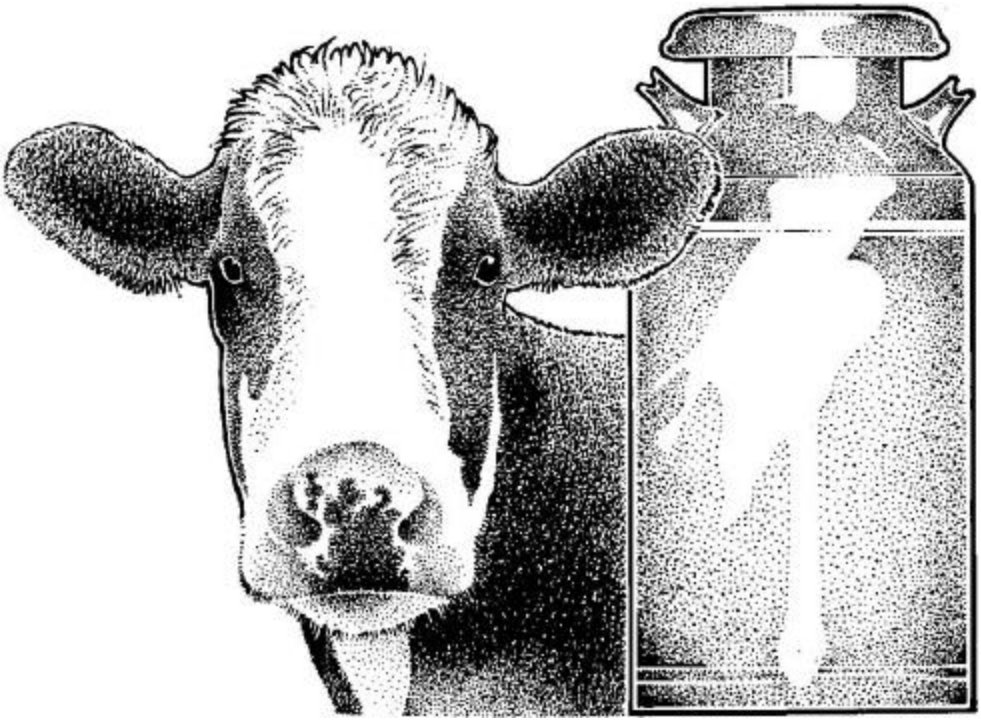
An Economic Analysis of the Southern Dairy Compact:

Implications for Kentucky



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An Economic Analysis of the Southern Dairy Compact: Implications for Kentucky

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Foreword

House Joint Resolution 159 of the 1998 Kentucky General Assembly urged the Legislative Research Commission to study the Commonwealth of Kentucky's participation in the Southern Dairy Compact. This research report, the product of that study, identifies and quantifies the economic implications of Kentucky's joining the Southern Dairy Compact by assessing the potential impacts on each sector of the dairy industry.

This report was prepared by Perry Nutt of the Legislative Research Commission. The assistance of the Kentucky Agricultural Statistical Service and various offices of the USDA in supplying information is gratefully acknowledged.

Robert Sherman
Director

Frankfort, Kentucky
March 2000

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GLOSSARY

1996 FAIR Act	1996 Federal Agricultural Improvement Reform Act
1937 AMAA	1937 Agricultural Marketing Agreement Act
ARMS	Agricultural Resource Management Study
BFP	Basic Formula Price
CCC	Commodity Credit Corporation
Class I price	Price of milk used for fluid purposes
Class II price	Price of milk used for soft dairy products
Class III price	Price of milk used for hard dairy products
Class I differentials	Amount by which a particular federal milk marketing order's Class I price exceeds the Class II price
FBAP	Farm Business Analysis Program
FCRS	Farm Cost and Returns Survey
FMMO	Federal Milk Marketing Order Federal regulation establishing minimum prices for milk used for different products
GAO	General Accounting Office
HJR 159	House Joint Resolution 159 A resolution passed by the 1998 Kentucky General Assembly authorizing a study of the effects of the Southern Dairy Compact on Kentucky
LRC	Legislative Research Commission Research staff of Kentucky's General Assembly
NAIC	North American Industrial Classification System
NDC	Northeast Dairy Compact An agreement among six northeastern states to regulate the price of fluid milk
NDCC	Northeast Dairy Compact Commission Entity responsible for administering the conditions of the NDC
SB 304	Senate Bill 304 Enabling legislation allowing Kentucky to enter into the Southern Dairy Compact
SDC	Southern Dairy Compact An agreement among states in the southeastern U.S. to regulate the price of fluid milk
SDCC	Southern Dairy Compact Commission Entity responsible for administering the conditions of the SDC
OMB	Office of Management and Budget
Over-order premium	Amount by which fluid milk price exceeds the federal minimum order price for fluid milk
USDA	Unites States Department of Agriculture
WIC	Special Supplemental Food Program for Women, Infants, and Children

SUMMARY

Kentucky is both an importer and exporter of dairy products; however, over the past two decades the Commonwealth has moved from a milk surplus state to a milk deficit state. Kentucky's dairy sector has followed national trends—a decreasing number of dairy farms and dairy cows—while milk production per cow has increased. One difference is that total milk production in Kentucky has fallen, because the reduction in dairy cows has exceeded the increase in milk production per cow. As a result, Kentucky's share of U.S. milk production has been falling.

In response to the changes that have taken place in Kentucky's dairy industry, the 1998 regular session of the Kentucky General Assembly enacted SB 304 (KRS 260.670) which allows Kentucky to enter into the Southern Dairy Compact (SDC) along with other states that have passed identical legislation. The SDC is modeled after the one dairy compact operating in the U.S.—the Northeast Interstate Dairy Compact (NDC). So far 14 states in the southeast have passed the compact legislation. Congressional approval is the last step remaining before the Southern Dairy Compact can become operational.

The system of federal milk marketing orders establishes minimum milk prices for producers while allowing states to regulate the prices above the federal minimum. Many states have been unsuccessful in establishing prices above the federal minimum. With milk being a commodity crossing state lines, courts have ruled that individual state action was not legal under the Interstate Commerce Clause of the U.S. Constitution, thus the need for cooperation among states.

Dairy compacts are designed to regulate the price of fluid milk in a geographical area. By establishing a fluid milk price, a compact attempts to stabilize the farm and retail price of milk. By establishing a dairy compact, the participating states can more effectively establish fluid milk prices above the federal minimum price.

A dairy compact may establish an over-order price for fluid milk, thereby stabilizing and enhancing the fluid portion of a dairy farmer's milk check. The compact price acts as a price floor for all fluid milk sales in the compact region. The difference between the compact price and the minimum federal order Class I (fluid milk) price is then collected, with the proceeds distributed to all dairy farmers that market milk in the compact. In any month that the Compact price exceeds the federal minimum price, dairy farmers selling milk in the region will benefit. To the extent that processors and retailers can pass on higher milk costs, higher consumer expenditures for milk will occur. In other words, given that processors and retailers choose not to lower their margins on

fluid milk, then the benefits at the farm level will be a result of increased consumer expenditures on fluid milk.

Since approximately 27% of the milk production in the U.S. will fall under some type of compact pricing with the existence of the NDC and the establishment of the SDC, it is likely that national dairy markets could be affected under such a scenario. In this study, a national milk model was utilized to account for the interrelationships between Compact and non-Compact regions. The results from the analysis presented in Section VI indicate there are a number of interrelated effects within a Compact region and in non-Compact regions that could occur as the SDC is implemented.

The impacts of Kentucky's joining the SDC can be summarized as follows:

- Milk marketings, in terms of quantity and value, should increase in response to higher farm milk prices;
- Percent of milk used for fluid purposes and the per capita consumption of fluid milk should fall as fluid prices increase;
- Retail expenditures on fluid milk should increase as fluid prices increase;
- Percent of milk used in manufacturing purposes should increase as milk production increases;
- The increase in the fluid prices will be offset to some extent by a price decrease for manufacturing products; and
- Farm price of milk will increase by a smaller amount than the Compact premium due to diverting more milk to manufacturing purposes, less to fluid purposes, and lower manufacturing milk prices.

The extent to which a dairy compact can raise farm milk prices is dependent on the Compact premium, fluid utilization in the market, and feedback effects. Farmers in Kentucky, where fluid utilization is high, will benefit more than lower fluid utilization states. However, the more milk comes under Compact pricing, the more milk production should increase. The subsequent surge in surplus milk could depress national dairy commodity prices, which serve as the basis for class I prices; therefore, Compact premiums will be offset to some extent by lower class prices.

A portion of the Compact premium could be passed through to consumers through fluid processors and retailers. Higher retail fluid milk prices reduce fluid milk consumption and fluid milk utilization, raising retail milk expenditures in Compact states. Also, if a fixed dollar markup is used, with lower fluid milk sales, retailers and processors also share a small portion of the burden associated with the Compact premium.

As milk now moves over different regions, once the SDC is implemented, feedback effects could occur in non-Compact regions. These effects can be summarized as follows:

- As more surplus milk reaches non-Compact regions, milk prices will fall;
- As milk prices fall in the non-Compact region, production declines could occur;
- Consumers in non-Compact regions should increase their purchase as milk prices fall;
- Fluid utilization should increase, in the non-Compact regions, as milk prices fall; and
- Estimated net negative effect on milk prices as price increase due to higher fluid utilization is not enough to offset the price decrease associated with more milk moving into the non-Compact region.

As the Compact premium leads to higher fluid prices and production within the Compact region, fluid consumption will likely decline. The result is that more milk flows into manufactured dairy products. Simply put, Compacts sell some of their excess production in non-Compact regions. This excess production affects non-Compact states and, to some extent, Compact states.

Greater supplies of dairy commodities result in lower class prices in federal orders. For farmers in the Compact region, these lower class prices are offset by Compact premiums; however, farmers in non-Compact regions and states face the full impact of lower class prices. With lower farm milk prices, dairy farmers outside of the Compact are likely to lower production, leading to lower milk sales (marketings). A small offset in the non-Compact regions occurs as consumers increase their purchases of fluid milk in response to lower prices.

