not required to sell to the CCC and milk processing costs vary, farmers may receive prices that are either above or below the support price. However, manufactured product prices generally will not fall below the floor for very long. Also, because the price for raw milk used for fluid purposes under the FMMO program is based in part on the price of raw milk used for manufacturing purposes, the price support program indirectly influences the price that farmers receive for raw milk used for fluid purposes as well.

[25]The dairy price support program was established by the Agricultural Act of 1949, legislation that also expanded the CCC's role as a government-owned entity to carry out price support activities for a variety of agricultural commodities.

[26]The Federal Agriculture Improvement and Reform Act of 1996 required that the support price be reduced $0.15 per year from $10.35 in 1996 to $9.90 per hundredweight in 1999.

The Secretary of Agriculture can adjust—or tilt—the related CCC purchase prices for butter and nonfat dry milk and still achieve the target support price for raw milk used in manufactured products. These products are considered joint products manufactured from the same 100 pounds of milk.[27] Therefore, by increasing the support price of butter while lowering the support price of nonfat dry milk, or vice versa, USDA is able to adjust the CCC purchase prices, while maintaining the overall support price. The ability to adjust the relative purchase prices of these products is important for correcting imbalances in the CCC's purchases of milkfat (butter) and nonfat solids (nonfat dry milk). Failure to correct for such imbalances can create an incentive for farmers to expand production and may alter the flow of milk to alternative uses. The 1990 Farm Bill authorized the Secretary of Agriculture to adjust the tilt twice annually to limit the accumulation of significant government stocks of certain commodities.[28]

As market prices rise, the support program allows the CCC to release its commodity stocks if the market price for a particular commodity exceeds that commodity's purchase price. In this respect, the program helps to decrease volatility in milk prices with regard to high-price periods as well as low-price periods.

Milk Income Loss Contract Program

In 2002, the MILC program began to provide countercyclical payments directly to farmers during periods of low prices.[29] The MILC program provides support to farmers when the price of Class I milk in Boston falls

[27]In fact, most of the butter manufactured in the United States is produced independent of nonfat dry milk; however, the assumption correctly implies that the relative price relationship between butter and nonfat dry milk must conform to relative yields from raw milk.

[28]Food, Agriculture, Conservation and Trade Act of 1990, Pub. L. No. 101-624 (codified at 7 U.S.C. §7251(d)). Butter/nonfat dry milk tilts were common in the early 1990s—several tilts were made between April 1990 and July 1993—to account for market conditions in which butter was in surplus relative to nonfat dry milk.

[29]The MILC program, also known as the National Dairy Market Loss Assistance Payment program, was authorized in the Farm Security and Rural Investment Act of 2002. USDA began accepting applications for the MILC program in August 2002 (payments were made retroactively to December 1, 2001) and will continue to do so until September 30, 2005.

below $16.94.[30] MILC payments are equal to 45 percent of the difference between $16.94 and the lower Boston Class I price. Farmers in all regions of the country have access to payments under this program, but only 2.4 million pounds of milk per farm are eligible for payments during each federal fiscal year. Farmers may choose the month that they begin accepting their payments.[31] This discretion may enable farmers producing more than 2.4 million pounds of milk per year to target their MILC payments during the lowest-price periods of the year to maximize the MILC payments they receive before reaching the cap on eligible production.

Trade Restrictions and Export Incentives for Dairy Products

According to some government and academic experts, trade restrictions have the greatest effect of any federal policy on farm milk prices. Trade restrictions maintain U.S. prices above average international market prices by restricting the amount of imports, particularly of manufactured dairy products, that enter the country.[32] In other countries, costs of production may be lower, or exports may be more heavily subsidized, possibly allowing these countries to export products to the United States at competitive prices. Thus, without trade restrictions, manufactured products from these other countries might enter the United States in greater quantities. This increased supply of manufactured products would be expected to decrease the demand for domestic raw milk and lead to lower farm prices. Without these trade restrictions, other dairy programs, such as the price support program, might not be feasible because lower manufactured product prices resulting from international competition

[30]This price is the same price that was in place when the Northeast Interstate Dairy Compact was effective. The compact included the six New England states—Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont. Legislative authority for the compact expired at the end of September 2001. MILC serves as an alternative to regional dairy compacts and ad hoc emergency payments to farmers.

[31]However, this discretion is limited. USDA regulations prohibit a farmer from selecting a month to receive payments if the month has already begun, if the month has already passed, or during which no milk was produced. A farmer also cannot change a previously selected start month after the 15th of the month before the month selected. Furthermore, once monthly payments begin, the farmer has no discretion in determining which month or months to receive payments.

[32]Between January 1998 and June 2004, U.S. prices remained above average international market prices reported by USDA's Foreign Agricultural Service for four dairy commodities whose prices are tracked internationally: butter, cheese, nonfat dry milk, and whole milk powder. During this time, U.S. prices averaged between 103 to 125 percent higher for butter, 44 to 58 percent higher for cheese, 24 to 35 percent higher for nonfat dry milk, and 62 to 74 percent higher for whole milk powder.

could trigger an increase in purchases by the CCC, which could render the program prohibitively expensive.

The primary U.S. international trade restriction is the tariff-rate quota, which is the primary international trade restriction allowed under current international agreements. USDA's Foreign Agricultural Service uses licensing to administer a tariff-rate quota system for most dairy products. Under tariff-rate quotas, a low tariff rate applies to imports up to a specified quantity, and a higher tariff rate applies to any imports exceeding that amount. These higher over-quota tariff rates generally limit trade to within quota levels. Quota rates and quantities vary by product.

Another aspect of U.S. trade policy that affects farm prices is the Dairy Export Incentive Program (DEIP), an initiative that aims to help exporters of certain U.S. dairy products–specifically, nonfat dry milk, butterfat, and various cheeses–meet prevailing world prices for targeted dairy products and destinations.[33] A major objective of the program is to develop export markets for dairy products where U.S. products are not currently competitive. Under the program, the Foreign Agricultural Service pays cash to exporters as bonuses, allowing them to buy dairy products at U.S. prices and then sell them abroad at lower international prices. DEIP could affect farm prices primarily by increasing demand for dairy products through export subsidies.[34] According to a 2002 report by the Congressional Research Service, past studies have indicated that DEIP subsidies have at times enhanced farm prices; for example, these studies indicated that DEIP subsidies enhanced farm prices by $0.30 to $0.50 per hundredweight in 1992.[35] Additionally, in May 2003, the National Milk Producers Federation

[33]The Dairy Export Incentive Program was introduced in the Food Security Act of 1985, Pub. L. No. 99-198, Title I, §153 (1985) (codified at 15 U.S.C. §713a-14) and has been reauthorized since then in successive farm bills. Most recently, the Farm Security and Rural Investment Act of 2002 extended the program to 2007.

[34]As is the case with other export subsidy programs, the degree to which demand is increased under a program such as DEIP depends on the degree to which the exports under the program are additional to those that would have occurred in the absence of the program.

[35]However, the Congressional Research Service study also noted that while DEIP may help to raise farm prices when milk markets are relatively balanced, the program would not be likely to have such impacts when supplies are relatively tight because the industry would not be willing to give up products for export that were needed to supply the domestic market. Geoffrey S. Becker, "Agricultural Export Programs: The Dairy Export Incentive Program (DEIP)," Congressional Research Service Report for Congress, September 18, 2002.

testified that the subsidies for 5,000 metric tons of butterfat provided by DEIP in March 2003 increased wholesale butter prices by an estimated $0.06 per pound.[36] This price increase boosted farm income by between $20 million and $30 million. DEIP can also help lower government costs by reducing the amount of product purchased under the price support program to the extent that savings in the price support program exceed the costs of subsidies. Given recent market conditions, DEIP has primarily been used to encourage exports of nonfat dry milk and cheese,[37] and for the most part, from 1998 through 2002 the program supported exports of these products to the maximum extent allowable under international trade commitment limits.[38]

Services Provided by Cooperatives, Market Structure, and Collective Action Can Influence the Price of Milk at the Cooperative Level

Milk reaches the consumer through a variety of pathways; however, most milk produced by dairy farmers in the United States is marketed through dairy cooperatives.[39] Dairy cooperatives can either sell, or arrange the sale of, raw milk purchased from farmers to wholesale milk processors, or they can process it into fluid and manufactured milk products and distribute them to retail outlets.[40] As part of sales to wholesale milk processors, cooperatives negotiate with the processors for over-order premiums, which represent the difference between the prices charged to the wholesalers and regulated minimum prices, in areas with federal or state marketing orders or regulations. The difference between the price at which cooperatives sell raw milk to wholesale fluid milk processors and the farm price for fluid

[36]This testimony was for the U.S. House of Representatives, Committee on Agriculture, Subcommittee on Department Operations, Oversight, Nutrition, and Forestry.

[37]DEIP assisted exports of butterfat have varied depending on market conditions.

[38]In some years, such as 1998 and 1999, actual shipments appeared to exceed the World Trade Organization (WTO) maximum. This excess occured because of provisions that enabled unused quantities from previous years to be rolled over into future years. Limits established by U.S. trade agreements are explained in greater detail in appendix VII.

[39]Dairy farmers who produce the raw milk used in fluid and manufactured products can (1) market it through dairy cooperatives, (2) sell it directly to wholesale milk processors, or (3) process it for direct sale to consumers.

[40]See GAO, *Dairy Industry: Information on Prices for Fluid Milk and the Factors That Influence Them*, GAO/RCED-99-4 (Washington, D.C.: Oct. 8, 1998) and GAO, *Dairy Industry: Information on Marketing Channels and Prices for Fluid Milk*, GAO/RCED-98-70 (Washington, D.C.: Mar. 16, 1998) for more information on the role of cooperatives and other entities in the marketing of fluid milk.

milk is influenced by the costs of services that cooperatives provide to their members and to their buyers, the relative market power of cooperatives and fluid milk processors, and the effects of collective action taken by dairy cooperatives in marketing their members' milk.

Costs of Services Provided by Cooperatives Influence Milk Prices

Over-order premiums, in part, compensate cooperatives for the services they provide to their members and on behalf of their members to wholesalers. Some distinctive features of cooperatives include member ownership and control, at-cost services for members, and distribution of income to members on the basis of patronage. Farmers join dairy cooperatives to guarantee a market outlet for their milk, to gain bargaining power to obtain the best price in the market, to have their milk marketed efficiently, with the assurance that their milk will be accurately weighed and tested, and to be effectively represented in legislative, regulatory, and public relations matters. Most dairy cooperatives require farmers to sign a 1-year membership agreement that commits them to market all their milk through the cooperative.[41]

Cooperatives operate like corporate businesses to perform services for their members. For example, Dairy Farmers of America, the largest dairy cooperative in the country, serves almost 23,000 members, producing about 21 percent and marketing about 33 percent of the milk in the United States. According to the cooperative's Web site, the cooperative provides a variety of services to its members, including the following:

- insurance—medical programs, dental/vision plans, and life insurance available to members via a milk check deduction;
- direct deposit—direct deposit of members' milk checks, ensuring that farmers' pay checks will be available within 24 hours of the pay date;
- forward contracting—a marketing service that allows members to protect themselves against price volatility by locking in the future sale price of their milk several months before it is produced; and
- financing services—loan packages for cattle, equipment, and operating expenses.

[41]Typically, these agreements are self-renewing.

In some cases, dairy farmers pay on a per-use basis for the services they receive. However, cooperatives may also try to offset the costs of their services through negotiations with wholesale milk processors for over-order premiums.

Over-order premiums also compensate dairy cooperatives for a number of services that they provide to fluid milk processors on behalf of their members. Generally, these services include (1) transporting milk from different milk-producing areas, (2) scheduling—or balancing—milk deliveries to coincide with demand, and (3) standardizing the component content of milk deliveries. Different cooperatives also provide additional services for fluid milk processors. For example, one cooperative we contacted noted the rigorous quality control procedures it performs on its members' milk. According to the cooperative official, these efforts allow the cooperative to market its members' milk as better quality, potentially helping the cooperative negotiate higher over-order premiums. Officials from another cooperative said that a major component of the costs of services provided by cooperatives is balancing the delivery of raw milk supplies to processors' plants. At certain times processors' plants have surging demand for raw milk, while at other times the plants are empty. In addition, supply disruptions, such as labor strikes, create significant balancing disruptions. In this environment, few, if any, fluid milk processing firms have the capital (plants to make cheese and other products during periods of low fluid demand) to assume the risks inherent in balancing, and so in most cases this responsibility is met by the cooperatives.

Relative Market Power of Cooperatives and Processors Influences Milk Prices

Historically, farmers produced and distributed fluid milk as well as some manufactured products. Milk is a highly perishable product that is bulky to transport. Traditionally, this left farmers dependent on local markets for the sale of their milk. The role of dairy cooperatives developed as farmers faced greater demand for fluid milk and dairy products and the number of farmers who processed and distributed their own milk products declined. Instead, specialized firms began taking on the role of processing fluid and manufactured milk products and marketing them for sale to consumers. However, in this environment, there were many more farmers than processors, so processors had the opportunity to bargain with different farmers to obtain a lower price for their raw milk supplies. In this situation, farmers were at a disadvantage. Consequently, cooperatives took on the role of collecting raw milk from farmers and distributing it to processors. By doing so, cooperatives helped to balance the bargaining power between

farmers and processors. The 1922 Capper-Volstead Act provides limited antitrust immunity to cooperatives that meet certain requirements under certain conditions and gives farmers an opportunity to work together in setting raw milk prices, including bargaining for market premiums. Thus, over-order premiums, in part, reflect market power acquired by cooperatives relative to processors.

Since our June 2001 report, the concentration of dairy cooperatives has increased, with the potential effect of enhancing their market power in negotiations with processors. In 2001, we reported that 83 percent of the milk produced in the United States was marketed by cooperatives. However, USDA recently reported that in 2002, the share of milk sold to processors and other distributors by cooperatives reached 86 percent of all the milk produced in the United States.[42] Cooperatives attained this market share despite a 13 percent decrease in the number of dairy cooperatives between 1997 and 2002. During this time the amount of member-produced milk marketed by the eight largest dairy cooperatives grew from 52 to 63 percent of the total volume of milk marketed by cooperatives. This translated into an increase from 42 to 52 percent of the total volume of milk produced in the United States.

A number of dairy experts cited the need to offset gains in market power made by increasingly concentrated firms at the wholesale processor and retail levels of the milk marketing chain as a key factor in the continued concentration of cooperatives. The greater the percentage of the milk supply that a cooperative markets, the greater its ability might be to obtain higher over-order premiums in negotiations with wholesale processors. On the other hand, one academic source questioned the extent to which increased concentration is enhancing the market power of dairy cooperatives, particularly over the long term. He noted that although Dairy Farmers of America has been consolidating its control over milk supplies in some regions, farmers and cooperatives have been able to command larger over-order premiums in the East and Upper Midwest regions—where the cooperative's presence is not as strong—than in the West, where milk supplies have been increasing. Other sources noted that competition still exists among cooperatives and independent dairy farmers and that this competition prevents even larger cooperatives from obtaining excessively high over-order premiums.

[42]K. Charles Ling, *Marketing Operations of Dairy Cooperatives, 2002*, USDA/Rural Business-Cooperative Service, Research Report 201, February 2004.

Collective Action by Cooperatives Influences Milk Prices

Another factor in determining the over-order premiums received by cooperatives for raw milk is collective action taken by cooperatives. Cooperatives work together to try to set prices by coordination allowed under the protection afforded by the Capper-Volstead Act. For example, officials with Dairy Farmers of America said that a major factor in the price of milk at the cooperative level is the action of marketing agencies composed of cooperatives. Marketing agencies behave like cartels and announce prices for their cooperative members. In most cases these agencies set prices for raw milk used in fluid milk and other products. Most of the prices announced by the marketing agencies represent the minimum federal order prices; additional charges may be added representing the costs of services provided by the cooperatives to the processors.

Representatives of Dairy Farmers of America said that there are marketing agency agreements in most major markets except in the Pacific Northwest and that for the most part, cooperatives participate in marketing agencies. They further stated that the use of marketing agencies has become more common in recent years. The marketing agencies may also market milk for independent farmers. The officials noted that while cooperatives and independent farmers can choose not to participate in the marketing agencies, experience has shown that as more producers choose to market milk outside the system, the marketing agencies face significant competition and prices fall. Eventually, if the prices get low enough, the producers have an incentive to work together again.

In an alternative type of collective action, three cooperatives—the Dairylea Cooperative, Dairy Farmers of America, and St. Albans Cooperative Creamery—established a milk marketing organization called Dairy Marketing Services. According to a Dairy Marketing Services official, the organization was formed because the cooperatives realized that they needed more market power to compete with increasingly concentrated processors and retailers. Cooperatives such as Dairylea, or individual farmers, establish contracts with Dairy Marketing Services to market their milk. Dairy Marketing Services markets about 16 billion pounds of milk annually for farmers in the Northeast area that extends from Maine to Maryland, and includes a small area in Ohio. The official estimated that this quantity represents about 45 percent of the milk marketed in the Northeast and is produced by some 10,000 to 11,000 farmers.

The Dairy Marketing Services official stated that the organization has been able to carve a niche for itself in the milk marketing chain by convincing processors that it is more efficient for them to have Dairy Marketing

Services arrange to have raw milk transported from the farm to the plant and allow the processors to focus on processing milk. As a result, Dairy Marketing Services has been able to obtain contracts from a number of major processors in the Northeast, including Dean Foods, Crowley Foods, and Kraft, to ensure an adequate supply of milk for their plants. Additionally, Dairy Marketing Services provides specialized services for farmers such as health insurance and workmen's compensation, a livestock purchasing service, and risk management operations for farmers engaged in forward contracting. Although we were unable to confirm the effects that Dairy Marketing Services' efforts have had, the official stated that the organization has provided higher over-order premiums and lower transportation charges for its participating cooperatives and farmers than would have otherwise been the case.

Input Costs, Service Levels, Innovations, and Market Structure Influence Wholesale Fluid Milk Prices

The difference between the price at which wholesale fluid milk processors sell fluid milk products to retail firms and the price they pay for raw milk is influenced by changes in input costs, such as fuel, labor, packaging, transportation, and capital expenses. These costs, in turn, are affected by recent innovations that have increased efficiency and lowered costs of fluid milk processing, as well as by the level of service that fluid milk processors provide to retailers. For example, in addition to shipping the products to retailers, some wholesalers provide in-store services, including unloading the milk on the store dock, restocking the dairy case, and removing outdated or leaking containers. The difference between what fluid milk processors pay for raw milk and the wholesale price they charge their retail customers is also influenced by continued structural change in the fluid milk processing industry, including a steady increase in firm consolidation and the market share of some firms. While there have been many reasons for these trends, the effects on the market and fluid milk prices at this level are unclear.

Input Costs, Service Levels, and Innovations Influence Wholesale Fluid Milk Prices

Several fluid milk processors stated that the cost of raw milk, and, in particular, the federal order minimum price, was the single most important influence on wholesale milk prices. We estimate that the price of raw milk ranges from about 60 to 70 percent of the wholesale price of 2 percent milk. As such, the wholesale price that processors charge would be directly linked to the Class I federal order price on a year-to-year basis, with adjustments for over-order premiums and other inputs. However, a variety of other input costs can also affect the price at which fluid milk processors

sell fluid milk products to retailers. Some sources indicated that costs of inputs other than raw milk have been increasing in recent years.[43] As one executive of a milk-processing firm explained, the primary input costs, apart from raw milk, include labor and energy. A 2002 study examining changes in fluid milk processing plants located in the state of Maine found that total processing costs rose at an annual rate of about 2.4 percent (adjusted for inflation) from 1993 through 2000.[44] The study indicated that economywide wage inflation plus a dramatic increase in health care premiums paid by employers drove labor costs above the costs of other inputs, such as land and building expenses and plant supplies. Equipment costs increased 10.9 percent per year with investments in plant automation and greater reliance on information technologies. Also, fuel costs increased by 4.6 percent per year, reflecting economywide trends in energy costs. Moreover, while the cost of operating capital constituted only 1.0 percent of processing costs, it increased substantially during this period due to an increase in the short-term lending rate. Table 28 displays the percentage change in fluid milk processing costs in Maine reported in this study for each cost category from 1993 through 2000.

[43]We could not identify any recent studies that have examined milk processing and distribution costs on a national level.

[44]T.J. Dalton, G.K. Criner, and J. Halloran, "Fluid Milk Processing Costs: Current State and Comparisons," *Journal of Dairy Science*, Vol. 85, No. 4 (2002): 984-991. The study used cost-engineering methods to look at four state-of-the-art fluid milk processing plants in Maine ranging from 335,000 gallons per week to 600,000 gallons per week.

Table 28: Change in Costs for Fluid Milk Processing Plants in Maine, 1993 through 2000

Cost category	Percent of total cost in 2000 (%)	Annual rate of change (%)	Total change from 1993 through 2000 (%)
Electricity	5.0	1.6	**12.0**
Equipment	20.0	10.9	**106.0**
Fuel oil	1.0	4.6	**37.0**
Labor	31.0	3.7	**29.0**
Land and building	13.0	3.8	**30.0**
Operating capital	1.0	15.5	**175.0**
Product loss	1.0	0.4	**3.0**
Supplies	27.0	(3.0)	**(19.0)**
Water and sewer	1.0	(0.3)	**(2.0)**
Total	**100**	**2.4**	**18.0**

Source: GAO analysis of data from Dalton et al. (2002).

Note: Percentages calculated based on 2000 dollars. Percent of total cost in 2000 was calculated by GAO and is rounded to the nearest percent. Annual rates of change and total change from 1993 through 2000 are from Dalton et al. (2002).

Changes in the level of service that some fluid milk processors provide their retail customers have increased the efficiency of the dairy supply chain, thus potentially influencing wholesale milk prices. For example, some fluid milk processors have begun to undertake supply-chain management for their retail customers.[45] According to a number of retailers and processors, supply-chain management commonly involves shared computer systems, which, in the vertical marketing chain, allow processors to more efficiently manage the processing and transporting of fluid milk products. One processor indicated that it uses an electronic data transfer system to manage supplies for certain retailers. In particular, this system allows the processor to contract for a certain number of loads of milk per day. Further, according to a recent presentation given by company officials, Dean Foods' national, refrigerated, direct-store-delivery system allows it to deliver fluid milk to its customers with increased route network efficiency

[45]Supply-chain management is an attempt to coordinate processes involving producing, shipping, and distributing products, generally performed only by large corporations with large suppliers.

and without customer disruption.[46] Dean Foods operates 129 fluid processing plants in 39 states, servicing more than 150,000 customers coast to coast via its direct-store-delivery system of more than 6,000 routes.[47]

By allowing fluid milk products to move more efficiently from the processor to the retailer, these kinds of services help to ensure quality and reduce waste and costs along the supply chain. To the extent that processors benefit from the reduced costs of supplying retailers with fluid milk products, the provision of these services could have a downward effect on wholesale prices. On the other hand, these services could provide value to retailers for which they might be willing to pay a higher price when acquiring fluid milk products. Therefore, the net effect on wholesale prices of the level of service that processors provide to retailers is uncertain.

Additionally, innovations in technology can affect prices at the wholesale milk processing level. For example, changes in processing technology, such as more automated equipment, can improve the efficiency of processing operations and, to the extent that processing firms are successful at reducing their costs through innovative practices, they may be able to reduce their prices. A representative of one fluid milk processor explained that improvements in processing and packaging technology have doubled and tripled output. Also, a representative of one firm that processes milk for sale in its own retail stores stated that the firm has dedicated a large contingent of people toward the goal of reducing milk losses at its processing plants and has been successful at cutting these losses in half. He noted that a driving force behind these efforts is to try to alleviate increases in other input costs, such as labor.

With innovations in technology, the fluid milk processing industry has also invested in innovative new products. By developing products with extended shelf lives, processors can potentially save shipping costs, leading to lower wholesale prices. For instance, the dairy processing industry's collective investment in extended shelf life, ultra high temperature, and aseptic packaging technology allows fluid milk products

[46]Dean Foods Company, Presentation at the Consumer Analyst Group of New York Conference, Scottsdale, Arizona, February 17, 2004. Available online at http://www.deanfoods.com/investors.

[47]Dean Foods Annual Report (2001), 18.

to reach the end user more efficiently while maintaining quality.[48] The benefits to processors and their retailers include the ability to ship these products longer distances because they are able to endure more stress than traditionally processed milk.

Market Structure in the Fluid Milk Processing Industry Can Influence Wholesale Prices

Since the 1960s, there has been long-term structural change in the wholesale fluid milk processing industry as a continuously declining number of firms have processed an increasing average volume of milk.[49] Structural change in the processing industry has been driven by economies of size, technological changes, high concentration at other levels of the milk marketing chain, and rapid consolidation into fewer and fewer firms.[50] While structural change can lead to lower prices due to cost reduction from greater efficiency in production, it can also lead to higher market concentration, particularly in individual markets. In general, high and increasing market concentration can result in greater market power, potentially allowing firms to increase prices above competitive levels. Accordingly, the net impact of increased market concentration on wholesale prices can be either positive or negative.

In recent years, through aggressive acquisitions of independent dairy processing plants, a handful of fluid milk processing firms have changed the market structure of the dairy industry at the wholesale level. These companies have generally pursued the business strategy of acquiring strong regional dairy processing plants so that they can strengthen their presence in existing markets, while expanding their geographic coverage to a national level. The acquisition and consolidation trend at the wholesale level has affected market structure by leading to higher market

[48]Aseptic packaging, commonly called "drink boxes," is the result of a beverage and liquid food system that allows perishable food products to be distributed and stored without refrigeration for periods up to six months or more. It is used to preserve and package everything from milk, juice, and drinks of all kinds to scrambled egg mix, tomato sauce, soups, and other liquid foods.

[49]Structural change is characterized by broad and long-term changes in key industry characteristics, frequently including consolidation and changes in concentration, methods of vertical coordination, and the mix of products and services offered by firms in an industry.

[50]Don P. Blayney and James J. Miller, "Concentration and Structural Change in Dairy Processing and Manufacturing," Paper presented at the 10th Annual Workshop for Dairy Economists and Policy Analysts, Memphis, Tennessee, April 2003.

concentration for fluid milk processors in some markets. One common measure of market concentration is the four-firm concentration ratio–the percentage of sales by the top four firms in a market. According to the 1997 Census of Manufacturers, the market share for the top four fluid milk processors in the nation was about 21 percent. However, the market share for top fluid milk processors at the local level was significantly higher. For example, in our June 2001 report, we found that in Boston, Massachusetts, the market share of the top four fluid milk processors increased from 66 percent in December 1997 to 88 percent in December 1999.[51]

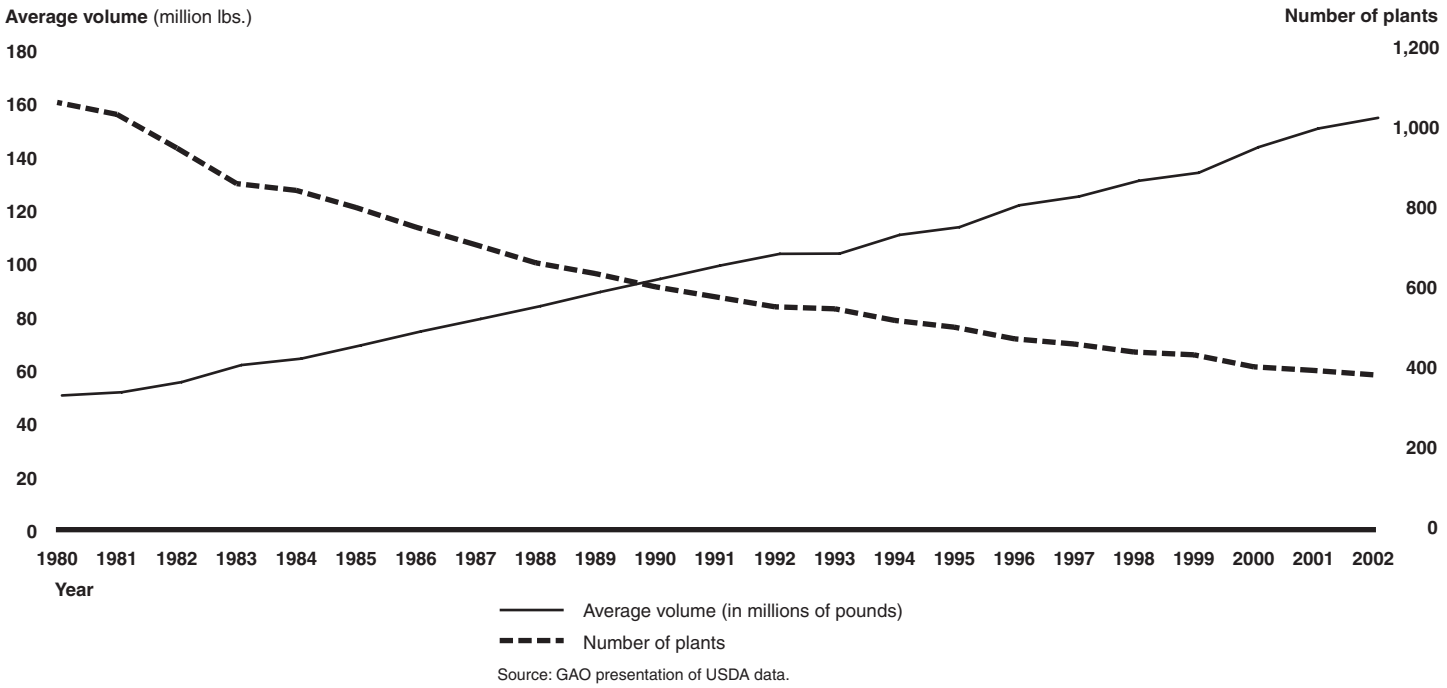
Since our last report in 2001 on fluid milk prices, this trend has continued, and there have been several significant mergers, acquisitions, and joint ventures that have further consolidated the industry. For example, in late 2001, Dean Foods merged with Suiza, Inc., bringing together the number one and two firms in terms of market share in the processing industry. Then, in July 2002, the Land O' Lakes dairy cooperative sold its fluid milk operations to Dean Foods. We estimate that these acquisitions and mergers gave Dean Foods about a 27 percent market share nationally in fluid milk products in 2002. Others have estimated that Dean Foods' market share is about 35 percent nationally and approximately 70 percent in New England.[52] As of 2002, we estimate that the market share of the top four fluid milk processors has increased to approximately 47 percent.[53] As seen in figure 33, with increased concentration, the number of fluid milk processing plants has gone from 1,066 plants producing an average of 50.1 million pounds of milk per year in 1980 to 385 plants producing an average of 154.2 million pounds per year in 2002.

[51]See GAO-01-561, appendix VI, for more information on consolidation at the wholesale milk processor level.

[52]As a result of a divestiture plan stemming from the Dean-Suiza merger, the second largest fluid milk processor, the National Dairy Holdings Group, was created.

[53]We estimated the four-firm concentration ratio using expert opinion from conversations with dairy experts at USDA on the leading four fluid milk processing firms, estimates of company sales from the August 2003 *Dairy Foods Magazine*, "The Dairy 100: The List," and the total value of shipments from the 2002 Economic Census, Industry Series (September 2004) for fluid milk manufacturing. We also adjusted company sales listed in *Dairy Foods*, per company annual statements and expert opinion, for the percent of sales that would account for products such as ice cream and cheese. To make our estimate consistent with the 1997 Economic Census four-firm concentration ratio, we also included the same categories for fluid milk manufacturing, such as cottage cheese and yogurt, along with fluid milk processing, that went into this calculation. This figure does not include the sales that firms may have from various joint ventures.

Figure 33: Number of Fluid Milk Processing Plants and Volume of Milk Processed per Plant, 1980 through 2002



Source: GAO presentation of USDA data.

Such increased concentration of fluid milk processing firms, particularly in individual markets, can increase the price at which fluid milk is sold to retailers because market concentration can provide these firms greater market power. Thus, some analysts viewed the trend toward greater concentration in the wholesale market as a means toward greater dominance and market power in selling fluid milk to retailers. Further, they noted that increased market power can also benefit processors in their negotiations for raw milk supplies from cooperatives and independent farmers. For example, the exercise of market power could allow processors to negotiate more favorable supply contracts, which could drive down input prices and increase the spread between wholesale and retail prices. Other economists who study the causes of market concentration described a phenomenon called the "replication hypothesis"—as concentration grows at one marketing level, it is likely to be replicated at other marketing levels. For instance, high market concentration at the retail level can lead to greater concentration at the fluid milk processor level, and higher concentration in fluid milk processing can, in turn, lead to higher concentration at the cooperative level. One fluid milk processor that

we spoke with stated that retail concentration has resulted in retailers preferring only one supplier, requiring a processor to have multiple plants in order to supply a retailer who serves many markets.

On the other hand, increasing concentration can lead to cost savings through efficiency gains, which may be passed on to retailers in the form of lower wholesale prices. For example, some economists viewed consolidation of processing firms as a result of increasing economies of scale and excess plant capacity. That is, processors decrease their costs per gallon for items like packaging or processing costs, as they increase the amount of milk they process.[54] One dairy analyst reported that in plants ranging from a monthly volume of 90,000 pounds per month to 30 million pounds per month processing costs decreased from about $1 per gallon to about $0.50 per gallon. In the end, the impact of market concentration on wholesale prices, either positive or negative, depends on whether market power or efficiency dominates.[55]

Retailing Costs, Consumer Demand, and Market Structure Changes Affect Retail Prices for Fluid Milk

Three key factors that influence fluid milk prices at the retail level are retailing costs, consumer demand, and market structure. Recent increases in input costs such as labor and energy have been substantial. In an effort to hold down their retailing costs and remain competitive, some retailers are implementing supply-chain management and other innovations that increase efficiency. At the same time, consumers are purchasing a declining amount of traditional fluid milk and are increasing consumption of other beverages, such as soft drinks and bottled water. Market structure changes include continued consolidation in recent years through mergers and acquisitions among large food retailers at the national level and in many local markets, along with an increasing number of outlets that are competing with traditional supermarkets to sell fluid milk.

[54]See T.J. Dalton, G.K. Criner, and J. Halloran, "Fluid Milk Processing Costs: Current State and Comparisons," *Journal of Dairy Science*, Vol. 85, No. 4, 2002, 984-991. Also, Day 3 of the Hearing on Pacific Northwest and Arizona/Las Vegas Producer-Handlers, September 25, 2003, including the exhibit on "Cost Structure of Fluid Milk Plants of Various Sizes."

[55]One study that we identified, however, that separated market power and cost-efficiency effects on the prices in 33 food processing industries from 1972 to 1992, found that the market power effect dominated in fluid milk manufacturing. Rigoberto A. Lopez, Azzedine M. Azzam, and Carmen Liron-Espana, "Market Power and/or Efficiency: A Structural Approach" *Review of Industrial Organization*, Vol. 20, March 2002: 115-126.

Costs of Retailing Influence the Price of Fluid Milk

Representatives of the Food Marketing Institute stated that after the wholesale costs of the milk, the primary costs that influence the retail price of fluid milk are related to labor and energy.[56] They added that all of these costs have been rising recently. According to the Bureau of Labor Statistics, the average hourly earnings for nonsupervisory food store employees went from $7.56 per hour in 1992 to $10.20 per hour in 2002. These payroll costs are the largest percentage of retail operating costs, followed by the second largest single category, employee benefits such as health insurance.[57] Table 29 shows the breakdown of supermarket operating costs in 2003 as a percentage of total sales and gross margin.[58]

Table 29: Supermarket Operating Costs as a Percentage of Sales and Gross Margin, 2003

Expenses	Percentage of sales	Percentage of gross margin
Depreciation and amortization	1.3	4.7
Employee benefits	3.5	12.7
Insurance	0.3	1.1
Maintenance and repairs	0.7	2.5
Other operating costs	3.8	13.8
Payroll	11.4	41.3
Property rentals	1.8	6.5
Supplies	1.1	4.0
Taxes and licenses	0.4	1.4
Utilities	1.3	4.7
Total expenses	**25.7**	**93.1**

Source: GAO analysis of Food Marketing Institute data.