Overall, if Congress grants approval to the SDC, significant changes are likely to occur within the U.S. dairy industry and in the South, as over one-quarter of the nation's milk production will fall under Compact pricing. While the focus of this study has been to estimate the impact of the SDC on Kentucky, it is important to note that the Commonwealth would have likely experienced the same outcome--lower milk prices for consumers and farmers, along with reduced milk production--as non-Compact states, if Kentucky had chosen not to join the SDC. By participating in the SDC, Kentucky consumers of fluid milk products will likely face higher prices, while farm sales of milk in Kentucky will likely increase. Processors in Kentucky could experience lower volumes of fluid sales and higher volumes of manufactured dairy products and, therefore, could bear a small portion of the increased costs due to the Compact premium. Given the price elasticity of fluid milk, however, there is a strong incentive to pass along these increased costs to consumers.

SECTION I
INTRODUCTION AND BACKGROUND

Significant changes have occurred in the U.S. dairy industry during the 1900's. In the early part of the century, because of limited transportation and refrigeration, milk markets were mostly local. With improved transportation and technology, they became more regional and now resemble a national market.

Fluid (bottled) milk and dairy products are readily available to American consumers. In 1996, per capita consumption of dairy products in the U.S. totaled almost 576 lbs. Fluid milk purchases equaled 223.5 lbs., while the remaining consumption came from such dairy products as cheese, yogurt, cottage cheese, ice cream, and butter. In 1995, consumers spent an average of $297 per household on dairy products. For the southern region, which includes Kentucky, the average expenditure on dairy products was $270. As a percent of the total food purchased at home, consumers spent a little over 10% on dairy products, of which 45% was spent on fluid milk alone.

Minimum prices for milk, begun by the United States Department of Agriculture (USDA) in the 1930's, continue today. In the 1990's, renewed emphasis has been placed on the role of federal milk marketing orders (FMMO), which establish minimum prices paid and received for milk, the availability of milk supplies, and the financial viability of dairy farms.

At the federal level, three changes that would directly affect the dairy industry are now receiving considerable attention: the reform of the federal milk marketing order system; the elimination of price supports by January 1, 2000; and the implementation of the Northeast Interstate Dairy Compact (NDC).

Given the fact that milk prices have been supported for close to 60 years and considering the movement toward more market-oriented agricultural policy in the U.S. beginning with the *1996 Federal Agricultural Improvement Reform Act (FAIR)*, dairy farmers and processors are interested in the potential implications regarding the future level and variability of milk prices. Moreover, given that fluid milk and manufactured dairy products are a staple of the American diet, consumers as well as policy makers share a common interest regarding factors affecting dairy farms in Kentucky and the U.S.

SB 304

The 1998 regular session of the Kentucky General Assembly enacted SB 304, which was codified as KRS 260.670. KRS 260.670 allows Kentucky to enter into the Southern Dairy Compact (SDC). At the present time, there is one dairy compact operating in the U.S.--the Northeast Interstate Dairy Compact. The NDC, which covers six New England states, has operated since April 1997 and is set to expire September 1, 2001.

Given the unique nature of dairy compacts, the 1998 Kentucky General Assembly passed HJR 159 urging the Kentucky Legislative Research Commission (LRC) to conduct a study to assess the impact of the Commonwealth of Kentucky's participation in the SDC. The purpose of this study is to analyze the economic implications of Kentucky's joining the SDC by assessing the potential impacts on each sector of the dairy industry.

The Southern Dairy Compact: Brief Summary

A dairy compact is an agreement among states to regulate the price of milk used for fluid purposes. KRS 260.670 enables Kentucky to enter into the Southern Dairy Compact along with other states that have passed identical legislation.

The compact establishes the Southern Dairy Compact Commission (SDCC), which is the legal entity responsible for administering the conditions of the Compact. The Commission is composed of delegations from each state in the Compact region. Kentucky's delegation of five members would be appointed by the Commissioner of Agriculture. Two of the members would be at large, one would be a dairy farmer, one a dairy processor, and one a consumer.

Before KRS 260.670 can become effective, three of the sixteen states (Alabama, Arkansas, Florida, Georgia, Kentucky, Kansas, Louisiana, Missouri, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia) must enact similar legislation, and congressional approval must be obtained. So far 14 states have passed the compact legislation. Congressional approval is the last step remaining in the process.[1]

Two primary goals of the SDCC, as stated in the compact legislation, are to help ensure that dairy farming remains viable in the South and to assure consumers of a local supply of milk. The objectives of the Commission will be to create a marketing system within the region that attempts to stabilize the farm and retail price of milk and to provide an environment so that the region's dairy farmers can supply the region's milk.

Factors Affecting the Analysis

When HJR 159 was passed, it was anticipated that this study would evaluate the effects of the SDC once in operation; however, congressional approval has not been given for a Southern Dairy Compact so such an entity does not yet exist.

Originally, the NDC was implemented as a temporary measure--allowed to operate as Federal Milk Marketing Order Reform was being established--with a sunset provision of October 1, 1999. However, a federal district judge in Vermont issued a temporary restraining order in September 1999 extending the life of the NDC and postponing FMMO reform. During FY 2000 budget negotiations of the 106th Congress, the NDC was granted permission to operate until September 30, 2001, FMMO reform was abandoned, and there were several attempts to provide

[1] Texas and Florida are currently seeking state approval.

for the creation of an SDC. In the Fall of 1999, U.S. dairy producers overwhelmingly approved the USDA's FMMO reform plan in a referendum, giving it a 96% vote of support.

As this study was taking place, it was difficult to anticipate the future direction of U.S. dairy policy and the final decisions regarding such questions as *Will the NDC continue? Will the NDC be allowed to expand? Will the SDC be given approval? Will FMMO move forward in the non-compact areas? What legislative changes will occur as the 13 appropriation bills--and primarily the new farm bill--move through the 106th Congress?* Given such uncertainty, it was difficult to evaluate what potential effects such changes may have for the U.S. in general and the Commonwealth of Kentucky in particular.

Simply put, the events taking place in late 1999 made it necessary to narrow the focus of the study by incorporating some assumptions. There are three major issues that complicate the analysis. First, assuming that FMMO reform does take place, forecasting the baseline farm milk price in future years is difficult. This baseline price would be used as a comparison to the expected farm price of milk, given that one or more compacts were allowed to operate. Second, as more milk production falls under different compact pricing, there will be differential regional impacts and subsequently different national impacts. In other words, as market prices change in one part of the country, there will be related, offsetting effects in other parts of the country which will in turn affect the compact regions. Accordingly, one needs to utilize a national model in order to make accurate estimates regarding the potential effects of dairy compacts. Finally, while Congressional approval is necessary before a dairy compact can begin operation, other conditions can be added that can result in different effects than those originally anticipated. What, if any, additional conditions would need to be met prior to the implementation of an SDC, and what the impact could be, is hard to gauge at this time.

Given the present circumstances, the areas addressed in HJR 159, the lack of access to a national milk modeling model[2], uncertainty as to the specific details attached to Congressional approval, and how different compact operations may be, subsequent sections of this study will proceed along the following outline:

Section II: Kentucky Dairy Farm Situation
Section III: Examining Dairy Compacts
Section IV: Background on Milk Pricing
Section V: Review of NDC
Section VI: Review of SDC and the Potential Impacts in Kentucky
Section VII: Summary and Conclusions

Section II examines in detail information related to Kentucky's dairy sector. The next two sections attempt to explain how milk prices are currently determined within the marketplace and how this might change. Section V describes how the NDC operates, followed by a summary of

[2] The USDA utilized a national model developed by Cornell University to estimate the likely impacts of the FMMO reform. Ken Bailey at the University of Missouri has also developed a national milk model.

the initial research aimed at evaluating the effects of the NDC. Section VI reviews how the SDC will operate, summarizes research aimed at evaluating the likely effects, and identifies and summarizes the potential impacts on consumers and dairy farms in Kentucky. The final section of the study is devoted to summarizing the findings and stating the relevant conclusions one can draw from the analysis.

SECTION II
KENTUCKY DAIRY SITUATION

Overview of Kentucky's Agriculture

Kentucky's agricultural sector has followed national trends--as the number of farms has declined, farm size has slowly increased. According to the *1997 Census of Agriculture*, Kentucky has over 82,000 farms, with an average size of 162 acres. With the relatively small scale of many farms in Kentucky, farming is not the primary occupation of many farm operators in the state. In fact, less than half (41%) of Kentucky farmers consider farming as their primary occupation. With respect to type of farm, 8.5% of Kentucky farms are classified as cash grain, 41% tobacco farms, 30% beef cattle farms, and 2.4% dairy farms. The remaining farms in Kentucky are classified as another type of field or specialty crop farm, or another type of livestock farm.

Agricultural output is composed of crop and livestock production. The major crops grown in Kentucky include tobacco, hay, corn, soybeans, and wheat. Livestock production includes dairy cattle (milk production), beef cattle, horses, hogs, and broilers as the major enterprises. Compared to other states, Kentucky ranks first in burley tobacco production and within the top 20 producing states in a number of other categories.

The economic importance of Kentucky's agriculture can be stated in a number of different ways. Cash receipts from farm marketings is a measure that is often used. In 1998, Kentucky's agricultural cash receipts were estimated to be $3.9 billion by the *Kentucky Agricultural Statistical Service*. In terms of annual net farm income, the value added to Kentucky's economy by the agricultural sector was estimated to be $1.3 billion in 1998.

Kentucky's Dairy Sector

The *1997 Census of Agriculture* provides the most complete farm-level data of agricultural production for the state and the U.S. The *Census* differs from other data sources in that it attempts to provide a complete enumeration of dairy operations in the state. The *Census* defines a dairy operation as any operation with one or more milk cows, either dry or milking, excluding heifers that have not freshened. This does not mean that each operation is selling milk commercially, thus the number of operations that have commercial milk sales will be smaller. Also, the *Census* classifies farms based on the North American Industrial Classification System (NAIC). Farms classified under dairy cattle and milk production are operations that are primarily engaged in milking dairy cattle and serve as the basis for the data used to describe dairy farms in Kentucky.

According to the *1997 Census*, there were 3,393 Kentucky farms with milk cows, with 2,600 having dairy product sales. Of these 2,600 farms, 2,010 were classified as primarily

engaged in dairy cattle and milk production. These particular farms accounted for over 78% of the market value of milk products sold by all dairy farms in Kentucky.

The average size of dairy farms in Kentucky in 1997 was 276 acres, which is larger than the average size for all farms in the Commonwealth. In terms of herd size, the average for dairy farms in Kentucky was 60 cows. In 1997, Kentucky dairy farms averaged $134,457 in agricultural sales and $91,917 in average expenses, leading to an average net cash return per farm of $42,540.