[56]The Food Marketing Institute is a trade association that represents segments of the retail food industry such as supermarkets. The Food Marketing Institute does not represent convenience stores.

[57]As table 29 shows, the category "other operating costs" is somewhat larger than "employee benefits," but according to the Food Marketing Institute, it is a catch-all category including items such as travel, equipment rentals, communication, and services purchased.

[58]The gross margin is a firm's sales revenue minus the costs of acquiring products, expressed as a percentage of sales.

Table 30 displays the sales and expense growth as a percentage of sales for the supermarket industry during the last decade, from 1993 through 2003. During this time, total employment costs increased by 12.0 percent, including a 10.7 percent increase in payroll expenses; the cost of supplies also increased by 10.0 percent.

Table 30: Growth of Supermarket Sales and Expenses during the Last Decade, 1993 through 2003

	1993	2003	Percent change 1993 through 2003
Supermarket sales (dollars in billions)			
Sales from supermarkets with more than $2 million in annual sales	$292.0	$432.8	48.2
Retailing costs as a percentage of sales			
Payroll expenses	10.3	11.4	10.7
Total employment cost	**13.3**	**14.9**	**12.0**
Supplies	1.0	1.1	10.0
Utilities	1.2	1.3	8.3

Source: GAO analysis of Food Marketing Institute data.

A 2003 study that was more specific to retailer costs related to fluid milk sales noted that these costs include both direct and indirect costs.[59] Direct costs are those for electricity, labor, store equipment, and fluid milk. Indirect costs include corporate, division, and store overhead. While the study found variation in the indirect costs, such as store overhead, there was less variation across retail stores in direct costs.

Increasing per unit costs have led some retailers to try to improve efficiency and reduce total costs. As mentioned in the discussion of factors influencing fluid milk prices at the wholesale level, some retailers are reducing costs by working with their wholesale suppliers to achieve supply-chain management. For example, officials with Wal-Mart noted that the firm has tried to reduce its costs and maintain its everyday-low-pricing strategy for consumers through

[59]George Criner, "Milk Retail Costs and Margins." Paper presented at the Northeast Dairy Policy Summit Meeting, November 17-18, 2003, University of Connecticut, Storrs.

- a computerized system called Collaborative Planning Forecast Replenishment that allows processors to track stock levels at Wal-Mart locations and schedule deliveries to specific locations;
- direct-store-delivery of the majority of its fluid milk products to increase the efficiency of its supply chain;[60] and
- changes to its shipping practices, such as not putting labels on its cases, that have allowed Wal-Mart to save time and money.

Another retailer indicated that it is trying to improve the way it stocks its shelves to cut costs. A representative indicated that the retailer has invested in retrofitting its stores to use a device called a "bossy cart," which allows store employees to move 80 gallons of milk into the milk case in one shelf-stocking.

Consumer Demand Influences Retail Fluid Milk Pricing

Consumer demand, driven by factors such as taste, convenience, and health, influences the retail price of milk. Moreover, since fluid milk represents approximately 3 percent of total supermarket sales, it is an important category for store performance, and retailers have an incentive to price their products competitively. However, over time, fluid milk consumption has gradually declined, with per capita demand for milk trending downward at a rate of 2 to 3 percent per year. This downward trend stems from several key factors including increasing consumption of substitute drinks such as carbonated soft drinks, juice drinks, coffee, teas, soy products, and bottled water. Also, there has been an increasing trend toward more eating outside the home, reducing the demand for fluid milk sold in food stores. Within the fluid milk category, whole milk has gone from being 92 percent of fluid milk consumed in 1960 to about 35 percent in 2001. Private labels represent the largest portion of the market, about 60 percent.[61] More recently, however, there has been growth in the development of innovative value-added dairy products. These new innovations include dairy products for medicine/health (such as low-

[60]For most other products, Wal-Mart officials said that the retailer maintains a network of approximately 30 food distribution centers.

[61]Private label refers to products that are "store brands" and have labels that represent the retailer. These products may be produced by manufacturers that also produce national brands or by retailers who own their own manufacturing operations.

carbohydrate products), multipack drinks such as single-serve and vending drinks, and organic dairy products.

In response to trends in consumer demand for fluid milk products, retailers from high-end supermarkets to mass merchandisers use diverse pricing strategies, and no single approach applies to any group. However, according to some retail executives, one method that retailers are currently using is category management. Using this strategy, a retailer would not focus on how much 1 percent, 2 percent, or whole milk it sells, but rather on how much is sold from the entire dairy case.[62] Accordingly, category managers would view product assortment strategically, evaluating the performance of entire groups of related dairy products. The goal is to maximize the sales for the entire category, which requires continual adjustment to match consumer demand. To accomplish this goal, managers may feed scanner data and other market information into computer models that make product assortment decisions.

A related issue influencing the retail price of fluid milk is the price elasticity of demand, that is, the sensitivity of fluid milk consumption to changes in price. For many years, empirical studies have indicated that milk prices were very price inelastic, meaning that there was little change in demand in response to a change in price. Most studies suggest that overall, the demand for milk is still price inelastic. However, some recent studies suggest that the demand for milk is not as price inelastic as it was previously.

Moreover, some researchers have found that for many fluid milk products, demand is elastic, or that there is a greater change in demand relative to a change in price for certain types of milk. One study reported that price elasticities varied considerably by container size, type (such as white or flavored), and fat content of the milk.[63] For instance, the study found that the demand for whole milk, skim milk, and low fat milk in half-gallon containers was price elastic. This research also suggested that carbonated

[62]Different retailers may define the dairy case differently depending on the market that they serve. The dairy case may include products such as fluid milk, cottage cheese, creamers, yogurt, butter, and eggs as well as a variety of new "value added" dairy products. A recent study by Cornell University on dairy case management found that, on average, stores used approximately 37 different milk products in their dairy cases.

[63]Oral Capps, Jr., "Demand and Marketing Analyses for Fluid Milk Products by Type and by Package Size." Presentation at the 2004 Dairy Forum, Boca Raton, Florida, January 2004.

soft drinks are the chief substitute or competitor for fluid milk products, while water is a complement in consumption.[64] In another study, researchers found that the elasticities of demand for skim/low fat and whole milk brands are different.[65] Demand for skim/low fat milk was found to be more price elastic than demand for whole milk, suggesting that retailers could increase overall fluid milk sales by lowering the prices of skim/low fat milk relative to prices for whole milk.

Retail Market Structure Can Influence Fluid Milk Prices

As with the fluid milk processing industry, there have been trends of increasing consolidation and concentration at the retail level during recent years, especially among retail firms in some individual markets. Structural change and increased consolidation at the retail level of the milk marketing chain could lead to lower retail prices as individual retailers experience increased efficiencies in their operations. On the other hand, high levels of concentration can result in greater market power, potentially allowing firms to increase market prices above competitive levels.[66] Also, greater market concentration at this level could increase a retailer's buying power with fluid milk processors, potentially lowering costs. Depending upon whether these lower costs are passed on to consumers, this can either lower retail milk prices or increase the spread between wholesale and retail prices.

According to USDA, since 1996, almost 4,700 supermarkets, representing $75.5 billion in sales, were acquired by other firms. Major mergers and acquisitions that have occurred in the retail food market in recent years include the following:

[64]If products are substitutes, an increase in the price of one would increase the demand for the other. A complement in consumption means that the products are consumed in conjunction with one another. An increase in price for one product would decrease the demand for the complementary product.

[65]Tirtha Dhar and Tom Cox, "Strategic Implications of Retail Pricing in the U.S. Fluid Milk Market." Paper prepared for presentation at the American Agricultural Economics Association Annual Meeting, Montreal, Canada, July 27-30, 2003.

[66]Economic studies of the relationship between price and market concentration in food retailing have found mixed results. Carolyn Dimitri, Abebayehu Tegene, and Phil R. Kaufman, *U.S. Fresh Produce Markets: Marketing Channels, Trade Practices, and Retail Price Behavior*, Agricultural Economic Report Number 825, Economic Research Service, USDA, September 2003.

- In 1998, Kroger, the nation's largest supermarket chain, acquired Fred Meyer, and Albertsons acquired American Stores, the second-largest at that time.

- In 2000, Delhaize America, operator of the Food Lion chain of stores, purchased Hannaford Brother's Shop 'n Save supermarkets in New England to become the eighth-largest food retailer at that time.

- In 2001, Kroger purchased supermarkets in Oklahoma and Texas from Winn-Dixie.

- In 2001, Safeway made several acquisitions including Genuardi's Family Market stores (Pennsylvania, New Jersey, and Delaware), Randall's food markets (Houston, Texas), and Dominick's supermarkets (Chicago metropolitan area).

- In 2004, Albertsons, the third-largest U.S. food retailer, purchased Shaw's, the eleventh-largest at the time.

In June 2001, we reported that, for the 100 largest U.S. cities, the combined average market share of the top four firms increased from 69 percent in 1992 to 72 percent in 1998, with some variation depending upon the particular market area.[67] An official of one large supermarket chain noted that because of Wal-Mart's large presence in the market, other companies' slices of the "demand pie" got thinner, providing an incentive to expand and buy out other companies. According to USDA data, the top four firms among all food retailers in 2003 were Kroger, Wal-Mart, Albertsons, and Safeway.[68]

Consolidation in food retail chains has led to high levels of concentration in individual metropolitan markets. Table 31 displays market concentration, as measured by the four-firm concentration ratio, in the 15 markets that we used in this report to analyze the spread between retail and farm milk

[67]These were defined by the U.S. Census Bureau as Metropolitan Statistical Areas. See GAO-01-561, appendix VI, for more information on concentration among retail firms.

[68]Sales by Wal-Mart and other super centers and mass merchandisers are not included in the supermarket category. Super centers are defined as a large combination supermarket and discount general merchandise store, with grocery products accounting for up to 40 percent of selling area.

prices.[69] While this threshold varies, some economists have characterized a market with a four-firm concentration ratio of 60 percent or greater as a "tight oligopoly" or highly concentrated.[70] In 2003, the levels of concentration varied by metropolitan market, with the percentage of the market held by the four largest firms ranging from 62.8 percent in the Minneapolis/St. Paul area to 84.9 percent in Denver, with an overall unweighted average of 73.9 percent. Moreover, for the 15 markets that we analyzed, the overall average four-firm concentration ratio for 1998 that we reported in 2001—74 percent—is comparable to the 2003 average.[71]

Table 31: Market Share of the Top Four Food Retailers in Selected Markets, 2003

Retail markets	Four-firm market share, 2003 (percent)
Atlanta, Ga.	78.2
Boston, Mass.	70.1
Charlotte, N.C.	82.0
Cincinnati, Ohio	79.4
Dallas, Tex.	67.3
Denver, Colo.	84.9
Miami, Fla.	81.6
Milwaukee, Wisc.	63.2
Minneapolis, Minn.	62.8
New Orleans, La.	74.7
Phoenix, Ariz.	80.2

[69]The four-firm concentration ratio in a market is the share of sales made by the four largest sellers.

[70]William G. Shepherd, *The Economics of Industrial Organization*, 3rd ed. Prentice Hall, 1990. While a useful tool for categorizing the degree of competition in a market, a numerical cut-off of a concentration index, such as the four-firm concentration ratio, is not generally considered a precise demarcation between various categories of the degree of competition in a market. The Federal Trade Commission and Department of Justice use an index of market concentration, the Herfindahl-Hirschman Index, in combination with a number of other market factors, in determining the potential anticompetitive effects of a proposed merger. Economic studies of various markets, however, have found that the four-firm concentration ratio and the Herfindahl-Hirschman Index are highly correlated.

[71]While very similar, some of the 15 market areas for our 2001 report for retail concentration in 1998 did not exactly match those in our present data for 2003 due to a realignment of MarketScope's metropolitan market area definitions.

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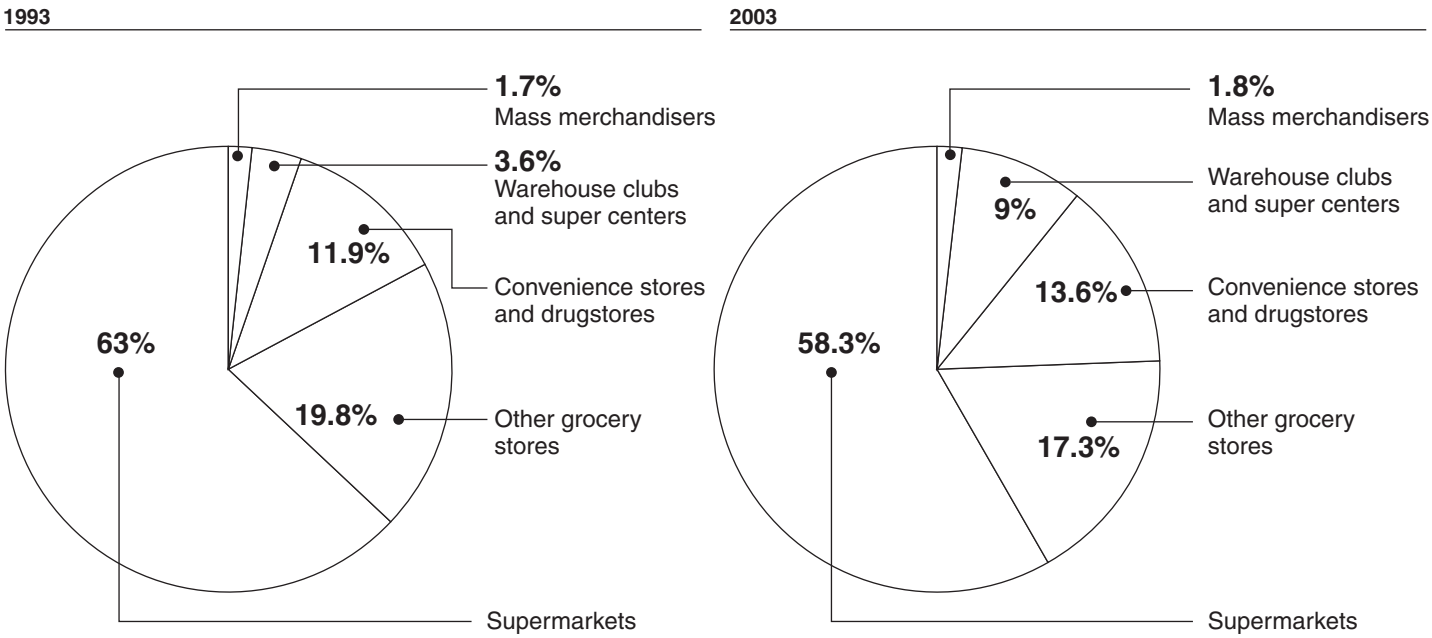
Retail markets	Four-firm market share, 2003 (percent)
Salt Lake City, Utah	67.6
San Diego, Calif.	68.8
Seattle, Wash.	71.8
Washington, D.C.	76.5
Average	73.9

Source: GAO presentation of USDA/ERS data.

Note: Four-firm market shares are for supermarkets and super centers only. Smaller grocery stores and convenience stores are excluded.

At the same time, the traditional dominance of supermarkets in food sales has been challenged by competition from new mass merchandisers and super centers such as Wal-Mart, K-Mart, and Target. These retailers tend to offer lower prices and often purchase their inventories in large quantities to pass on low prices to consumers. According to a recent USDA report, even the larger conventional food stores do not have the same buying power as these large general merchandisers. They also tend to grow by new investment in stores rather than through mergers and acquisitions, in contrast to traditional supermarkets. Figure 34 displays the change in food sales by market segment of food retailers between 1993 and 2003. Sales from supermarkets decreased from 63 percent to 58.3 percent during this time period. However, sales from warehouse clubs and super centers increased from 3.6 percent to 9 percent, while those of convenience stores and drug stores also increased—from 11.9 percent to 13.6 percent. Overall, sales from nontraditional food retailers—warehouse clubs and super centers, mass merchandisers, and convenience and drugstores—went from 17.2 percent in 1993 to 24.4 percent in 2003.

Figure 34: Percentage of Retail Food Sales by Market Segment, 1993 and 2003



Source: GAO presentation of USDA data.

Within the fastest-growing segment, warehouse clubs and super centers, the largest food retailer is Wal-Mart, followed by Target and Meijer's, while the second fastest growing segment includes the major drug chains, such as Walgreen's and CVS. As of 2003, Wal-Mart super center sales reached $103.2 billion, with estimated grocery sales of $41.3 billion.[72] According to a recent ACNielsen study, while all U.S. households still shop in traditional grocery stores, the annual number of trips to such stores continues to decline.[73] In contrast, super centers have shown strong gains in household penetration as well as gains in the number of trips per year. In dairy,

[72]Wal-Mart super center sales for 2003 were taken from Supermarket News, SN's Top 75 (supplement), January 12, 2004. The estimate of grocery sales was provided by USDA. These grocery sales represent about 40 percent of total super center sales.

[73]"ACNielsen Study Finds Grocery Stores Continuing to Lose Share of Customer Shopping Trips," news release, ACNielsen, May 4, 2002, http://www.acnielsen.com/news/american/us/2002/200220504.htm (accessed Sept. 9, 2004).

however, conventional food stores still offer a larger selection of milk products. A recent study by researchers at Cornell and Oklahoma State Universities on dairy case management found that the number of milk products offered was highest in supermarkets (74) and lowest in drug stores (16).[74] While the volume of milk products was highest for mass merchandisers, the number of products (24) was similar to convenience stores (22). The authors explained that historically, mass merchandisers concentrated on moving a large volume of product with a limited variety.

[74]Todd M. Schmit, Harry M. Kaiser, and Chanjin Chung, *The Dairy Case Management Program: Does It Mooove More Milk?* National Institute for Commodity Promotion Research and Evaluation, Department of Applied Economics and Management, Cornell University, Ithaca, New York, January 2004. Specifically, this study evaluated the Dairy Case Management Program operated by the American Dairy Council in the Northwestern Hudson Valley Market in New York State.

Economic Studies of Price Transmission in the U.S. Fluid Milk Market

This appendix summarizes the findings of 14 economic studies of price transmission in U.S. fluid milk markets. These studies estimated the extent to which price changes at one level, such as the farm level, are transmitted to other levels, such as the retail level, and the time in which these price changes are transmitted. Many of the studies found a difference, or asymmetry, in either the extent or speed of price transmission, depending on whether the initial price change was an increase or a decrease (see table 32).[1] Some of the studies analyzed possible causes for price asymmetry and often identified the presence of noncompetitive markets as a contributing factor.[2] Although most studies estimated how prices are transmitted from the farm to the retail level, a few also estimated how price changes are transmitted from the retail level back to the farm level.

[1]More generally, a recent article in the economics literature looking at 77 consumer and 165 producer goods suggested that asymmetric price transmission is a broad phenomenon, and that prices rise faster than they fall in about two-thirds of the markets that were examined. See S. Peltzman, "Prices Rise Faster than they Fall," *Journal of Political Economy*, Vol. 108, No. 3, 466-502.

[2]Other factors identified included the costs of changing prices, government policies, spatial market competition, asymmetric information, economies of scale, and differentiated products.

Table 32: Overview of Fluid Milk Price Transmission Studies and Results on Price Transmission Asymmetry/Symmetry

Author	Year	Model	Period of study	Geographic area	Results on price transmission asymmetry/ symmetry (long run)[a]	Additional results
Carman and Sexton	Forth-coming 2005	Econometric model based on Houck (1977)	1999-2003	Nine western U.S. cities[b]	Asymmetry in certain milk types and markets	Asymmetry in timing in CA markets
Sexton, Xia, and Carman	2004	Hotelling framework; Econometric model	1999-2003	Nine western U.S. cities[c]	Asymmetry	Asymmetry in timing
Capps, Jr.	2004	Houck econometric model and error correction model	1994-2002	Seven U.S. cities[d]	Asymmetry in majority of cities	
Linkow, Gould and Stiegert	2004	Asymmetric friction model	1997-2004	Ten U.S. cities[e]	Asymmetry	
Chidmi, Lopez, and Cotterill	2004	New Empirical Industrial Organization model	1996-2000	Boston	N/A	
Lass	2004	Econometric model based on Kinnucan and Forker (1987)	1982-2002	New England	Post-compact asymmetry[f]	Pre-compact same as 2001
Wang	2003	Structural econometric model based on Emerick (1994)	1971-1997	National	Asymmetry	Asymmetry in short run; Symmetry retail to farm
Romain, Doyon, and Frigon	2002	Marketing margin, econometric model	1980-1997	Upstate New York (UNY) and New York City (NYC)	Asymmetry UNY and NYC prior to price-gouging law; only NYC after the law[g]	Same results in short run
Dhar and Cotterill	2002	Two-stage market channel model	1996-1998	Boston	N/A	
Lass, Adanu, and Allen	2001	Econometric model based on Kinnucan and Forker	1982-1997	New England	Symmetry	Asymmetry in short run
Frigon, Doyon, and Romain	1999	Marketing margin, econometric model	1980-1997	Northeast U.S.; UNY and NYC	Symmetry in all markets except asymmetry in NYC after law[g]	Asymmetry in all markets in short run
Carman	1998	Econometric model based on Houck	1985-1997	Three California cities[h]	Symmetry	Asymmetry in short run
Emerick	1994	Structural econometric model based on Houck	1971-1991	National	Asymmetry	Symmetry in short run
Hansen, Hahn, and Weimar	1994	Econometric model	1983-1990	National	Asymmetry	

Source: GAO analysis using various sources (see table 33).

[a]These results indicate farm-to-retail price asymmetry or symmetry.

[b]These cities include the four California markets of Sacramento, San Francisco, Los Angeles, and San Diego and the five non-California markets of Seattle, Portland, Salt Lake City, Denver, and Phoenix.

[c]The cities are the same as in Carman and Sexton (forthcoming 2005).

[d]These metropolitan markets include Atlanta, Boston, Chicago, Dallas, Hartford, St. Louis, and Seattle.

[e]These metropolitan markets could not be disclosed.

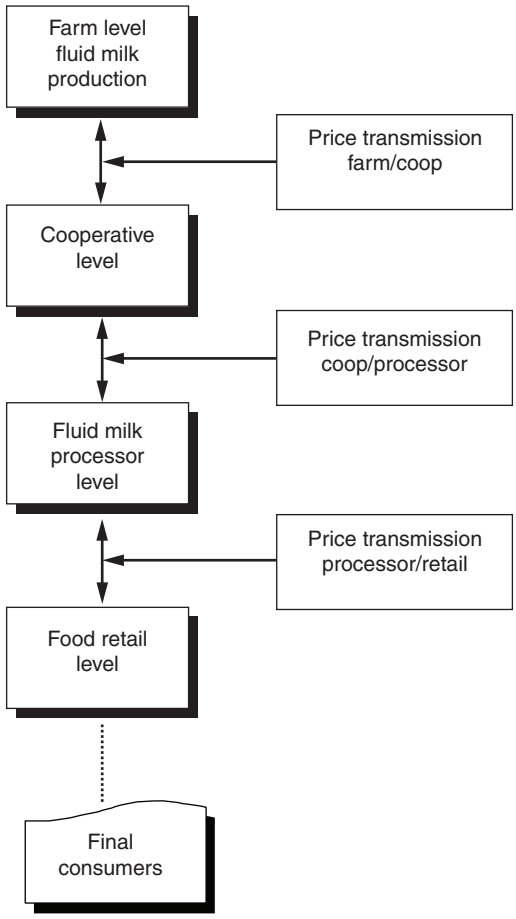
[f]The Compact refers to the Northeast Interstate Dairy Compact.

[g]This law refers to the New York milk price-gouging law of 1991 (codified at NY Gen. Bus. §396-rr).

[h]These three California cities include Los Angeles, San Francisco, and Sacramento.

How prices are transmitted within the milk marketing chain is important to policy makers because it affects both farmers and consumers. Farmers may be concerned with price transmission because they may believe increases in retail prices are not fully passed back to the farm level, while decreases are passed on. Consumers and farmers may believe that decreases in farm prices are not fully passed along to the retail level, while increases are passed on. Figure 35 illustrates price transmission through the vertical milk marketing chain; the arrows show how price signals are transmitted in both directions between marketing levels.

Figure 35: Marketing Chain and Price Transmission for the U.S. Fluid Milk Industry



Source: GAO.

The first section of this appendix is a detailed table summarizing the models, data, and key assumptions used in each study, and each study's results. The second and third sections discuss the farm-to-retail results, including evidence of price asymmetry, with respect to the extent of price transmission and the speed of price transmission. The fourth section discusses the retail-to-farm results on price transmission. The last section discusses the studies' findings regarding factors that might cause price asymmetry.

Summary of Recent Economic Studies of Price Transmission in the U.S. Fluid Milk Market

While most of the studies summarized in table 33 use, as a basis for their models, the standard Houck (1977)[3] and Kinnucan and Forker (1987) models to identify price asymmetry,[4] others use newer methods such as the error correction model, which some researchers believe provides a more appropriate specification for examining asymmetric price transmission.[5] Most of the studies estimated only "forward" price transmission, or price transmission from the farm to the retail level, but we also report on one study that estimated "backward" price transmission, from the retail level to the farm. The studies also differed in whether they estimated short-run or long-run price transmission asymmetry or both.[6] We take all of these differences into account in interpreting the studies' overall conclusions and discussing their results.

[3]James P. Houck, "An Approach to Specifying and Estimating Nonreversible Functions," *American Journal of Agricultural Economics* 59 (1977): 570-572. In the Houck model (1977), changes in the retail price are linked to increases and decreases in the farm level price as well as changes in other marketing costs. Also, the estimated parameters on the farm-level price increases and decreases can be tested to determine if retail price movements in response to farm price changes are symmetric or asymmetric.

[4]H.W. Kinnucan and O.D. Forker, "Asymmetry in Farm–Retail Price Transmission for Major Dairy Products," *American Journal of Agricultural Economics* 69 (1987): 285–292. Kinnucan and Forker combine the mark-up model proposed by Heien (1980) and the approach used by Houck (1977) to estimate asymmetric functions using a dynamic approach for fluid milk, cheese, butter, and ice cream.

[5]A recent study by von Cramon-Taubadel and Fahlbusch (1994) points out that in the case of cointegration between two time series, an error correction model, extended by the incorporation of asymmetric adjustment terms, provides for a more appropriate specification for testing for asymmetric price transmission. See S. von Cramon-Taubadel and S. Fahlbusch, "Identifying Asymmetric Price Transmission with Error Correction Models." Poster session at the European Association of Agricultural Economists European Seminar in Reading, UK, 1994.

[6]Short-run asymmetry occurs when increasing and decreasing prices have different immediate responses when the farm price is changed. Long-run asymmetry occurs when increasing and decreasing farm prices have different responses over the full adjustment period. For most of the studies that we examined, both the short run and long run represented fairly short time horizons. For example, the short run typically extended from the current month to one month out, while the long run was usually from 2 to 4 months. Nevertheless, in most of the studies, the long run was the time required for the lag structure to run its course.

Table 33: Recent Price Transmission Studies of the Fluid Milk Market

	Model Description			Price Transmission Results	
Author/ Study/Year	**Type of economic model**	**Scope of model and price data used**	**Additional assumptions/ variables/ limitations**	**Timing/symmetry and degree of price transmission[a]**	**Other model results**
Carman and Sexton, "Supermarket Fluid Milk Pricing Practices in the Western United States," *Agribusiness*, forthcoming 2005.	Econometric model based on the farm-to-retail price transmission model of Houck (1977) for whole, skim, 1 percent, and 2 percent milk. Estimated time lags using an Almon distributed lag model.	Average monthly prices for nine California and non-California metro markets, 1999–2003. **Farm prices:** *California*: Class I California milk prices. *Other states:* FMMO Class I prices. **Retail prices:** ACNielsen average monthly retail prices.	Market power based on hypothesis tests of parameter size, parameter tests for asymmetry, and a departure from cost differences of fluid milk products due to different fat contents.	**Timing/price asymmetry:** *California and non-California*: Contemporaneous to 3-month period. *California markets:* Some evidence of price symmetry and some of price asymmetry, depending on market and product. *Non-California markets:* Price transmission in almost all markets was asymmetric. **Degree of price transmission:** *California:* Sacramento: Increases: 72%-122% Decreases: 52%-97% Los Angeles: Increases: 60%-115% Decreases: 75%-106% San Francisco: Increases: 65%-115% Decreases: 49%-94% San Diego: Increases: 56%-109% Decreases: 58%-110% *Non-California:* Seattle: Increases: 57%-72% Decreases: 39%-64% Portland: Increases: 3%-25% Decreases: 4%-30% Phoenix: Increases: 5%-59% Decreases: 6%-63% Salt Lake City: Increases: 39%-56% Decreases: 54%-83% Denver Increases: 43%-56% Decreases: 40%-55%	Analysis revealed evidence of market power in fluid milk pricing in each of the nine metro markets analyzed. In Portland, estimated retail price coefficients did not respond to farm prices. In non-California markets, only 3 of 40 estimated coefficients were consistent with perfect competition in pricing. Addition of retail skim milk, 1 percent, and 2 percent led to different results than previous analysis of only whole milk.

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	Model Description			Price Transmission Results	
Author/ Study/Year	**Type of economic model**	**Scope of model and price data used**	**Additional assumptions/ variables/ limitations**	**Timing/symmetry and degree of price transmission[a]**	**Other model results**
Sexton, Xia, and Carman, "Horizontal Differentiation with Differential Input Costs: Retail Prices for Milk by Fat Content." Paper presented at the annual AAEA meetings, Denver, Colorado, 2004.[b]	Theoretical model based on Hotelling framework of horizontally differentiated products with differential costs. Econometric estimation – seemingly unrelated regression–of a differentiated product, market competition model using metropolitan retail markets for whole and skim milk.	Average monthly prices for nine California and non-California cities. California data, 1999–2003; Non-California data, 2000–2003. **Farm prices:** Class I prices from California Dairy Information Bulletin and FMMO Class I component prices. **Retail prices:** California Dairy Information Bulletin.	Three competition scenarios examined for retail fluid milk markets: perfect competition, monopoly, and oligopoly. Skim milk (low-cost) and whole milk (high-cost) represent products with differential costs transmitted differently in different competition scenarios. Farm prices do not contain over-order premiums.	**Timing/price asymmetry:** *California:* Los Angeles and San Diego have longer transmission periods than Sacramento and San Francisco. *Non-California:* Prices are transmitted gradually for Denver, Salt Lake City, Portland, and Phoenix, while prices in Seattle are transmitted quickly, within 1 month. **Degree of price transmission:** N/A	Competition results: *California:* Results suggest oligopoly scenario for Sacramento, San Francisco, and Los Angeles markets. Some evidence of oligopoly scenario for San Diego market. *Non-California:* Results suggest oligopoly scenario for Phoenix, Salt Lake City, and Seattle markets. Model also suggests Denver market is closer to oligopoly, while Portland is closer to monopoly scenario.

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	Model Description			Price Transmission Results		
Author/ Study/Year	**Type of economic model**	**Scope of model and price data used**	**Additional assumptions/ variables/ limitations**	**Timing/symmetry and degree of price transmission[a]**		**Other model results**
Capps, Jr., "Asymmetry in Farm-Retail Price Transmission Associated with Whole Milk and Two Percent Milk in Selected U.S. Cities: A Comparison of the Conventional Houck Approach and the Error Correction Model Approach." Working paper, Department of Agricultural Economics, Texas A&M University, 2004.	The standard Houck econometric price transmission approach is compared to the error correction model using co-integration procedures. Model estimates results for whole milk and 2 percent milk.	Monthly data from January 1994 to October 2002 for seven U.S. cities: Atlanta, Boston, Chicago, Dallas, Hartford, St. Louis, and Seattle. **Farm prices:** USDA Agricultural Marketing Service. **Retail prices**: USDA Agricultural Marketing Service.	Elasticities of price transmission are calculated for each product and market. The model does not include any other marketing input costs.	**Houck method** **Price asymmetry:** (Whole milk) *Asymmetric-* Atlanta, Boston, Chicago, and Dallas, and Hartford *Symmetric-* St. Louis and Seattle (2 percent) *Asymmetric-* Atlanta, Boston, Chicago, and Hartford *Symmetric-* Dallas, St. Louis, and Seattle **Elasticity of price transmission** (ranges): (Whole milk) *Increases:* (+0.23)–(+0.58) *Decreases:* (-0.02)–(+0.12) (2 percent) *Increases:* (+0.11)–(+0.46) *Decreases:* (-0.06)–(+0.25)	**Error correction model** Atlanta, Chicago, and Dallas St. Louis Atlanta, Chicago, and Seattle St. Louis and Dallas *Increases:* (+0.24)–(+0.35) *Decreases*: (-0.03)–(+0.06) *Increases:* (+0.05)–(+0.29) *Decreases:* (-0.006)–(+0.12)	Author notes that results suggest there is a possible market failure due to a highly concentrated retail sector, with the exception of St. Louis and Seattle.

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	Model Description			Price Transmission Results	
Author/ Study/Year	**Type of economic model**	**Scope of model and price data used**	**Additional assumptions/ variables/ limitations**	**Timing/symmetry and degree of price transmission[a]**	**Other model results**
Linkow, Gould, and Stiegert, "Retail Consolidation, Market Concentration, and Farm-Retail Price Asymmetry in the U.S. Fluid Milk Market." Working paper, Department of Agricultural Economics, University of Wisconsin-Madison, 2004.	Authors use an asymmetric friction model that accounts for the existence of menu costs (the costs of repricing products). Estimated model uses the price of private label whole milk.	Weekly panel data from 1997--2004 for 10 metropolitan fluid milk markets. **Farm prices:** FMMO Class I announced cooperative price. **Retail prices:** IRI retail price data; private label (store brand) whole milk.[c]	Price asymmetry and menu costs are allowed to vary by city. Includes a marketing cost index variable based on a paper by Romain et al., (2002). Includes a measure of market concentration and a measure of spatial market concentration.	**Timing/price asymmetry:** *Asymmetric*-Farm price decreases are passed on less completely than increases. Responses to price increases do not differ considerably across cities. Responses to price decreases do differ across cities. **Degree of price transmission:** N/A	

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	Model Description			Price Transmission Results	
Author/ Study/Year	Type of economic model	Scope of model and price data used	Additional assumptions/ variables/ limitations	Timing/symmetry and degree of price transmission[a]	Other model results
Chidmi, Lopez, and Cotterill, "Dairy Compact, Market Power, and Milk Prices in Boston." Working paper, Department of Agriculture and Resource Economics, University of Connecticut, 2004.	The New Empirical Industrial Organization structural model of Appelbaum (1982) that includes measures of market power and price transmission. The model tests for values of these variables with and without the Northeast Interstate Dairy Compact (NEDC).[d]	Weekly data from1996-2000 for Boston metropolitan fluid milk market. **Farm prices:** The higher of the FMMO Class I prices or Compact Class I prices, plus over-order premiums. **Retail prices:** Computed from IRI retail data by dividing total sales by total volume.[c]	Assesses retail prices under four scenarios: NEDC, no NEDC, with perfect competition, and oligopoly; estimates market power and market conduct variables. Assumes cost-plus pricing between processors and retailers in the Boston area. Model does not estimate the timing of price transmission.	**Timing/price asymmetry:** N/A **Degree of price transmission:** *Increases:* 68% Transmission elasticities were estimated at 0.331 pre-Compact and 0.2911 post-Compact.	Retail price increases due to market power outweighed impact of NEDC by nearly 7 times. Both the pre- and post-NEDC retail price markup over marginal cost (the competitive benchmark) is about 25% of the retail fluid milk price. Market conduct–supermarkets do not ignore each other's actions. MILC program provides benefits to farmers, consumers, and retailers at the expense of taxpayers.[e]

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	Model Description			Price Transmission Results	
Author/ Study/Year	Type of economic model	Scope of model and price data used	Additional assumptions/ variables/ limitations	Timing/symmetry and degree of price transmission[a]	Other model results
Lass, "Impacts of the Northeast Dairy Compact on New England Prices Revisited: New Data, New Lessons." Working paper, Department of Resource Economics, University of Massachusetts, Amherst, 2004.[d]	Update of the previous 2001 econometric mark-up model of Kinnucan and Forker (1987) allowing for rising and falling farm prices and different speeds of adjustment.	Monthly time-series price data for New England (Boston and Hartford), 1982 to 2002. **Farm prices:** FMMO Class I price for the New England market. **Retail prices:** USDA Agricultural Marketing Service retail price series for Boston and Hartford.	Longer data series than 2001 paper with time periods split into pre and post-Compact; a pre-1997 period and a 1997-2002 period. Parameters of the pre- and post-Compact periods were tested to determine changes in price transmission. Assumes constant returns to scale and a competitive market beyond the farm gate. Included variable to measure changes in processing costs using USDA's Food Marketing Cost Index.	**Timing/price asymmetry:** *Pre-Compact period:* Results were consistent with original findings (Lass et al., 2001); price asymmetry in the short run and symmetry in the long run. *Post-Compact period:* Short run: Price asymmetry Long run: Price asymmetry. **Degree of price transmission:** N/A	Boston: There was greater variation in farm prices without the Compact, leading to higher retail prices. Hartford: There was greater variation in farm prices without the Compact, with greater increases in retail prices.