Table 1 displays the market value of agricultural products sold by dairy farms in Kentucky in 1997. The largest percentage of dairy farms in Kentucky have sales between $100,000 and $250,000. Also, dairy farms are evenly divided in that 50% have agricultural sales below $100,000 and 50% have agricultural sales above $100,000. Table 2 indicates the percent by different herd sizes of the total milk cows in Kentucky for 1998. Most dairy farms in Kentucky have between 50-99 cows, while one-quarter have less than 50 cows in their operation.

TABLE 1
KENTUCKY DAIRY FARMS BY VALUE OF SALES

Market Value of Agricultural Sales	Percent of Dairy Farms
Less than $50,000	22%
$50,000 - $100,000	28%
$100,000 - $250,000	38%
Over $250,000	12%

Source: 1997 Census of Agriculture

TABLE 2
KENTUCKY MILK COWS BY HERD SIZE

No. of Head	Kentucky
1-29	8%
30-49	18%
50-99	40%
100-199	24%
200 and over	10%

Source: 1997 Census of Agriculture

In terms of tenure, Kentucky dairy farm operators average more than 22 years on their present farm and have an average age of 52 years. Given the demands of a dairy farm, it is not

surprising to find that 87% of these dairy operators list farming as their primary occupation and that 93% are either full or part-owners, while 7% of the operators were classified as tenants.

Table 3 presents some comparative statistics for dairy farms in Kentucky and for all farms within the state. Dairy farming, by its very nature, dictates that these farms will differ from the "typical" farm in Kentucky. The production of milk takes place twice, or even three times a day, seven-days a week, 365 days a year; thus it is a very labor intensive endeavor. Also, modern dairy farms require considerable capital investment in livestock, machinery, and equipment. The data in Table 3 indicate that dairy farms in Kentucky comprise approximately 2.4% of all farms. On average, dairy farms in Kentucky are larger than the average Kentucky farm and have a higher average level of investment and agricultural sales.

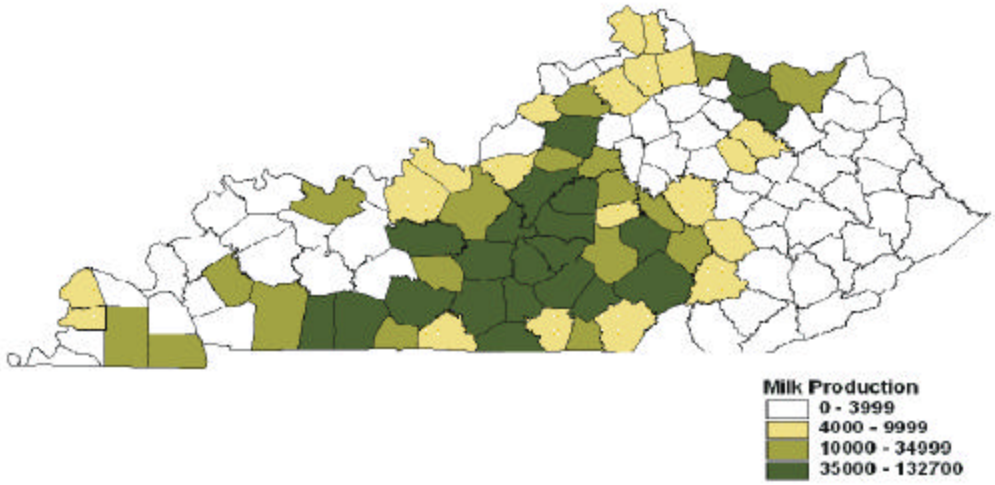
TABLE 3
CHARACTERISTICS OF KENTUCKY DAIRY FARMS AND ALL KENTUCKY FARMS

	Kentucky Dairy Farms	**Kentucky Farms**
Number	2,010	82,273
Average Size	276	162
Average Value of Machinery & Equipment	$72,000	$33,000
Average Value of Land & Buildings	$363,000	$230,000
Average Market Value of Agricultural Products Sold	$134,000	$37,000

Source: 1997 Census of Agriculture

The figure below indicates that milk production occurs in over one-half of the counties in the Commonwealth. In particular, production is concentrated in Central Kentucky, around the Bowling Green (Warren County) area. 1998 data indicate that Barren, Adair, Fleming, Nelson, and Lincoln counties were the top producers.

FIGURE 1
1998 KENTUCKY MILK PRODUCTION



Source: Kentucky Agricultural Statistics

Trends

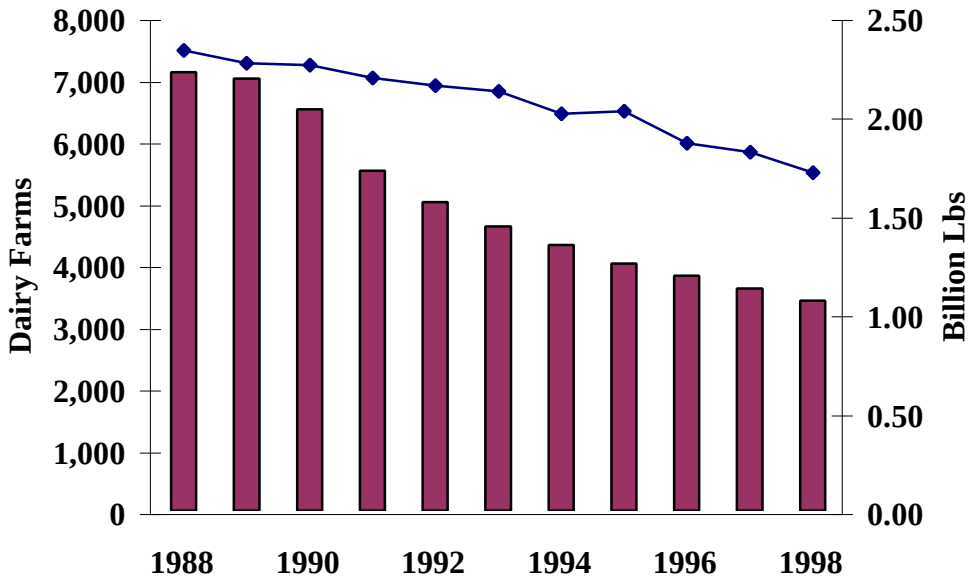
One significant long-term trend occurring within the U.S. dairy industry has been a decline in the number of dairy cows and farms, coupled with increasing production per cow. A number of other changes--namely, artificial insemination, improved feed rations, milking parlors, computerization, and the like--have also taken place at the farm level and have served to improve the productivity and efficiency of dairy farms.

Generally, Kentucky's dairy sector has followed national trends--a decreasing number of dairy farms and dairy cows--while milk production per cow has increased. However, while total U.S. milk production has been rising, total annual milk production within Kentucky has fallen to 1.71 billion lbs., or approximately 147 million gallons. Figure 2 displays the rapid decline in the number of dairy farms in Kentucky, along with the reduction in total milk production in the state. Figure 3 indicates the steady decline in Kentucky's milk cow herd and the increase in milk production per cow.

Since 1988, Kentucky's total milk production has declined by 22% and the state has lost almost 50% of its dairy farms (Figure 2). The decline in milk production is a product of two related factors--the number of dairy cows and milk produced per cow (Figure 3). While the average number of cows per dairy farm has increased, total dairy cows have fallen by 36%, as

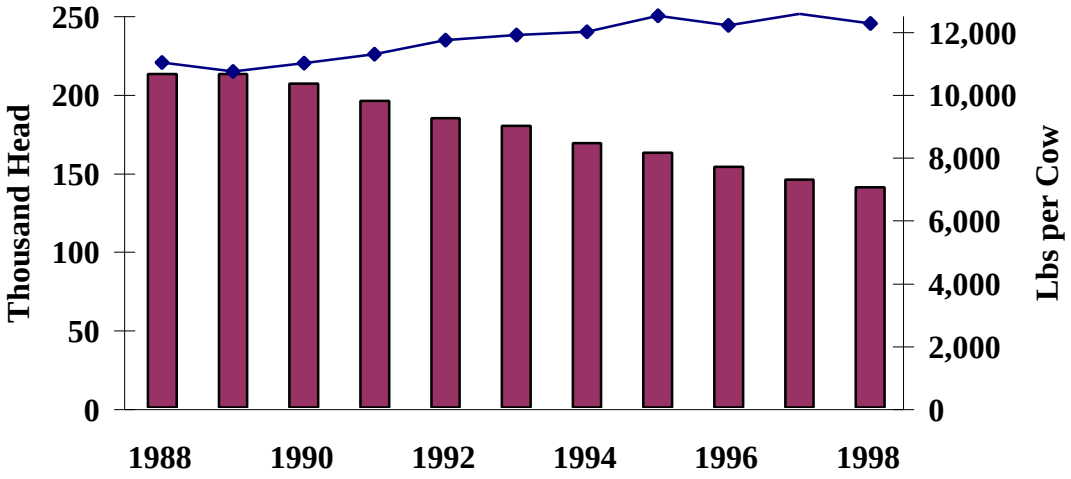
milk production per cow has trended upward by 14%. In Kentucky, total milk production has fallen because the reduction in dairy cows has exceeded the increase in milk production per cow.

FIGURE 2
KENTUCKY DAIRY FARMS AND MILK PRODUCTION



Source: Kentucky Agricultural Statistics

FIGURE 3
KENTUCKY DAIRY COWS AND MILK PER COW



Source: Kentucky Agricultural Statistics

From a national perspective, milk production has slowly increased over the past 10 years (Table 4). The number of dairy cows and dairy farms has been falling, while average milk production per cow has been rising. The difference, compared to Kentucky, is that milk production per cow in the U.S. has been increasing slightly faster than the decrease in the number of milk cows, thereby leading to small production increases. With declining milk production in Kentucky, coupled with increasing U.S. production, Kentucky's share of U.S. milk production has fallen from 1.6% to 1.2%, since 1988.

Kentucky's output per milk cow has always lagged the national average, and within the last decade the Commonwealth has been losing ground in this respect. In 1988, Kentucky's milk production per cow was 77% of the U.S. average, but fell to 73% by 1997. With respect to national ranking, Kentucky is 18th in terms of milk cows, 20th in terms of milk production, but ranks 48th in milk sales per cow[3].

[3] Milk sales per cow is an important measure of competitiveness. States with higher levels have tended to increase production, while those with lower levels have tended to decline in total production and cow numbers.

TABLE 4
KENTUCKY AND U.S. MILK PRODUCTION

	UNITED STATES				KENTUCKY			
	Milk Production (Mil. Lbs.)	Cow Numbers (1,000 HD)	Milk Per Cow (Lbs.)	Dairy Farms	Milk Production (Mil. Lbs.)	Cow Numbers (1,000 HD)	Milk Per Cow (Lbs.)	Dairy Farms
1988	145,034	10,224	14,186	216,130	2,327	212	10,976	7,100
1989	143,893	10,046	14,323	202,890	2,265	212	10,684	7,000
1990	147,721	9,993	14,782	192,660	2,255	206	10,947	6,500
1991	147,697	9,826	15,031	180,640	2,190	195	11,231	5,500
1992	150,847	9,688	15,570	170,500	2,150	184	11,685	5,000
1993	150,636	9,581	15,722	157,150	2,120	179	11,844	4,600
1994	153,602	9,494	16,179	148,140	2,007	168	11,946	4,300
1995	155,292	9,466	16,405	139,670	2,020	162	12,469	4,000
1996	154,259	9,361	16,479	130,980	1,860	153	12,157	3,800
1997	156,602	9,258	16,915	123,700	1,815	148	12,517	3,600
1998	157,441	9,158	17,192	116,430	1,710	140	12,214	3,400

Source: Milk Disposition and Income, Milk Final Estimates, and Milk Cows and Production.

As with production agriculture, the number of dairy farms in the U.S. has fallen as the size of these farms has increased. The result is that an increasing share of U.S. milk production originates from dairy farms with greater than 200 cows. For the U.S., 65% of the milk produced comes from farms having more than 100 cows. Conversely, 61% of the milk produced in Kentucky comes from farms with less than 100 cows (Table 5).

TABLE 5
MILK PRODUCTION BY HERD SIZE 1997

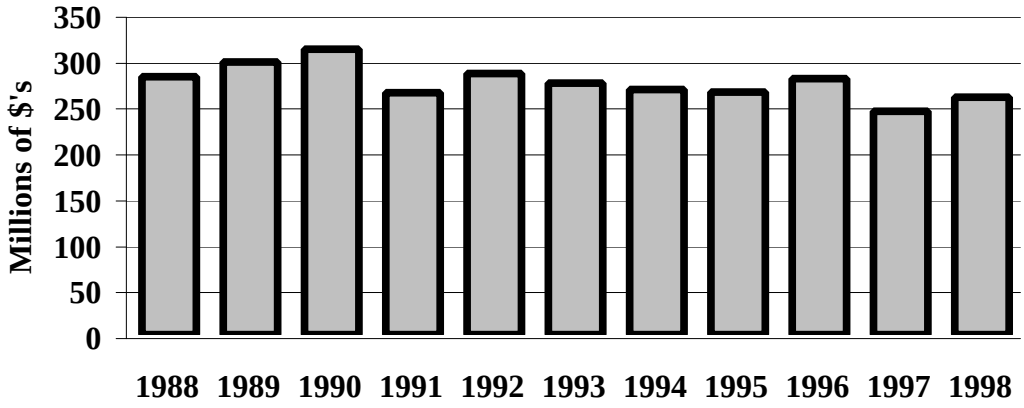
No. Head	KY	U.S.
1-29	6.0%	2.4%
30-49	15.0%	9.5%
50-99	40.0%	23.4%
100-199	28.0%	20.0%
200 +	11.0%	44.7%

Source: Milk Cows and Productio
Final Estimates 1993-97.

Over time, Kentucky has consistently placed in the top 20 milk producing states in the U.S. Figure 4 shows that over the past ten years, Kentucky's annual cash receipts from milk marketings has varied between $250-$300 million dollars. In 1988, cash receipts from milk represented 18% of total livestock receipts and 11% of total agricultural receipts in Kentucky (Figure 5). However, over the past decade, other livestock and crop sectors have grown more

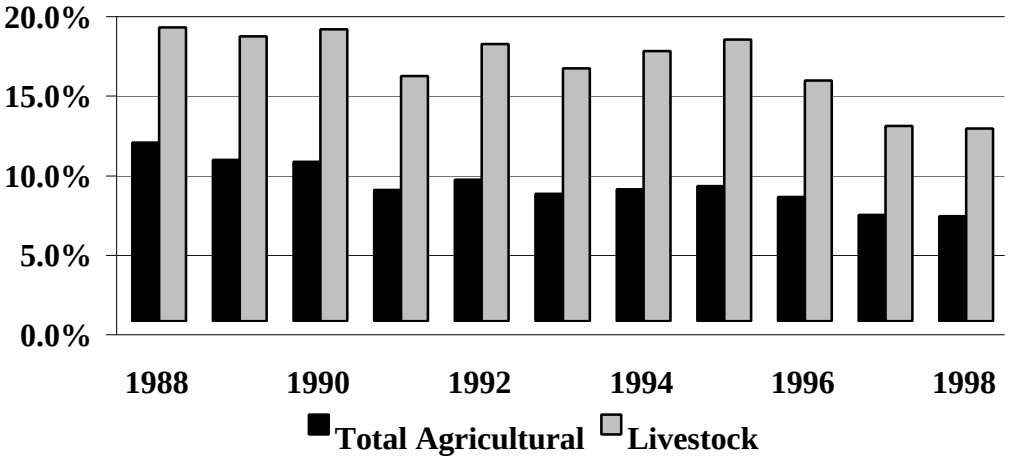
rapidly; therefore, milk receipts as a percent of total agricultural and livestock receipts have been falling.

FIGURE 4
CASH RECEIPTS FROM MILK MARKETINGS



Source: Kentucky Agricultural Statistics

FIGURE 5
MILK RECEIPTS AS A PERCENT OF TOTAL AGRICULTURAL AND LIVESTOCK RECEIPTS



Source: Kentucky Agricultural Statistics

Returns to Dairy Farming in Kentucky

Farm-level data for dairy farms are difficult to obtain. USDA collects some survey data from the *Farm Cost and Returns Survey (FCRS)* and the *Agricultural Resource Management Study (ARMS)*. Also, the University of Kentucky has a number of farms that participate in their *Farm Business Analysis Program (FBAP)*. Table 6 shows milk production costs and returns for the U.S. and the Appalachian region--the region most similar to Kentucky. The data indicate that the returns to dairy farms in the Appalachian region have been similar to the returns in the U.S., although the most recent data suggest Appalachian dairy farms have been losing ground. Moreover, the *ARMS* study indicates that farmers in the Appalachian region have lower levels of debt, a fact confirmed by information from the *FBAP*. In terms of reasons why returns vary across the U.S., a recent USDA study found that the major determinants of the financial performance of dairy farms were their level of indebtedness, membership in a record-keeping association, adoption of the most up-to-date management practices (e.g., artificial insemination, automatic take-offs, milking parlors, milking three times a day, etc.), and most importantly, size.[4] Certain dairy farms in Kentucky have been able to take advantage of increased returns associated with size economies; however, those dairy farms that cannot increase in size will have to be highly efficient in order to remain competitive.

TABLE 6
MILK PRODUCTION COSTS AND RETURNS

Year	U.S. ($'s/cwt.)	Appalachian Region ($'s/cwt.)
1988	$2.78	$3.48
1989	$4.41	$4.57
1990	$4.62	$5.18
1991	$3.32	$3.48
1992	$4.44	$4.88
1993	$1.99	$1.84
1994	$1.60	$1.66
1995	$1.76	$1.73
1996	$2.97	$2.32
1997	$0.93	$0.38

Source: Milk Costs and Returns, USDA

Prices received by dairy farms in Kentucky and the U.S. are reported in Table 7. For milk that is used for fluid purposes, Kentucky dairy farmers receive slightly higher prices when compared to the U.S. average fluid milk price. Moreover, almost all of the dairy production in

[4] See El-Osta and Johnson.

Kentucky qualifies for Class I, or fluid use. Fluid utilization in Kentucky--the percent of Class I production used for fluid products--is in the 75-80% range, compared to about 45% for the U.S.

TABLE 7
U.S. AND KENTUCKY MILK PRICES

Year	KY Milk (Fluid)	U.S. Milk (Fluid)	KY Milk (Manufacturing)	KY Milk (Wholesale All)	KY Fluid Grade
1989	13.90	13.56	11.40	13.60	92%
1990	14.50	13.74	11.60	14.30	93%
1991	12.60	12.27	10.00	12.50	95%
1992	13.80	13.15	11.00	13.70	95%
1993	13.50	12.84	10.90	13.40	95%
1994	14.00	13.01	11.30	13.90	96%
1995	13.50	12.78	11.00	13.50	98%
1996	15.50	14.75	12.50	15.46	98%
1997	13.80	13.36	11.20	13.70	98%
1998	15.60	15.05	13.40	15.50	98%

Source: Kentucky Agricultural Statistics, USDA, AMS Dairy Programs, Market Administrator for Federal Order No.46.

Dairy Processing, Wholesale Trade, and Retail Trade

After milk leaves the farm, it is processed into fluid products or made into a variety of non-fluid dairy products. Compared to others, Kentucky is a small dairy processing state. According to the *1997 County Business Patterns*, Kentucky had 15 establishments engaged in dairy products manufacturing, eleven of which were fluid milk processors. These establishments had slightly less than 2,000 employees and a total annual payroll of approximately $60 million dollars. Kentucky also has a number of firms engaged in the wholesale and retail trade of dairy products. In 1997, there were 56 establishments in Kentucky engaged in the wholesale and retail trade of dairy products. Total employment of these establishments was less than 600 employees, with annual payroll of approximately $13 million dollars.

Milk Production and Consumption

Kentucky is both an importer and exporter of dairy products. On balance, the Commonwealth has moved from a milk surplus state to a milk deficit state. The data in Table 8 show the production of milk and estimated consumption and the extent to which Kentucky must now rely on outside supplies to meet domestic consumption. The method used to calculate this estimate was to assume that people in Kentucky consume milk in the same amount as the U.S. average. This per capita milk consumption was then compared to per capita milk production and

the difference was calculated and expressed as a percent of total production within the state. In 1992, Kentucky was basically in balance, with production and consumption approximately equal. Since that time, per capita consumption has increased modestly, while production within Kentucky has fallen, leading to the deficit that now exists.