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	Model Description			Price Transmission Results		
Author/ Study/Year	**Type of economic model**	**Scope of model and price data used**	**Additional assumptions/ variables/ limitations**	**Timing/symmetry and degree of price transmission[a]**		**Other model results**
Wang, *Price Transmission and the Role of Federal Dairy Policy in U.S. Dairy Markets*. Master's thesis, Cornell University, 2003.	Structural econometric model using a simultaneous system of equations of national dairy prices, including farm and retail fluid milk. Models both farm-to-retail and retail-to-farm price transmission. Model based on a previous one by Emerick (1994).	National in scope; uses national monthly average data from 1971–1997. **Farm prices**: Announced cooperative Class I price. **Retail prices**: U.S. retail price from Bureau of Labor Statistics-USDA.	Competitive fluid milk market and constant returns to scale. Policy variable for changes in price support in 1980s. Price lags chosen from dairy market literature.	**1988 – 1997 Period** **Farm-to-retail:** **Timing/price asymmetry:** *Short run:* (1 month) Asymmetric *Long run:* (3 months) Asymmetric **Degree of price transmission:** *Short run:* Increases: 94% Decreases: 31% *Long run:* Increases: 83% Decreases: 64%	**Retail-to-farm:** *Short run*: (1 month) Asymmetric *Long run:* (3 months) Symmetric *Short run:* Increases: 94% Decreases: 2% *Long run:* Increases: 40% Decreases: 34%	Decreases in dairy price supports in the mid-1980s led to greater asymmetric price transmission and more volatility in the post-1988 period than in the pre-1988 period for fluid milk and nonfat dry milk.

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	Model Description			Price Transmission Results	
Author/ Study/Year	**Type of economic model**	**Scope of model and price data used**	**Additional assumptions/ variables/ limitations**	**Timing/symmetry and degree of price transmission[a]**	**Other model results**
Romain, Doyon, and Frigon, "Effects of State Regulations on Marketing Margins and Price Transmission Asymmetry: Evidence from the New York City and Upstate New York Fluid Milk Markets," *Agribusiness*, 2002.	Marketing margin model that includes quantity of commodity marketed and marketing costs combined with the Houck (1977) model. It includes variables measuring cumulative increases and decreases in farm-level prices. The Akaike Information Criterion was used to determine the appropriate lag structure.	Monthly data from 1980 – 1997 for Upstate New York (UNY) and New York City (NYC) markets. **Farm prices:** UNY and NYC prices are the FMMO Class I prices. **Retail prices:** UNY and NYC prices are from the New York State Department of Agriculture.	Model allows for testing of constant returns to scale. Model allows for asymmetry of other marketing costs. Model includes state policy variables–such as deregulation of milk distribution in NYC and the NYC price-gouging law.[f] Model does not account for over-order premiums in farm prices.	**Timing/price asymmetry:** **Short run:** Asymmetric–NYC and UNY before price-gouging law. Asymmetric–NYC after price-gouging law. **Long run:** Asymmetric–UNY and NYC, before price-gouging law. Asymmetric–NYC after price-gouging law. **Price transmission elasticities:** **NYC** **UNY** *Before the price-gouging law:* Increasing elasticities: 0.70 0.62 Decreasing elasticities: 0.30 0.49 *After the price-gouging law:* Increasing elasticities: 0.52 0.52 Decreasing elasticities: 0.43 0.51	Model results indicate constant returns to scale. NYC experienced price asymmetry in the long run prior to 1991, before the price-gouging law came into effect, but much less thereafter. The deregulation of milk distribution to NYC in 1987 allowed Farmland Dairies' entry into the NYC market and significantly reduced marketing margins.

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	Model Description			Price Transmission Results	
Author/ Study/Year	**Type of economic model**	**Scope of model and price data used**	**Additional assumptions/ variables/ limitations**	**Timing/symmetry and degree of price transmission[a]**	**Other model results**
Dhar and Cotterill, "Price Transmission in Differentiated Product Market Channels: A Study of the Boston Fluid Milk Market and the Northeast Dairy Compact," Food Marketing Policy Center, Department of Agricultural and Resource Economics, University of Connecticut, 2002.	A two-stage structural market channel model of the Boston milk market using a nonlinear model of costs and demand. The model looks at the Boston fluid milk processor and retailer market channels.	Monthly average data for Boston market from March 1996 to July 1998. **Farm prices:** Boston FMMO Class I fluid milk price. **Retail prices:** IRI data for aggregate retail and top 4 supermarket chains in the Boston market.[c]	Model allows for both vertical and horizontal market channel effects. Model allows for the identification of cross-firm pass-through rates. Authors specify three different oligopoly games. Study does not test for the timing of price transmission or price transmission asymmetry.	**Timing/price asymmetry:** N/A **Degree of price transmission (ranges):** Processor-to-wholesale: 55%-65% Wholesale-to-retail: 54%-62% Firm-specific transmission: 32%-47% Industrywide transmission: 88%-100%	Competition between retailers was lessened due to focal point pricing and the Compact. Industrywide and firm-specific cost shocks were not identical, nor did the latter aggregate to the former.

(Continued From Previous Page)

	Model Description			Price Transmission Results	
Author/ Study/Year	**Type of economic model**	**Scope of model and price data used**	**Additional assumptions/ variables/ limitations**	**Timing/symmetry and degree of price transmission[a]**	**Other model results**
Lass, Adanu, and Allen "Impacts of the Northeast Dairy Compact on Retail Prices," *Agricultural and Resource Economics Review*, 2001.	Econometric model based on the basic markup model of Kinnucan and Forker (1987) allowing for rising and falling farm prices and different speeds of adjustment.	Monthly time-series price data for New England (Boston and Hartford), 1982 to 1997. **Farm prices:** Class I FMMO price for the New England market. **Retail prices:** USDA Agricultural Marketing Service retail price series for Boston and Hartford.	Uses national data to determine the lag structure for fluid milk–uses lags of 1 and 2 months. Model uses impacts of price transmission to determine the impact of the Compact. Assumes constant returns to scale and a competitive market beyond the farm gate. Includes variable to measure changes in processing costs using USDA's Food Marketing Cost Index.	**Timing/price asymmetry:** **Boston:** Retail prices increased most rapidly in the current period; for declines, the greatest decreases occurred after a one-period lag. **Hartford:** Current period effects of rising farm prices were greater than current period falling farm prices. **Boston and Hartford**: Short run: Price asymmetry. Long run: Price symmetry. **Degree of price transmission and elasticities of price transmission:** *Degree of price transmission:* **Boston** 58% average; **Hartford** 48% average *Elasticities*: **SR** **LR** **SR** **LR** Rising elasticity 0.46 0.35 0.30 0.33 Falling elasticity 0.14 0.35 0.15 0.25	In the long run, increases in margins were primarily accounted for by other factors, such as processing costs, rather than the Compact. Impact of the Compact on retail prices was less than the over-order premium, suggesting that less than the full amount of the premium was passed on to consumers.

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	Model Description			Price Transmission Results	
Author/ Study/Year	Type of economic model	Scope of model and price data used	Additional assumptions/ variables/ limitations	Timing/symmetry and degree of price transmission[a]	Other model results
Frigon, Doyon, and Romain, "Asymmetry in Farm-Retail Transmission in the Northeastern Fluid Milk Market," Food Marketing Policy Center, Department of Agricultural and Resource Economics, University of Connecticut, 1999.	Hybrid of the marketing cost model, which includes the quantity of commodity marketed and costs, with the Houck model, which includes variables of cumulative increases and decreases in farm-level prices.	Northeast United States, Upstate New York (UNY), and New York City (NYC) markets using monthly data, 1980–1997. **Farm prices:** UNY and NYC prices are the Class I FMMO prices; for Northeast United States–FMMO Class I average prices of the four FMMO regions at that time. **Retail prices:** UNY and NYC prices from New York State Department of Agriculture; Northeast United States prices from the Bureau of Labor Statistics.	Competitive market and constant returns to scale assumptions are relaxed. A variable for market concentration, the four-firm concentration ratio, included for UNY and NYC. Model allows for marketing costs. Model includes policy variables such as the NYC price-gouging law. Model does not account for over-order premiums in farm prices.	**Timing/price asymmetry:** **Short run:** Asymmetry existed for UNY after 2 months, and still existed in NYC and the Northeast United States after 3 months. **Long run:** After 4 months, the Northeast United States, UNY, and NYC (postgouging law) fully adjusted. Only NYC (pregouging law) had not adjusted. Symmetry existed in all regions in the long run except NYC prior to 1991. **Degree of price transmission:** N/A	NYC experienced price asymmetry in the long run prior to 1991, before the price-gouging law came into effect. Variable for market concentration was found insignificant for both UNY and NYC. Authors believed that the problem of consumer information was the predominant cause of asymmetric price transmission.

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	Model Description			Price Transmission Results	
Author/ Study/Year	**Type of economic model**	**Scope of model and price data used**	**Additional assumptions/ variables/ limitations**	**Timing/symmetry and degree of price transmission[a]**	**Other model results**
Carman, "California Milk Marketing Margins," *Journal of Food Distribution Research*, 1998.	Response of retail-level milk prices to changes in farm prices using Houck's (1977) model for estimating nonreversible functions. The model is estimated using prices for whole milk.	Three California market areas: Los Angeles, San Francisco, and Sacramento. Monthly data, January 1985 to March 1997. **Farm prices:** Class I prices for Northern and Southern California from California Dairy Information Bulletin. **Retail prices:** California Dairy Information Bulletin.	Uses lags of 1 month for price increases and 2 months for price deceases. Uses an index of marketing costs from the USDA/Economic Research Service marketing cost index.	**Timing/price asymmetry**: **Short run**: Asymmetric–Unlike price increases, there was a significant 1-month lag between farm price decreases and total retail price decreases for each city. **Long run**: Symmetric–Retail milk price changes were not significantly different for increases and decreases of farm prices. **Degree of price transmission:** *Sacramento:* Increases: (111%-112%) Decreases: (110%-117%) *San Francisco:* Increases: (117%-118%) Decreases: (94%-103%) *Los Angeles:* Increases: (76%-88%) Decreases: (62%-94%)	For five of the six equations, the one-for-one price transmission process is consistent with constant dollar markup pricing. For Los Angeles, tests showed that retailers were maintaining prices by absorbing some cost increases, and reducing prices less than farm prices decreased.

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	Model Description			Price Transmission Results		
Author/ Study/Year	**Type of economic model**	**Scope of model and price data used**	**Additional assumptions/ variables/ limitations**	**Timing/symmetry and degree of price transmission[a]**		**Other model results**
Emerick, *An Econometric Analysis of Dairy Market Price Transmission Processes.* Master's thesis, Cornell University, 1994.	Structural econometric model based on Houck's method (1977) using a simultaneous system of 32 equations and a distributed lag formulation. The model estimates price transmission for five dairy products, including fluid milk.	National scope-national monthly average data series, 1971-1991. **Farm prices**: Announced cooperative Class I price. **Retail prices**: U.S. average city retail fluid milk price from Consumer Price Index, Bureau of Labor Statistics.	Price lags chosen from knowledge of the dairy market-lag length 2 months for farm price increases and decreases. Models both farm-to-retail and retail-to-farm price transmission results. Model uses slope and intercept dummy variables used to separate time periods into 1977–1988 and 1988–1991 to account for government support price decreases and greater price volatility.	**Farm-to-retail:** **Timing/price asymmetry** **Short run:** (Immediate) **Long run:** (2 months) **Degree of price transmission** **Short run:** Increases: 45% Decreases: 41% **Long run:** Increases: 107% Decreases: 55%	 Symmetric Asymmetric	Author estimates causality for fluid milk using data from 1971–1991 and finds it multidirectional. Since 1988, different retail price responses (asymmetric) occur 1 and 2 months after the initial farm-level price change. Author notes this may be due to greater volatility causing difficulties in determining the "appropriate" price at wholesale or retail. Asymmetry is not a short-run phenomenon in most other dairy products including retail butter, wholesale nonfat dry milk, and retail ice cream.

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	Model Description			Price Transmission Results	
Author/ Study/Year	Type of economic model	Scope of model and price data used	Additional assumptions/ variables/ limitations	Timing/symmetry and degree of price transmission[a]	Other model results
Hansen, Hahn, and Weimar, *Determinants of the Farm-to-Retail Milk Price Spread*, Economic Research Service, USDA, 1994.	Statistical techniques similar to those used by Hahn's (1989, 1990) markup model in his study of price transmission. Estimates price transmission for whole milk.	National average quarterly data, 1983–1990 for farm, wholesale, and retail levels. **Farm prices:** Class I FMMO prices from AMS/USDA plus over-order premiums. **Wholesale prices:** Firm-level private cost-accounting company data for 30 companies across the country. **Retail prices:** Bureau of Labor Statistics data based on retail prices in 91 areas.	Unlike other studies, includes the wholesale market level in the model.	**Timing/price asymmetry:** **Farm-to-wholesale:** Asymmetric Farm price increases: wholesale price adjusted in three quarters. Farm price decreases: wholesale price adjusted in one quarter. **Farm-to-retail**: Asymmetric Farm price increases: retail price adjusted in one quarter. Farm price decreases: retail price adjusted in 10 quarters. *Degree of price transmission*: **Retail price adjustment**: Asymmetric Farm price increases: 173% Farm price decreases: 92%	Wholesale prices exhibit short-run asymmetric responses to farm prices, while retail prices exhibit short-run and long-run, or irreversible, price adjustments. In this study, wholesale milk price adjustments were more rapid for farm price decreases than for farm price increases.

[a]The degree or level of price transmission is represented by the percentage of full price pass-through from farm to retail. Some studies, however, measured instead the elasticity of price transmission, which is defined as the percentage change in the retail price of a product due to a 1 percent change in the corresponding farm price. As noted in the table, some studies do not measure the degree of price transmission or the elasticity of price transmission and only report on the timing and symmetry of transmission.

[b]The AAEA is the American Agricultural Economics Association.

[c]IRI stands for Information Resources, Inc.

[d]The Northeast Interstate Dairy Compact was a pricing program established by the 1996 Farm Bill that set a minimum price for raw milk to be used for and sold as fluid milk in the New England states of Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont. This program expired on September 30, 2001.

[e]The Milk Income Loss Contract program (MILC) is similar to the Compact, in that it is based on the Boston raw milk price and provides a partial subsidy to dairy farmers; however, it is funded through taxpayers rather than processors.

[f]The New York City price-gouging law (codified at NY Gen. Bus. §396-rr) imposed a duty on the New York Commissioner of Agriculture and Markets to determine if prices of fluid milk are unconscionably excessive whenever the retail price of fluid milk exceeds 200 percent of the price for Class I fluid milk. The New York State Legislature passed this law, in part, because of a perceived lack of response in retail milk prices to decreases in farm prices.

Results on the Extent of Farm-to-Retail Price Transmission and Price Transmission Asymmetry

On both national and regional or citywide levels, the majority of the fluid milk studies that we identified found evidence of farm-to-retail price transmission asymmetry in price levels. While the studies estimated a wide range of price transmission levels, in general, the estimates of price transmission for initial farm price increases were greater than for farm price decreases.

National Level Results

The fluid milk price transmission studies that we identified using national aggregate data estimated a wide range of price transmission levels and generally found evidence indicating asymmetric price transmission—farm price increases were more fully transmitted to retail prices than farm price decreases. Using national average farm and retail prices for whole milk, Emerick (1994) and Wang (2003) developed two similar studies that identified the degree of price transmission nationally. While both studies used similar models, the Wang study used somewhat more recent data. Taken together, both studies' short-run results suggest that about 45 percent to 94 percent of farm price increases were passed along to the retail level, while only 31 percent to 41 percent of farm price decreases were similarly passed along. These studies estimated that in the long run, transmission levels for price increases ranged from 83 percent to 107 percent, while transmission levels for price decreases ranged from 55 percent to 64 percent. Both researchers found price asymmetry in the long run, but Wang also found price asymmetry in the short run. In his study of seven metropolitan markets across the country using data from 1994 to 2003, Capps Jr. (2004) also identified price asymmetry in a majority of selected fluid milk markets for whole and 2 percent milk. Measuring the level of price transmission by using the elasticity of price transmission, he estimated elasticities for farm price increases ranging from 0.23 to 0.58 for whole milk and 0.11 to 0.46 for 2 percent milk. For farm price decreases, these elasticities were much lower, ranging from –0.02 to 0.12 for whole

and –0.06 to 0.25 for 2 percent, respectively.[7,8] Similarly, in Linkow et al. (2004), using an asymmetric friction model of 10 metropolitan markets across the country, the authors found evidence of price asymmetry—retail prices were more responsive to cooperative farm price increases than decreases.

Regional and City-Level Results

Many studies that used regional or city-level data also estimated a wide range of price transmission levels as well as asymmetric price transmission. In an econometric model for whole, skim, 1 percent, and 2 percent milk, Carman and Sexton (forthcoming 2005) estimated farm-to-retail price transmission for nine metropolitan markets in the Western United States. Estimated levels of price transmission for all types of fluid milk combined for the California markets ranged from 56 percent in San Diego to 122 percent in Sacramento for price increases, and from 49 percent in San Francisco to 110 percent in San Diego for price decreases. For the non-California markets, for both increases and decreases, the estimated levels of price transmission were much lower, ranging from 3 percent in Portland to 72 percent in Seattle for price increases and 6 percent in Phoenix to 83 percent in Salt Lake City for price decreases. The authors also noted that none of their price transmission parameters for all types of fluid milk for Portland was statistically different from zero, indicating no evidence that retail prices responded to farm price changes in this market.

Several researchers have also estimated farm-to-retail price transmission for markets in the Northeast United States. Lass et al. (2001) estimated price transmission in reference to the Northeast Interstate Dairy Compact for the Boston and Hartford metropolitan areas. For price increases, they found that the level of price transmission for a farm price increase was 58 percent for Boston and 48 percent for Hartford. While Lass et al. only found price asymmetry in the short run, in a subsequent study, using more recent data, Lass (2004) found price asymmetry in the short run and in the long run. Using the New Empirical Industrial Organization approach, Chidmi, Lopez, and Cotterill (2004) found a similar result: a degree of price

[7]The elasticity of price transmission from the farm to retail level is the percentage change in the retail price of a product due to a 1 percent change in the corresponding farm price.

[8]While these elasticity estimates are ones obtained from using the Houck method, the author found similar results, although smaller, using a time-series, cointegration approach: the error correction model (see table 33).

transmission of 68 percent for farm price increases for the Boston market.[9] Within the same study, the authors also note that Cotterill (2003), in other research for Boston, estimated a pass-through rate of between 20 and 26 percent for price decreases, suggesting price asymmetry in this market. In another study of the Boston market, using a two-stage market channel model, Dhar and Cotterill (2002) found that the firm-specific price pass through rate was 32 to 47 percent, while industrywide pass through was 88 to 100 percent for price increases.[10]

In yet another study of the Northeast market, Romain et al. looked at price asymmetry before and after the imposition of the New York price-gouging law in 1991 and tested for price asymmetry using the elasticity of price transmission. Before the price-gouging law, they found that a 1 percent increase in the farm price translated into a 0.70 percent and 0.62 percent increase in retail prices in New York City and Upstate New York, respectively, while a 1 percent decrease translated into a 0.30 percent and 0.49 percent decrease in these markets. After the law went into effect, they found that a 1 percent increase in the farm price translated into a 0.52 percent increase in retail prices in both New York City and Upstate New York, while a 1 percent decrease translated into a 0.43 percent and 0.51 percent decrease in these markets, respectively. Therefore, long-run price asymmetry was significant in both regions prior to the price-gouging law, but remained statistically significant only in New York City afterwards, though at a much lower level.

[9]The New Empirical Industrial Organization is an approach that focuses primarily on the relationship between prices and marginal costs that has been used to identify and estimate the degree of oligopoly market power in a market. Specifically, the Chidmi et al. study is a structural oligopoly model that measures market power, demand, marginal cost, and the farm-to-retail price transmission.

[10]This approach is a cost-pass through model consisting of a two-stage vertical market system where there are two processors at the first stage and two retailers at the second stage. Within these stages the authors assume different conduct and game theoretic assumptions. This study, however, did not address price asymmetry because it did not estimate the extent to which price decreases were passed through.

Results on Farm-to-Retail Speed of Adjustment and Price Transmission Asymmetry

We identified fewer studies that examined the speed of adjustment and related price asymmetry, or differences in the time required for farm and wholesale level price increases and decreases to be passed through to the retail level. Hansen et al. (1994), using national aggregate price data for whole milk, estimated that it took 3 months after the wholesale price increased for the retail milk price to increase, but that it took 30 months for the retail price to adjust to wholesale price decreases. In another study using national data, Wang (2003), using a structural model, found that, for farm price increases, retail prices adjusted more quickly in the first month after the increase and more slowly in subsequent periods. Conversely, for farm price decreases, the speed of price adjustment was slower in the initial month and increased in the following months, implying speed of adjustment asymmetry.

Nearly all of the studies of regional or metropolitan price transmission found asymmetry in timing—the price adjustment process for price decreases much exceeded that for farm price increases. Carman (1998) found a 1-month lag for price decreases and no lag for price increases in the California markets. In a later study, Carman and Sexton (forthcoming 2005) found that for the majority of cities they analyzed, the time lags estimated for price decreases generally exceeded those for price increases. For the four types of fluid milk, Carman and Sexton found that farm price decreases generally took from 1 to 3 months to be transmitted to the retail level, while price increases took no more than 1 month. In the California markets, the authors found that, in general, retail prices responded more quickly to farm price increases than to decreases. Lass et al. (2001) found that for the Boston and Hartford markets, retail price adjustments to rising farm prices were much more rapid than similar adjustments to falling farm prices. Lass (2004) also found evidence of slower price transmission to the retail level when farm prices were falling. For markets in the Northeast, Frigon et al. (1999) reported short-run asymmetry in price adjustment for several markets: price adjustment was complete in Upstate New York after 2 months and in New York City and the Northeast United States after 3 months. The authors concluded that short-run asymmetry seemed to be milder in Upstate New York, because it lasted for only 2 months. In the long run, after 4 months, the Northeast United States, Upstate New York, and New York City (after enactment of the gouging law) markets had fully adjusted, with only the New York City (before enactment of the gouging law) market not fully adjusting.

Results for Retail-to-Farm Price Transmission and Price Transmission Asymmetry

Using data from 1971 through 1991, Emerick (1994) tested for causality in fluid milk pricing between the farm and retail levels and found that it was bidirectional. That is, the author found that for these data, in addition to farm price changes affecting retail prices, retail price changes also affect prices at the farm level. However, this specification resulted in some parameter values for retail-to-farm price transmission that were inconsistent with economic expectations. In a later study, Wang (2003) estimated results for retail-to-farm price transmission. In the short run, which was estimated to be 1 month, the author found that price increases were immediately passed on to the farm level with a level of transmission of 94 percent, while price decreases were passed on at a level of 2 percent. However, in the longer run, which was estimated as 3 months, price increases were passed through at a level of 40 percent, while price decreases were passed through at a level of 34 percent. In the long-run specification, neither increases nor decreases in price were fully passed through. Thus, while the author found price asymmetry in the short run, she found price symmetry in the long run for retail-to-farm level price changes. As in Wang's farm-to-retail analysis, increases in the retail price were passed through nearly fully in the initial month, and then decreased substantially. However, although decreases in the retail price were not passed on initially, they were passed on at an increasing rate in the following months.

Possible Causes of Asymmetry in the Extent and Speed of Price Transmission

Even fewer economic studies have provided evidence on what causes price transmission and price transmission asymmetry. For the U.S. fluid milk market in particular, we found few studies that examined factors affecting the extent of price transmission and price transmission asymmetry. While two major explanations are cited in the economic literature as central to explaining price transmission and transmission asymmetry—noncompetitive markets and adjustment costs—there are several others cited, including the role of government policies, spatial market competition, substitution in processing technology, asymmetric information, economies of scale, and differentiated products. However, only the presence of noncompetitive markets and the effects of government policies were examined in the studies of price transmission that we identified.

Noncompetitive Markets

In general, economic research has found that a higher degree of market power can reduce the degree of price transmission.[11] Particularly relevant to the fluid milk market, researchers have also shown that the number of vertical stages and the extent to which a market varies from the competitive norm both influence the degree of price pass through.[12] Of the 14 studies that we examined, only 5 explored the role of competition in combination with the degree of price transmission and price transmission asymmetry in the milk marketing chain. In particular, 2 of these studies examined market power stemming from product differentiation of different milk types. The evidence from these studies is somewhat mixed. While 1 study did not find a linkage between market concentration and price transmission, other studies using a variety of methods did find evidence of either a lack of price transmission or price transmission asymmetry in markets that also possessed a degree of market power.

Carman and Sexton (forthcoming 2005), using multiple analytical techniques, found that fluid milk markets in the Western United States that displayed noncompetitive pricing also tended to lack price transmission and show price asymmetry. Using monthly data from 1999 through 2003, the authors (1) analyzed the effects of horizontal differentiation among fluid milk types by ranking milk with different fat contents for different markets based on the costs that would be predicted under perfect competition, (2) performed correlation analysis between changes in the monthly farm and retail prices of milk with different fat contents, with a lack of correlation indicating the exercise of market power, and (3) analyzed price transmission, along with the estimated price transmission coefficients, to determine competition in the market.

In the first analysis, rank values for all milk types did not conform with price expectations, with the exception of whole milk for all the months in Seattle. Moreover, except in Portland, they found that the rankings of retail milk prices for whole, skim, 1 percent, and 2 percent milk provided

[11]S. McCorriston, C. W. Morgan, and A. J. Rayner, "Processing Technology, Market Power, and Price Transmission," *Journal of Agricultural Economics*, Vol. 49, No. 2, 1998, 185-201. Steve McCorriston, "Why Should Imperfect Competition Matter to Agricultural Economists?" *European Review of Agricultural Economists*, Vol. 29, No. 3, 2002, 349-371.

[12]Steve McCorriston and Ian M. Sheldon, "The Effect of Vertical Markets on Trade Policy Reform." Working paper, September 1994. Also, S. M. McCorriston and I. M. Sheldon, "Agricultural Policy Reform in Successive-Oligopolistic Markets: A General Framework," University of Exeter and Ohio State University, December 1995.

evidence of not being based on costs, as would be expected in perfect competition. For the price correlations, the results indicated that only a few product pairs in the nine markets have a high degree of interdependence, as one would expect for close substitutes. Low correlations ranging from nearly complete independence to moderate independence for at least one pair of products were evident in each market. For instance, retail price changes for skim milk appeared independent of other milk prices in Sacramento, Seattle, Portland, Salt Lake City, and Denver. The authors explained that these correlations all indicated pricing that was inconsistent with competitive pricing.

For the price transmission analysis, the estimated results differed among the California markets, depending on the city and type of milk. For instance, in certain California markets, such as Los Angeles and San Diego, farm price decreases lagged farm price increases by 2 to 3 months, depending on the product, indicating price asymmetry in timing. Some of these price coefficients were consistent with competitive pricing and others were not. However, price transmission estimates for other metropolitan regions in the West (Seattle, Portland, Phoenix, Salt Lake City, and Denver) provided stronger evidence of noncompetitive pricing, and some also indicated price adjustment asymmetry, such as Salt Lake City and Phoenix. For these markets, only 3 of the 40 estimated price transmission coefficients were consistent with perfect competition.

Using another model of horizontal product differentiation, a subsequent study by Sexton, Xia, and Carman (2004) econometrically estimated the timing of fluid milk price transmission and tested for market power for four California and five non-California cities from 1999 to 2003. While the results were somewhat mixed, hypothesis tests for the cities indicating oligopoly or monopoly scenarios also displayed more gradual price transmission results than those indicating more competitive scenarios, suggesting a link between noncompetitive market structures and a lack of price transmission.

Chidmi et al. (2004) estimated price transmission and market power for the Boston fluid milk market using the New Empirical Industrial Organization approach and data from 1996 through 2000. The empirical results of the model, in particular the conjectural variation elasticity, suggest that participants in this market may possess market power and that

supermarkets do not ignore each other's actions.[13] Although the model did not account for speed of adjustment, the authors estimated a price transmission level of 68 percent, suggesting that market power is associated with incomplete price transmission. A study by Frigon et al. (1999) includes a measure of market power, the four-firm concentration ratio, in its model of price transmission for Upstate New York and New York City. However, this variable did not prove to be significant. Later, in a similar study (Romain et al., 2002), the authors explain that their results of price asymmetry prior to 1991 in New York City were evidence that middlemen in the fluid milk market were exercising market power prior to the price-gouging law. The authors found that price asymmetry decreased after the law went into effect. They acknowledged, however, that to rigorously address the issue of a noncompetitive market, an alternative market power model would have to be developed.

Government Policies

Two studies looked at the effects of national government intervention on price transmission. Emerick (1994) and Wang (2003) both examined the question of whether changes in dairy policy, especially the reduction in the dairy price support level that began in the mid-1980s, had changed the nature of price transmission for dairy products. Both authors basically came to the same conclusions. Emerick noted that asymmetry is more likely to have occurred since 1988, adding that the greater price volatility may have caused some difficulties for retailers and wholesalers in determining the "appropriate" price. Wang, using additional data through 1997, found that reductions in the price support level tend to have a large impact on the fluid milk and nonfat dry milk price transmission relationships. In the fluid milk market, the farm-to-retail price transmission process became asymmetric, with the greater price volatility in the post-1988 period. While the degree of price transmission increased for both increases and decreases in price, it increased proportionately more for increases than for decreases.

Six of the studies examined price transmission in conjunction with other state and federal policies and programs, such as the New York price-gouging law and the Northeast Interstate Dairy Compact. Four studies, Lass et al. (2001), Lass (2004), Chidmi et al. (2004), and Dhar and Cotterill

[13]For this model, the conjectural variation elasticity, a measure of market conduct and firm interdependence within the market, was significantly different from zero at the 5 percent level.

(2002), estimated price transmission while the Northeast Interstate Dairy Compact was in effect. Lass et al. found that processors and/or retailers did not fully pass through their price increases and, in fact, may have absorbed part of the cost of the Compact's over-order premium. In his 2004 study, Lass explained that the greater variation in farm prices that occurs without the Compact would actually lead to higher retail prices because of the larger estimated impacts on retail prices of increasing farm prices than decreasing farm prices. Dhar and Cotterill disagreed and contended in their study that the risk reduction benefit from the Compact was completely overpowered by a shift toward tacit collusion in the post-Compact period. In the studies of New York markets (Frigon et al., 1999, and Romain et al., 2002) that looked at the effect of the price-gouging law, researchers found that after the law took effect, price asymmetry was not present or was present at much lower levels.

Effects of Recent Federal Dairy Program Changes and Alternative Policy Options

Recent changes in federal dairy programs vary in their effects on policy considerations that we identified, such as farm income, milk production, federal costs, price volatility, economic efficiency, and consumer prices.[1] A number of options have been proposed or discussed to further modify existing programs or introduce alternative policies, all of which could affect these policy considerations in different ways. The likely effects of these program modifications or alternative policies are influenced by prevailing conditions, such as high and low dairy prices, and may be different in the short and long terms.

Recent Changes in Federal Dairy Programs Vary in Their Effects on Policy Considerations We Identified

Since 2000, three major changes have taken place in federal dairy programs. First, in response to legislative requirements, the U.S. Department of Agriculture (USDA) reformed the federal milk marketing order (FMMO) system. Second, USDA adjusted the relative purchase prices of butter and nonfat dry milk under the price support program. Finally, Congress authorized and USDA established the Milk Income Loss Contract (MILC) program. These changes had mixed effects on the policy considerations included in our analysis. Reforms to the FMMO system had mixed effects on farm income, depending on the geographic location of the farmer, while the overall effects on all farmers are less clear. Because of their effect on fluid milk prices, changes in the price support program tended to reduce the level of support for farm income and reduce federal costs, but increase economic efficiency. Introduction of the MILC program typically had the opposite effects, while maintaining production.

Federal Milk Marketing Order Reforms

In carrying out requirements in the Federal Agriculture Improvement and Reform Act of 1996 to reform FMMOs, USDA conducted extensive research and held public hearings. Agricultural Marketing Service (AMS) officials indicated that as a result of this process USDA implemented reforms to the FMMO system in January 2000 that were consistent with the findings of its research. Its major reforms included

[1]There can be different kinds of economic efficiency effects. Government policies may be more or less economically efficient depending upon the extent to which they prevent the transmission of market price signals and lead to a misallocation of resources into excess production. Policies may also be more or less efficient depending upon the extent to which they affect the distribution of production between farmers with high or low costs of production.

- consolidating the number of marketing orders from more than 30 to 11;[2]
- changing the classified pricing structure by creating a new class for manufactured milk products, Class IV, with the "higher of" the advanced[3] Class III or Class IV skim milk values as the basis—or mover[4]—for Class I prices; reducing the lag between the Class I and Class III and IV price announcements; and establishing a fixed differential of $0.70 per hundredweight to be added to the advanced Class IV skim milk value in determining the price to be paid for milk used in Class II products;
- introducing a new product formula pricing system; and
- relaxing restrictions on pooling milk in some marketing orders.[5]

[2]The Federal Agriculture Improvement and Reform Act of 1996 required USDA to consolidate the number of marketing orders. Two marketing orders were discontinued between 1996 and 1999, so 31 orders were actually consolidated.

[3]Basing Class I and II prices on the advanced Class III and IV skim milk values ensures that minimum prices of raw milk used in these products will be known in the month preceding the month to which they apply.

[4]The mover links the dairy price support program to the FMMO system, so that changes in one program are reflected in the other. The dairy price support program maintains the prices of manufactured products throughout the United States regardless of whether a particular area is part of the FMMO system. By using these manufactured product prices as the basis for other milk class prices, the FMMO system aims to ensure that its minimum prices will reflect the level of support provided by the price support program.