TABLE 8
KENTUCKY MILK PRODUCTION AND ESTIMATED CONSUMPTION

Year	KY Milk Production (million lbs.)	KY Population (thousands)	KY Per Capita Milk Production (lbs.)	U.S. Per Capita Milk Consumption (lbs.)	Over/Under Production Per Capita	Total Over/Under (1,000 lbs.)	Percent of Milk Production
1980	2,219	3,661	606.1	543.2	62.9	230,345	10%
1981	2,281	3,670	621.5	540.6	80.9	296,998	13%
1982	2,364	3,683	641.9	554.6	87.3	321,408	14%
1983	2,414	3,694	653.5	572.9	80.6	297,707	12%
1984	2,106	3,695	570.0	581.9	-11.9	(44,120)	-2%
1985	2,222	3,695	601.4	593.7	7.7	28,278	1%
1986	2,327	3,688	631.0	591.5	39.5	145,548	6%
1987	2,338	3,683	634.8	601.2	33.6	123,780	5%
1988	2,327	3,680	632.3	582.5	49.8	183,400	8%
1989	2,265	3,677	616.0	563.8	52.2	191,907	8%
1990	2,255	3,685	611.9	568.4	43.5	160,446	7%
1991	2,190	3,715	589.5	565.6	23.9	88,796	4%
1992	2,150	3,752	573.0	565.9	7.1	26,743	1%
1993	2,120	3,793	558.9	574.1	-15.2	(57,561)	-3%
1994	2,007	3,824	524.8	586.0	-61.2	(233,864)	-12%
1995	2,020	3,856	523.9	584.4	-60.5	(233,446)	-12%
1996	1,860	3,882	479.1	575.5	-96.4	(374,091)	-20%
1997	1,815	3,910	464.2	579.8	-115.6	(452,018)	-25%
1998	1,710	3,936	434.5	580.0	-145.5	(572,880)	-34%

Source: Kentucky Agricultural Statistics, Agricultural Outlook, USDA.

SECTION III
EXAMINING DAIRY COMPACTS

Since dairy compacts are new, this section presents a brief explanation regarding what a dairy compact is and how it operates. Also included in this section is a discussion regarding the essential features of the Southern Dairy Compact.

What is an Interstate Compact?

An interstate compact is a formal agreement among two or more states. The agreement takes the form of identical legislation passed by each participating state. The legislation for the SDC creates a new entity--the Southern Dairy Compact Commission--to act jointly for the states in the Compact. The Commission is given certain legal powers; however, before the Commission can be established, the Compact must acquire congressional approval.

Constitutional Aspects of a Compact

The Compact Clause (Article 1, section 10, clause 3) and the Interstate Compact Clause (Article 1, section 8) of the U.S. Constitution are the key elements authorizing compacts. Once congressional approval is given, the entity created from the compact--in this case the Southern Dairy Compact Commission--is given federal power to regulate interstate commerce across state lines. Therefore, milk entering a dairy compact region from outside the region is subject to the same rules as milk produced and sold within the region.

How Does a Dairy Compact Work?

The system of federal milk marketing orders establishes minimum milk prices for producers while allowing states to regulate prices above the federal minimum. A dairy compact commission may establish compact over-order prices. Over-order prices can only be established for Class I milk (i.e., fluid milk used for drinking purposes). In essence, a constant over-order price acts to stabilize and enhance the fluid portion of a dairy farmer's milk check.

The compact commission establishes a compact price, which acts as a price floor, for all fluid milk sales in the compact region. The commission then determines the over-order premium each month, which is the difference between the compact price and the minimum federal order Class I (fluid milk) price and collects this difference on all fluid milk sales from fluid handlers.

The commission distributes the net proceeds collected to all dairy farmers that market milk in the compact.[5] The percent fluid utilization rate--percent of milk used for fluid purposes--is the mechanism used. The fluid utilization rate is obtained from the market administrator for the

[5] The gross proceeds are adjusted for administration expenses, and amounts are withheld to compensate the CCC, WIC, and School Lunch program.

federal milk marketing order in the compact region. For example, suppose the fluid utilization rate was 47% and the over-order premium was $2.50/cwt.[6]; therefore, $2.50*.47 = $1.175/cwt. This is called the uniform rate. This rate is the dollar amount returned to all dairy farmers--even those selling to a manufacturing plant that does not produce fluid milk products.

What is the Compact Price?

It is the price announced by the Commission for all fluid milk sales in the Compact region. Currently, the NDC has maintained a Compact price of $16.94/cwt. The Compact price for the SDC cannot exceed $1.50/gal at Atlanta.[7] In establishing the over-order, or Compact price, the Commission shall consider the existing supply and demand for milk in the area, costs of production, milk supplies and price from other sources, and the purchasing power of the public.

What is the Compact Premium?

It is the monthly difference between the Compact price and the federal order Class I price. Since the Class I price changes each month, the Compact premium is also expected to change each month. If the monthly Class I price exceeds the Compact price, there is no Compact premium and no payments to dairy farmers for that month. If the Class I price is below the Compact price, a Compact premium exists and payments are made to dairy farmers for that month.

Where does the Compact Premium Come From?

Processors pay the Compact premium and the administration costs, including start-up costs of the program, to the Compact Commission. The Commission can also impose fines on those who do not adhere to Commission regulations. The compact also allows provisions for reimbursements based on increased costs to WIC and to other parties.

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[6] CWT. is an abbreviation for one-hundred pounds, the weight standard used to price milk at the farm-level.

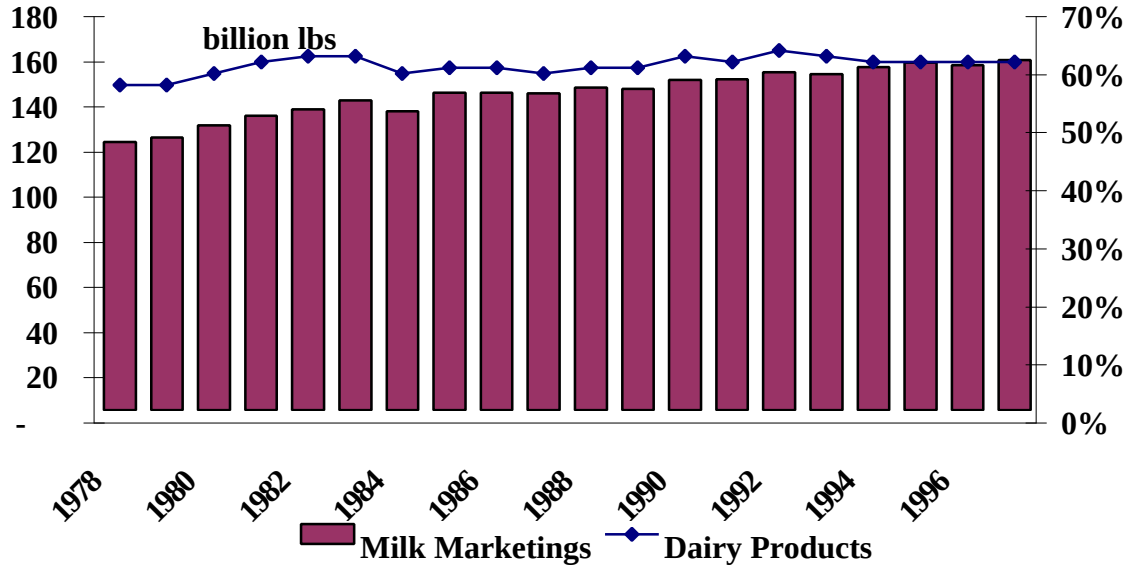
[7] This price will be adjusted from 1990 using the CPI, and given that milk weighs about 8.6 pounds per gallon, translates into a price of $17.50/cwt.

SECTION IV
BACKGROUND ON MILK PRICING

Milk is composed of about 86% water and weighs about 8.6 lbs./gal. As milk leaves the farm it is pasteurized and homogenized and ends up as a consumer product in fluid (bottled) form, or as a manufactured dairy product such as butter, cheese, and ice cream. Milk produced in the U.S. is designated either Grade A or Grade B. Grade A is produced under higher sanitation standards and is the only type of milk used for fluid consumption, yet can also be used for manufactured dairy products. The price of Grade A is generally higher than Grade B. Milk marketing orders establish the minimum prices that processors must pay producers for Grade A milk. Market order prices are based on how the milk is used in each order and on the particular location.

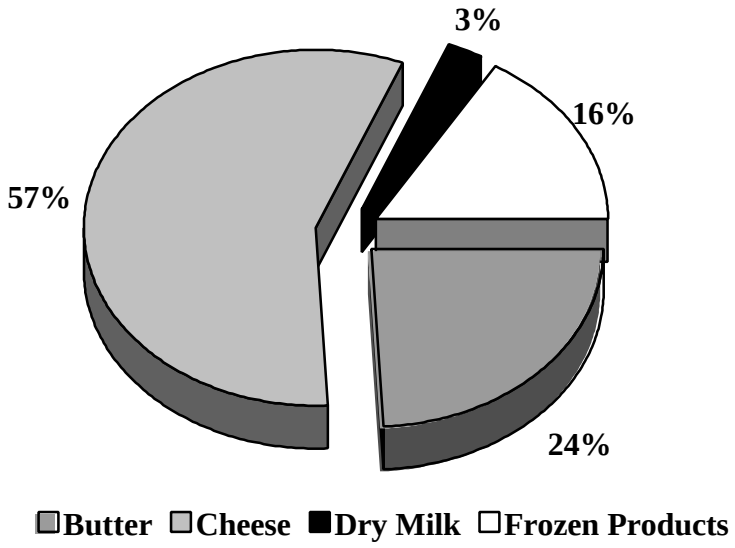
Of the milk produced in the U.S., 90% is Grade A and 10% is Grade B. Figure 6 shows that of all the milk produced in the U.S. about 40% is placed into fluid products, with the remaining 60% used for manufactured dairy products--both hard and soft--such as butter and ice cream. Of the 60% going to dairy products, over one-half is used to make cheese, one-quarter is used to make butter, and 16% is used in frozen products (see Figure 7).