[5]In addition to these major reforms, USDA made other changes, including modifying the system of differentials used to determine Class I prices. USDA increased Class I differentials in 21 markets, ranging from $0.01 per hundredweight in New England (Boston) and New York/New Jersey (New York City), to $0.50 per hundredweight in the Upper Midwest (Minneapolis). Class I differentials in 4 markets were not changed. Class I differentials in 8 markets were reduced, ranging from $0.04 per hundredweight in the Ohio Valley (Columbus) to $0.18 in Eastern Colorado (Denver). In general, these changes retained the existing Class I pricing surface in markets east of the Rocky Mountains. USDA originally proposed an alternative set of differentials, but the Consolidated Appropriations Act, 2000 required adoption of the differentials noted above.

USDA implemented additional reforms to the classified pricing system in April 2003 that modified aspects of the Class III and IV pricing formulas.[6]

Federal Order Consolidation

In response to the legislative requirement, USDA reduced the number of FMMOs to 11, which were typically combinations of pre-existing orders.[7] For example, the Central Order is a combination of several smaller marketing orders in the central part of the United States. According to USDA's final regulatory impact analysis for the order reforms, these consolidation decisions were based on structural factors such as milk movement, the number of market participants, and natural boundaries.[8]

USDA officials and other dairy experts told us that nationally, the prices received by farmers for their raw milk did not change much as a result of FMMO consolidation. One academic study reported that order consolidation probably increased the economic efficiency of the FMMO system by more closely aligning areas where raw milk is marketed by dairy farmers with areas where it is distributed as fluid milk products. Additionally, the study noted that consolidation helped to reduce the amount of market distortion created by order regulation.

However, the magnitude of the effects on farm income varied among orders because, in some cases, the consolidation combined orders that had substantially different raw milk utilization rates for the manufactured and fluid products in the various milk classes, particularly Class I (fluid milk). As a result, some dairy farmers experienced higher or lower utilization of their raw milk in Class I products than they had in the past. Changes in utilization rates are significant because farmers receive a blend price for their milk based on the utilization rates for the different milk classes within an order; thus, farmers in orders where Class I utilization rates increased generally saw their incomes increase, while farmers in orders where the Class I utilization rates decreased generally had their incomes reduced.

[6]The Consolidated Appropriations Act, 2000 also required USDA to reconsider the Class III and IV pricing formulas that were implemented with the 2000 reforms. USDA conducted a hearing on the issue in May 2000. The reforms implemented in April 2003 stemmed from the changes USDA proposed as a result of this hearing.

[7]In some cases the new orders included areas previously unregulated by the FMMO system.

[8]U.S. Department of Agriculture, *Federal Milk Marketing Order Reform: New England et al.*, *Final Decision*, *Regulatory Impact Analysis*, Agricultural Marketing Service, Dairy Programs, March 1999.

The changes in utilization rates associated with FMMO consolidation were particularly evident in the Western Order. When USDA created the Western Order, it combined the Great Basin and the Southwestern Idaho–Eastern Oregon Orders. These orders had substantially different Class I utilization rates. In 1999, the Great Basin Order had a Class I utilization rate of 51 percent, while the Southwestern Idaho–Eastern Oregon Order had a Class I utilization rate of 8 percent. When these orders were combined into the Western Order, the resulting Class I utilization rate was estimated to be about 23 percent, lowering income for the farmers in the Great Basin Order who had previously received much higher blend prices. To address this and other concerns, Dairy Farmers of America, a cooperative representing a number of farmers in the Western Order, requested that USDA hold a hearing to reform the order's provisions. USDA made some changes based on the concerns presented at the hearing; however, the revised order provisions did not receive the two-thirds approval necessary to be adopted, and USDA terminated the order as of April 1, 2004, stating that the continuation of the existing Western Order would not be in conformance with declared policy.[9]

Elimination of the Western Order has raised concerns that increased amounts of Idaho milk, which had been pooled on the Western Order, would be pooled on the Upper Midwest Order. Based on past experience, this would reduce the Class I utilization rate and lower the blend price for Upper Midwest farmers. However, dairy experts had mixed views on whether additional orders would be terminated. In particular, one industry expert noted that it remains unclear whether farmers in the former Western Order will be able to receive higher prices for their milk without their order. Some of these farmers, particularly those that had been in the Great Basin Order, could benefit by not having to pool their Class I milk. On the other hand, one source stated that these farmers could face increased shipping requirements to pool their milk on a remaining order. Additionally, some experts stated that without FMMOs farmers and cooperatives do not

[9]After USDA holds a hearing, it may decide to issue proposed amended regulations for notice and comment. At the end of the administrative process, USDA issues a final rule, and those covered by the order must vote to adopt the order in its amended form. The amended order must be approved by at least two-thirds of the affected dairy farmers, or dairy farmers who produce at least two-thirds of the milk produced in that order. In addition, the amended order will not become effective until the handlers of at least 50 percent of the milk covered by the order have signed a marketing agreement, or until a hearing has been held and the Secretary of Agriculture makes particular determinations that the marketing order should nonetheless be effective.

have the market power to obtain high prices for their raw milk in negotiations with processors.

Classified Pricing Structure Changes

FMMO reform changed the structure of the classified pricing system by creating a new Class IV, representing the minimum price that processors pay for raw milk used in butter, nonfat dry milk, and other dry milk powders.[10] Additionally, the new mover of Class I prices became the "higher of" the advanced Class III or Class IV skim milk values. Use of the "higher of" mover was intended to enable fluid milk processors to attract milk from butter, nonfat dry milk, and cheese processors by helping to ensure that the blend price would exceed both the Class III and IV prices. USDA also reduced the lag period—the time between when the Class I price is announced and the Class III and IV prices are announced—from approximately 8 weeks, to 6 weeks. Class I prices are announced in the month preceding the month to which they apply, based on the "higher of" the advanced Class III and IV skim milk values.[11] However, the Class III and IV prices that determine the price of raw milk used to manufacture these products are not announced until the Friday on or before the 5th of the month following the month to which they apply. Consequently, there is a 6-week lag between these two price announcements. Further, USDA established that the minimum prices paid for skim milk used in Class II products would be the advanced Class IV skim milk and butterfat values, plus a fixed differential of $0.70 per hundredweight.[12] In its March 1999 regulatory impact analysis, USDA concluded that these changes would help to eliminate situations in which prices of milk used in manufactured products rise above the price of milk used in fluid milk products and thus make the Class I mover more representative of current market conditions.

[10]Over time, the number of classes has varied by order, from at least two, to seven or eight. Class I use has consistently been defined as the milk going into fluid milk products. Class II includes soft manufactured products such as ice cream and yogurt, Class III includes cheese, and Class IV includes butter and nonfat dry milk.

[11]Advanced values are derived from formulas that use weighted average prices of butter, cheese, dry whey, and nonfat dry milk reported by the National Agricultural Statistics Service on the Friday on or before the 23rd of the month preceding the month to which the prices apply. There is a 1-week lag in reporting by the Service, so the advanced values are usually based on the commodity prices for the first two weeks of the preceding month.

[12]Class II butterfat is priced by adding $0.007 per pound to the monthly Class III/IV butterfat price. Consequently, Class II skim milk is advanced priced but Class II butterfat is not.

Academic researchers and an industry official indicated that the creation of Class IV continued disincentives that were present prior to the 2000 reforms to shift milk to its highest-valued use. Previously, separate minimum prices were established for raw milk used in manufactured products that are now included in the new Class IV. Raw milk used in the production of butter was priced under Class III, which also included cheese and other products. However, nonfat dry milk was priced in a separate Class III-A. According to AMS officials, the development of Class III-A was necessary because manufacturers were unable to sell nonfat dry milk at market prices that would allow them to pay the Class III minimum price for their raw milk. They noted that for a classified pricing system to work, the minimum class prices must be below the market clearing prices for products produced with that raw milk (taking into account the cost of other inputs to these products). However, one study found that the creation of Class IV institutionalized separate pricing for nonfat dry milk.[13] By separating out the price for nonfat dry milk (the lowest-valued use), the classified pricing system might maintain production of nonfat dry milk even when market signals indicate that raw milk should be used to manufacture cheese as the higher-valued use.

Additionally, a 2004 study sponsored by the American Farm Bureau Foundation for Agriculture (American Farm Bureau) reported that creating a separate Class IV and then basing Class I prices on the "higher of" the advanced Class III or IV skim milk values, has reduced the influence that cheese prices traditionally had over other prices in the FMMO system, and thus partially isolated Class I prices from market forces.[14] For example, in every month from January 2000 through July 2001, advanced Class IV skim milk values were higher than advanced Class III skim milk values. However, as of 2000, utilization of milk for Class IV products across all federal orders averaged 7 to 8 percent, while Class III products accounted for about 45 percent of milk utilization.[15] According to the American Farm Bureau study, without the advanced Class III skim milk value as the mover

[13]Bob Cropp and Ed Jesse, "The Butter-Powder Tilt," Marketing and Policy Briefing Paper Number 72, Department of Agricultural and Applied Economics, University of Wisconsin–Madison, June 2001.

[14]David Anderson, Bob Cropp, Wilson Gray, Joe Outlaw, and Mark Stephenson, "Milk Pricing Policy Options and Consequences," an Analysis for the American Farm Bureau Foundation for Agriculture, February 2004.

[15]According to a USDA official, Class IV use averages about 12 percent across all federal orders and is much higher than 12 percent in several orders.

for Class I prices, when the Class IV price exceeds the Class III price, similar price signals are no longer received by farmers in relatively high Class I utilization markets and in high Class III utilization markets. This difference occurs because during these times farmers in high Class I utilization markets are receiving their price signals based on the high Class IV prices, which are heavily influenced by the price support program during periods of excess production and low manufacturing product prices. Therefore, farmers in high Class I utilization areas receive higher farm prices than would otherwise be the case, and higher prices encourage increased production by these farmers. However, the higher production levels of these farmers puts downward pressure on the Class III prices and causes regional inequities in farm income.

Furthermore, because Class I prices are now more closely related to the level at which the price support program sustains nonfat dry milk prices, proposed changes to the price support program have become much more controversial. Prior to the 2000 FMMO reforms, Class I prices were based on the Class III price, which, as noted previously, did not include nonfat dry milk. However, with the 2000 reforms, the level of support provided by the price support program for nonfat dry milk prices directly influences the Class IV price. During periods when the Class IV price is higher than the Class III price, changing the price support program in such a way that Class IV prices are reduced will cause the Class I price to similarly fall, thus having a greater impact on the overall blend prices received by farmers.

Introduction of a New Product Formula Pricing System

As part of FMMO reform, USDA introduced a new product formula pricing system that established minimum prices for raw milk based on milk component values for butterfat, protein, nonfat solids, and other solids. These values are derived from the wholesale prices of cheddar cheese, butter, nonfat dry milk, and dry whey as announced in weekly surveys conducted by the National Agricultural Statistics Service.[16] The minimum prices also factor in allowances based on estimates of manufacturing costs for these products and product yield factors representing the amount of a particular product that can be manufactured from specified quantities of the underlying components. Seven of the 11 orders (primarily the Northern orders) adopted the new product formula pricing system, while the other

[16]Whey is the water and solid components of milk that remain after the curd is removed in cheese-making. It contains about 93.5 percent water and 6.5 percent lactose, protein, minerals, enzymes, water-soluble vitamins, and traces of fat.

four orders (primarily the Southern orders) use a pricing system that bases milk prices on skim milk and butterfat.[17]

During much of the time that classified pricing has been part of the federal order system, the formulas used to set minimum prices paid to farmers were based on competitive pay prices. The pay price was known as the Minnesota–Wisconsin price, and it represented the results of state surveys of competitive market prices for Grade B milk paid by manufacturing plants in Minnesota and Wisconsin. However, with a reduction in Grade B milk production, this milk was very thinly traded and the pricing series became less representative of the value of Grade A milk used for manufacturing.[18]

According to a number of dairy experts, the change from a competitive pay to a product formula pricing system that incorporates fixed manufacturing allowances has enhanced the effects of price volatility on dairy farmers.[19] As noted in appendix V, there are a variety of input costs to the manufacturing process, including labor, energy, and capital. With product formula pricing, manufacturing allowances, which are supposed to compensate for these other input costs, and product yield factors are fixed. To the extent that changes in these other input prices are reflected in the prices at which manufacturers sell their products, fixed manufacturing allowances will allow changes in other input costs to more readily affect the minimum raw milk prices paid to farmers.

[17]Raw milk quality is also factored into the pricing formulas in all but two orders.

[18]As a result of declining Grade B milk production, the Minnesota–Wisconsin price was replaced by the basic formula price in the mid-1990s. The basic formula price established the minimum prices for raw milk by updating the Minnesota–Wisconsin competitive pay price series with wholesale product price information on the value of cheese, butter, and nonfat dry milk. This system was in place from June 1995 through December 1999.

[19]This is not to say that the FMMO classified pricing system is causing additional volatility in milk prices. As noted by AMS officials, an historical review of milk prices shows that price volatility existed well before the product pricing formulas were introduced in 2000. AMS officials indicated that there are several causes of price volatility including: the level of support provided by the price support program, exposure to international trade, and the responses to changes in prices by farmers and consumers. However, according to a number of dairy experts, the fixed manufacturing allowances in the new product formula pricing system have more readily transmitted price volatility within the classified pricing system and thus enhanced its effects.

Dairy experts also indicated that the fixed manufacturing allowances in the product pricing formulas reduced economic efficiency by reflecting raw milk supply and demand conditions less clearly. Moreover, one large processor stated that the manufacturing allowances in the pricing formulas are too low and do not adequately represent the costs of manufacturing.[20] Regardless of the market price of cheese, butter, or nonfat dry milk, the fixed manufacturing allowances provide manufacturing plants with the same net returns from 100 pounds of raw milk. Therefore, when market conditions reflect higher prices for one of these products, relative to the others, manufacturers have less of an incentive to shift production to the higher-valued use because any gains they might have realized from selling a higher-priced product would be negated by the fact that their manufacturing allowance is fixed.[21] The 2004 American Farm Bureau study noted that prior to the introduction of the new product formula pricing system, manufacturers that produced butter, cheese, and nonfat dry milk competed more aggressively for raw milk. The study found that if the prices of nonfat dry milk and butter, for example, were depressed relative to cheese prices, cheese manufacturers would attract milk away from the manufacturers of these other products. Therefore, raw milk would more readily move to its highest-valued use.[22]

Further, some dairy experts noted that the additional volatility introduced by the fixed manufacturing allowances in the new product formula pricing system, when combined with the disincentives these allowances and separate manufacturing classes create against shifting milk to its highest-valued use, might have contributed to negative producer price

[20]AMS officials indicated that USDA has been working with researchers at Cornell University to collect manufacturing plant costs, which these officials believe will assist them in establishing the proper level of manufacturing allowances should the dairy industry propose a change.

[21]Other factors that could affect the incentive to shift milk to a higher-valued use include transportation costs and changes in processing technology. In addition, when cooperatives own the capacity to produce butter, cheese, and nonfat dry milk, they may still have an incentive to shift milk to the higher-valued use despite fixed manufacturing allowances, in order to provide greater returns to their members.

[22]One source also noted that by not providing incentives to shift milk to its highest-valued use, the product formula pricing system could discourage the development of innovative dairy products.

differentials[23] and de-pooling.[24] Negative producer price differentials can occur because with the 6-week lag between the Class I and Class III and IV price announcements, rapid increases in the manufactured product prices from which Class III and IV prices are derived can raise these prices above the Class I price.[25] USDA officials noted that the change to a "higher of" mover for Class I prices and the reduction of the lag period were designed to reduce the frequency of negative producer price differentials. However, to the extent that the fixed manufacturing allowances have introduced additional volatility into the pricing system, and the disincentives created by these fixed manufacturing allowances and separate manufacturing classes have prevented raw milk supplies from moving to their highest-valued use, negative producer price differentials and de-pooling have continued.

During times when the producer price differential is negative, some processors of manufactured products who normally receive a draw from their federal order pool to pay farmers instead have to pay into the pool. In such circumstances, many of these processors choose to de-pool because by doing so, they gain a competitive advantage over those that remain and have to pay into the pool.[26] One study on FMMO pooling issues reported that since June 2003, negative producer price differentials and de-pooling have become more common.[27] The study noted that the producer price differential in the Upper Midwest Order was negative from July through November 2003 and reached a record low level in April 2004 of $4.11 per

[23]The producer price differential represents the difference between the value of milk established by the classified pricing system as paid by processors and the weighted average value of milk as paid to farmers for milk components (butterfat, protein, and other solids). The producer price differential is calculated by multiplying the volume of each class of milk used in the order by its announced price to obtain a total classified value of milk for that order, and then subtracting the total value of milk paid to farmers for butterfat, protein, and other solids on a per hundredweight basis.

[24]This presumes that minimum prices are the effective prices.

[25]Rapidly rising Class IV prices are a remote possibility at this time due to the surplus of nonfat dry milk.

[26]Processors may remain in a federal order pool despite negative producer price differentials for a variety of reasons. For example, Class I processors are not allowed to de-pool under FMMO regulations.

[27]Bob Cropp and Ed Jesse, "Federal Milk Marketing Order Pooling, Depooling, and Distant Pooling: Issues and Impacts," Marketing and Policy Briefing Paper Number 85, Department of Agricultural and Applied Economics, University of Wisconsin–Madison, June 2004.

hundredweight. For example, cheese prices in the Upper Midwest Order began to rise sharply in mid-July 2003; thus the advanced Class III skim milk value that served as the Class I mover for August did not include these higher prices. However, the Class III price that was announced in August did include these higher prices, creating a negative producer price differential. As a result, a number of cheese processors de-pooled in August, reducing the order's Class III utilization, which is usually around 75 to 77 percent, to just 8.4 percent. Nationally, negative producer price differentials were reported for this month in the 7 FMMOs that used the new product formula pricing system. For the 11 FMMOs existing at the time, de-pooling resulted in 33 percent less milk being pooled compared to the same month in the prior year.

De-pooling reduces the overall value of the federal order pool and increases differences in the abilities of processors to pay for raw milk. As a result, dairy farmers do not receive uniform prices. Farmers marketing milk with processors who are able to de-pool may receive higher prices and thus an increase in farm income, while farmers marketing milk with processors who do not de-pool may receive lower prices. According to the June 2004 University of Wisconsin study, this situation represents an inequity and is contrary to one of the stated purposes of the FMMO system: orderly marketing conditions.

Relaxed Pooling Provisions

In some cases, the 2000 FMMO reforms resulted in more relaxed pooling provisions. AMS officials noted that when USDA consolidated the marketing orders, the pre-existing orders each had its own pooling provisions, such as minimum amounts of raw milk required to be shipped to processing plants participating in that order's pool to qualify for its blend price or restrictions on rejoining the pool after de-pooling.[28] AMS officials indicated that where two orders were combined that had different pooling provisions, USDA applied the more liberal pooling standard to the combined order to prevent farmers from being shut out of the consolidated order pool.

[28]Because these provisions are established on an order-by-order basis, the minimum shipping percentages vary by order. In federal milk orders with relatively high Class I use, such as the Southeast and Florida Orders, the shipping percentage requirements are higher than in orders with relatively low Class I use, such as the Upper Midwest Order. Shipping requirements may also vary by months of the year. In orders where milk production tends to vary a lot seasonally, the minimum shipping requirements may be greater during low production months.

According to AMS reports from 2000 and 2001, relaxed pooling provisions contributed to the pooling of more distant raw milk to receive other orders' attractive blend prices. Pooling was easier because most of the milk that was pooled from outside individual federal orders was not required to actually be shipped to those orders. Therefore, distant farmers were able to share in an order's blend price without incurring substantial transportation costs for shipping milk. For example, under the Upper Midwest Order's pooling provisions, an Idaho dairy cooperative could choose to ship raw milk from some of its Idaho farmers to a processing plant that participates in the Upper Midwest Order. All subsequent milk deliveries of those designated farmers would be priced under the Upper Midwest Order, even if only one day's production was actually shipped to the participating processing plant. Other deliveries from these farmers would stay in Idaho for processing. In 2001, USDA reported that raw milk from California was pooled on the Central, Upper Midwest, and Western Orders. However, most of this 4 billion pounds of milk was actually processed in California plants that are not regulated by the federal order system. Also during 2001, large volumes of raw milk from Minnesota and Wisconsin were pooled on the Central, Mideast, and Northeast Orders, while increasing amounts of raw milk from Idaho were pooled on the Upper Midwest Order.

According to some dairy experts, the increased pooling of milk across orders has had mixed effects on farm income. Those farmers who were able to have their milk pooled on distant orders that had higher blend prices received an increase in their farm income after accounting for the costs of transporting their milk. However, farmers in the receiving orders had their farm income reduced as milk from outside the orders reduced the value of the pool that could be shared among farmers in the receiving orders. The combination of more milk pooled on these orders and constant sales of higher-valued Class I and II products decreased the weighted average value of the orders' pools by decreasing the utilization rates of the higher-valued classes.

In response to this loss in value, participants in some orders petitioned USDA to hold hearings to address relaxed pooling provisions. For example, through the hearing process, the Central and Mideast Orders tightened their pooling provisions to control the large quantities of milk from Minnesota and Wisconsin that were being pooled on these two orders. With these tightened provisions, those seeking to pool milk on the Central or Mideast Orders have to ship more milk per year or meet other requirements to become eligible to share in the receiving orders' blend prices. A number

of dairy experts indicated that these changes have significantly reduced the incentive for distant pooling on these orders.

2003 Classified Pricing Reforms

USDA made additional reforms to the classified pricing system that went into effect in April 2003, modifying aspects of the Class III and IV pricing formulas. The principal changes in 2003 were increasing the manufacturing allowance in the formula that established a price for the other solids component of milk used in Class III products; eliminating the lower bound of zero on the Class III other solids component price;[29] reducing the product yield for the nonfat solids components of milk used in Class IV products; and altering the Class III protein formula to prevent Class III prices from being lowered by rising butter prices. The 2003 changes were partly the result of a court-ordered injunction against the implementation of other changes that USDA had proposed based on the 2000 requirement that USDA reconsider the Class III and IV pricing formulas.

An analysis by researchers at the University of Wisconsin before implementation of the changes indicated that the differences from many of these changes would not be dramatic.[30] However, the researchers estimated that the changes would increase Class III prices by as much as $0.57 per hundredweight. More specifically, the study found that the 2003 changes would eliminate the negative effect that rising butter prices were having on the Class III price. Under the prior protein price formula, a $0.10 per pound increase in the butter price would lower the Class III price by $0.04 per hundredweight. The researchers found that the revised formula instead yields about a $0.04 per hundredweight increase in the Class III price for a $0.10 per pound increase in the butter price. The study also reported that the new protein price formula would make it somewhat less

[29]The Class III other solids component price (per pound) is calculated by taking the difference between the dry whey price reported by the National Agricultural Statistics Service and a manufacturing allowance of $0.159, multiplied times a product yield factor of 1.03. The lower bound of zero, or "snubber," was designed to prevent the price of other solids components from being negative should the market price for dry whey fall below the manufacturing allowance. Removing this lower bound created the possibility that the other solids component price could actually lower the Class III price during periods of low market prices for dry whey, which in fact, occurred from April to June of 2003. However, because other solids comprise a small percentage of the overall component value of Class III milk, the effect of this change was minor.

[30]Bob Cropp, Brian Gould, and Ed Jesse, "Federal Milk Marketing Order Reform: November 2002 Final Decision on Class III/IV Formulas," Marketing and Policy Briefing Paper Number 79, Department of Agricultural and Applied Economics, University of Wisconsin–Madison, November 2002.

likely that the advanced Class IV skim milk value rather than the advanced Class III skim milk value would consistently serve as the mover for Class I prices.[31] Increased Class III prices would most likely benefit farmers in areas where cheese is an important commodity and where processors do not typically pay premiums in excess of federal order minimum prices.

Dairy Price Support Program Adjustments

Since 2000, USDA twice adjusted—or tilted—the purchase prices of butter and nonfat dry milk as part of its efforts to administer the dairy price support program. The first tilt occurred in May 2001, when USDA reduced the nonfat dry milk purchase price by approximately $0.10 per pound (to $0.90 per pound) and increased the butter purchase price by about $0.20 per pound (to approximately $0.85 per pound). USDA adjusted the tilt again in November 2002 by reducing the nonfat dry milk purchase price another $0.10 per pound (to $0.80 per pound) and increasing the butter purchase price approximately $0.20 per pound (to $1.05 per pound). USDA took these actions because the Commodity Credit Corporation (CCC) was accumulating large stocks of nonfat dry milk, leading to high purchase and storage costs for USDA, as well as significant market distortions.

As a result of the 2000 FMMO reforms, the federal order class prices and the level of support provided by the price support program for nonfat dry milk were tied more closely. Many dairy experts noted that, subsequently, tilts became more politically controversial because they can have a greater negative effect on the FMMO class prices. Lowering the purchase price of nonfat dry milk while raising the purchase price of butter decreases the overall Class IV price when market prices for nonfat dry milk are at the level of the purchase price and market prices for butter are above the level of the purchase price. When the advanced Class IV skim milk value is serving as the mover for the Class I price, this reduction in Class IV prices also reduces Class I prices. Further, because the advanced Class IV skim milk value serves as the basis for Class II prices, Class II prices are similarly reduced. This scenario occurred during both the May 2001 and November 2002 tilts. A representative of one dairy cooperative stated that these impacts were particularly pronounced in areas with high Class I utilization rates, such as the Northeast and Southeast.

[31]However, the study noted that Class III prices would have been the driver in only one additional month between January 2001 and November 2002.

According to a report published by the International Trade Commission in May 2004, estimates of the actual impacts of these tilts on farm prices varied.[32] The study presented a USDA estimate that the November 2002 tilt reduced fiscal year 2003 average milk prices from $12.10 to $11.90 per hundredweight. While USDA reported that this decrease lowered the amount of raw milk produced and thus was partially offset by an increase in butter prices from reduced production, it still led to a loss in net farm income of $192 million.[33] Alternatively, the study reported that the National Milk Producers Federation estimated that the two tilts ultimately lowered farm prices by $0.19 per hundredweight in 2001, $0.48 per hundredweight in 2002, and $0.76 per hundredweight in 2003. With these price reductions, the organization projected that farm income would fall by $156 million in 2001, $816 million in 2002, and about $1.3 billion in 2003. Another study cited by the International Trade Commission's report estimated that the 2002 tilt could have decreased average milk prices by $0.16 per hundredweight, reducing production by 814 million pounds and farm income by $371 million. However, that study also found that these impacts varied substantially, depending upon the assumption of high or low prices and the effects of other government programs.

While the tilts reduced farm income and raw milk production, a number of dairy experts indicated that USDA's tilts have increased economic efficiency and reduced federal costs associated with the dairy price support program. Additionally, some experts noted that by maintaining nonfat dry milk prices at artificially high levels, the price support program was inducing surplus production of nonfat dry milk. In some cases, nonfat dry milk was produced specifically for sale to the government at the CCC purchase price. From the beginning of October 2000 through the end of May 2001, the CCC purchased approximately 330 million pounds of nonfat dry milk (more than 40 percent of national production), and government purchase costs exceeded $340 million. Furthermore, in 2002, the CCC stocks of nonfat dry milk were equivalent to two-thirds of domestic production and exceeded annual domestic consumption by more than 30

[32]U.S. International Trade Commission, *Conditions of Competition for Milk Protein Products in the U.S. Market*, Publication 3692 (Washington, D.C.: May 2004). The U.S. International Trade Commission is an independent federal agency. Its purpose is to assist in the administration of trade laws and to protect U.S. industry, as well as to provide advice and research on trade issues.

[33]The USDA estimate also factored in the benefits provided by the introduction of the Milk Income Loss Contract program.

percent. By reducing the purchase price of nonfat dry milk, USDA reduced the incentive to produce surplus nonfat dry milk. The International Trade Commission study reported that while production of nonfat dry milk continued to rise between 2001 and 2002, after the second tilt production declined by about 5 percent between 2002 and 2003. The tilts also helped to reduce federal costs associated with purchasing and storing nonfat dry milk.

Some sources also indicated that the tilts affected the balance of trade in dairy products between the United States and its trade partners. The International Trade Commission study reported that during the majority of the period from January 1998 to November 2002, U.S. prices for nonfat dry milk exceeded international market prices by more than $500 per metric ton. Consequently, domestic manufacturers had an incentive to import alternative dairy protein products such as milk protein concentrates. By lowering the purchase price of nonfat dry milk through the tilts, USDA decreased this incentive because domestic manufacturers could obtain nonfat dry milk more cheaply.

Introduction of the Milk Income Loss Contract (MILC) Program

With the introduction of the MILC program in 2002, dairy farmers began receiving payments on milk production up to 2.4 million pounds annually when the Class I price in Boston dropped below $16.94 per hundredweight. MILC payments are equal to 45 percent of the difference between $16.94 and the lower Boston Class I price. From the program's inception, MILC payments were made every month from the retroactive start date of December 2001 through August 2003 because there was an extended period of depressed farm prices, which reached a 25-year low in early 2003. Prices temporarily recovered from September through December 2003, so no MILC payments were made in those months; however, payments resumed during January and continued through April 2004. During the spring of 2004, farm milk prices reached record highs and remained strong through the fall of 2004, so no MILC payments were required for the remainder of fiscal year 2004.

As a result of depressed farm milk prices during 2002 and 2003, federal costs associated with MILC payments exceeded original estimates. Based on market conditions in March 2002, the Congressional Budget Office estimated total federal costs of the MILC program at $963 million over the life of the program (i.e., about 4 years). However, 1 year later, the Congressional Budget Office revised its total cost estimate for the MILC program to $4.2 billion. USDA distributed approximately $1.8 billion in

MILC payments to dairy farmers in fiscal year 2003.[34] Thus, the cost of MILC through fiscal year 2003 alone exceeded the previously estimated total costs for the entire 4-year period through 2005 by about $800 million. The Congressional Budget Office's March 2004 estimate for total MILC program costs was $3.8 billion, somewhat lower than the 2003 estimate because of higher farm milk prices in 2004.[35]

Many dairy experts indicated that by providing income support during low-price periods, the MILC program has helped keep some farmers, particularly smaller farmers, in business.[36] For example, some academic experts noted that some farmers received MILC checks of about $20,000 to $25,000, and others said that despite low prices, fewer farmers exited the market in 2003 than in previous years. USDA officials indicated that these payments delayed the supply response to low prices and maintained depressed milk prices over a longer period of time. By providing direct payments when prices were low, MILC obscured market signals that would normally cause farmers to decrease production, and continued high levels of production retained downward pressure on milk prices. To the extent that these lower farm prices were passed on through the retail level, consumers may have experienced lower prices for dairy products.

Despite this effect, dairy experts stated that smaller farmers receive a net benefit from MILC because those with about 100 to 130 cows can have all of their production covered under the 2.4 million-pound annual cap. In contrast, larger farmers do not receive net benefits from MILC because the negative farm income effects of reduced milk prices are greater than the payments they receive under the production cap. A couple of dairy experts noted that the break-even size, at which MILC payment benefits just offset the negative farm income effects of prolonged low prices, is about 400 cows. Because the effects of MILC vary by producer size, they also vary

[34]This included retroactive payments made for production in fiscal year 2002.

[35]The $3.8 billion estimate comprises actual outlays of about $1.8 billion in fiscal year 2003 and forecasts of $935 million in fiscal year 2004, $963 million in fiscal year 2005, and $77 million in fiscal year 2006. Some MILC payments will extend into fiscal year 2006 for milk produced in fiscal year 2005. USDA noted that its estimate of MILC payments for fiscal year 2004 is $300 million, much less than the Congressional Budget Office's estimate.

[36]While MILC has helped some farmers to weather low price periods, USDA officials stated that the program has not necessarily changed the long-term strategy of farmers to exit production. When making a decision to remain in production, farmers have to weigh a number of considerations in addition to MILC payments, particularly costs and market conditions.

regionally. States with many small dairy farmers, such as Pennsylvania, Wisconsin, and Vermont, have received greater proportional benefits from MILC. However, the MILC program has disadvantaged states with larger producers, such as western states.

Effects of Alternative Dairy Policies Differ under Various Scenarios

A number of options have been proposed or discussed to further modify existing programs and policies or introduce alternative ones, all of which could affect the policy considerations we identified in different ways. These options span a range of existing and potential federal dairy programs and policies, including FMMOs, price supports, MILC, target price deficiency payments, the proposed National Dairy Equity Act, trade restrictions and export incentives, risk management, and supply management. Current international trade agreements and ongoing negotiations can have implications for certain of these policy options, such as price supports, export incentives, and trade restrictions.[37] The purpose of this analysis is not to take a position for or against any of these options or to analyze them in terms of their overall economic impacts, but simply to discuss their likely effects on the policy considerations we identified. The likely effects of these alternatives sometimes differ under various scenarios, such as high or low prices, and may be different in the short and long terms.

In general, options that increase farm income over the short term also tend to increase milk production and thus the potential for oversupply and

[37]In the 1994 Uruguay Round Agreement on Agriculture of the General Agreement on Tariffs and Trade, World Trade Organization (WTO) members, including the United States, made commitments to improve market access, reduce export subsidies, and limit and in some cases reduce trade-distorting domestic agricultural supports. For example, Uruguay Round commitments on domestic agricultural subsidies include annual aggregate ceiling levels for certain types of direct government support, which include price supports for dairy products. The United States and other WTO members are currently engaged in another round of multilateral trade negotiations that began in Doha, Qatar, in 2001, where they reaffirmed their commitment to agricultural trade liberalization, and in July 2004, WTO members agreed on a framework to guide negotiations on agriculture. The U.S. negotiating position has emphasized harmonizing, reducing, and further disciplining agricultural subsidies. In the interim, existing Uruguay Round commitments will continue at established levels. WTO members found to be in violation of these commitments can be subject to retaliatory measures, such as punitive tariffs on exports.

lower average farm prices over the long term.[38] These options also tend to be costly for the federal government during periods of low prices. In some cases options that increase the economic efficiency of federal dairy programs also increase price volatility because they allow clearer transmission of market price signals.[39] Further, to the extent that price changes at the wholesale level are passed through to the retail level, a number of options would likely have mixed effects on consumer prices depending upon the particular product under consideration (e.g., butter, cheese, or fluid milk). The potential impacts of the options also vary according to the size of the producer and region of the country. In general, options that affect farm income without respect to farm size or cost of production could further shift production towards larger, western farms. Production shifts toward larger farms could increase the potential for oversupply in the market, because such farms have a greater capacity to increase production in response to policy incentives. In some cases, options that reduce support for farm income could have disproportionately negative impacts on smaller farmers, who often have higher costs of production.[40]

Change the Federal Milk Marketing Order Program

Dairy experts have cited a number of concerns with FMMOs, including that with the increasing ability to transport milk products longer distances, the differences in Class I differentials provide incentives for overproduction in some regions; that recent revisions to the classified pricing system enhanced the effects of price volatility on dairy farmers; that changes in pooling restrictions increased the flow of milk between different regions of the country, which disrupts the market; that consolidation of the FMMOs combined some areas of the country that were not part of the same natural "milksheds;" and that it takes too long to change the federal order system

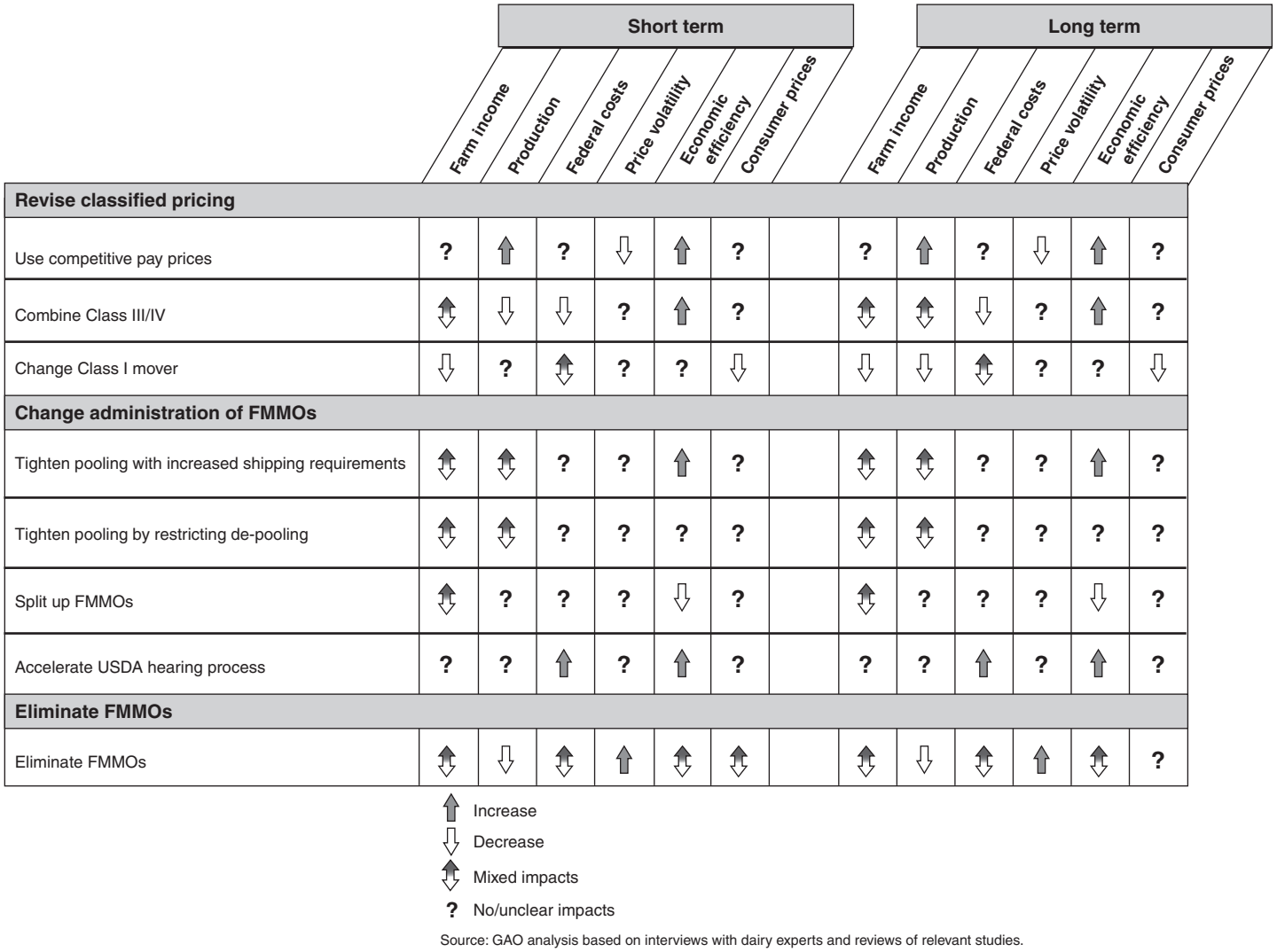
[38]Small surpluses or shortages in the short term may be the result of market corrections and may not represent inefficiencies in the allocation of production resources.

[39]The level of price volatility could influence both the supply and demand for milk products. For example, manufacturers of products using dairy ingredients might purchase larger quantities of these ingredients if prices are more stable.

[40]To evaluate the impacts of various options on policy considerations such as farm income, milk production, and federal costs, we compared these options against a baseline scenario of the policies in place as of August 2004: FMMO regulations, a MILC program that is scheduled to expire at the end of fiscal year 2005, a price support program at $9.90 per hundredweight, a Dairy Export Incentive Program (DEIP), trade restrictions, and milk regulatory policies in some states.

through the USDA hearing process. A number of options have been proposed or discussed to modify the FMMO program, including revising the classified pricing system, making administrative changes such as tightening pooling provisions, or eliminating FMMOs altogether. Figure 36 shows the effects of various options to change the FMMO program over the short and long terms.

Figure 36: Potential Effects of Options to Change FMMOs on Various Policy Considerations



Source: GAO analysis based on interviews with dairy experts and reviews of relevant studies.

Note: The figure does not indicate the degree of increase or decrease for each policy consideration as it relates to a policy option. In addition, as discussed in this appendix, limitations affecting some policy options could affect the degree of an option's potential impact on a policy consideration.

Revise Classified Pricing

Academic, industry, and government sources cited a variety of concerns with recent reforms in the classified pricing system, including that these changes enhance the effects of price volatility on farmers; lessen the transmission of market price signals; reduce incentives for market participants to shift milk to its highest-valued use; discourage innovation; and contribute to de-pooling during periods of price volatility. A number of options exist to revise the classified pricing system, including basing the class pricing formulas on competitive pay prices instead of product prices, combining Class III and IV into a single manufacturing class of milk, and changing the Class I mover from being the "higher of" the advanced Class III or IV skim milk values to a weighted average of these prices.

Use Competitive Pay Prices Instead of Product Formula Pricing

One option to reform the classified pricing system would be to return to a system of competitive pay prices as the basis for the minimum prices that manufacturers pay for raw milk. As indicated by AMS officials, the change to a product formula pricing system has enhanced the effects of price volatility on the prices that farmers receive for their raw milk. The AMS officials, as well as academic and industry sources, noted that competitive pay prices for raw milk would be a better basis for the minimum class prices. However, the officials noted that the lack of good data is a major challenge to developing a competitive pay system that is more broadly based than the old Minnesota-Wisconsin price series.[41]

In an earlier report, we compared the concept of a competitive pay system to a product formula pricing system, among other options.[42] We found that while a product formula pricing system would be superior to other mechanisms in reflecting national prices of manufactured dairy products,

[41]With declining Grade B milk production, any alternative competitive pay system would have to include Grade A milk. Consequently, a key challenge in developing a good competitive pay price series is obtaining data that are not already influenced by the FMMO classified pricing system. AMS officials noted that during FMMO reform and consolidation, AMS commissioned a blue-ribbon committee of academics to evaluate various milk pricing methods. Although the committee's preference was for a competitive pay price series, they were unable to develop or suggest a way of creating such a series.

[42]GAO, *Milk Pricing: New Method for Setting Farm Milk Prices Needs to Be Developed*, GAO/RCED-90-8 (Washington, D.C.: Nov. 3, 1989).

the accuracy of price levels under the system would depend on a number of factors, including whether the manufacturing allowances—deductions made for the costs of manufacturing different dairy products—are accurate. Setting accurate manufacturing allowances is difficult because individual plants could have different cost structures. As noted earlier, we heard from several academic, industry, and government sources that the fixed manufacturing allowances in the current product pricing formulas have negative impacts on the economic efficiency of the classified pricing system by reflecting supply and demand conditions less clearly.[43]

On the other hand, we found that while a competitive pay system for Grade A milk was similar to a product formula pricing system in that it would generally reflect national prices of manufactured dairy products, it would more readily reflect national supply and demand conditions for raw milk used for manufacturing. Also, it would more accurately reflect competitive pressures from the fluid milk market because Grade A milk is used to meet shortages in areas of the country with high Class I utilization. Furthermore, we reported that a competitive pay system would be better than a product formula pricing system at self-adjusting automatically because the competitive system would be based on actual reported prices. Therefore, a competitive pay system could improve the economic efficiency of the classified pricing system by providing clearer market price signals.

AMS officials stated that if it were possible to obtain adequate data, returning to a competitive pay system would introduce greater stability into farm milk prices because basing the price formulas on competitive pay prices allows manufacturers' margins to be set outside the federal order system. According to the officials, when manufacturing costs increase, manufacturers tend to decrease their margins; they then increase their margins when costs go back down. The AMS officials also stated that to the extent the effects of price volatility are reduced by eliminating fixed manufacturing allowances, raw milk production would increase, holding average milk prices constant.

[43]Another alternative modification to the classified pricing system would be to raise the manufacturing allowances; however, the accuracy of any adjustment that does not change according to market forces would eventually decrease. Further, the problem of trying to develop an allowance that adequately represents costs of production in an environment of widely varying cost structures would still exist.

Combine Class III and IV

A second option discussed by some of the academic and industry sources we contacted would be to combine Class III and IV into a single manufacturing class.[44] While an objective of USDA's FMMO reforms, including developing separate manufacturing classes on which to base fluid milk prices, was to avoid situations in which the price of milk used in manufactured products rises above the price of milk used in fluid products; as we noted earlier, this change has muted market price signals and has reduced incentives to move milk to its highest-valued use. However, an academic source indicated that a potential challenge in combining Class III and IV is identifying an appropriate formula that considers the products in an expanded class. In addition, AMS officials cited this issue noting that one barrier would be finding a way to price the lowest-valued use, nonfat dry milk, so that manufacturers of this product would be able to afford to pay the minimum class price to farmers.

A number of industry and academic sources said that combining Class III and IV into a single manufacturing class would allow milk to move to its highest-valued use. With a separate Class IV, processors of butter and nonfat dry milk can pay less for their raw milk supplies under certain market conditions, which can stimulate additional allocation of raw milk into Class IV products. Under such conditions, by reducing these market distortions, combining Class III and IV might help to increase the economic efficiency of the classified pricing system.[45] It could also help to limit the decline in market prices caused by overproduction of nonfat dry milk and thus reduce the federal costs of CCC purchases of this commodity. Over the long term, limiting overproduction incentives will help all farmers by maintaining higher average farm prices. However, these benefits could be limited by constraints on the extent to which raw milk is free to move between different uses. Some USDA officials have indicated that manufacturing capacity for different products varies by region and that manufacturing plants are often specialized. In addition, fixed supply agreements within the dairy industry may not allow manufacturers

[44]Class I includes fluid milk products, Class II includes soft manufactured products such as ice cream and yogurt, Class III includes cheese, and Class IV includes butter and nonfat dry milk.

[45]As discussed later in this appendix, this distortion could also be reduced by changing the price support program.

significant freedom to shift raw milk between uses in response to price signals in the short term.

Combining Class III and IV could have mixed impacts by region on farm income because with a combined manufactured product price, high prices for one particular use of milk would offset low prices for other uses in creating a weighted average price. Utilization rates for the different manufacturing uses vary among orders, and farmers whose average blend prices might be higher based on utilization of their raw milk for a higher-valued use under a separate class price scenario could experience lower average returns under a combined class price scenario if the price of their higher-valued use were weighted down by the inclusion of the lower-valued use. Conversely, farmers whose average blend prices might be lower based on utilization of their raw milk for a lower-valued use under a separate class price scenario could experience higher average returns under a combined class price scenario. For example, in regions with higher Class IV utilization, the loss of a separate Class IV could result in lower average farm income during periods when Class IV prices would otherwise be higher than Class III prices. In regions with higher Class III utilization, however, the loss of a separate Class IV could result in higher average farm income during periods when Class III prices would otherwise be lower than Class IV prices.

Change Class I Mover

If Class III and IV prices are kept separate, a third option to modify classified pricing would be to use a weighted average of Class III and IV prices as the mover for Class I prices. This option would tie fluid milk prices more closely to market related manufacturing prices, particularly when prices of Class III products are depressed relative to Class IV products. One academic study that modeled the price volatility impacts of using a weighted average of Class III and IV prices to set Class I prices reported that using the weighted average, rather than the "higher of" the advanced Class III or IV skim milk values, slightly decreases the volatility of farm prices, largely through a more substantial decrease in the volatility of the Class I price.[46] As a result of this reduced volatility, the study estimated that the average Class I price would decline by roughly $0.40 per

[46]Charles F. Nicholson and Thomas Fiddaman, "Dairy Policy and Price Volatility." Paper presented at the 10th Annual Workshop for Dairy Economists and Policy Analysts, Memphis, Tennessee, April 2003.

hundredweight, causing an average farm price decline of $0.09 per hundredweight. The study found that there would be essentially no change in the volatility of other class prices or product prices.

These effects are likely to vary by region. As the Class I price is expected to decrease more than the average farm price, the effects of this option could be more significant in regions with high Class I utilization of raw milk. The reduction in farm prices could cause a marginal downward supply adjustment over the long term, the effects of which would also be stronger in high Class I utilization areas. The effects of reduced prices on farm income could be partially offset by increased MILC payments as long that program remains in existence. Increased MILC payments would raise federal costs, particularly during periods of low prices. However, this option could also help USDA minimize the costs of the price support program by making it less controversial to adjust the tilt between butter and nonfat dry milk purchase prices because these prices would no longer exert as great an influence on the Class I price.

AMS officials cautioned, however, that this option could increase the likelihood that manufactured product prices would rise above blend prices, leading to more frequent negative producer price differentials and de-pooling.[47] The officials noted that the purpose of implementing the "higher of" the advanced Class III or IV skim milk values provision was to reduce the frequency of negative producer price differentials. They said that implementing an option that reduces blend prices makes it more likely that the value of one of the manufacturing class prices will rise above the blend price. The officials also indicated that consumers may benefit from lower prices to the extent that the Class I and blend price decreases are transmitted through the milk marketing chain. One AMS official questioned the extent to which this option would reduce the volatility of Class I prices, noting that since January 2000 the volatility of Class I prices would have been about the same under a weighted average mover.

Change the Administration of FMMOs

Another set of options to modify FMMOs involves changing their administration. Pooling provisions could be tightened by increasing the amount of milk that must be shipped to an order to qualify for that order's blend price or by placing restrictions on de-pooling. Alternatively, federal

[47]AMS officials noted that other alternatives, not discussed in this appendix, that could prevent negative producer price differentials include eliminating the advanced Class I price announcement and setting minimum prices for all classes in advance.

order reform could be reconsidered by splitting up some of the consolidated orders. Finally, USDA may be able to shorten the time between a hearing request and implementation of a final decision.

Tighten Pooling Provisions with Increased Minimum Shipment Requirements

Federal order reforms relaxed the pooling provisions of many orders, which negatively affected some farmers by diluting their Class I utilization rates and lowering their blend prices as increased amounts of distant milk were pooled on their orders. In response, participants in some orders called for hearings to tighten their pooling provisions, often by increasing the minimum amount of milk that must be delivered to processing plants participating in their pool to qualify for the blend price. With the end of the Western Order, the concern that some milk formerly pooled on that order could be pooled on the Upper Midwest Order led two groups of dairy cooperatives operating there to request a hearing to tighten the order's pooling provisions.[48]

According to some AMS officials, restricting the pooling of raw milk through increased shipping requirements would not have a significant national impact. However, they said there could be mixed regional effects on farm income and production. Farmers in areas seeking to pool milk to other orders would generally see a negative impact on their farm incomes because they would incur greater transportation costs trying to share in the value of another order's pool and would, therefore, pool less milk in other orders. However, farmers in the receiving order could see an increase in their farm income because with less milk pooled from outside the order, their pool would retain more of its value and they would receive higher blend prices. In each case, there could be localized production effects depending upon whether farmers experience an increase or a decrease in their farm income. The AMS officials stated that tightening pooling provisions would have minimal effects on price volatility because the tighter provisions would not change overall supply and demand conditions. However, the officials also indicated that the economic efficiency of the FMMO system would increase to the extent that reducing the amount of milk pooled on distant orders would reduce the amount of money spent on transporting milk. Because impacts on national production levels are likely to be limited, impacts on federal costs would be minimal.

[48]This hearing took place in August 2004.

Tighten Pooling Provisions with Restrictions on De-Pooling

A second option for tightening federal order pooling provisions is to place additional restrictions on those who choose to de-pool. As noted earlier, price volatility leading to negative producer price differentials and de-pooling can negatively affect those who remain in a federal order pool because the overall value of the pool is reduced.[49] Some orders restrict de-pooling by preventing milk handlers who choose to de-pool from re-pooling for a specific period of time.[50] One such restriction recently proposed by cooperatives in the Upper Midwest Order would limit a processor's pooled milk in any month to a specified percentage of that processor's pooled milk in the previous month. Under that restriction, if a processor partially de-pooled in one month, it could only partially re-pool in the subsequent month. If it fully de-pooled, it would have to wait a month before it could re-pool.

Restricting de-pooling would have mixed effects on farm income. Because de-pooling allows some processors to pay farmers higher prices, some farmers would be harmed if de-pooling were restricted. Conversely, those farmers who are harmed by de-pooling could benefit if more of the pool value were retained during periods of volatile prices. While nonuniform farm prices do not help to achieve orderly marketing, restricting de-pooling could make this problem worse if it encourages some processors to leave the order system permanently. In that case, the reserve supply of milk for fluid production would shrink, and orders would have to increase minimum shipping requirements for remaining pooled processors and dairy cooperatives. If restricted de-pooling actually caused fewer processors to be associated with the federal order system, volatility in fluid milk prices could increase because with less milk available in reserve to supply the Class I market, seasonal or episodic fluctuations in milk supply and demand could have greater price impacts. However, an AMS official indicated that in general processors benefit over the long term from being pooled, and so restrictions on de-pooling would not necessarily decrease the supply of milk available for fluid milk products. If the supply of milk

[49]Changes in federal dairy policy that reduce price volatility, such as increasing the level of support provided by the price support program, would help to reduce instances of negative producer price differentials and de-pooling.

[50]Handler is the federal order term for cooperatives, processors, or dealers of milk who commonly purchase raw milk and sell pasteurized milk and milk products. See 7 C.F.R. §1000.9 for a more complete definition.

available for fluid milk products did not decrease, then the volatility of fluid milk prices would not increase. The effects of restricted de-pooling on other policy considerations, such as federal costs or consumer prices, are unclear.

Split Up Consolidated Federal Orders

A third option to revise the administration of FMMOs is to split up some of the consolidated orders where the combination of orders with different utilization rates of the different classes of milk has created problems. Many industry, academic, and government sources stated that federal order consolidation has had some significant regional effects, including the demise of the Western Order. One source stated that because of order consolidation, some orders have become so large that they include milk that would not normally be in the milkshed for particular marketing areas. This increases the potential that some farmers' blend prices will decrease with lower utilization rates of raw milk in Class I products. To address this problem, USDA is currently considering a proposal to split up the Southeast Order and create a "Mississippi Valley" Order.[51]

Splitting up certain orders could have mixed effects on farm income. In cases in which experts have cited problems with federal order consolidation, the problems developed because two previously existing orders that had largely different Class I utilization rates were combined. With the additional milk pooled under the consolidated order, farmers that had been in the order with the higher Class I utilization rate saw a decrease in their blend price. However, farmers that had been in the order with the lower Class I utilization rate experienced an increase in their blend price. Therefore, splitting up the consolidated orders in these instances would affect farmers differently depending on the Class I utilization rates of the new orders. AMS officials indicated that splitting up orders would affect the distribution of farm income but would not affect overall production and therefore would have minimal impacts on federal costs. They also noted that splitting up orders could increase the movement of milk because having smaller orders makes farm prices more closely reflect local supply and demand conditions. Therefore, to the extent that smaller orders would increase the blend prices in some areas, this option could create incentives to transport more milk to those areas.

[51]Also under consideration are alternative proposals that would merge the Southeast and Appalachian Orders, as well as add areas to the merged orders.

Accelerate USDA's Hearing Process

Some experts suggested that USDA's federal order hearing system is too slow to effectively respond to problems and changing market conditions. The American Farm Bureau study reported that it can take 2 or more years from the time USDA receives a request for a hearing or direction from the Congress before USDA implements the rules of a final decision. The study noted that within this long time frame, either the industry may have struggled under faulty rules or, by the time final rules are effective, industry changes may have occurred rendering the final rule obsolete. For example, a couple of industry sources stated that the dairy industry is changing rapidly, with a number of new products coming onto the market. They indicated that USDA would have difficulty regulating these products because it takes too long to get a decision on the class under which they would be priced.

USDA faces a number of challenges in shortening the time between receiving a hearing request and implementing the rules of a final decision, while still ensuring the promulgation of economically sound regulation.

- The USDA hearing process is set forth by law.[52] Before issuing or amending marketing orders, the Secretary of Agriculture must conduct a formal on-the-record rulemaking proceeding. USDA must notify the public and provide an opportunity for a public hearing and comments. Before an order regulation or amendment to a milk marketing order can become effective, it must meet certain requirements including that it be approved by at least two-thirds of the affected dairy farmers in the order, or dairy farmers who produce at least two-thirds of the milk produced in that order.

- If individual parties do not agree with the USDA decision, they can seek review of that decision in federal court. For example, after the 2000 FMMO reforms, several industry groups received an injunction that prevented USDA from implementing new pricing rules that would have established separate Class III and IV butterfat prices. In response, USDA issued a revised decision, but these new rules were not implemented until April 2003.

[52]7 U.S.C. §608(c).

- Making informed decisions about changes in complex federal dairy policy can be time-consuming. For example, such decisions require thorough analysis and possibly modeling. In addition, AMS officials indicated that hearing participants are not always ready on time, and keeping a stricter schedule could result in an incomplete hearing record. Furthermore, they stated that it is difficult to compile the hearing transcripts quickly and accurately. However, they noted that USDA has recently begun evaluating its transcript contracts using an approach that considers timeliness and accuracy.

- The politicized nature of dairy policy makes it difficult to agree on proposed changes to FMMOs. Because FMMO provisions affect cooperatives and processors in different ways, these entities may not always agree on a proposed change. Moreover, given regional differences in production and utilization, farmers in different regions may not agree on changes in federal dairy policy.

AMS officials said that delays are also caused by the lack of available judges and attorneys who deal with milk pricing issues. The officials said that increasing the speed of the decision-making process is likely to increase federal costs because more of these resources would be required. USDA officials indicated that they do not believe the hearing process inhibits the ability of FMMOs to respond to changing market conditions or the marketing of new dairy products.

Eliminate FMMOs or Classified Pricing

Rather than trying to reform the FMMO system, some dairy experts have considered the possibility of eliminating FMMOs and thus the classified pricing system.[53] To the extent that manufactured product prices stay above the level of the price support program, market forces would set prices for all uses of milk. In a 1988 report on FMMOs,[54] we found that the production and marketing conditions used to justify federally guaranteed milk prices under marketing orders no longer existed because most milk

[53]This would be such a major change in federal dairy policy that its impacts are uncertain. This uncertainty is reflected in the differences in the estimated impacts of various empirical studies that considered this alternative. AMS officials indicated that without the FMMO system of minimum prices set for milk based on wholesale dairy product prices, it is unclear whether or not a structure would evolve that similarly transmits wholesale price signals to farmers.

[54]GAO, *Milk Marketing Orders: Options for Change*, GAO/RCED-88-9 (Washington, D.C.: Mar. 21, 1988).

being produced is now Grade A and is eligible to serve the fluid milk market during periods of supply and demand imbalance.[55] Also, our study noted that improvements in refrigeration and the transportation system have made it less expensive to rely on milk supplies from other markets. Further, we reported that the differences in Class I differentials—which were, in part, intended to represent the costs of producing and transporting milk from areas with a surplus to areas with a deficit—actually bear little relationship to differences in either production or transportation costs for milk, thereby providing incentives for overproduction in certain regions. A 2002 University of Wisconsin study argued that this overproduction has hurt farmers in areas with low Class I utilization through an overall reduction in the price of milk used for manufacturing purposes.[56]

Academic and USDA studies have generally concluded that without the classified prices established by FMMOs, fluid milk processors would likely pay lower average prices to farmers, which would decrease farm income in high fluid milk utilization areas, especially in the short term. Estimates of impacts on farm prices varied among studies. For example, the American Farm Bureau study estimated that average farm prices for raw milk would fall by about $0.50 per hundredweight during the first couple of years following federal order elimination.[57] Another study, published by USDA, estimated that eliminating the federal order system would decrease Class I prices an average of $0.95 per hundredweight over the period from 2002

[55]Dairy farmers sell two grades of milk. Grade A may be used for fluid consumption or in manufactured products. Grade B may be used only for manufactured products. Farmers producing Grade A milk must adhere to higher sanitation requirements than for Grade B milk. The FMMO system was developed to ensure an adequate supply of Grade A milk to meet the fluid milk needs of consumers.

[56]Tom Cox, Bob Cropp, Randy Fortenbery, and Ed Jesse, "Rethinking Dairyland Chapter 3: The Effects of Federal Dairy Programs on the Competitiveness of Dairying in Wisconsin," Marketing and Policy Briefing Paper Number 78C, Department of Agricultural and Applied Economics, University of Wisconsin–Madison, September 2002.

[57]This analysis assumed that a fluid milk premium of $0.50 per hundredweight would remain nationally and that California would make no changes to its state milk marketing system. If the assumption of a fluid milk premium is dropped, the study showed a farm price decrease of closer to $0.70 per hundredweight during the first couple of years following FMMO elimination.

through 2007.[58] Further, the 2002 University of Wisconsin study estimated that farm prices would decrease around $0.05 to $0.10 per hundredweight. AMS officials indicated that farmers would likely reduce production to the extent they receive lower average farm prices.

The effects of FMMO elimination could be different based on farm size. Some of the academic and industry sources we contacted noted that farmers are at a disadvantage in terms of market power within the dairy industry. Without the pooling of milk proceeds and the payment of uniform blend prices, larger farms would have increasing incentives to establish contracts directly with processors, and processors would increase their efforts to procure milk directly from larger farms closer to their own plants. Smaller and more distant farms could be more likely to be bypassed. Also, to the extent that dairy cooperatives are unable to cover the costs of balancing and other services they provide, processors may be able to deflect the costs of these operations back to farmers.

Studies also indicated that the magnitude of these effects could vary by region. Without classified pricing, the prices of raw milk used in fluid milk products are likely to fall, while the prices of raw milk used in manufactured products are likely to rise. As a result, farmers in regions with higher utilization of raw milk for fluid purposes, such as the Northeast, would be worse off without classified pricing, while farmers in regions with high utilization of raw milk for manufacturing purposes, such as the Upper Midwest, could be better off without classified pricing. For example, the American Farm Bureau study reported that states with less than 20 percent fluid utilization of raw milk would have higher average farm prices with the elimination of federal orders, while those states with fluid utilization of raw milk in excess of 35 percent have higher farm prices with the federal order system in place.

In the short term, to the extent that lower farm prices paid for raw milk used in fluid products are passed on to consumers, fluid milk consumption could marginally increase. The American Farm Bureau study estimated a

[58]J. Michael Price, U.S. Department of Agriculture, *Effects of U.S. Dairy Policies on Markets for Milk and Dairy Products*, Market and Trade Economics Division, Economic Research Service, Technical Bulletin Number 1910, May 2004. This analysis assumed a national fluid milk premium of $1.30 per hundredweight. According to the USDA study, this change is in the effective Class I price. Since Class I prices and prices for raw milk used for manufacturing purposes would move in opposite directions with elimination of the FMMO program, the change in average prices would be less than $0.95 per hundredweight.

2.5 percent increase in fluid milk demand, while the USDA study estimated a 2 percent increase. On the other hand, the University of Wisconsin study reported that the combination of less milk production and more fluid milk consumption would reduce the amount of raw milk available for manufactured products and increase manufactured product prices accordingly.[59] To the extent that manufactured product prices increase, consumers may buy less of these products.

Over the long term, increased prices for milk used in manufactured products could limit reductions in both farm income and production resulting from elimination of FMMOs and classified pricing. In fact, the American Farm Bureau study found that once a supply adjustment occurs, average milk prices would return to levels similar to those prior to FMMO elimination. However, to the extent that farmers in areas with high manufacturing use experience higher prices for their milk, the incentive to produce more milk could limit potential increases in manufacturing product prices. In the end, some decline in production could be expected over the long term because the overproduction incentive resulting from the classified pricing system would be removed.

Eliminating FMMOs and classified pricing could also affect other federal dairy policies and, therefore, affect federal costs. If MILC payments were still based on the relationship between what fluid milk processors pay to acquire milk in Boston and a target price of $16.94, MILC payments would likely increase in size and frequency.[60] At the same time, elimination of FMMOs could decrease federal costs related to the price support program because an increase in manufactured dairy product prices resulting from eliminating classified pricing could reduce the need for dairy commodity purchases by the CCC. However, it is unclear whether this effect would be large enough to offset additional payments under the MILC program.

Some AMS officials also indicated that farmers could experience increased price volatility without FMMOs. In the absence of minimum class prices, greater price volatility could result, in part, from seasonal production variation or short-term factors, such as holidays or weather events. Further, while some sources questioned the extent to which a state

[59]The May 2004 USDA study estimated that manufactured product prices would increase by 2 percent above the study's baseline estimate for the period 2002 through 2007.

[60]Should the MILC program not be extended beyond fiscal year 2005, this scenario would only exist in the short term.

regulatory system, such as California's, could continue to exist in the absence of the federal classified pricing system, others indicated that state regulation of milk could increase if the federal system were eliminated. A couple of industry sources that we contacted indicated that an increase in the number of states that regulate milk could make it more difficult for them to do business and would be a less efficient system of regulation.

On the other hand, eliminating FMMOs and classified pricing could also provide greater incentives for product innovation. Without classified pricing, the market would price products more openly based on supply and demand and would increase the incentives for processors to develop alternative dairy products. To the extent that alternative products generate new demand for milk, this innovation could benefit farmers. For example, a recent study by researchers at Cornell University on the assignment of new products under a classified pricing system found significant difficulties.[61] The study reported that the assignment of a new product to a higher-priced class increases farm income in the short run; however, the incentive to increase production provided by the use of raw milk in this higher-priced class and reduced demand for raw milk stemming from these higher prices can offset farm income gains in the long run. Furthermore, the study found that whether the new product detracts from sales of existing fluid milk products could also affect whether assignment to a higher-priced class increases net revenues to farmers. One USDA representative stated that a number of new products, such as low-carbohydrate milk beverages, have recently entered the market. In some cases, according to the representative, these products are intended to compete with Class I products but are formulated to avoid regulation as Class I products. Processors seek to avoid having these products regulated as Class I products because they would then be required to pay more for raw milk. Conversely, farmers want these products classified as Class I products so that their raw milk used in these items will be priced at the higher level.

Some sources suggested that classified pricing could be eliminated without eliminating FMMOs altogether. In this case, FMMOs might continue to perform functions such as pooling revenue, auditing, verifying weights and milk components, and collecting statistical information. A few dairy experts indicated that these particular aspects of the FMMO system benefit

[61]Andrew M. Novakovic, Charles F. Nicholson, and Mark W. Stephenson, "Assignment of New Products Under Classified Pricing: A Conceptual Dynamic Model of Class Assignment Outcomes," Cornell University, January 2004.

the dairy industry. While some of these functions might be picked up by the private sector if FMMOs were eliminated, they would come at a cost to dairy farmers.

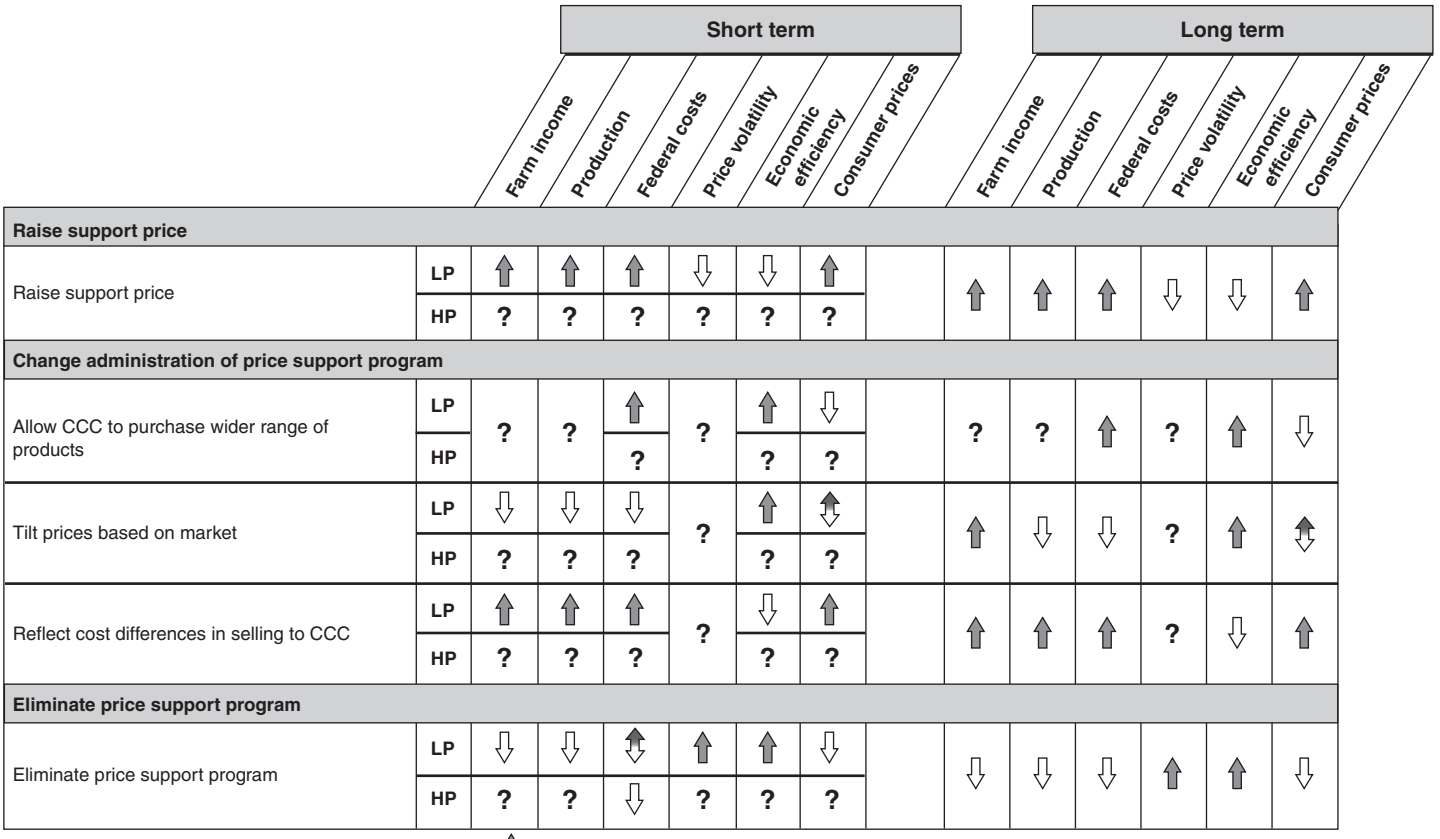
Retaining FMMOs while eliminating classified pricing would probably lessen the impacts of deregulating raw milk prices but would be unlikely to change the direction of most effects or who benefits. For example, while farm income would still fall without classified pricing, continuing to pool revenues through FMMOs, if possible, could help cooperatives negotiate over-order premiums because pooling could help cooperatives maintain their market power relative to processors. Thus, farm income might fall by less than it would if FMMOs were eliminated entirely. Moreover, by continuing to pool revenues, retaining FMMOs could limit increases in price volatility resulting from the elimination of classified pricing. In addition, the orders would continue to aim to ensure equitable treatment for producers and processors. Maintaining orders is not likely to change the fact that farmers in regions with high fluid milk utilization would experience greater reductions in farm income from eliminating classified pricing than farmers in regions with high manufacturing utilization. Production would still adjust downward in response to lower milk prices, and retail fluid milk prices would also decrease to the extent that lower prices for raw milk used in fluid milk products are passed on to the consumer. However, to the extent that cooperatives are able to maintain higher over-order premiums by retaining FMMOs, these production and consumer price effects might be less than they would be if orders were eliminated entirely. Effects on federal costs would still be mixed.