FIGURE 6
U.S. MILK MARKETINGS AND PERCENT USED FOR DAIRY PRODUCTS



Source: Dairy Products: 1998 Summary

FIGURE 7
U.S. MANUFACTURED DAIRY PRODUCTS
1998



Source: Dairy Products: 1998 Summary

Federal Milk Marketing Orders (FMMO)

Americans buy milk in fairly constant quantities throughout most of the year, but milk production is more seasonal than consumption. Most milk is produced in the early spring and summer, while a lesser amount is produced in late fall and winter. Therefore, the pricing system for milk attempts to provide some market stability--less price variability--throughout the year. Moreover, fluid milk is highly perishable, therefore milk not consumed in fluid form must be processed into manufactured products to prevent loss. Put simply, ensuring an adequate but not excessive supply of milk can be a complicated task.

In the dairy industry, producers sell their fluid milk to processors, including cooperatives, that manufacture dairy products. Eighty-percent of all milk is produced by members of dairy farm cooperatives. Many of these cooperatives own and operate dairy manufacturing and bottling plants that process milk produced by their farmer members. Processors in turn sell their products in the commercial market or to the federal government at specified prices. Revenues generated by commercial and federal sales are the source of funds that processors use to pay producers for their milk. No federal funds go directly from the federal government to milk producers for the sale of dairy products.

The *Agricultural Marketing Agreement Act (AMAA) of 1937* established the federal government's central role in regulating the dairy industry. The *AMAA* allowed the Secretary of Agriculture to set minimum milk prices, while states retained the authority to establish prices above the minimum, given such actions did not interfere with interstate commerce. The

Agricultural Act of 1949 established the dairy price support program. The support for milk is unique in that it is the only agricultural commodity with both order pricing and a price support program.

Minimum prices were established through the federal milk marketing order system following the 1937 act, as milk prices had fallen by half during the Great Depression. At this time, producers had few alternatives to selling their milk to local handlers. This situation led to charges of unfair buying practices by milk dealers and handlers; thus, FMMO's were designed to return some market power to producers.

Over time, the basic structure of how milk prices are determined has remained the same. Milk marketing orders set minimum prices paid to milk producers and dairy processors and are entered into voluntarily by dairy farmers. The price support program sets prices for dairy products sold to the federal government with the support price acting as a price floor for dairy products in the commercial market. Milk prices are supported indirectly through commodity purchases (i.e., the price support program) and directly through federal milk marketing orders. The objectives have been to support farm prices and incomes, expand consumption, ensure an adequate supply of milk, and stabilize dairy prices and markets.

There are currently 31 milk marketing orders covering 75% of the milk produced in the U.S. The remaining 25% falls under state orders or is not regulated at all. Over time, FMMO's have become increasingly complex. In essence, milk marketing orders are regulations issued by the Secretary of Agriculture that require manufacturers to pay minimum prices for various classes of milk. A milk marketing order is designed to represent a fluid milk demand area; covers only Grade A milk; and determines how milk is priced at the farm-level.

Each milk marketing order identifies different classes and prices for milk. Milk used for fluid (bottled) purposes is placed in Class 1. This class receives the highest price. Milk used to produce soft products such as ice cream, cottage cheese, and yogurt is Class II milk. Class III milk is used to manufacture hard products such as butter, cheese, and nonfat dry milk.[8]

Minimum prices for Class I and II milk are determined by adding fixed differentials to the Basic Formula Price (BFP). The BFP represent the value of milk used for manufacturing purposes which is based on a survey of processors in the Upper Midwest who purchase Grade B milk (e.g., milk that can be used only for manufacturing purposes). These processors manufacture mainly cheese, some butter, and some nonfat dry milk. In essence, this element of the BFP is similar to the previously used Minnesota-Wisconsin price, which was an estimate of the average price paid for all manufacturing grade (Grade B) milk at about 166 plants and receiving stations in Minnesota and Wisconsin. The M-W price was first used in 1961 in FMMO's, and since 1975 has been the basis for establishing minimum class prices in all federal order markets. The second part of the BFP is an update of these prices based on a product price formula that examines the change in butter, nonfat dry milk, and cheese prices. The BFP serves as the Class III price, thus as the BFP rises, so does a farmer's milk check.

[8] In some orders nonfat dry milk is placed in Class III-A.

The current Class II price is constant over all marketing orders, at 30 cents above the Class III (BFP) price. The Class I differential varies for each milk marketing order. These differentials are partially based on the distance from the base point (Eau Claire, Wisconsin). The justification for pricing milk higher farther away from Eau Claire was to stimulate production in milk deficit areas. The rationale at the time was to ensure that fresh milk was available locally all over the U.S. Generally, Class I differentials increase from Northern to Southern markets, ranging from $1.20/cwt. in the Upper Midwest to $4.18 in Miami, Florida.[9]

Within each market order, the milk used for all purposes is pooled to generate a uniform average price, called a blend price. Data are collected by a market administrator on the quantities of milk used in each class in a particular order. The blend price is then calculated based on the class prices and the quantities used in each class. The blend price becomes the minimum that handlers must pay producers or producers' cooperatives. Since all handlers must pay the minimum class prices, those who produce cheese, butter, and nonfat dry milk receive payments back from the marketing order pool to compensate for the difference between the blend price and the lower class III and III-A prices. In contrast, Class I and II handlers must pay into the pool the difference between the blend price and their higher class prices. Processors may pay prices higher than those required by the order. These higher prices are referred to as over-order prices.

Initially, the rationale used to justify the differentials across marketing orders was that poor refrigeration and unreliable transportation would prevent localities far from milk-producing states from receiving a fresh and wholesome product. Recently, this rationale has encountered criticism with opponents arguing there is little reason for the government to establish minimum prices for milk.

It is argued that as a result of the milk marketing orders, consumers in higher differential regions pay higher prices for milk and dairy products than consumers in Wisconsin and Minnesota. For instance, due primarily to the differentials, consumers in New York and Texas pay almost thirty cents more per gallon of milk and most people in Florida pay 35 cents more per gallon. Opponents argue that the differential system penalizes dairy farmers in the regions best-suited for dairy farming and rewards dairy farmers operating in high-cost, inefficient areas.

Price Support Program

The *Agricultural Act of 1949* required that the price of milk be supported between 75-90% of parity. Since 1981, however, the support price has been established by Congress either at specific levels, or by a formula relating to expected surpluses rather than parity levels. In the 1970's and early 1980's, high support prices led to surpluses and declining sales of milk. Government purchases skyrocketed to $2.7 billion in 1982-83. These events led to the milk diversion and dairy termination program--which paid farmers to take their milk cows out of production for a specific time period.

[9] For a complete listing of Class I differentials see Appendix A.

As part of the 1996 farm bill--the Federal Agriculture Improvement and Reform Act (FAIR)--the milk price support program was authorized through calendar year 1999 at the following levels:

1996 $10.35 cwt.
1997 $10.20 cwt.
1998 $10.05 cwt.
1999 $9.90 cwt.

The support program sets minimum prices for cheese, butter, and nonfat dry milk and is carried out through purchases of these products by the Commodity Credit Corporation (CCC). The idea is that the support prices announced should be adequate for a plant with average efficiency to pay producers, on average, a price that is not less than
the price support. To carry out the milk price support program, CCC offers to buy carlots of butter, cheese, and nonfat dry milk in bulk containers at announced prices, thus providing a floor for milk and dairy product prices.

By mandating that the federal government purchase all hard products offered to it for sale at specified prices, the price support program acts as a floor price for sales to the commercial market. That is, if the commercial market price falls to, or below, the support price level, processors will start to sell to the federal government because they can obtain an equivalent or better price. Recently federal purchases have been about 5% of dairy product sales by processors.

Current Issues

Presently, there are two key issues with respect to federal dairy policies: 1) FMMO's are considered outdated and create pricing inequities, and 2) the dairy industry needs to become more market-oriented. In two previous reports, the *GAO*[10] found that the economic factors that led to the creation of the dairy pricing system have changed. Milk marketing orders were created to encourage and maintain a locally produced supply of Grade A milk. At that time, transporting fluid milk was difficult because the necessary technologies to avoid spoilage did not exist. Furthermore, the transportation infrastructure was not developed enough to make long distance milk hauling feasible. Since these obstacles have long since been resolved, the *GAO* concluded that the rationale for the pricing inequities created by the marketing order system needs to be reconsidered.

Moreover, research indicates that U.S. dairy policy may adversely affect consumers. A 1993 *GAO* study found that a reduction in the price support system would have netted consumers savings of $10.4 billion from 1986 to 2001.[11] Taxpayers would have also saved an additional $3 billion in government purchases. Also, residents who buy dairy products with food stamps pay unnecessarily high prices, thereby diminishing the purchasing power of the stamps.

[10] See GAO reports from March 1995 and October 1998.
[11] See GAO report T-RECD-95-2.

Pricing Inequities under a Marketing Order

Initially, marketing order differentials were established to make it profitable for surplus milk producing areas like the Upper Midwest to ship milk to deficit milk-producing areas, if necessary. Recently, these differentials have served as an incentive for some of the historically milk-deficit producing areas to increase their production. Some of these areas have now become surplus milk-producing areas. As a result, the price differentials have produced a regional price structure that in many cases does not reflect regional variations in cost of production or the cost of obtaining supplies from alternative sources.

Higher distance differentials in regions of the U.S. encourage production and surpluses by guaranteeing higher milk prices and profits to producers at the expense of producers in other regions. This incentive is particularly strong in the Southwest, once a deficit milk-producing area. According to dairy industry sources, Southwestern producers sometimes transport surplus milk as far as the Upper Midwest to find dairy plants with available processing capacity because processing plants are either operating at full capacity or are not available in the Southwest. As a result, the increased shipments of lower cost milk to the Upper Midwest processing plants decrease milk prices paid to Upper Midwest producers.

Additionally, the Grade A differential, originally created to provide farmers with financial incentives to produce Grade A milk, is far higher than the additional costs of producing Grade A milk rather than Grade B. According to a 1986 study, the added cost is no more than 15 cents/cwt., while the current price differential is $1.04.[12]

Recent Legislative Changes

The *1996 FAIR Act* included two significant changes under the Dairy title. The first phased out the dairy price support program, which for years established the minimum price for milk. The second was the requirement that the USDA consolidate and reform the FMMO system.

Dairy Price Supports

Dairy price supports were set to expire on January 1, 2000.[13] *FAIR* also provides for a recourse loan program for milk once the price support program expires. The objective is to make loans available to processors of dairy products to assist in managing inventories. The loan rates will reflect a milk equivalency of $9.90/cwt. The parties receiving the loan will be liable for the full repayment plus interest.

Milk Marketing Orders

FAIR mandated the USDA to reduce the number of milk marketing orders from 31 to no less than 10 and no more than 14 by April 4, 1999. An extension until October 1, 1999, was

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[12] See GAO report T-RECD-95-203.

[13] As part of the Consolidated Appropriations Act 2000, the milk price support program was extended to January 1, 2001.

granted to the USDA in the FY '99 agricultural spending bill.[14] Reducing the number of FMMO's will enlarge the area and expand the number of producers and handlers covered by a typical order. The current proposed rule would consolidate the present 31 orders into 11. Under the new proposal, the 11 orders will include the Northeast, Appalachia, Florida, Southeast, Mideast, Upper Midwest, Central, Southwest, Arizona-Las Vegas, Western, and Pacific Northwest.[15]

Besides consolidation of milk marketing orders, the formulas used to determine how farmers are paid would be changed, as required under *FAIR*. Moreover, *FAIR* allowed the Secretary of Agriculture to approve an NDC if there was a compelling public interest and further stipulated that the NDC would terminate upon completion of the farm bill's order consolidation and reform.

All milk marketing orders would be affected under the proposed rule changes the USDA considered as part of consolidation and reform, although some orders would see only minor changes. The proposed rule would replace the BFP--the price for milk used in manufacturing purposes--with a Class III price for cheese and a class IV price for butter and dry milk products. Under the proposed rule, the USDA will use component prices (i.e., based on protein, butterfat, and other nonfat solids) to determine the values of milk used in Class III milk (e.g., milk used in cheese) and a new Class IV (e.g., milk used in butter and nonfat dry milk). This approach will allow the USDA to use information on market prices for butter, cheese, nonfat dry milk, and whey; to determine the value of milk components; and to determine minimum prices using formulas that incorporate these component values.

These new prices will be determined monthly, will be the same in all markets, and should more accurately reflect the value of milk components used in manufactured dairy products. Fluid milk prices (Class I) in each order will be set using either the Class III or Class IV price--whichever is higher--plus a differential that varies by location. The new differentials for Class I milk are intended to reflect market distribution costs. The new Class II price under the proposed rule will be 70 cents plus the Class IV price. As previously mentioned, historically, FMMO's have recognized a single basing point for milk, namely the Upper Midwest--the dominant surplus milk production area in the U.S. In the proposed rule, USDA now recognizes multiple basing points as surplus production areas, and the proposed pricing options reflect this.

In the proposed rule, the USDA prefers option 1B, based on research generated by the Cornell University national dairy model. This option has been characterized as the most market-oriented price surface. The price changes stipulated under this option would be phased in over a five year period, with the new Class I differentials phased in by 20% each year. An analysis of the effects of milk marketing order reform suggests that only minor change for the U.S. would occur; however, Class I prices would be redistributed--some areas would experience higher Class I prices, while some would experience lower Class I prices.[16]

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[14] This bill also extended the deadline for the NDC to 10/1/99.

[15] Appendix B contains a map of the proposed orders.

[16] According to estimates by the USDA, the Class I price for Kentucky would fall only marginally under the reform plan.

What Could Be the Economic Effect of FMMO Reform?

Merging milk marketing orders could have two impacts. First, when orders are combined, the utilization rate--the relative use of each class of milk--will be the average of the orders; therefore, blend prices--the average across all classes--will be affected. Some orders will bring lower Class I utilization rates to new orders, thus lowering the blend price, and vice versa. The second impact concerns zoning. Zoning relates to setting different blend prices at rural versus urban plants within an order to encourage the movement of milk to where it is needed.

Perhaps the most contentious change will be the differentials received by region. The Texas differential is estimated to drop from $3.16 to $2.10, while in Chicago, the differential would increase from $1.40-$1.95. The differentials are higher for regions that are considered milk deficient, with the intent of drawing supplies to these regions and/or stimulating milk production. Based on USDA research, the changes are expected to benefit consumers only slightly--the average price of fluid milk is expected to drop by about 2 cents/gal.

SECTION V
REVIEW OF NORTHEAST INTERSTATE DAIRY COMPACT

The idea for a Northeast Dairy Compact originated in the late 1980's. One reason cited for the compact was that the current federal milk pricing system neglected to account for regional differences in the cost of producing milk. Also, with milk being a commodity crossing state lines, courts ruled that individual state action was not legal under the Interstate Commerce Clause of the U.S. Constitution, thus the need for cooperation among states. By 1993, dairy compact legislation had passed each of the six New England states--Maine, Rhode Island, New Hampshire, Massachusetts, Connecticut, and Vermont. Compact legislation was introduced in 1994 and 1995 in the U.S. Congress but failed to win consideration.

The *FAIR Act of 1996* enabled the Secretary of Agriculture to approve the NDC, subject to certain conditions. Chief among these was the need to determine if there was a "compelling public interest." After receiving public comments and testimony, the Secretary determined a "compelling public interest" existed and noted that the compact was a short-term measure expiring upon the completion of federal milk marketing order reform. The Secretary also stated in his findings that higher prices would result, which would help dairy farmers in the compact, while having a consumer impact, especially for those with low incomes.

The NDC had several other conditions that had to be met. First, before the end of each fiscal year that the compact price is in effect, the Commission must reimburse the CCC for any increased purchases of milk products resulting from increased milk production in the region, above the projected national average rate. This condition was established to limit the federal government's exposure to higher CCC purchases, given that over-order prices will reduce the consumption of fluid milk, thereby increasing the supply of milk going into manufactured products and will spur additional production in the Compact region. Second, the Commission agreed to compensate the WIC program for increased costs. Also, milk sold in the school lunch program is exempt from higher Compact prices.

Litigation

Subsequent to Secretary Glickman's finding of a compelling public interest, thereby allowing the NDC to move forward, the Milk Industry Foundation filed suit challenging the constitutionality of the NDC and the administrative propriety of the Secretary's finding. The Foundation argued that Congress did not consent to the Compact but impermissibly delegated this constitutional authority to the Secretary of Agriculture. This litigation has been concluded and the constitutionality of the NDC was upheld.

New York Dairy Foods, Inc. filed suit against the Northeast Dairy Compact Commission (NDCC) challenging the authority of the Commission to regulate milk that is produced and processed outside of the Compact region, but distributed and sold within the Compact region.

The court denied the processor's challenge, ruling that Congress gave the NDCC the authority to regulate the pooling and pricing with respect to partially regulated plants.

Establishment

The NDCC was up and running by January 1, 1997, allowing regional pricing for fluid milk sold in six New England states. The Commission established a floor price on fluid milk for farmers, with the intention of stabilizing farm milk prices and enhancing dairy farmer incomes.

In July of 1997, the dairy compact commission in the Northeast established a compact price of $16.94 cwt.--$3/cwt. (22%) above the FMMO July '97 Class I milk price. With a flat price, it was hoped milk prices in the Northeast would be less variable, and with the Compact price exceeding the applicable FMMO for Class I milk in New England, dairy farmers' income would be increased.

In the NDC, all milk sold in the region is uniformly regulated--regardless of the source. In other words, New York farmers selling to processors who then market this milk in any of the six New England states receive the same benefits as those in the compact region. Also, all dairy farmers share in the benefits, regardless of the final use of their milk.

Mechanics of Over-Order Pricing in the NDC

Given a federal order minimum price for Class I milk of $13.94, and a Compact over-order price of $16.94, the Compact premium is $3 per cwt. Processors multiply their total fluid milk sales in the Northeast by this amount, and this is the amount they pay into the Commission. Three percent of the proceeds are set aside to hold harmless the impact of the NDC on participants in the WIC program in the Northeast. Another 4-5 cents/cwt. is deducted to take care of late payments by processors. The remaining amount is divided by all milk produced in the region to get the producer price. The Commission then disburses the appropriate dollars to farmer cooperatives and milk handlers who then in turn make payments to farmers based on their production.

For example, with an over-order premium of $3, total milk production of 500 million pounds--50% Class I--the total amount sent to the Commission for that month would be $7.5 million. Once the WIC and other adjustments are made, the amount left to disburse would be around $7.15 million. Distributed over total production (500 million pounds) equals $1.43/cwt. In other words, if a farmer produced 100,000 pounds of milk that month, his/her revenues from milk production would be $1,430 higher compared to revenues that would have been received under federal minimum prices.

In any month that the Compact price exceeds the federal minimum price, dairy farmers selling milk in the region will benefit. Specifically, dairy farmers benefit by receiving higher milk prices than would have been received, and they experience lower price variability. The increased

milk revenues paid to farmers help them to either cover more of their costs, or increase their profitability, while a steady price helps them to avoid price uncertainty.

To the extent that processors and retailers can pass on this increased cost, higher consumer expenditures for milk will occur. In other words, given that processors and retailers choose not to lower their margins on fluid milk, then the benefits at the farm level will be a result of increased consumer expenditures on fluid milk. One difference from the consumer perspective could be less variability in the price paid for milk (i.e., more stable, yet higher, prices). In the literature, a number of studies suggest that the demand for fluid milk is price inelastic. This simply means that if the price of fluid milk rises by 1%, then the quantity of fluid milk sold will fall by something less than 1%. In other words, as prices rise, quantity sold declines by a smaller percentage, resulting in increased revenues to the seller; therefore, there is a strong incentive for processors and retailers to pass on to consumers the amount of the compact premium.

Studies Examining the NDC

The NDCC is required to examine the impact of its actions. The regulation passed by the NDCC stipulated that four areas would be examined: the retail milk market; the WIC program; milk production in New England; and the New England milkshed. The University of Massachusetts and the University of Vermont were commissioned to perform studies relevant to these four areas; to date, these studies have not been released.

OMB Study

The *Agriculture and Appropriations Act of 1998* directed the *Office of Management and Budget (OMB)* to study the economic effects of the NDC and how it has affected federal food and nutritional programs. The study examined the July-December 1997 period and was released in February of 1998.

OMB concluded that the dairy industry in New England was not that different from other regions of the U.S. Specifically, output, productivity, dairy farm numbers, size, and price margins in New England reflect the same trends that have happened across the country. *OMB* also noted that due to the limited time frame, they could not accurately estimate the effects of an over-order price in the Compact region. From a statistical perspective, *OMB* did not have enough data to formulate reliable estimates regarding the potential effects. Moreover, since retail prices have fluctuated in recent years, it was difficult to establish what retail prices would have been, given the Compact was not in effect; thus they could not establish a baseline retail fluid milk price that could be compared to retail prices under the Compact rules.