Change the Dairy Price Support Program

Dairy experts have raised several concerns about the price support program in recent years, including that the support level is too low to adequately support farmers; that the program provides incentives to overproduce milk and certain commodities purchased by the CCC; that USDA has not managed the program to maintain the established support price during periods of low market prices; that there are additional costs of selling dairy products to the government, which diminish the effectiveness of the support price; and that the program stifles innovation in the industry. Accordingly, a number of options have been discussed to modify the price support program, including raising the overall level of the support price (and thus the related commodity purchase prices), making administrative changes such as allowing the CCC to purchase a wider range of dairy

products, and eliminating the program altogether.[62] Figure 37 shows the effects of various options to change the dairy price support program under low- and high-price scenarios over the short and long terms.

Figure 37: Potential Effects of Options to Change the Price Support Program on Various Policy Considerations



Source: GAO analysis based on interviews with dairy experts and reviews of relevant studies.

[62]Changes in the dairy price support program could potentially conflict with the U.S.'s WTO commitments.

Note: The figure does not indicate the degree of increase or decrease for each policy consideration as it relates to a policy option. In addition, as discussed in this appendix, limitations affecting some policy options could affect the degree of an option's potential impact on a policy consideration.

Raise the Level of the Support Price

One option for modifying the dairy price support program is to raise the support price and the related commodity purchase prices. Many dairy experts indicated that the support price has fallen below the costs of production for most farmers and, therefore, is not providing an effective safety net during periods of low prices. Additionally, sources cited the reduction in the support price as a factor in increasingly volatile milk prices. For example, one academician we contacted stated that recent volatility in milk prices has resulted from the virtual elimination of the price support system as an effective price floor during periods of low milk prices. The price support program also worked to reduce price volatility during periods of high milk prices by releasing CCC stocks of purchased dairy commodities when market prices reached 110 percent of the support price.[63] However, without purchasing sufficient quantities of manufactured dairy products, the program does not perform this balancing function.

According to an economist with USDA's Farm Service Agency (FSA), raising the support price would increase farm income and, thus, raw milk production. The economist indicated that this option, by raising the floor for milk prices, would also reduce price volatility; however, increased purchases of dairy products would mean higher federal costs for the price support program. Similarly, the American Farm Bureau study found that while raising the support price would reduce price volatility, it could create a situation in which the CCC purchases surplus dairy products in most years. The FSA economist noted that these federal costs might be offset, at least in part, by a reduction in payments under the MILC program. The economist also said that consumer costs would likely be higher, on average, because increasing the support price would limit the fall of prices for manufactured products.

The FSA economist also noted that increasing the support price would decrease the economic efficiency of federal dairy policies, particularly to the extent that a higher support price stimulates increased production. Under this scenario, increased production would represent an allocative inefficiency because resources would go into producing milk that is not

[63]USDA indicated that currently, the price support program allows the CCC to release its commodity stocks if the market price for a particular commodity exceeds that commodity's purchase price.

needed to supply the market. Some sources cited examples of how high support prices under the program led to misallocation of resources into surplus milk production. For example, from 1977 to 1981, the support price for Grade A milk rose from $8.26 to $13.10 per hundredweight, and annual government expenditures on dairy price supports increased from a few hundred million dollars to over $2 billion.

Change the Administration of the Price Support Program

A number of options have been proposed or discussed to change the administration of the dairy price support program. These options include allowing the CCC to purchase a wider range of products, adjusting commodity purchase prices based on market conditions, and setting commodity purchase prices to reflect cost differences between selling to the CCC and selling in the marketplace.

Allow the CCC to Purchase a Wider Range of Products

One potential modification to the administration of the price support program would be to allow the CCC to purchase a wider range of products than butter, cheese, and nonfat dry milk. Some dairy experts and studies indicated that by focusing on the purchase of a few specific commodities, the price support program distorts the market by providing incentives to overproduce these commodities, while at the same time dampening incentives for innovation in the dairy industry. Manufacturers that develop innovative products incur more risk because they will not be able to sell their products to the government if they cannot obtain a market price high enough to cover their costs. One cooperative representative said that while nonfat dry milk contains protein and calcium—both valuable components that could be used in other products, such as protein bars—manufacturers continue to produce nonfat dry milk in excess quantities because that is what the government is buying. A number of other sources, including industry representatives, academicians, and a report by the International Trade Commission, noted that by purchasing nonfat dry milk, the price support program may be impeding development of a domestic milk protein concentrate industry by creating disincentives to shift raw milk supplies to innovative products.

USDA officials cautioned that in order for a product to function well as a price support product, it must (1) represent a major use of milk; (2) have enough extra capacity to absorb a substantial amount of milk; (3) be storable for long periods; and (4) have an active, liquid wholesale market. Given these conditions, it is questionable whether some alternative products, such as protein bars, would be effective as price support

products. Furthermore, the officials argued that requiring the price support program to incur the risk of product innovation through this approach would alter the fundamental purpose of the program—supporting farm prices.

If the CCC were to purchase a wider range of products, manufacturers would have greater incentives to use milk in alternative ways because the price support program would decrease the risks of trying to produce and market a greater number of products. Consumers could benefit as innovative products gained easier access to the market, causing consumer prices to fall. However, one FSA economist stated that this option would greatly increase the complexity of the price support program, potentially increase federal costs, and require new legislation. Moreover, he noted that this change would require close coordination between trade policies and the price support program. For example, without tariff-rate quotas on some products such as milk protein concentrates, the CCC could end up supporting additional imports if the purchase prices were set too high. The economist stated that this option could reduce production of nonfat dry milk but would be less likely to affect price volatility.

Adjust Commodity Purchase Prices Based on Market Conditions

A second potential modification would be to adjust—or tilt—commodity purchase prices based on market conditions. Some dairy experts, as well as academic studies, reported that because USDA does not tilt CCC purchase prices frequently enough to maintain a balance between butter and nonfat dry milk purchase prices that is based on current economic conditions, the price support program has distorted the market with unclear price signals and induced surplus production of certain goods (notably nonfat dry milk). Therefore, some experts indicated that tilting prices based on established criteria would be better. For example, one dairy processor recommended changing the balance of butter and nonfat dry milk purchase prices automatically if the ratio of CCC purchases of butter and nonfat dry milk falls outside a certain range. Similarly, the American Farm Bureau study suggested that to achieve the support program's objectives without distorting the market and increasing government costs, changes to commodity purchase prices should be based on market conditions so that they would not be subject to political pressure.

Basing the tilt of commodity purchase prices on market conditions would increase the economic efficiency of the price support program by reducing the price distortions that lead to surplus production of goods that are not

required to supply the market. Falling market prices for a particular commodity suggest that the quantity supplied temporarily, at least, exceeds the quantity demanded. If the CCC continues to buy the commodity in significant amounts while the market price remains low, it distorts the market by providing an incentive to produce that commodity purely for the purpose of selling it to the government. This incentive not only delays a market response to the lower commodity price but also prevents that milk from going toward a higher-valued use. Moreover, a study by researchers at the University of Wisconsin found that tilts make it more likely that fluid milk prices will be driven by cheese prices because the price support program would no longer be supporting the manufacturing prices of Class IV products above market levels.[64] This study reported that tightening the relationship between cheese prices and Class I prices improves market signals to dairy farmers because nationally, as noted earlier, a greater percentage of raw milk is used in Class III products (cheese) than in Class IV products (butter and nonfat dry milk).

According to one FSA economist, lowering the purchase price of a particular commodity in the short term could reduce farm income; however, by encouraging production levels to respond more quickly to low price periods, tilting CCC purchase prices to reflect market conditions could maintain higher farm prices over the long term. The economist also indicated that this change could decrease federal costs for purchasing and storing dairy products. The consumer price effects of market-based tilts are less clear. For example, if market butter prices are high and market nonfat dry milk prices are low, a market-based response would indicate that USDA should raise the CCC butter price and lower the CCC nonfat dry milk price. However, further price adjustments could result in the CCC purchase price for butter exceeding the market price, which could trigger CCC purchases of butter and raise the market price even higher. In such cases, assuming that price changes at the wholesale level are passed on through the retail level, consumers would benefit from lower prices on some commodities, while potentially experiencing higher prices on others. The net effect to consumers would then depend on the relative price changes for these products and the quantities of each that were purchased.

[64]Bob Cropp and Ed Jesse, "The Butter-Powder Tilt," Marketing and Policy Briefing Paper Number 72, Department of Agricultural and Applied Economics, University of Wisconsin–Madison, June 2004.

Reflect Cost Differences in Selling to the CCC

A third option to change the administration of the price support program would be to set CCC purchase prices to reflect cost differences in selling to the CCC versus selling in the marketplace. In recent years market prices have fallen below the support price level in some months. For instance, between July 2002 and June 2003, the Class III milk price was below the $9.90 target level in 9 months. Although FSA officials indicated that USDA is required to set product purchase prices in such a way that only the average annual farm milk price, not the monthly price, is at the support price, the Farm Security and Rural Investment Act of 2002 (2002 Farm Bill) simply states that the price of milk should be supported at $9.90 per hundredweight.[65] Concerns over USDA's management of the price support program led to language in the Consolidated Appropriations Act, 2004 requiring the Secretary of Agriculture to more diligently support the farm price of milk.[66] Some dairy experts and studies indicated that one reason that market prices sometimes fall below the CCC support price is because there are additional costs of selling to the government that are not reflected in the commodity purchase prices. Therefore, the effective support price is actually below $9.90 because with higher costs of selling to the government, the market price has to fall below the CCC purchase price before processors are better off selling to the CCC than to the market. Some of these additional costs include packaging for longer-term storage, meeting stricter grading standards, and a time lag between when the product is made and when it is approved for sale to the federal government. An FSA economist estimated that these cost differences amount to about $0.04 to $0.05 per pound for cheese.[67]

One option for reflecting the differences in cost between selling dairy products to the government and selling in the marketplace would be to raise the CCC purchase prices of these products to reflect the additional

[65]USDA also averages the Class III and Class IV prices in determining if the $9.90 per hundredweight support price has been met.

[66]The Consolidated Appropriations Act, 2004 required the Secretary of Agriculture to more diligently support the farm price of milk at the farm bill-mandated support price of $9.90 per hundredweight or lose funding for the administration of the program. Pub. L. No. 108-199 §780.

[67]The FSA economist also stated that there are minimal cost differences for Class IV products (butter and nonfat dry milk). An academic expert indicated that with the exception of April to June 2003, the Class IV price has not dropped below the support price.

costs of manufacturing product for sale to the government.[68] This would help ensure that manufacturers receive a price for their products that allows them to return at least $9.90 per hundredweight (the support price) to farmers. One FSA economist indicated that this change could cause farmers to marginally increase production, leading to increased CCC purchases. Increased CCC purchases, in addition to higher purchase prices, would increase the federal costs of the price support program and, at the same time, higher manufactured product prices could translate into higher consumer prices. However, it is difficult to estimate the added costs of selling to the CCC because these costs are likely to vary widely among different manufacturers. Thus, raising the product purchase prices could provide unwarranted benefits to some manufacturers while still being insufficient to induce sales to the government by some others. In addition, according to one academic study, there is no clear evidence that higher selling costs are the major barrier in selling to the government. Some experts have put forth the possibility that fixed contracts between dairy product manufacturers and their buyers may prevent manufacturers from selling to the government.

An alternative way to reflect the differences in cost between selling dairy products to the government and selling them in the market place would be to require the CCC to alter product specifications and payment terms to conform to those used on the Chicago Mercantile Exchange (the Exchange).[69] An FSA economist stated that some changes to product specifications are already being considered and have been put out for comment to the dairy industry.[70] The economist stated that while these proposed changes will help bring CCC product specifications into greater conformance with market standards, some differences would remain. Most notably, the CCC requires that products be storable for up to 3 years, a longer period than is generally required in the market. To the extent that this proposal reduces additional costs of selling manufactured dairy

[68]The National Milk Producers Federation has asked the CCC to increase its purchase prices for cheese by $0.056 per pound.

[69]The Chicago Mercantile Exchange is a central marketplace with established rules and regulations where buyers and sellers trade agreements known as futures contracts to, for example, buy or sell a commodity at a future date.

[70]USDA put the proposed draft Announcement Dairy 6 out to the dairy industry for comment on April 5, 2004. The proposal includes a number of changes such as increasing lot quantities for manufactured dairy product purchases, as well as changing commodity, packaging, and marking specifications.

products to the CCC by more closely aligning product specifications with market standards, it could induce greater manufactured product sales to the CCC and would keep market prices higher. Therefore, aligning these specifications could increase farm income, provide a marginal production stimulus, and raise federal costs related to additional CCC purchases. Also, this option would not necessarily prevent the Exchange prices from falling below CCC purchase prices because if there are barriers other than costs (such as contractual obligations) that prevent manufacturers from selling to the government, these barriers would still exist.[71]

Eliminate Dairy Price Supports

Another policy option would be to eliminate the price support program altogether and rely on alternatives available to farmers to assist them in managing risk of low and/or highly volatile prices for their milk. A number of dairy experts have argued that the support price has been set so low at $9.90 per hundredweight that it is not having significant impacts. Thus some academicians, as well as USDA, have studied the potential effects of eliminating the program.

In the short term, eliminating the program would have a greater impact if market prices were at or below the level of the support price. The May 2004 USDA study estimated that eliminating the price support program would cause wholesale prices of nonfat dry milk to decline by 15 to 20 percent over the first couple of years.[72] For subsequent years, the study estimated that prices would recover somewhat to 10 percent below baseline levels. Further, the study estimated that the decline in nonfat dry milk prices would encourage diversion of this milk to alternative uses, leading to lower prices for these alternative uses. Generally, lower prices would reduce farm income and potentially lead to lower consumer prices. Farmers would likely respond to these lower prices by producing less milk.

[71]Another proposed alternative would be to have the CCC place bids for commodity purchases on the Exchange as a better way to provide a price floor for manufactured products. However, because the CCC cannot entirely change its product standards to conform to industry requirements, an FSA economist indicated that this alternative is not feasible.

[72]The study established a baseline assumption whereby CCC purchases of nonfat dry milk averaged approximately 17 percent of total U.S. production over the period 2002 through 2007. Purchases of other commodities were assumed to be minimal. However, this assumption was based on a nonfat dry milk purchase price of $1.01 per pound. The actual purchase price was lowered to $0.80 per pound and, thus, the study may overstate the effects of eliminating this program.

According to an FSA economist, eliminating the price support program would increase economic efficiency by allowing market price signals to be transmitted more clearly. The economist also stated that volatility in milk prices would increase. He noted that the combination of increased volatility and reduced farm income would force less efficient farmers to exit production. This exit would increase the economic efficiency of national resource allocation by enhancing current shifts in production to more efficient dairy farms. He added that in the absence of a price support program, new entrants to dairy production would likely be larger, more efficient operations. The FSA economist also said that eliminating the price support program would provide a cost savings for the federal government because the CCC would no longer have to purchase or store dairy commodities. These savings would be greater during periods when farm prices are low because when they are high, even if the program remains in effect, the government purchases fewer dairy products and incurs less cost. However, when farm milk prices are low, savings from eliminating the price support program could be partially offset by increased payments under the MILC program for as long as that program continues.

Over the long term, reduced production would mitigate some of the impacts of eliminating the price support program, because reduced supplies lead to increased prices (assuming demand stays the same). However, the USDA study estimated that even with the positive price effects resulting from reduced production, farm income would still decrease by approximately $3.5 billion over the long term. Additionally, without CCC purchases of dairy commodities, USDA would be unable to balance high market prices by releasing these stocks, thereby contributing to increased price volatility over the long term.

Extend the Milk Income Loss Contract Program

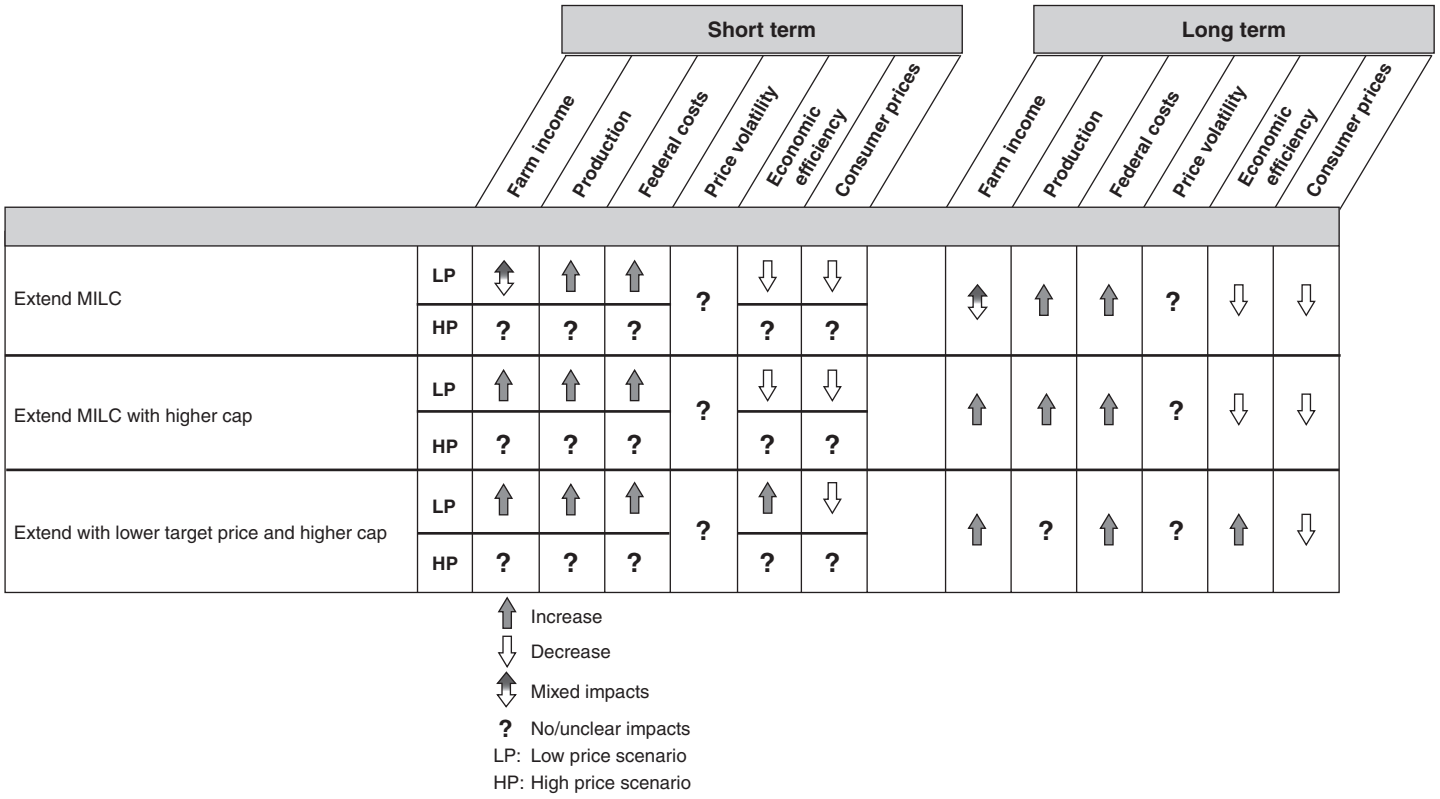
The MILC program has benefited many smaller dairy farmers during the most recent period of low farm prices by providing them income support. However, by providing support to some farmers who otherwise might have exited the dairy industry, the program has slowed the normal downward supply response to lower farm prices and kept aggregate production higher during this period than it otherwise would have been. The MILC program is scheduled to expire at the end of fiscal year 2005. If it is not extended in some form, aggregate production is likely to respond more rapidly to future low-price periods because smaller farmers are likely to exit production at greater rates than they did during the most recent period of low farm prices. With this more rapid production response, farm prices would likely start rising again sooner than in the recent past when the MILC program

has been in place. However, although production levels in the short term would likely decrease more during low-price periods, in the long term aggregate production might not decrease substantially because higher average farm prices would stimulate additional production from the dairy farmers that stay in business. In addition, by allowing the MILC program to expire, the government can avoid the costs of the payments to farmers that the program provides.

There are several options to maintain the benefits of the MILC program to some dairy farmers by extending it beyond 2005. One option is to extend MILC at its current target price and eligible production limit. A second option, a proposal introduced in the Senate in the 108th Congress, would extend MILC through fiscal year 2007 with an increase in the eligible production cap from 2.4 million pounds to 4.8 million pounds.[73] A third option would extend MILC with a lower target price but a higher or no eligible production limit. Figure 38 shows the effects of various policy options to extend the MILC program under low- and high-price scenarios over the short and long terms.

[73]The draft legislation is known as the Milk Income Loss Contract Extension, S. 2609 (2004). A bill that would extend authorization for the MILC program to 2007, but would not increase the eligible production cap, has been introduced in the House, H.R. 3990 (2004). Additionally, a separate bill, S. 2825 (2004), was introduced in the Senate. Section 426 of this proposed legislation would extend authorization for the MILC program to 2007, increase the target price for the MILC program from $16.94 per hundredweight to $17.10, and eliminate a provision for determining whether producers are on separate dairy operations for purposes of determining payment eligibility. However, the bill would not change the MILC program's eligible production cap of 2.4 million pounds.

Figure 38: Potential Effects of Options to Extend MILC on Various Policy Considerations



Source: GAO analysis based on interviews with dairy experts and reviews of relevant studies.

Note: The figure does not indicate the degree of increase or decrease for each policy consideration as it relates to a policy option. In addition, as discussed in this appendix, limitations affecting some policy options could affect the degree of an option's potential impact on a policy consideration.

Extend MILC in Its Current Form

One analysis conducted by a researcher at the University of Missouri estimated that compared to a baseline estimate in which the MILC program expires in 2005, extending the MILC program through 2012 in its current form would result in greater milk production and lower farm prices.[74]

[74]Scott Brown, "The Effect on the United States Dairy Industry of Removing Current Federal Regulations," Report Number 03-03, Food and Agricultural Policy Research Institute, University of Missouri, April 2003. Both the baseline estimate and the estimate for the MILC extension scenario are based on the assumption that the price support program, federal milk marketing orders, import restrictions, and the Dairy Export Incentive Program remain in effect.

Production was estimated to be 0.8 billion pounds higher in 2006 and to average 1.4 billion pounds per year higher from 2008 through 2012. The estimated price difference was also greater in the longer term than initially.[75] Greater production and lower farm prices are consistent with the expectation that extending the MILC program would keep some smaller dairy farmers in the industry who otherwise might exit after 2005 if the MILC program is allowed to expire then. This study also estimated that due to the MILC payments, farm income would increase if the program were extended, despite lower farm prices. Initially, in 2006, the estimated increase in farm income was $0.43 per hundredweight, and even in 2012, when the estimated farm price was $0.50 per hundredweight below what it would be if MILC expires after 2005, the estimated increase in farm income was $0.08 per hundredweight. In addition, extending MILC in its current form would increase federal costs. This study estimated that, on average, annual government costs from 2006 through 2012 would be about $1.2 billion higher than if the MILC program expires after 2005.[76]

According to an FSA economist, lower farm prices resulting from extending MILC in its current form could be passed on as lower retail prices for consumers. However, the economist indicated that the effects on price volatility are less clear. He added that the extension of the MILC program as currently designed would continue to favor smaller farmers over larger farmers, because a greater percentage of smaller farmers' production is eligible for MILC payments. Thus, in general, the MILC program would continue to benefit farmers in the eastern and upper midwestern states over farmers in the western states. Therefore, for a given level of milk production and to the extent that larger farmers in the West are more efficient than smaller farmers in the East, extension of the MILC program as currently designed would reduce the economic efficiency of the allocation of dairy production resources nationally compared to the allocation that would occur if MILC expires.

[75]Although, as discussed above, one might expect that the price and production differences would become smaller over time, according to the author of this study the model assumes competitive markets and, therefore, does not fully capture long-term adjustments.

[76]However, the baseline assumption for farm milk prices was lower than the prevailing prices of the past few months and, according to the study's author, with higher assumed farm prices, the effect on government costs of extending the MILC program would be less. The accuracy of the other estimates also depends on the accuracy of the market prices assumed in the baseline.

Extend MILC with a Higher Cap or with No Cap

An alternative proposal has been introduced in the Senate in the 108th Congress that would extend the MILC program at its current target price but increase the cap on eligible production. The University of Missouri study examined the impacts of a similar option in which the cap on eligible production is removed in 2003 and MILC is extended through 2012 without a cap.[77] This study estimated that extending MILC without a cap would result in a larger increase in production and a larger decrease in farm prices than extending MILC with a cap. For example, production in 2006 was estimated to be 2.3 billion pounds per year higher than if MILC is allowed to expire or 1.5 billion pounds greater than if MILC is continued in its current form. Greater production and lower farm prices are consistent with the expectation that making all milk eligible for MILC payments would provide farmers who might otherwise exit the industry after 2005 (if MILC is allowed to expire) an even greater incentive not to leave than is provided by extending MILC in its current form. As with the previous option, this study estimated that due to MILC payments, farm income would increase if MILC were extended without a cap despite lower farm prices. Initially, in 2006, the estimated increase in farm income would be $0.63 per hundredweight, and even in 2012, when the farm price was estimated to be $1.05 per hundredweight below what it would be if MILC expires after 2005, the estimated increase would be $0.18 per hundredweight. Moreover, this study estimated that farm income would be higher with this option than with extending MILC in its current form because the additional payments to farmers due to eliminating the cap would more than offset the additional farm price reduction resulting from greater production. Extending MILC without a cap would increase federal costs even more than extending MILC in its current form. This study estimated that, on average, annual government costs from 2006 through 2012 would be about $2.5 billion higher than if the MILC program expires after 2005, more than $1 billion per year more than was estimated if MILC is extended in its current form.[78]

[77]Because the University of Missouri study's baseline included a MILC program through 2005, its results can only be used as estimates of the impact of extending MILC with a higher cap compared to letting MILC expire for years beyond 2005. The study's results comparing this option with the study's baseline for 2003 through 2005 are estimates of the difference between having a MILC program with no cap and one with the current cap.

[78]However, the baseline assumption for farm prices was lower than the prevailing prices of the past few months and, according to the study's author, with higher assumed farm milk prices, the effect on government costs of extending the MILC program would be less. The accuracy of the other estimates also depends on the accuracy of the market prices assumed in the baseline.

An FSA economist indicated that consumers would likely benefit from reduced retail prices under this scenario. Additionally, without the cap on eligible production levels, the equity concerns about MILC would be eliminated because the program would no longer favor smaller farmers over larger farmers. However, the FSA economist also indicated that in addition to the inefficiencies of increased surplus milk production, this alternative would reduce economic efficiency of milk production compared to allowing MILC to expire after 2005 to the extent that it provided incentives for production by smaller producers with higher costs of production.

Extend with Lower Target Price and Higher or No Cap

A third alternative, considered in the American Farm Bureau study, is to extend MILC with a lower target price and a higher or no cap on eligible production. The study argued that the $16.94 per hundredweight target price is too high because MILC payments are triggered any time the Class I mover is less than $13.69 per hundredweight; at this target price, MILC payments could be expected in most months given that from 1990 through 1999 the Class I mover averaged $12.28 per hundredweight and was below the $13.69 threshold in 104 of 120 months. The analysis concluded that a target level for MILC payments of a Class I mover at $12.00 per hundredweight or lower would help to make the program more marketbased. Further, expanding the cap or eliminating it completely would help to make the program more equitable among farmers of different sizes.

The effects of extending MILC in the absence of a cap on eligible production depend significantly on the level of the target price. If the target price were set too high, it would stimulate surplus production. During periods of low prices, the government would have to contribute additional MILC payments to counteract the effects of lower prices. Additional production would also decrease manufactured product prices, potentially increasing the costs of the dairy price support program because these prices would be more likely to reach the support level. At the same time, these lower prices could provide benefits for consumers. While a lower target price without a cap would treat farmers with different sized herds the same way, it might not provide enough payments to keep farmers in areas with high costs of production from exiting during periods of low prices. Therefore, this option could increase the economic efficiency of national dairy production, while also accelerating shifts in dairy production to the West.

Introduce a New Target Price Deficiency Payment Program

Some dairy experts indicated that in lieu of maintaining both the dairy price support and MILC programs, operating one new target price deficiency payment program could be a better alternative.[79] USDA and other dairy experts stated that having both the price support and MILC programs is problematic, particularly during periods of low prices. As noted in the American Farm Bureau study, the idea behind establishing a target price deficiency payment program is to allow markets to work to clear dairy products at market prices and then, when the market price is below the target price, to pay farmers based on the difference between these prices. But with both dairy programs in force, MILC maintains and encourages surplus milk production that must then be purchased by the CCC under the price support program. This market distortion adds to the costs of both programs.

Under a new target price deficiency payment program, dairy farmers would receive a payment when the market price of Class III milk products drops below a specific target level. Thus, the program would establish a floor on farm income through a countercyclical payment to dairy farmers instead of a floor on manufactured product prices with purchases by the CCC.[80] Instead of providing an incentive for manufacturers to continue producing a particular product that the CCC is purchasing, the program would allow the market to clear a wholesale product price and then pay farmers the difference if the price were too low. This option would provide manufacturers the incentive to shift raw milk supplies to their highest-valued use, further promoting the development of new and innovative products. This option could also potentially reduce federal costs, depending on the level of the target price; one expert estimated that with a target price of $10.50 per hundredweight for Class III milk, the government would have spent $300 million less than under the MILC program since its inception in December 2001. With a target price of $10.00 per hundredweight for Class III milk, these savings would have reached $1.2 billion.

Notwithstanding these potential benefits, dairy experts indicated that a new target price deficiency payment program could have its own challenges depending upon how it is designed. In particular, such a program would require some key decisions regarding price level and

[79]The MILC program is a target price deficiency payment program.

[80]A countercyclical payment is a payment provided during periods of low prices.

regional differences, and whether to cap program benefits based on payments or quantities of production.

Set Price Level and Consider Regional Differences

Some dairy experts said that a problem with the target price deficiency payment approach is that it would be hard to determine the appropriate target price without creating distortions in production incentives. If the target price were set too high, it would have the same effect as setting the support price too high: it would lead to excess production by supporting farm income at higher levels than would be available if farmers received market prices. Long-term overproduction would place additional downward pressure on market prices and increase federal costs for the program. If the target price were set at a low level to avoid stimulating production and increasing government costs, it might not maintain adequate support for farm income, and could increase price volatility. Additionally, by influencing domestic production levels, which in turn influence U.S. market prices, the level of the target price can affect the incentives of other countries to export manufactured products to the United States. However, these incentives are also affected by the export subsidies and lower production costs of some other countries.

The difficulty in setting the appropriate target price is exacerbated by regional differences in costs of production. A certain Class III target price might provide adequate support during periods of low prices based on the costs of production in one region, but not in another. However, increasing the target price to provide adequate support for higher-cost regions would not only support production in areas where it is less economically efficient to do so, but would also provide greater benefits to farmers in lower-cost regions. These higher benefits would increase the incentives to overproduce in those areas. Given current trends in the United States, this scenario would encourage the western shift in dairy production.

Place Cap on Payments or Production

Another challenge in designing a target price deficiency payment program would be to determine whether to cap the program's benefits either by limiting the payment a farmer could receive or by limiting the quantity of milk production on which a farmer would be eligible to receive payments. The MILC program calls for payments equal to 45 percent of the difference between $16.94 and the Boston Class I per hundredweight price and has a production cap (2.4 million pounds of production per dairy operation each fiscal year). These controls have helped to keep federal costs lower than they otherwise would have been during periods of depressed prices by limiting incentives for overproduction. However, the production cap has

targeted the program's benefits primarily to smaller farmers, raising questions of equity.

If a target price deficiency payment program were implemented without any controls, the risk of market distortions and increased federal costs from establishing a target price level that is too high could increase substantially. At the same time, a couple of researchers noted that establishing the target price deficiency payment program without a production cap could encourage farmers to enhance the efficiency of their dairy operations. With a cap limiting eligible production, farmers have less incentive to adopt new technologies that would increase production. However, whether or not a cap is placed on eligible production, the program is likely to confer benefits to farmers in varying degrees. If the program did not cap eligible production, farmers who could increase their production efficiency with new technology might have more of an incentive to do so. But the farmers who would be most likely to take advantage of this incentive would be larger farmers who may be more efficient, and might have the resources and access to capital to undertake such an investment. Conversely, capping eligible production would target benefits to smaller farmers in the same way as MILC.

Adopt the National Dairy Equity Act

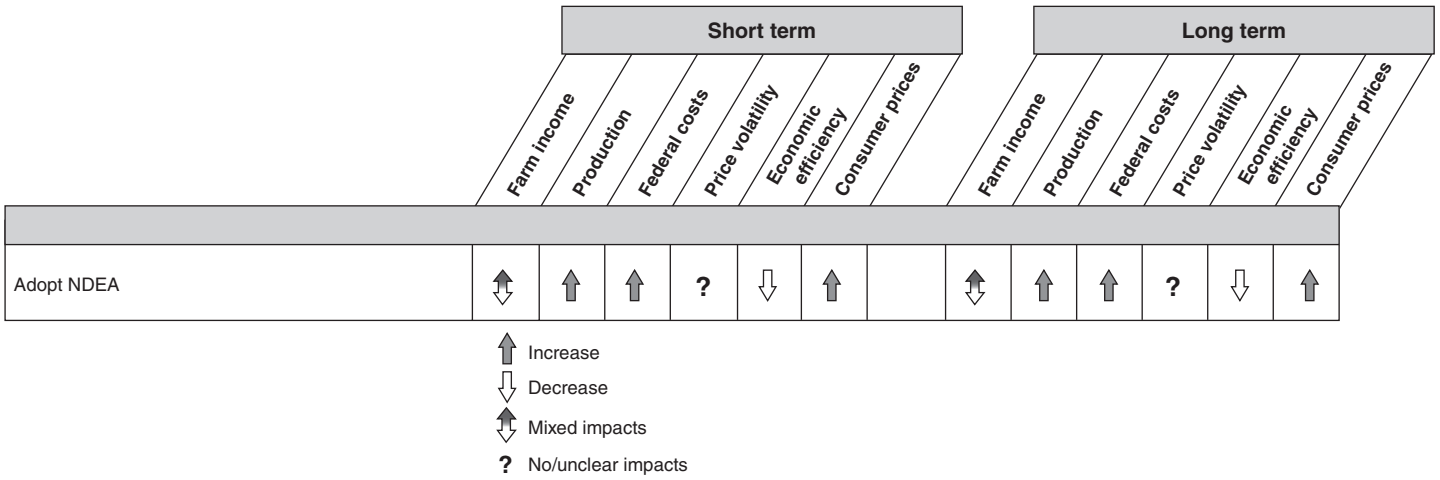
To address concerns about the pending expiration of the MILC program and provide additional support to dairy farmers, the National Dairy Equity Act of 2004 (NDEA) has been introduced in the House and the Senate.[81] This proposed legislation would change the federal regulation of milk marketing through the establishment of regional dairy marketing areas in which boards created to administer these areas would set minimum prices that processors would have to pay for raw milk used to make fluid milk products sold in those areas.[82] The NDEA would have a similar effect as the MILC program in that it might lead to higher incomes for some dairy farmers. However, concerns have been raised about its impact on farm

[81]This proposed legislation was introduced in the 108th Congress as S. 2525 and H.R. 4597.

[82]In earlier legislation, the Federal Agriculture Improvement and Reform Act of 1996, Congress authorized the six New England states to enter into an agreement called the Northeast Interstate Dairy Compact, which was implemented in July 1997. The Compact functioned similarly to the proposed dairy marketing boards of the NDEA in that it supplemented the FMMOs and state programs by setting the monthly minimum price to be paid for raw milk used for fluid milk marketed in the six-state area. The authorization for the Compact expired on September 30, 2001.

incomes in some regions, retail fluid milk prices, coordination of milk prices across regions, and existing trade agreements. Figure 39 shows the effects of adopting the NDEA over the short and long terms.

Figure 39: Potential Effects of Adopting the NDEA on Various Policy Considerations



Source: GAO analysis based on interviews with dairy experts and reviews of relevant studies.

Note: The figure does not indicate the degree of increase or decrease for each policy consideration as it relates to a policy option. In addition, as discussed in this appendix, limitations affecting some policy options could affect the degree of an option's potential impact on a policy consideration.

Elements of the NDEA

The NDEA would create five marketing areas that together would encompass the entire nation. States in the Northeast,[83] Southern,[84] and Upper Midwest[85] regions would automatically be participating in the marketing area program established by the NDEA upon enactment of the legislation. States in the Intermountain[86] and Pacific[87] regions could become participating states by providing written notice to the Secretary of Agriculture. The NDEA would authorize each region's board to set an "over-order" minimum price for Class I sales that exceeded the FMMO Class I price in that region, with an initial maximum of $17.50 per hundredweight, subject to approval by farmers within the region in a referendum.[88] Although the boards would have discretion in setting the over-order price, the legislation directs the boards to consider several factors including the

- balance between production and consumption of milk and milk products in the regulated area;
- costs of milk production in the regulated area;
- prevailing price for milk outside the regulated area;
- purchasing power of the public; and
- price necessary to yield a reasonable return to an eligible farmer.

The NDEA would establish a fund in the U.S. Treasury to carry out the program. During months in which a region's over-order price exceeded the

[83]States in this region include Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, and Vermont.

[84]States in this region include Alabama, Arkansas, Florida, Georgia, Kansas, Kentucky, Louisiana, Mississippi, Missouri, Nebraska, North Carolina, Oklahoma, South Carolina, Texas, Tennessee, Virginia, and West Virginia.

[85]States in this region include Illinois, Indiana, Iowa, Michigan, Minnesota, North Dakota, South Dakota, and Wisconsin.

[86]States in this region include Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, and Wyoming.

[87]States in this region include Alaska, California, Hawaii, Oregon, and Washington.

[88]The NDEA would allow the maximum to increase over time in accordance with changes in the Consumer Price Index for All Urban Consumers published by the Bureau of Labor Statistics in the Department of Labor.

FMMO Class I minimum price in Boston, processors would be required to pay the Secretary of Agriculture an amount equal to the difference between those two prices, known as the over-order premium, times the quantity of milk purchased for use in Class I products. The Secretary would deposit these amounts into the U.S. Treasury fund, and the fund would make payments to each board, which would distribute the payments to eligible farmers in its region.[89] Each month the board would receive at a minimum an amount equal to the over-order premium times 50 percent of the milk produced in that region.[90] The proposed legislation would require CCC funds to be transferred to the fund when necessary to allow the fund to make the required payments; according to one analysis, such contributions would typically be necessary because only one of the proposed dairy marketing areas has a Class I utilization rate equal to 50 percent or higher.

The NDEA also would require boards to compensate the CCC for any additional costs of CCC purchases of milk products resulting from increases in milk production that exceed the national average growth rate. To manage overproduction of milk that could result from the NDEA, the NDEA would authorize boards to take action, including developing and implementing incentive-based supply management programs.

In addition, the NDEA would link participation in the dairy marketing areas with participation in the current MILC program. Farmers who participate in the new program would not be able to continue to receive MILC payments. If states in the Intermountain and Pacific regions chose not to participate in the NDEA program, farmers in those states could continue to receive MILC payments, and the NDEA would extend the authorization period for the MILC program until the end of September 2007. States in the other regions, which would become participants upon enactment of the NDEA, could withdraw their participation. If they did, farmers in those states could also continue their MILC payments through the end of September 2007. Individual farmers in states that participated in the NDEA program could

[89]Other payments from the fund would include compensation for administrative costs that USDA or the boards incur in carrying out the program, increased costs of specified federal nutrition programs that might result from the program, and increased costs that the states might occur due to the program in carrying out the Child Nutrition Act of 1996. Boards could also collect assessments from processors in their region not to exceed $0.03 per hundredweight to cover the boards' administrative costs.

[90]Each month the board would receive the greater of (1) this amount or (2) the amount of payments made by processors to the fund for purchases of Class I milk that will be sold in the region during the month.

choose not to participate in the new program and would then be able to continue receiving MILC payments. However, those farmers would not be able to extend their payments beyond September 2005 and would not be eligible for subsequent participation in the NDEA program.

Impacts of the NDEA

Although the NDEA may lead to higher incomes for some dairy farmers, academicians and industry participants have raised many concerns about the proposed legislation's impacts. These concerns include regional divisiveness due to lower incomes for dairy farmers in some regions, higher retail prices, reduced coordination of dairy prices across regions, and potential conflict with World Trade Organization (WTO) rules.

The NDEA could lead to higher incomes for farmers in participating states when milk prices are relatively low because processors would have to pay the over-order prices set by the boards for Class I milk; however, the total effect on farmers would depend on what happens to the price of milk used for manufacturing purposes as well.[91] To the extent that higher blend prices stemming from higher Class I prices lead farmers to increase milk production, the result could be lower prices for Class III and IV milk both in participating and nonparticipating states. Even if all states participated in the dairy marketing areas, the large differences in Class I utilization rates across regions imply that different regions would be affected differently by the combination of higher Class I prices and lower Class III and IV prices, and farmers in regions with low Class I utilization rates might see a decline in their incomes. If some states do not participate, their farmers would be even worse off because unless these farmers pool milk in states that are included in the marketing areas, they would not receive any benefits of higher Class I prices. In a report that we issued in September 2001[92] in which we analyzed the inter-regional impacts of various scenarios in which some states were grouped in dairy compacts that functioned like the NDEA's dairy marketing areas, we reported that one effect of compacts was to reduce farm income in noncompact regions. We estimated this effect to be minimal when we examined the impact of the Northeast Interstate Dairy Compact because the six New England states included in that Compact

[91]Even the extent to which income from Class I sales might rise from the NDEA is hard to estimate because it is unclear to what extent the over-order premiums that processors would be required to pay for Class I milk might be replacements for market-driven over-order premiums that would exist without the NDEA.

[92]GAO, *Dairy Industry: Estimated Economic Impacts of Dairy Compacts*, GAO-01-866 (Washington, D.C.: Sept. 14, 2001).

produced only 3 percent of the nation's milk. However, we estimated that the effect was somewhat greater in a scenario in which states producing 27 percent of the nation's milk supply were included in compacts.

To the extent that the NDEA would result in fluid milk processors paying more to buy their milk from farmers, the NDEA would also lead to increases in retail fluid milk prices. In our report on compacts, we reported that several studies concluded that the Northeast Interstate Dairy Compact resulted in higher retail prices for fluid milk in New England, with estimated impacts ranging from $0.03 to $0.20 per gallon. Higher retail prices could have a greater effect on retail sales in upcoming years than occurred in the past, as some dairy experts believe that the demand for fluid milk has become more responsive to price changes, given the increasing number of beverages that are considered substitutes for fluid milk, among other reasons. Consequently, retailers with whom we spoke generally opposed the NDEA. Furthermore, declines in fluid milk sales would cause more milk to be available for manufacturing purposes, which would further depress the prices for Class III and IV milk.

Several academicians told us that they believed the NDEA would also create regional distortions because price-setting in each dairy marketing area would be controlled by its board, and prices for raw milk used in fluid products would no longer be closely linked to prices for raw milk used in manufactured products. This would be a major change from the current system in which Class I prices are set based on differentials added to the "higher of" the advanced Class III or IV skim milk values, with the differentials still somewhat reflective of the costs of transporting milk from the Upper Midwest, a key dairy surplus region. Before the 1960s, Class I prices in different orders were not coordinated, and the resulting disorderly marketing system led to the coordinated system that we now have. Adopting the decentralized price-setting system of the NDEA risks losing the advantage of more orderly marketing that the coordination of the 1960s brought to the dairy industry.

Concerns about whether the NDEA would make U.S. dairy policy less consistent with existing agreements under the WTO arise because of the effects of the NDEA on milk production and, hence, U.S. milk prices. As indicated previously, recent U.S. commitments under the General Agreement on Tariffs and Trade are leaning in the direction of more liberalized trade. To the extent that the NDEA provides a subsidy for U.S. milk production and reduces the prices of manufactured dairy products, the act would reduce the competitiveness of imported products.

We identified one study that estimates the effects of the NDEA on milk production, farm prices, and government costs compared to a baseline scenario that did not include the NDEA.[93] This study estimated that the NDEA would increase milk production compared to the baseline by an average of about 7.6 billion pounds per year during the period from 2006 through 2013. The increased production would result in estimated declines in Class III and IV prices from the baseline such that average milk prices would be $1.17 per hundredweight below the baseline estimate. The estimated annual average increase in federal costs for payments to the boards was $1.7 billion.[94]

Change Trade Restrictions and Export Incentives

Recent concerns about the effects of imported dairy products, most notably milk protein concentrates, on U.S. dairy prices have highlighted the importance of U.S. trade policy—trade restrictions and subsidy programs—as a foundation for domestic dairy policies. Several policy options related to international trade in dairy products have been suggested. As noted previously, current international trade agreements and ongoing negotiations can have implications for certain policy options that have been suggested. These options include (1) increasing trade restrictions, specifically for imports of milk protein concentrates;[95] (2) relaxing trade restrictions; (3) introducing domestic subsidies for products significantly affected by international trade competition, specifically establishing a subsidy program for domestic production of milk protein concentrates; and (4) changing the Dairy Export Incentive Program (DEIP), either by using it more effectively or by eliminating it. Those options that succeed in limiting imports or encouraging exports of manufactured dairy products could support higher farm income, production levels, and consumer prices. These options may also reduce

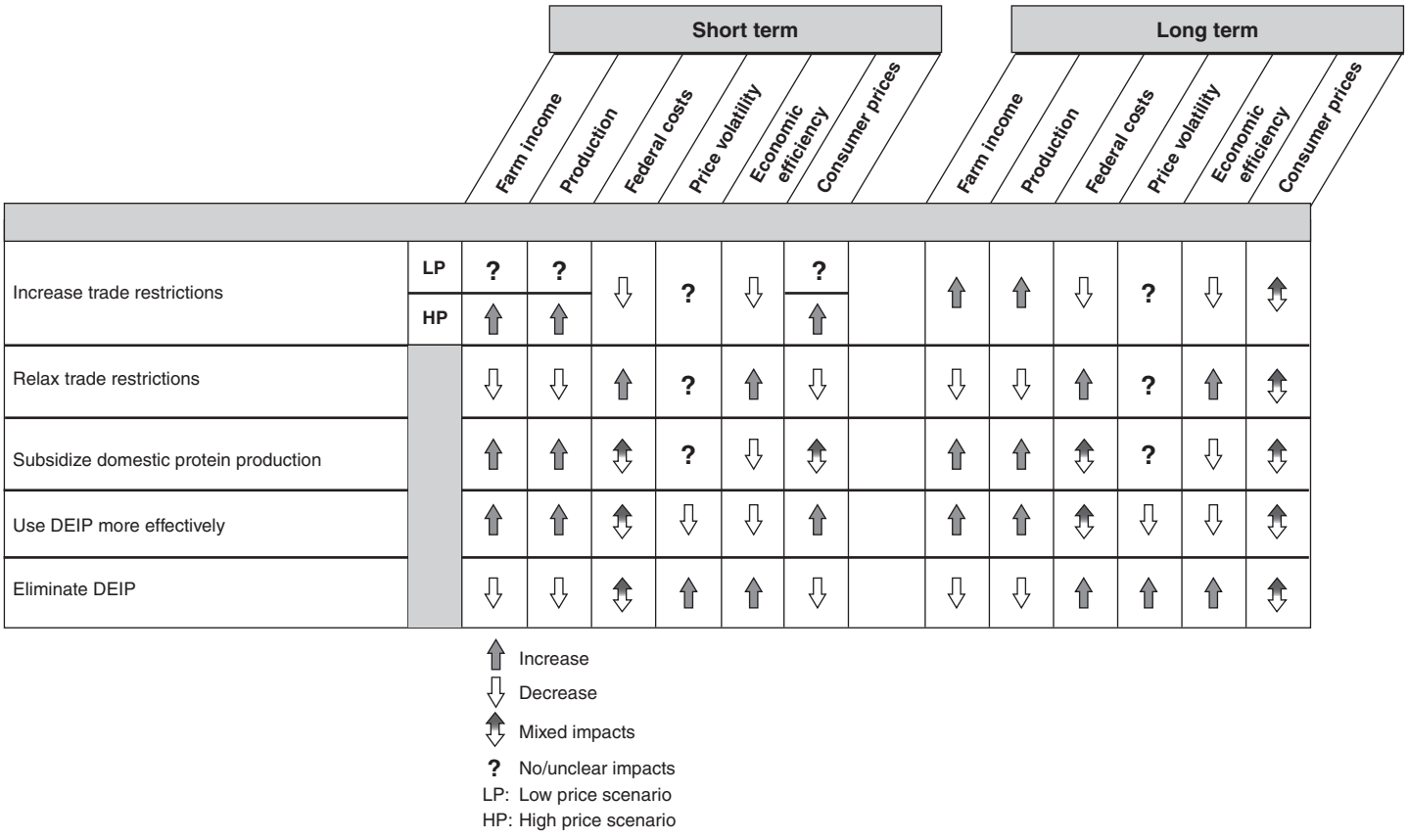
[93]Scott Brown, "An Introductory Examination of the National Dairy Equity Act," in *Dairy Policy and Product Innovation*, 11th Annual Workshop for Dairy Economists and Policy Analysts, April 15-16, 2004.

[94]These estimates were developed under a particular set of assumptions, including that all states would participate in the NDEA and that over-order prices were set relatively high. These estimates, as acknowledged in the study, are likely to cause the estimated effects of the NDEA to be larger than if, alternatively, it had been assumed that few states participated and the over-order prices were relatively low.

[95]Milk protein concentrate is a concentrated milk protein product that contains both of the major forms of protein found in milk: casein and whey. The protein content of this product can vary considerably from 42 to over 90 percent.

federal costs if higher farm prices reduce costs to the price support program to a greater degree than the cost of these trade options. Figure 40 shows the effects of options to change trade restrictions and export incentives over the short and long terms.

Figure 40: Potential Effects of Changing Trade Restrictions and Export Incentives on Various Policy Considerations



Source: GAO analysis based on interviews with dairy experts and reviews of relevant studies.

Note: The figure does not indicate the degree of increase or decrease for each policy consideration as it relates to a policy option. In addition, as discussed in this appendix, limitations affecting some policy options could affect the degree of an option's potential impact on a policy consideration.

Increase Trade Restrictions/Establish a Tariff-Rate Quota for Milk Protein Concentrates

One international trade policy that has been proposed is to increase trade restrictions within the constraints of existing international trade agreements. More specifically, a bill entitled the Milk Import Tariff Equity

Act[96] has been introduced in the Congress that would impose tariff-rate quotas on dairy protein products such as milk protein concentrates and certain casein products. Import quotas prior to the WTO Uruguay Round Agreement on Agriculture did not cover milk protein concentrates and casein.[97] Therefore, no tariff-rate quota was established for these products after the agreement was implemented. The May 2004 report by the International Trade Commission showed that U.S. imports of some dairy proteins increased significantly from 1998 through 2000 and then declined. Some of these protein imports displaced domestic dairy proteins, particularly those used in making processed cheese products not covered by the Food and Drug Administration's standards of identity.[98]

The International Trade Commission report concluded that imports of milk protein concentrates to the United States have the effect of lowering U.S. farm prices either directly or indirectly, depending upon whether U.S. market prices for manufactured dairy products are above or at the level of the support price. If U.S. prices are above the support price, then imports of dairy proteins could directly lower the market prices of nonfat dry milk, butter, and cheese to the extent these proteins can be imported at lower prices than proteins available in the domestic market. In turn, lower product prices could reduce the prices received by U.S. farmers for their raw milk. If U.S. prices are at the support price, then imports of dairy proteins could indirectly affect U.S. market prices. Increasing imports of proteins when U.S. market prices for manufactured dairy products are at the support price will cause the CCC to purchase more nonfat dry milk as this alternative protein source is displaced in the market. Eventually, these increasing stocks could cause USDA to lower the purchase price of nonfat dry milk in an attempt to reduce federal costs. This adjustment

[96]This proposed legislation was introduced in the 108th Congress as S. 560 and H.R. 1160.

[97]As a result of the agreement, the United States committed to convert quotas and fees that had been established pursuant to section 22 of the Agricultural Adjustment Act of 1933 into tariffs in the form of tariff-rate quotas. Further, the United States agreed not to use section 22 in the future against imports from other WTO members. Virtually all section 22 quotas were converted to tariff-rate quotas in 1995.

[98]Standards of identity were introduced under the 1938 Federal Food, Drug, and Cosmetic Act and are enforced by the Food and Drug Administration. Standards of identity define food products by establishing what ingredients must or may be used in the food manufacturing process, as well as the quantity of such ingredients. In most cases, milk protein concentrate is not accepted for use in cheeses covered by the standards of identity.

would then lower prices for manufactured dairy products, in turn decreasing the prices received by U.S. farmers for their raw milk.[99]

Because introducing tariff-rate quotas on milk protein concentrate and casein would likely reduce imports of these products, federal costs due to CCC purchases and storage of nonfat dry milk under the price support program would likely decrease. When U.S. market prices are above the purchase prices established by the price support program, a reduction in imports could maintain prices of some products, such as cheese, at higher levels due to reduced domestic supply of dairy proteins used in these products. Higher product prices could increase farm prices and thus stimulate additional production. These effects could be more significant in regions of the United States where raw milk is used to a greater extent in the manufacturing of Class III products. (If U.S. trading partners successfully challenge tariff-rate quotas on dairy proteins, compensation such as increased market access for other products could be required, reducing the benefits to U.S. dairy farmers.) Because production adjustments tend to lag behind price changes, this additional production could delay adjustments to lower market prices in the future. Therefore, to the extent that the exclusion of imports masks market price signals that would exist without the exclusion, this policy option would decrease economic efficiency. Additionally, to the extent that changes in the manufacturing prices of dairy products are passed on through the retail level, consumers could experience higher prices for some products (such as cheese) and lower prices for other products (such as butter).[100]

Relax Trade Restrictions

A second option is to relax trade restrictions by reducing or eliminating tariffs on dairy products. Trade restrictions such as tariff-rate quotas support domestic programs such as the FMMO classified pricing system and the dairy price support program by limiting the available supply of dairy products to take advantage of higher U.S. market prices. Unilaterally

[99]Despite its conclusion that imports of dairy proteins to the United States could lower manufactured product prices, the International Trade Commission was unable to conclude that these imports actually caused USDA to tilt commodity purchase prices in May 2001 and November 2002. The International Trade Commission found that between 1996 and 2002, CCC stocks of nonfat dry milk grew from zero to 1 billion pounds. However, of this amount, the commission estimated that only 25 to 35 percent of the stocks came from nonfat dry milk that had been displaced by imports of dairy proteins. Therefore, 66 percent of the increase in CCC stocks was due to factors other than imports.

[100]Butter prices could decrease as higher production levels, among other things, increase the supply of butterfat.

relaxing U.S. trade restrictions would likely increase imports of manufactured products as foreign producers seek to take advantage of the higher prices available in the U.S. market. Despite higher transportation costs for imported products, some manufacturers might be able to import certain dairy products from U.S. trading partners at prices below U.S. market prices either because those partners provide export subsidies (as the European Union does) or because they have lower milk production costs (as Australia and New Zealand do). Relaxing trade restrictions such as tariff-rate quotas is unlikely to increase imports of fluid milk products because of health restrictions, transportation costs, and the perishable nature of these products.

Increased imports could put pressure on the CCC to purchase larger quantities of manufactured dairy products, thereby increasing federal costs.[101] At some point these pressures could become unsustainable, leading to a reduction in the support price or the end of the price support program and to a decline in the price of milk used for manufacturing purposes. Moreover, because the price of milk used in fluid milk products is based on the price of milk used in manufactured products, a decline in the prices of manufactured products from increased imports could lower average farm prices. As long as MILC is authorized, these lower prices could trigger additional MILC payments to farmers, further increasing government costs.

In the short term, increased imports could cause U.S. prices to fall, resulting in a decline in farm income for U.S. dairy farmers. With reduced farm income, production would also decrease as less efficient farmers exit production. Over the long term, the decline in production could cause farm prices to rebound toward the levels that existed before trade restrictions were relaxed. Similarly, in the short term, lower farm prices are likely to lead to lower consumer prices for fluid milk and other dairy products, but as farm prices rise toward their previous levels due to production decreases, consumer prices for fluid milk and other dairy products would likely rise as well. Economic efficiency will increase with relaxed trade restrictions because such relaxation will allow market price signals to be more visible than with restrictions in place. These signals will lead to increased imports when it is cheaper to substitute increased imports for

[101]The extent to which increased imports put pressure on the CCC to increase its purchases depends on the extent to which increased imports replace commercial sales of domestically produced dairy products.

some domestic dairy production. Additionally, the economic efficiency of U.S. dairy production resource allocation could increase with relaxed trade restrictions as the reduction in domestic production is more likely to come from less efficient domestic farmers.

Subsidize Domestic Milk Protein Concentrate Production

Another proposed option is to support the development of domestic casein and milk protein concentrate production. Under the proposed U.S. Dairy Proteins Incentive Program, the CCC would make subsidy payments, on a bid basis, to entities that produce and market dairy proteins from skim milk.[102] The proposed legislation would provide, among other things, that receipt of a payment is contingent upon the end use of the dairy proteins produced; that no applicant receives a payment if the contract submitted for review would undercut domestic prices for milk, nonfat dry milk, or dairy proteins; and that the sale of the dairy proteins represents a new use of domestically produced dairy proteins.

This program's potential impact on domestic dairy protein production depends on the relative profitability of these proteins, which, in turn depends on production costs and demand. The International Trade Commission's May 2004 study on milk protein products found that, given disincentives inherent in the price support program and constraints on U.S. demand for dairy proteins other than nonfat dry milk, the profitability of domestic protein production could be limited. For example, the study reported that the price support program creates a disincentive for U.S. processors to produce dairy proteins other than nonfat dry milk because by purchasing nonfat dry milk the price support program reduces the financial risk of manufacturing that product. Processors of other proteins would need to invest in production facilities and then market their product without the benefit of a standing government offer of support. The study found that only under the most favorable conditions (high skim milk protein yield[103] and low variable costs) would it be beneficial for U.S. processors to begin producing milk protein concentrate instead of nonfat

[102]A bill to create this program was introduced in the U.S. House of Representatives as H.R. 4223 on April 27, 2004. The bill defines dairy proteins as whey, whey protein concentrate, casein, or milk protein concentrate.

[103]The protein content of raw milk can change with the age of the cow, seasonally, and with feeding and management practices.

dry milk. Even then, positive returns were only for milk protein concentrates with protein concentrations above 70 or 80 percent.[104]

The classified pricing system could create an impediment to the development of a domestic protein industry depending upon how milk protein concentrate is classified. Based on analysis presented in the International Trade Commission's report, classification under a higher-valued class would require producers of milk protein concentrate to pay more for their raw milk supplies, thus reducing their profits.[105] In addition, the report noted that since May 2002, the CCC has had a program to provide incentives to convert nonfat dry milk held in its stocks to casein. Under this program, the CCC accepts competitive bids for CCC-owned nonfat dry milk stocks for the manufacture of casein. However, while USDA has accepted some bids, in many cases processors' bids have been so low that USDA has rejected them.

Finally, the International Trade Commission's report found that while milk protein concentrate is considered a useful additive to standardize protein content, the limitation on its use inherent in the Food and Drug Administration's standards of identity further restrict domestic milk protein concentrate production. This limitation keeps the market for milk protein concentrates relatively small in comparison to the market for other dairy proteins. Given these restrictions, the International Trade Commission estimated that the total U.S. market for milk protein concentrate is 40,000 to 50,000 metric tons per year. A new production facility in New Mexico reportedly is capable of producing 16,000 tons annually. Therefore, barring a large drop in imports or changes to the standards of identity, the demand for milk protein concentrate would have to increase substantially to induce additional domestic production.

To the extent that the proposed program can overcome these challenges, it could provide incentives for manufacturers to produce alternative dairy proteins domestically. Should these proteins replace some nonfat dry milk production, they could reduce federal costs for the price support program.

[104]The International Trade Commission reached these conclusions by estimating the price, cost, and returns for U.S. producers who produce nonfat dry milk and sell it to the CCC. The Commission then compared the result with what producers in its survey had earned from producing and selling milk protein concentrate.

[105]However, USDA officials noted that this may be a moot issue because they believe milk protein concentrates will be classified as Class IV products.

However, the overall impact on federal costs would depend on whether these reductions are offset by the cost of the subsidy program itself. Various dairy experts disagree as to whether subsidizing domestic dairy protein production would result in a net increase or decrease in federal costs. For example, a study that was published in May 2004 by researchers at Cornell University concluded that reduced costs to the price support program would not be great enough to offset the cost of the subsidy program.[106] Conversely, an analysis by the National Milk Producers Federation found that a protein subsidy program providing assistance up to $2.30 per hundredweight of skim milk would result in a net cost savings for the federal government. The study by Cornell University researchers also estimated that a subsidy program for casein and milk protein concentrate would raise average milk prices by $0.40 per hundredweight, yielding an increase in farm income of $913 million. These increases would have greater impacts on farm income and milk production in areas of the country with higher Class IV utilization, such as the West.

Also, should these proteins replace some nonfat dry milk production, the resulting effects on the prices that consumers pay for products made with dairy proteins could be mixed. If dairy protein prices increase with reduced imports, consumer prices for those products for which they are an ingredient (such as cheese), could also increase to the extent that these price changes are passed through. However, additional production resulting from higher farm prices could lower consumer prices for butter. Over the long term, increased domestic production of casein and milk protein concentrate could lower their production costs and also the costs of other products for which they are ingredients. With the subsidy program in place, the economic efficiency of resource allocation would likely decrease as the government provides incentives for the production of proteins that could potentially be supplied more cheaply through imports.

Change the Dairy Export Incentive Program

Some dairy experts indicated that DEIP can help reduce government expenditures by allowing USDA to subsidize exports rather than purchase products and maintain high stock levels through the price support program. However, in some cases, academic experts indicated that under current market conditions the impact of DEIP on U.S. prices is limited. For

[106]Phillip M. Bishop and Charles F. Nicholson, "Dairy Market Impacts of U.S. Milk Protein Imports and Trade Policy Alternatives," Department of Applied Economics and Management, Cornell Program on Dairy Markets and Policy, R.B. 2004-08, Cornell University, Ithaca, N.Y. (May 2004).

example, one source noted that with CCC purchases of nonfat dry milk at over 800 million pounds in 2002, and with over 1 billion pounds of CCC stocks on hand, DEIP currently has no impact on U.S. prices. Also, WTO commitments have limited the scope of DEIP. For example, in the Uruguay Round Agreement on Agriculture the United States committed to reducing the quantity of subsidized exports by 21 percent and the value of these exports by 36 percent over the period from 1995 to 2000. Therefore, a couple of alternative policy options have been discussed with regard to DEIP, using it more effectively or eliminating it entirely.

Use DEIP More Effectively

Some dairy experts suggested that the government could make greater use of DEIP.[107] The American Farm Bureau study concluded that DEIP may be underutilized, noting that it is difficult to develop foreign markets unless a commitment is made to serving the market. Such a commitment is more difficult if a given product is made available only when it is in surplus. The study criticized USDA for (1) being slow to invite and accept bids and (2) concentrating on products in surplus. Other dairy experts indicated that invitations for DEIP bids may be announced too late in the year for potential exporters to participate in the program due to seasonal sales patterns. To improve the effectiveness of DEIP, the American Farm Bureau study recommended three potential changes:

- Exporters should be encouraged to submit bids for products and countries that offer the greatest potential for longer-term market development. USDA should use DEIP in conjunction with the Foreign Agricultural Service to coordinate export assistance programs to fully develop markets.

- USDA should consider DEIP bids for any eligible products and not base acceptance primarily on removing surplus products from the domestic market. Bids should be accepted for products that may have the greatest market development potential and do not violate WTO subsidization volume limits.

[107]As an alternative to government export subsidies, the National Milk Producers Federation's Cooperatives Working Together program includes, among other things, an export subsidy element.

- USDA needs to act under shorter time frames in reviewing and accepting DEIP bids to maximize the volume allowable under WTO rules.

USDA indicated that it has announced and awarded subsidies under the DEIP program up to the limits allowed by WTO rules for nonfat dry milk and cheese and that DEIP-assisted exports of butterfat have varied depending on market conditions. USDA also noted that the Foreign Agricultural Service has worked closely with the dairy industry to ensure that national and annual DEIP assistance optimizes longer-term market development prospects and minimizes any potential detrimental effects on the U.S. market. For example, a Foreign Agricultural Service official stated that the Service generally tries to wait until the market for a particular product, such as butterfat, is in surplus before inviting bids for DEIP export subsidies. The official said that if the market is not in surplus, subsidized exports would increase U.S. market prices for products manufactured with butterfat, such as ice cream. USDA further indicated that expanding the use of DEIP is not possible as the program is bound by quantitative and monetary caps under WTO rules. Finally, USDA noted that the bid review and acceptance process occurs within a time span equivalent to less than one working day. Specifically, another Foreign Agricultural Service official stated that USDA responds to all bid proposals by 10:00 a.m. on the next business day after the proposals are submitted.

To the extent that USDA could identify ways to make greater use of DEIP, the effects on the dairy industry of increased exports of U.S. dairy products could be similar to the effects of an increase in demand.[108] In the short term, greater demand for dairy products would increase wholesale prices, raising farm prices and, to the extent that these changes are passed on to consumers, retail prices. While higher retail prices could cause marginal declines in domestic consumption, higher farm prices over the long term could stimulate additional production, which could put downward pressure on wholesale and retail prices. Under such a scenario, price volatility could decrease as the government balances swings in domestic manufactured product prices by adjusting its level of support for DEIP. However, economic efficiency would decrease to the extent that increased use of DEIP induces additional production that would not have occurred

[108]As is the case with other export subsidy programs, the degree to which demand is increased under a program such as DEIP depends on the degree to which the exports under the program are additional to those that would have occurred in the absence of the program.

without the government program. Finally, in relation to federal costs, while increased use of DEIP could increase federal costs for the program, these increases might be offset by decreases in the costs of purchasing and storing commodities under the price support program. Further, greater competition for milk supplies used in manufactured products could increase Class I prices, decreasing MILC payments while the MILC program remains in existence.

Eliminate DEIP

Eliminating DEIP could lower U.S. market prices and increase government costs, specifically for nonfat dry milk.[109] For example, the May 2004 USDA study estimated that exports of nonfat dry milk under DEIP account for approximately 9 percent of total U.S. production. The study further found that in comparison to just eliminating the price support program, eliminating DEIP as well would reduce wholesale nonfat dry milk prices another 5 percent below baseline levels. Under this scenario, the study reported that for 2002 through 2007, farm income would decline by approximately $5.3 billion and payments required under the MILC program would increase by approximately $900 million. Therefore, while ending DEIP would eliminate the costs of the subsidies provided by the program, these cost savings could be offset by increased MILC expenditures. Also, should DEIP be eliminated without eliminating the price support program, there would be an increase in federal costs for purchases of commodities that would otherwise have been exported.

The American Farm Bureau study reported that in the short term eliminating DEIP would cause dairy products formerly exported under the program to be commercially exported. However, the study found that over the long term dairy product prices in the U.S. market would be too high relative to world prices to allow formerly subsidized products to move as commercially exported products. In the short term, a decline in the prices of some manufactured products formerly exported under DEIP, such as nonfat dry milk and cheese, would lower the blend prices farmers receive which, in turn, would cause a decline in milk production. This reduced production could cause butter prices to increase. However, the overall effect is a decrease in both average milk prices and milk supplies. With lower prices for some manufactured dairy products and higher prices for

[109]The degree to which the U.S. market would be affected depends on the degree to which the exports under DEIP would be eliminated if the program were eliminated.

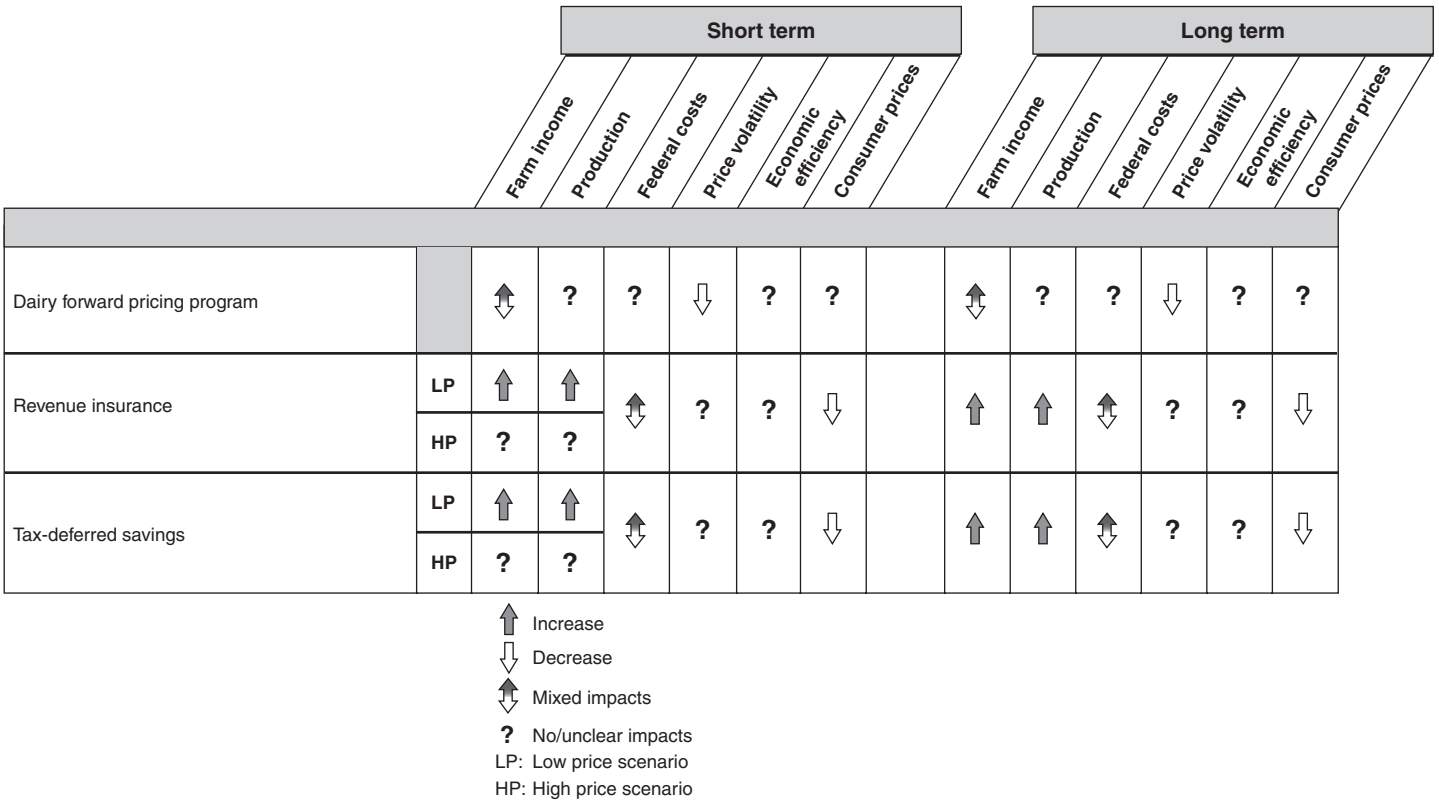
others, consumer prices may rise or fall depending on the extent to which these price changes are passed on by retailers. In other respects, the elimination of DEIP could increase price volatility because USDA would lose an outlet to help balance surplus production. However, the supply adjustment could marginally increase economic efficiency as excess supply is wrung out of the market. Further, to the extent that DEIP is providing incentives for nonfat dry milk production rather than production of other dairy products, elimination of these incentives would also marginally increase economic efficiency.

Facilitate Risk Management for Dairy Farmers

The increased volatility in farm milk prices has increased dairy farmers' interest in managing the risk that low prices will reduce farm incomes. Risk management alternatives to stabilize dairy farmers' incomes can take many forms. These include, among others, increased use of forward contracting to guarantee prices, such as through USDA's Dairy Forward Pricing Pilot Program;[110] revenue insurance policies that pay farmers when dairy proceeds fall below specified levels; and tax-deferred savings incentives that encourage setting money aside during higher income years that could be withdrawn during lower income years. Figure 41 shows the effects of options to facilitate risk management under low- and high-price scenarios over the short and long terms.

[110]Trading in milk futures and options represents another alternative for farmers to reduce the risks associated with price volatility by locking in prices, or setting price floors, for future production. This alternative would remain available to farmers even if some dairy programs, such as the dairy price support program, were eliminated.

Figure 41: Potential Effects of Options to Facilitate Risk Management on Various Policy Considerations



Source: GAO analysis based on interviews with dairy experts and reviews of relevant studies.

Note: The figure does not indicate the degree of increase or decrease for each policy consideration as it relates to a policy option. In addition, as discussed in this appendix, limitations affecting some policy options could affect the degree of an option's potential impact on a policy consideration.

Continue Dairy Forward Pricing Program

Forward contracting of milk—entering into a contract with a processor or cooperative to sell milk in the future at a guaranteed price—is one way for farmers to manage the risk that volatile prices create for their income. Although forward contracting may prevent farmers from benefiting from price increases, this risk management tool stabilizes their income and ensures that the price they receive does not fall below the contracted price. In this respect, forward contracting, like the MILC program, limits the decline in farm income from a fall in farm milk prices.

Most, but not all, dairy cooperatives offer their members the ability to enter into forward contracts to guarantee the prices members will receive for

their milk. One option that could allow dairy farmers to make more use of forward contracting to manage their price risk would be to extend and expand the Dairy Forward Pricing Pilot Program to cover Class I milk. The program was mandated by the Congress in 1999 and is scheduled to expire at the end of 2004.[111] Under the pilot program, farmers are not allowed to enter into forward contracts for Class I milk. However, if the program were extended or made permanent, it could also be expanded to allow forward contracting on all classes of milk.

The forward contracting pilot program offers farmers who sell to proprietary processors an option to enter into fixed-price forward contracts by providing processors with an exemption from paying the otherwise required FMMO minimum prices. (Dairy cooperatives are already exempt from paying the FMMO minimum prices.)[112] Normally, when either cooperatives or proprietary processors buy milk from farmers under forward contracts, they can offset their risk that farm prices might be lower at the end of the contract period (in which case they would pay more for milk than their competitors who buy later at the lower price) with a futures market transaction in which they would gain an amount equivalent to the decrease in the farm price of milk.[113] However, when prices rise during the contract, the cooperatives or processors will lose money on the futures market transactions and cannot afford to pay farmers more than the contracted price. The pilot program encourages proprietary processors to enter into forward contracts with farmers by exempting these processors from having to pay farmers the relevant order minimum

[111]Legislation has been introduced in the U.S. House of Representatives and the U.S. Senate to make permanent the authority for the Dairy Forward Pricing program, H.R. 3308 (2003) and S. 2565 (2004).

[112]As a practical matter, it could be difficult for cooperatives to continue paying their members less than the regulated minimum price for an extended period of time because farmers could choose to market their milk with a different cooperative. However, farmers' ability to switch cooperatives could be limited by the extent to which individual cooperatives dominate milk marketing over a wide area.

[113]Most forward contracts for milk are for a base Class III price, which in multiple component pricing orders, is the sum of milk component values per hundredweight of milk at standardized test. Class III milk futures and options contracts are actively traded on the Chicago Mercantile Exchange. To offset their price risk from the forward contracts to buy milk, proprietary processors and cooperatives can take an equal but opposite position in the futures market by selling futures contracts for an equivalent amount of Class III or IV milk. Then, if the price of farm milk falls during the life of the contract, when the contract period ends, their gain in the futures market will equal their loss from buying milk under a fixed-price forward contract rather than buying after the price fell.

price for the portion of their milk that is under forward contract. Without this program, proprietary firms might not readily enter into forward contracts because if they offset their risk of a price decline in the futures market and the prices were to rise above the contract price, they might have insufficient funds—including their futures market loss—to pay their forward-contracted farmers the minimum price.

Some cooperatives have opposed proposed legislation that would make permanent the authority for forward contracting by proprietary processors on the grounds that allowing those processors to pay farmers less than the minimum price could undermine the federal order pricing system. However, one academic analysis of options to address price volatility indicated that this exemption would not undermine the federal order pricing system because while proprietary processors could pay farmers less than the minimum price, these processors would still have to pay minimum class prices into their federal order pools.[114] Another academician told us that even if allowing forward contracting on Class I milk caused farmers to receive lower minimum prices in return for reduced risk, neither that price reduction nor any other rationale would be a good reason for not making fluid milk eligible for forward contracting by those farmers who want to enter into such contracts.

In October 2002,[115] USDA released a report that examined the performance of the pilot program from its inception, in September 2000, through March 2002. The report found that the average monthly price received for milk sold under forward contracts authorized by the pilot program was lower than the average monthly price that would have been received for that same milk if it had not been under contract by about $0.50 per hundredweight, but that the variation in price for milk sold under forward contracts was much less. At times the contract price exceeded the price that would have been received without the contracts, and at times it was lower. More recent USDA data show that the contract price exceeded the price that would have been received without the contracts in each month

[114]Bob Cropp, "Innovations To Address Price Risk Management and Price Volatility" in *Dairy Policy and Product Innovation*, 11th Annual Workshop for Dairy Economists and Policy Analysts, April 15-16, 2004.

[115]"A Study of the Dairy Forward Pricing Pilot Program and Its Effect on Prices Paid Producers for Milk," prepared for the Senate Committee on Agriculture, Nutrition and Forestry and the House Committee on Agriculture by Dairy Programs, Agricultural Marketing Service, U.S. Department of Agriculture.

from April 2002 through July 2003, but for the remainder of 2003 the contract price was lower. On average, for the entire period from April 2002 through December 2003, the contract price was about $1.40 per hundredweight higher.

Participation in the program during the period covered by the USDA report was relatively small and was concentrated most heavily in the Upper Midwest Order, which has a low Class I utilization rate. More recent USDA data show that participation remained relatively low through the end of 2003. Farmers in orders with high Class I utilization rates had less opportunity to participate because Class I milk was ineligible, so it is uncertain whether participation rates in those orders would have been higher if farmers were allowed to enter into forward contracts for Class I milk. One academic source also noted that even if the program were expanded to include Class I milk, fluid milk processors might be reluctant to engage in forward contracting for this milk because there is no good hedge in the futures market for Class I prices. In addition, the USDA study reported that participating farmers were generally more accustomed to using risk management tools than were nonparticipants. Farmer education on using forward contracting may be important to increase participation.

Provide Revenue Insurance

Another option to help dairy farmers manage their price risk is revenue insurance. Revenue insurance allows farmers to protect themselves against loss of revenue from, for example, low market prices, high feed prices, or reduced production due to natural disasters. Revenue insurance can stabilize farm income, reducing the need for direct payments such as under the MILC program, during periods of low prices. Whether there would be a savings to the government would depend on whether the subsidies required to induce farmers to participate in the insurance program would offset the savings from reduced direct income support. Overall production could increase with this type of option because the revenue insurance would step in when prices are low representing in effect, a countercyclical payment. With this type of income support, downward supply adjustments during periods of low prices might not happen as quickly. Consumers would then benefit from prolonged periods of low prices to the extent that price changes are passed through the retail level.

USDA's Risk Management Agency currently operates several pilot programs in selected states, using three different approaches to revenue insurance. Although none of these programs applies to dairy farming, they could, in theory, be extended to cover dairy farmers. Doing so could be difficult, however, because the complexity of the dairy industry and the

variation in management expertise among farmers would make it hard to estimate the probability of losses, a calculation that is necessary for pricing the insurance.

Institute Tax-Deferred Savings

Tax-deferred savings accounts allow farmers to manage fluctuations in farm income by accumulating cash reserves during higher income years with deferral of some tax liability. Farmers could then withdraw from these accounts in lower income years and, in essence, receive tax benefits if they accumulated funds in these accounts. One study suggested that farmers might be more comfortable with this risk management tool than with forward contracting because these accounts resemble individual retirement accounts and other familiar tax-deferred savings vehicles.

Similar to revenue insurance, this option has the potential for reducing direct income support payments from the government, such as MILC payments, by stabilizing farm income during periods of low prices. However, whether these accounts worked as a risk management tool would depend on whether the authorization of these new accounts—with their tax benefits—led to substantial additional savings by farmers in higher income years, or whether the new accounts were simply funded with savings that would have been made anyway in other, not tax-favored, accounts. Also, like revenue insurance, withdrawals from tax-deferred savings would represent, in effect, countercyclical payments during periods of low prices. Thus withdrawals from tax-deferred savings accounts could maintain overall production by dampening supply adjustments during periods of low prices. Similarly, consumers would benefit from the prolonged periods of low prices to the extent that price changes are passed through the retail level.

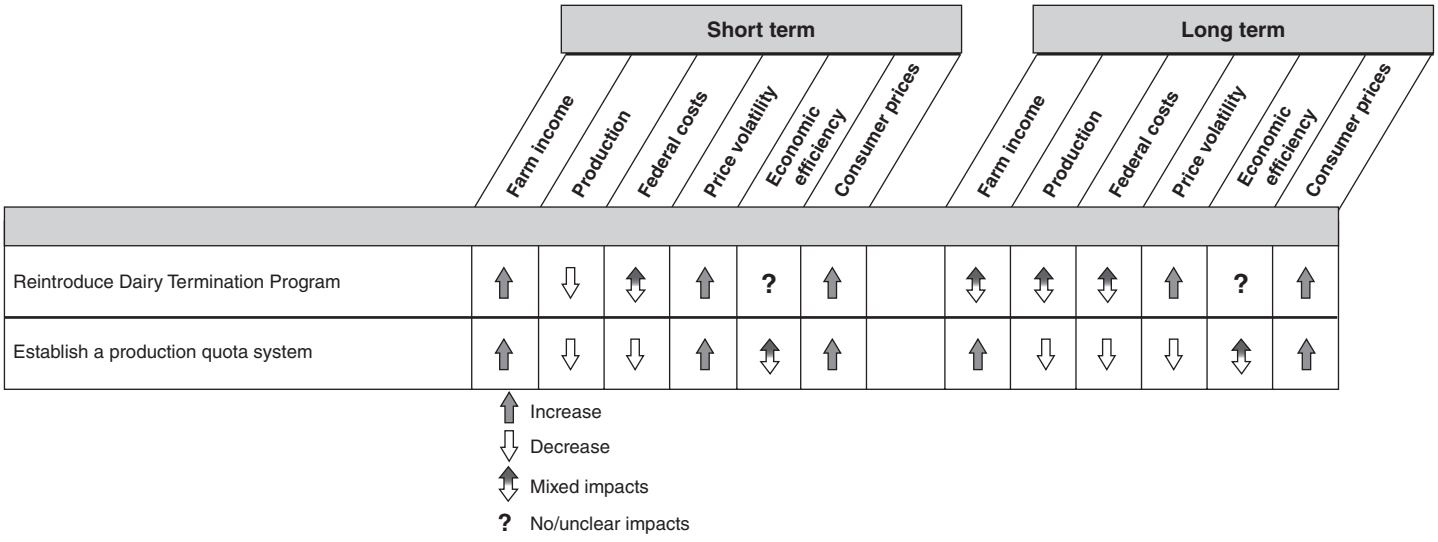
Many issues would have to be resolved to start this type of account, such as the amount that farmers would be allowed to deposit in any year, whether the government would match any funds deposited, and whether there would be restrictions on farmers' ability to withdraw funds from the accounts based on price drops or income losses. Canada and Australia both offer these accounts, and they were first proposed in the United States in 1996. Since then, there have been several proposals to adopt them here, but none has been implemented.

Manage Raw Milk Supplies

According to one dairy expert, given the long-term declining demand for fluid milk as well as the increasing productivity of dairy farmers, the best way to maintain farm income is through some form of effective supply

management. Following periods of excess supply in the 1980s, the U.S. government introduced supply management initiatives, such as the Dairy Termination Program.[116] Other options, such as production quota systems, have been tried by different dairy-producing nations. Thus, a number of options have been discussed to try to manage dairy supplies, including reintroducing a program similar to the earlier Dairy Termination Program, or establishing mandatory supply controls through quota allocations, as has been done in other countries. Figure 42 shows the effects of options to manage raw milk supplies under low- and high-price scenarios over the short and long terms.

Figure 42: Potential Effects of Options to Manage Raw Milk Supplies on Various Policy Considerations



Source: GAO analysis based on interviews with dairy experts and reviews of relevant studies.

Note: The figure does not indicate the degree of increase or decrease for each policy consideration as it relates to a policy option. In addition, as discussed in this appendix, limitations affecting some policy options could affect the degree of an option's potential impact on a policy consideration.

[116]Another initiative was the Milk Diversion Program. Both of these programs were in effect for only a short time.

Reintroduce the Dairy Termination Program

One option that has been discussed to manage milk supplies is to reintroduce the Dairy Termination Program.[117] This program was first tried as part of the Food Security Act of 1985. Under the Dairy Termination Program, farmers submitted competitive bids for the minimum raw milk price per hundredweight for which they would be willing to comply with the program requirements. If their bids were accepted, farmers were required to sell for slaughter or export their entire herds and not participate in dairying for the next 5 years. The program was in effect from April 1986 through September 1987 and resulted in the removal of more than 1 million cows, or about 9 percent of the national dairy herd in 1985. In total, this culling of the national dairy herd was estimated to decrease milk supplies by about 39.4 billion pounds between 1986 and 1990 at a cost of more than $1.8 billion.[118] California farmers accounted for the largest portion of this reduced production, but farmers in southeastern states had the highest rates of participation.

In a 1989 report looking at the effects of the Dairy Termination Program, we indicated that it was unlikely to have a lasting effect on milk production, given that some participants would likely return to production after the 5-year waiting period.[119] In the short term, high market prices resulting from lower levels of production reduced federal purchases of surplus dairy products. In 1989, we estimated that these reduced purchases provided a net cost savings to the government of $2.4 billion for fiscal years 1986 through 1990. However, over the long term, we predicted that increased production would bring the return of excess milk supply.

The effects of reintroducing this supply management alternative would depend on a variety of factors. In particular, the effects on federal costs and milk production would depend heavily on how much farmers needed to be paid to terminate their herds and agree not to produce for a specific period of time. Farmers' decisions about whether to participate in a new Dairy Termination Program at a certain price would rest on the individual profitability of dairy farms, the long-term production outlook of the

[117]The National Milk Producers Federation's Cooperatives Working Together program, started in July 2003, is an industry-led supply management initiative. Among other things, it includes a herd retirement element similar to the Dairy Termination Program.

[118]Over one-third of this cost was funded by an industry assessment.

[119]GAO, *Dairy Termination Program: An Estimate of Its Impact and Cost-Effectiveness*, GAO/RCED-89-96 (Washington, D.C.: July 6, 1989).

individual farmer, and the expectation of certain market conditions. For example, with today's high market prices, farmers may be unlikely to agree to stop production except at payment levels that could make the program prohibitively expensive. During low-price periods, the program could potentially reduce supply to a level that reduces overall government costs for both the price support program and the MILC program, as long as the latter program remains in existence. In either case, the program would likely increase price volatility and consumer prices, although higher consumer prices for manufactured products could be mitigated by additional imports. Given the fact that farmers in southeastern states had the highest rate of participation in the Dairy Termination Program, a reintroduction of this program is likely to strengthen western shifts in production. As compared to western farmers, eastern farmers tend to have lower profitability and higher costs of production. Consequently, they are more likely to participate in this kind of program and less likely to return to production after the program, because their re-entry costs are higher. Thus, a new Dairy Termination Program could have disparate regional effects.

Establish a Production Quota System

A second option that has been discussed for supply management is to implement a quota system, as has been done in Canada and in the European Community.[120] Under this option, production would be controlled by allocating production shares, or quota shares, limiting how much milk each dairy farmer could market. Such quota shares could be set based on a farmer's historical marketing level. Any milk marketed over the allocated quota shares would be priced far below the cost of production. Quota shares could be traded and increased over time as additional supplies are needed.

A quota system would help manage supply by taking away incentives to increase production based on the benefits provided by government

[120]California also has a quota system; however, it does not function as a supply management program. In California, milk receipts are pooled, and those farmers who own quota shares get $1.70 per hundredweight more than the California butter/nonfat dry milk/cheese price for the number of quota shares they own. The original allocation of quota shares was made in 1969 based on Class I sales, and because not many additional quota shares have been allocated, quota shares currently cover about 25 percent of California's milk production. Most farmers have some quota shares, but some larger newer operations have come into the system without a quota. While the California quota shares are traded through brokers, people are not allowed to purchase them for investment purposes. Purchasers have to be farmers, and the quota shares come with minimum shipping requirements. One representative of a major California dairy cooperative said that the effect of the quota system is purely a way to distribute the proceeds of California's classified pricing system.

programs, such as MILC or the price support program. Moreover, compared to other supply management alternatives, a quota system has a greater likelihood of achieving long-term supply management, because production incentives would continue to be limited by the number of quota shares available in the system. With more effective supply management, federal costs for other programs such as MILC and the price support program would be reduced. Additionally, federal costs for administering a quota system are relatively low. In the short term, price volatility might increase, but as the market adjusts to a stabilized production level, long-term price volatility could be reduced.

Nonetheless, there are some drawbacks to implementing a quota system. As quota shares reduced production, consumer prices could increase. While demand for fluid milk products is relatively price inelastic, higher prices could reduce long-term consumption by providing incentives to purchase substitute goods. Also, the distribution of quotas would provide a substantial benefit to current farmers to the detriment of farmers who might try to enter the system in the future, entrenching geographical production patterns and stifling incentives for technological enhancements. Given the high production costs in some areas and the greater efficiency of larger, newer dairy operations, this would represent an economic inefficiency because milk would not be produced and marketed as cheaply as possible. However, this drawback could be limited to the extent that a well-functioning market is established to trade quota shares. If participation costs in this market were kept low, farmers would still realize incentives to adopt technology enhancements. The most efficient dairy farmers' willingness to pay for additional quota shares would represent their cost advantage over less efficient farmers plus some assessment of risk. To the extent that this willingness to pay was greater than the profits realized by less efficient farmers, these less efficient farmers would have an incentive to sell their quota shares to more efficient farmers. Thus, in the long term, the quota system might not hamper increased economic efficiency if trade is relatively easy.

Comments from the U.S. Department of Agriculture

Note: GAO comments supplementing those in the report text appear at the end of this appendix.

DEPARTMENT OF AGRICULTURE
OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20250

OCT 22 2004

Mr. Lawrence J. Dyckman
Director
Natural Resources and Environment Team
Government Accountability Office
441 G Street NW., Room 2T23A
Washington, D.C. 20548

Dear Mr. Dyckman:

Thank you for the opportunity to review and comment on the Government Accountability Office (GAO) Draft Report – "Dairy Industry: Information on Milk Prices, Factors Affecting Prices, and Dairy Policy Options" dated September 16, 2004. This letter provides a summary of our general comments on the draft report.

See comment 1.

We believe that the information provided on milk prices at the farm, cooperative, and retail levels is valid. However, we would note that farm-level milk prices were not "record" low in 2002 and 2003, but rather the lowest since 1979. In addition, farm-level milk prices reached a record high in May 2004, which was the primary factor leading to record high retail prices for fluid milk during the summer of 2004. For calendar year 2004, the Department of Agriculture (USDA) projects the all-milk price will be record high and up more than $3 per hundredweight from the previous year. We continue to have reservations regarding the use of prices paid for fluid milk at commissaries as an indicator of the wholesale price of fluid milk but there seems to be no viable alternative. It is important that readers of this report are aware of this weakness in the data.

See comment 2.

See comment 3.

We largely agree with the discussion on the factors that influence the price of milk as it moves from the farm to the consumer and the characterization of economic studies of price transmission in the U.S. fluid milk market. USDA's Federal Milk Order Program, the Dairy Price Support Program, the Dairy Export Incentive Program (DEIP), and the Milk Income Loss Contract (MILC) Program affect farm and retail prices for fluid milk and dairy products. Other USDA programs, such as domestic and international food assistance programs and tariff rate quotas on imports of dairy products administered by USDA, also influence farm and retail prices for milk and dairy products. In many instances, changing one or more of these programs would alter the performance of other programs administered by USDA.

See comment 4.

The Farm Security and Rural Investment Act of 2002 (2002 Farm Bill) mandated that USDA conduct two studies including an economic evaluation of the effects of various elements of national dairy policy and of terminating Federal milk price support and supply management

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programs and allowing States to manage milk prices and supply. USDA combined these two studies into one report to provide a comprehensive economic evaluation of the effects of alternative dairy policies. That report combined the work of more that 20 researchers from 10 universities with information provided by researchers at USDA and was submitted to Congress on September 10, 2004. The USDA report provides quantitative estimates of the effects on producers and consumers and the cost of Federal programs under various policy scenarios.

See comment 5.

Appendix VII of the draft report provides a qualitative, indeterminate discussion of the effects of recent Federal dairy program changes and alternative policy options. This appendix seems to be a compilation of policy recommendations that are examined independently and within the existing program structure. GAO should make it clear to the reader the caveats of this type of analysis. In some instances, this section of the report mischaracterizes the operation of current programs and the effects that changes to current programs or the introduction of new programs would have on program outlays, producers, and consumers. These concerns are as follows:

See comment 6.

See comment 7.

- MILC Program – The draft report indicates that producers may maximize payments by reorganizing their farming operation to increase production eligible for payments and by choosing the month in which they are eligible to receive payments. Under the 2002 Farm Bill, USDA is required to use the same definition of farming operation as used in previous dairy market loss payment programs. We have no evidence to indicate that farmers are abusing the program by reorganizing their farming operations. In addition, USDA regulations prohibit a producer from selecting a month to receive payments if the month has already begun or changing a previously selected start month after the 15th of the month before the month selected. Furthermore, once monthly payments begin, the producer has no discretion in determining which month or months to receive payments.

See comment 8.

See comment 9.

- DEIP – The draft report contains several options for improving the operation of DEIP. However, the reliance by GAO on the American Farm Bureau study appears to have led to several misconceptions. The DEIP is administered by the Foreign Agricultural Service (FAS) – an agency within USDA. Since 1995, USDA has continually exported under the DEIP the maximum amount of cheese and nonfat dry milk permitted under World Trade Organization (WTO) rules, while DEIP assisted exports of butterfat have varied depending on market conditions. FAS has worked closely with the dairy industry to ensure that our country and annual allocations optimize our longer-term market development prospects and minimize any potentially detrimental effects on our domestic market. Expanding the use of the DEIP is not a legitimate option. Under the WTO trading rules, the DEIP is not only bound by quantitative and monetary caps, but also product-specific restrictions that limit its use to the current range of eligible commodities. Further, given that the bid review and acceptance process occurs within a time-span equivalent to less than one working day, we believe the process is timely and efficient.

See comment 10.

- Dairy Price Support Program – We believe the Dairy Price Support Program has been effective in supporting the price of milk. We continue to work with the dairy industry to monitor the operation of the program to ensure that the price of milk is being supported at $9.90 per hundredweight as mandated by the 2002 Farm Bill. USDA has no authority to eliminate the program and has not proposed or is not considering any proposal to eliminate the program. Elimination of the price support program would require Congress to amend the 2002 Farm Bill.

See comment 11.

- Federal Milk Order Program – GAO correctly captures an objective of the Federal Milk Order Program which is to stabilize milk marketing conditions between farmers and the first buyers of milk. However, it is a misstatement to suggest that a Federal milk order objective is "to ensure an adequate level of milk production." That objective is the objective of the Dairy Price Support Program. Federal milk orders help assure an adequate supply of milk for fluid use in areas where demanded, but that supply may come from local or distant producers, whoever can fill the supply most efficiently. The minimum Federal milk order prices established at a location under the orders may cover the costs of an adequate local production or they may not. The minimum prices are limited by the cost of supplying that market from non-local sources. Economic forces generate prices above the minimum prices in most markets.

See comment 12.

We agree with GAO that there are several marketing conditions occurring within the purview of Federal milk orders which can not be considered orderly. Price inversions and negative producer price differentials, and the incentives they create to market milk outside of the Federal milk order system (de-pooling) are noted. We also agree that the cause of these disorderly marketing conditions is price volatility in wholesale dairy product markets. However, Federal milk orders cannot directly address price volatility in wholesale dairy product markets. Therefore, GAO's options for changing Federal milk orders fail to address the underlying source of disorderly marketing conditions for milk and dairy products.

See comment 13.

Federal milk orders provide separate classes for milk used in the production of butter and nonfat dry milk and for milk used in the production of cheese. Minimum prices for milk in these classes are priced by product price formulas which include fixed make allowances. GAO concludes that because of this pricing method, "manufacturers do not have an incentive to shift production to the higher-valued uses because any gains they might have realized for selling a higher-priced product would be negated by the fact that their manufacturing allowance is fixed." This rationale fails to recognize that in 2002 about 86 percent of nonfat dry milk, 71 percent of butter, and 40 percent of total cheese was manufactured by cooperatives. Twelve cooperatives, including the four largest, own all three types of plants. Regardless of manufacturing costs in the formula, it is in the best interest of a cooperative and its members if the cooperative shifts milk into the use

See comment 14.

that returns the highest value to its membership taking into account pool draws and product price premiums. While these adjustments may be slow to occur, they do occur as evidenced by the changing relationship of the Class III and Class IV prices.

What may retard the shifting of milk to the highest valued use is that as there are fewer and larger manufacturing plants. As transportation costs rise, the cost of transporting milk to a plant making higher valued products may more than offset benefits that would be received from making the higher valued product. As the use of reverse osmosis and ultra-filtration technologies expand in the industry, the transportation cost factor will be substantially reduced.

GAO proposes adopting a competitive pay price to establish class prices under Federal milk orders. This option was considered prior to implementation of Federal milk order reform on January 1, 2000. USDA and a committee of academicians spent considerable time trying to devise a competitive price series that could be used to establish minimum class prices under Federal milk orders. However, no such competitive price series could be identified by either the committee or USDA, and GAO does not identify or indicate how to create such a price series.

See comment 15.

GAO also proposes combining Class III and Class IV into a single manufacturing milk class. Again, no specifics are offered as to how milk in such a class would be priced. Depending upon the price established for that class, the manufacturers of butter and nonfat dry milk, or of cheese, occasionally could be required to account to the pool for a greater value than the value returned by wholesale product markets which could lead to disorderly marketing conditions.

See comment 16.

In the section on eliminating the Federal Milk Order Program, GAO indicates that an objective of Federal milk orders is to provide for a local supply of fresh milk. This is not an objective Federal milk orders. In USDA's response to a 1988 GAO study, we stated: "The objectives of Federal milk orders are to promote orderly marketing conditions in fluid milk markets, to improve the income situation of dairy farmers by establishing minimum milk prices, to supervise the terms of trade in milk markets in such manner as to achieve more equality of bargaining between producers and milk handlers, and to assure consumers adequate supplies of good quality milk at reasonable prices."

See comment 17.

Federal milk orders help assure an adequate supply of milk for fluid use in areas where demanded, but that supply may come from local or distant producers, whoever can provide fluid milk most efficiently. The Class I price surface does in fact reflect the cost of moving milk from surplus to deficit markets as estimated by academicians at Cornell University (Pratt, et al, "A Description of the Methods and Data Employed in the U.S. Dairy Sector Simulator, Version 97.3," Department of Agricultural Resource and Managerial Economics, Cornell University, July 1997).

See comment 18.

See comment 19.

Mr. Lawrence J. Dyckman
Page 5

Federal milk orders continue to accomplish their stated objectives and for that reason the program continues to be supported by the majority of producers and fluid milk processors. As milk marketing has changed and marketing problems have developed, the industry has come to USDA to request amendments to the program to address their concerns. Through the formal hearing process, orders have continued to evolve and remain current and vital to the industry. We do not believe that the rulemaking process inhibits the ability of USDA to respond to changing market conditions or the marketing of new dairy products.

Again, we appreciate the opportunity to review the draft report. We request that our letter be cited in the GAO report. Detailed comments on the draft report by USDA's Agricultural Marketing Service, Farm Service Agency, Economic Research Service, Foreign Agricultural Service, and Office of the Chief Economist were provided earlier.

Sincerely,

for J. B. Penn
Under Secretary
Farm and Foreign Agricultural Services

Bill Hawks
Under Secretary
Marketing and Regulatory Programs

The following are GAO's comments on the Department of Agriculture's letter dated October 22, 2004.

GAO Comments

1. We revised the report to reflect that farm prices during 2002 and 2003 were the lowest since 1979.

2. We revised the report to reflect that USDA has estimated that average 2004 farm prices will be more than $3 per hundredweight higher than they were in 2003.

3. We agree that there are limitations on the use of commissary data as a proxy for proprietary wholesale data. However, as noted in USDA's comments, there seems to be no viable alternative. We revised the report to further discuss the limitations of using these data.

4. During the course of our work, USDA declined to provide us with a draft of its study. Although USDA indicates that it submitted its study to the Congress on September 10, 2004, we were unable to obtain a copy until early October 2004, well after we had provided a draft of our report to USDA for review and comment. Because of this timing, we were unable to fully consider and analyze the results of USDA's study and related documents. Furthermore, although USDA notes that it developed quantitative estimates of the effects on producers (dairy farmers) and consumers and the cost of various federal programs under various policy scenarios, the scope of USDA's analysis was more limited than the range of policy options discussed in our report.

5. We agree that the potential effects of various policy options in appendix VII are examined independently and qualitatively within the existing program structure. Our discussion of dairy policy options are not policy recommendations. As stated in the report, to identify these policy options and their potential impacts we relied heavily on a synthesis of the views of leading dairy experts and the results of an extensive literature search, including our review of more than 50 studies and other publications. Time and resource constraints for completing our work precluded us from developing or contracting for the use of an economic model that would have provided quantitative estimates of these potential impacts. In addition, some of the policy options would have been difficult to model and quantify, such as the potential impacts of accelerating USDA's hearing and rulemaking process for amending FMMOs. The report also notes that we compared the policy options

identified against a baseline scenario of policies in place as of August 2004. This baseline scenario existed at the start of our work and was needed to provide a consistent context for our analysis.

6. Regarding caveats, as noted in the report, we examined the impact of federal dairy program changes and policy options on six policy considerations: farm income, milk production, federal costs, price volatility, economic efficiency, and consumer prices. We acknowledge in the report that other stakeholders may have different views on the importance of these policy considerations or other considerations that we did not include in our analysis. The report also states that the potential effects of policy options on these considerations could vary depending upon economic conditions and other policy decisions. In this regard, we did not assess the options' overall economic or budgetary impacts, or their consistency with U.S. international trade commitments or positions in ongoing negotiations. As indicated in the report, each option has varying potential impacts on the policy considerations used in our analysis. Despite these caveats, we believe this analysis is informative and helpful to congressional decision makers who must weigh competing interests in determining dairy policy.

7. We have made some technical corrections and clarifications in light of USDA's comments, but we do not agree that we mischaracterized the operation of current programs or the effects that changes to current programs or the introduction of new programs would have on program outlays, producers (dairy farmers), and consumers. See also our responses in comments 8 through 19 below.

8. Although during the course of our work, USDA officials suggested that it was possible that dairy farmers might divide their holdings to make more of their milk eligible for compensation through the MILC program, we deleted this discussion from the report in light of USDA's comment that it has no evidence that farmers have done this.

9. We correctly state in the report that farmers may choose the month that they begin accepting their payments. However, in response to USDA's comment we revised the report to clarify that farmers' discretion on when they receive MILC payments is limited by USDA's regulations for implementing this program. Specifically, these regulations prohibit a farmer from selecting a month to receive payments if the month has already begun, if the month has already passed, or during which no

milk was produced. A farmer also cannot change a previously selected start month after the 15th of the month before the month selected. Once monthly payments begin, a farmer has no discretion in determining in which month or months to receive payments.

10. The discussion of expanding the use of DEIP in the draft report did not suggest that WTO rules, including quantitative and monetary caps and product-specific restrictions, be violated. Rather, this discussion identified ways in which dairy experts suggested that DEIP might be used more effectively as a marketing tool. However, we have revised the language in the report to more fully reflect USDA's views and to minimize confusion as to what we mean by increasing the use of DEIP as a marketing tool without exceeding WTO caps.

11. We revised the language in the report to clarify that USDA has not proposed or considered any proposal to eliminate the Dairy Price Support Program. However, USDA analyzed the potential effects of eliminating this program in the study it prepared in response to the 2002 Farm Bill mandate.

12. We agree with USDA that ensuring an adequate level of milk production is not an objective of the FMMO program. We revised the report accordingly and added language suggested by USDA to better describe the FMMO program's objectives.

13. We agree that price volatility contributes to disorderly market conditions, and we revised the report to better explain the potential causes of price volatility. We also agree that FMMOs cannot directly address price volatility in wholesale dairy markets. However, by setting minimum prices that must be paid to farmers for raw milk, the FMMOs can affect the extent to which price volatility is reflected in the prices that farmers receive.

14. We revised the report to reflect that cooperatives owning the capacity to produce multiple products may still have an incentive to shift milk to the higher-valued use, in order to provide greater returns to their members. We also expanded our discussion of other factors that might influence how milk is used, such as transportation costs and changes in processing technology.

15. We acknowledge that the report does not explain how a competitive pay price series could be created for use in the FMMO program.

However, this option was identified by stakeholders during the course of our work. Other options discussed in the report also may present challenging implementation issues and in many cases the report discusses those issues. Nonetheless, we revised the report to reflect that USDA and a panel of academicians attempted to devise a competitive pay price series but ultimately were unsuccessful. We also revised the report to note that a key difficulty in developing a competitive pay price series is the need for data that are not already influenced by the FMMO classified pricing system.

16. We acknowledge that the report does not explain how, after combining Class III and Class IV, milk would be priced in the expanded class. However, this option was identified by stakeholders during the course of our work. Other options discussed in the report also may present challenging implementation issues and in many cases the report discusses those issues. Nonetheless, we revised the report to reflect that a barrier to combining Class III and IV is identifying an appropriate pricing formula that considers the products in an expanded class.

17. We revised the report to reflect this clarification and added language suggested by USDA to better describe the FMMO program's objectives.

18. We agree with USDA that any area's supply of fluid milk can come from local or distant farmers. USDA noted that the Class I price surface, generated from different minimum Class I prices in different locations, reflects the cost of moving milk from surplus to deficit markets. However, as we pointed out in a 1988 report, when the price surface does not also account for regional differences in production costs, it can result in incentives for overproduction in certain regions. Furthermore, the Class I price surface that resulted from the 2000 federal order reform differs from USDA's recommended option.

19. The report accurately reflects the views of some stakeholders that the slowness of USDA's hearing and rulemaking process used to modify FMMOs inhibits the agency's ability to respond to changing market conditions or the marketing of new products. The report also discusses challenges USDA faces to improving this process while ensuring the promulgation of economically sound regulation. Further, the report notes that USDA has made efforts to improve the hearing process, particularly in the way it evaluates its contracts for hearing transcripts.

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