OMB found that the initial $3/cwt. premium equaled about one-quarter per gallon when the NDCC first implemented an over-order price in July 1997. By the end of December 1997, prices were the same in the Compact region, while prices had risen across the U.S.; therefore, the differential in Northeast prices had dropped to eight cents by December.

OMB presented three scenarios for describing the events that happened during the last half of 1997 in the Northeast dairy market. These scenarios were: a) a high retail impact (15-20 cents/gal.); b) a moderate retail impact (10-15 cents/gal.); and c) a low retail impact (5-10 cents/gal.). The high retail impact was based on comparing fluid milk prices in the first half of 1997 to the last half of 1997. For the moderate case, *OMB* examined the difference between fluid prices in the Northeast and the rest of the U.S. prior to the Compact, and then following the implementation of the Compact. The low impact estimate was based on a comparison with historical patterns back to 1990.

With respect to dairy farms, *OMB* estimated that revenues had increased by $22-$27 million over what they would have been in New England during the last half of 1997, and that milk production had increased by 3%. For areas outside the Northeast, *OMB* estimated that dairy producers and consumers had not been adversely affected, since the New England milkshed accounts for just 3% of total U.S. milk production. *OMB* did caution, however, that such an effect would differ if the Compact region were substantially larger.

Regarding the potential federal impacts, *OMB* found that after compensation to the WIC program for increased costs, and given a 15 cent increase in the price per gallon of milk, the costs for other food program participants (e.g., School Lunch and Breakfast program, Food Stamp program, etc.) would be about $3.5 million. *OMB* went further in suggesting that the NDCC fully reimburse each federal feeding program, not just WIC, for any additional costs. Another conclusion reached by *OMB* was that lower-income households not participating in the federal feeding programs would be significantly affected.

SECTION VI
SOUTHERN DAIRY COMPACT

As previously mentioned, KRS 260.670 enables Kentucky to enter into the Southern Dairy Compact with sixteen other states, given each of these states has passed identical legislation and Congressional consent is granted. Although a number of attempts were made during the 106th Congress, Congressional approval has not been received for the Southern Dairy Compact.

Review of Research

In early 1999, the University of Missouri (MU) released a study which focused on the potential impacts of the implementation of the Southern Dairy Compact. The conclusion from the study was that if Missouri joined the SDC, its membership would help to slow the steady decline in dairy production in the state, but would come with offsetting costs. The offsets were anticipated to come in the form of higher costs for consumers in the Compact region and lower prices for dairy farmers outside of the Compact region.

The MU study described the SDC as an effort to stabilize and enhance fluid milk prices in the Southeast. It was noted that farm income from milk production would increase and would subsequently have related effects on feed sales and local retail sales, but these benefits would come at the expense of dairy consumers.

The Compact premium used in the MU study assumed a $2/cwt. premium, which is equal to the 1997 average premium paid in the NDC. The authors of the study estimated that such a premium would boost Missouri dairy farmer income and milk production within the state. Conversely, the price of fluid milk for consumers would increase. Another conclusion was that fluid milk price increase would lead to consumption decreases.

Given the proposed states in the SDC, approximately one-quarter of the milk produced in the U.S. would fall under the pricing policies of the Commission. Farmers outside of the Compact would receive lower prices than farmers within the Compact. Also, as Compact farmers responded to higher prices by increasing milk production, more milk outside of the region might go to manufacturing purposes, further depressing the price of milk. Such an effect would likely serve as an incentive for certain states to oppose the SDC.

Potential Impacts on Kentucky of Joining the SDC

Since approximately 27% of the milk production in the U.S. will fall under some type of compact pricing, with the existence of the NDC and the establishment of an SDC, it is likely that national dairy markets could be affected under such a scenario.

In order to evaluate the impacts associated with the operation of the SDC, a national milk model should be used. A national model is necessary because as the Compact premium affects production and utilization in the Compact region, other regions (states) will be affected.

Moreover, even with the existence of an SDC, fluid milk and dairy products will continue to flow across Compact and non-Compact regions. Simply put, a national model is needed to account for the interrelationships between Compact and non-Compact regions.

Economic Model

A national dairy model based on previous research from the University of Missouri was used to obtain the results for Kentucky, assuming an SDC was operational. The model is a static equilibrium model, which yields market adjustments given certain price changes. The model is "built-up" from federal market orders, and it segments the demand for milk based on whether it is used for fluid or manufacturing purposes. Based on previous studies that have examined the price sensitivity of the demand for milk, the demand curve for fluid milk in the model is relatively inelastic, while the demand curve for milk used in manufacturing products is more elastic.

Milk production within the model reacts to the blend price (i.e., weighted-average price of fluid and manufacturing milk). Production is then allocated based on historical use patterns for fluid and manufacturing purposes. Once the supply of manufacturing products is determined, separate equations for dairy commodities (butter, cheese, and nonfat dry milk) enter the model. Dairy product prices are then determined based on these supply and demand factors, which then drive class prices, which in turn drive milk production (supply) and allocation.

Assumptions

The baseline which was used to compare to the effects of the SDC in order to estimate the "net" effects associated with the Compact operation was based on the federal milk marketing order reform proposed by the USDA's Secretary Glickman in 1999. At the time of the analysis, federal order reform appeared to be the most likely future scenario to use as a baseline. However, after a two-year development phase, federal order reform was abandoned in late 1999 during the congressional budget deliberations. Given the relatively small (negative) impact associated with federal order reform across the nation, and in Kentucky in particular, such an assumption does not materially limit the analysis presented for Kentucky. What this assumption does mean is that the estimates presented may be slightly larger compared to an alternative analysis using existing federal market orders as the baseline.

Another critical assumption involved the Compact price. According to the SDC legislation, the Compact price shall not exceed $1.50/gal at Atlanta, which translates into a Compact price of $17.50/cwt. What is not known is how the price may vary across orders within the SDC. Given this, the approach used was to institute a constant premium within the model. In other words, a constant over-order premium was established, at $2/cwt., above the fluid milk price generated within the model for the baseline scenario.

Another area of concern was how to implement the margin between the farm price and the retail price of milk. One could assume that processors simply markup milk by a fixed amount--say

50 cents/gal. Alternatively, one could assume that processors markup milk by a fixed percentage – say 50%. In both instances, increases in the farm price of milk will be "passed-through" to the consumer. The different assumptions vary in the degree of "pass-through" that occurs. The assumption used was that processors markup milk by a fixed dollar amount.

Results for Kentucky

Table 9 presents the results for the non-Compact (baseline) analysis, the analysis assuming an SDC is operating (Compact scenario), and the difference between the two scenarios. The first row of the table indicates marketings of milk by Kentucky producers increases under the Compact scenario. Under the conditions of the Compact, dairy producers will receive higher prices for their milk and will respond by producing more milk. The results suggest that a 6.8% increase in the farm price of milk will lead to a 2.3% increase in milk marketings (production), thus reflecting a minor production response to the increase in the farm price. Notice that the results indicate that the retail price of fluid milk will increase by $.16 per gallon.[17] As a result, consumers will drink less milk, thus total fluid consumption falls, along with the percent of milk marketings going into Class I (fluid) use. Additionally, as more milk is produced and less is consumed in fluid form under the Compact scenario, more must go into dairy products; therefore, Class III use rises. Note that the consumer impact for fluid milk expenditures ($9.7 million) is less than the increase in farm sales ($23 million). The reason for this difference is that the increase in farm milk sales originates from higher fluid revenues and higher manufacturing revenues. In other words, the consumer effect, or the increase in retail expenditures that flow back to the farm level price, is just one component of the higher farm milk sales. The other component is higher production and more sales of milk that go into manufactured dairy products.

[17] For a detailed treatment of the relationship between the farm and retail price of milk, and how the NDC has affected New England retail milk prices, see the study by Lass, Adanu, and Allen.

TABLE 9
ESTIMATED IMPACTS OF SDC ON KENTUCKY

KENTUCKY	Non-Compact Scenario	Compact Scenario	Difference
Milk Marketings (mil. lbs.)	1,708.0	1,747.8	39.8
Class I	70.7%	68%	-2.7%
Class II	10.7%	10.5%	-.2%
Class III	18.6%	21.5%	2.9%
Total	100%	100%	----
Class I Price ($/cwt.)	$13.92	$13.70	-$.22
Blend Price ($/cwt.)	$13.37	$13.10	-$.27
Compact Price ($/cwt.)	$13.92	$15.70	$1.77
Compact Over-Order Premium ($/cwt.)	N/A	$2.00	$2.00
Effective Farm Price	$14.46	$15.45	$.99
Total Fluid Consumption (millions of gallons)	94.2	92.5	-1.7
Class I price ($/gal)	$1.33	$1.49	$.16
Dollar Markup	$1.23	$1.23	$0.00
Retail Fluid Milk Price ($/gal)	$2.56	$2.72	$.16
Retail Fluid Milk Expenditures (millions)	$241.5	$251.2	$9.7
Farm Milk Sales (millions)	$247.0	$270.0	$23.0

Potential Effects on Non-Compact Regions

The Compact premium serves as a stimulus for production in the Compact region. The price increase for fluid milk in the Compact region reduces consumption of fluid milk products and as a result more milk is utilized--shipped out of the Compact region--to be used in manufacturing products. The non-Compact regions could be affected in that the surplus milk from the Compact regions will help to decrease prices for manufacturing products in the non-Compact regions. Since manufacturing prices are the basis for farm milk prices, as the manufactured price falls in the non-Compact regions, producers will decrease production to a small extent, while consumers in the non-Compact regions will experience lower fluid prices and will increase their consumption of fluid products. Fluid utilization in the non-Compact regions may increase, but this increase is estimated to have a smaller positive effect on the blend price than the negative effect associated with increased supplies of milk in the non-Compact region. In other words, the farm price of all milk and the retail price of fluid milk in the non-Compact regions is expected to decline.

The Compact region is not immune to the effects of increased production stemming from the Compact premium. While consumers will pay more for fluid products due to increases in the

production of milk, with more milk moving into manufactured dairy products, consumers in the Compact region should experience decreased prices for non-fluid products. Dairy producers in the Compact region are also affected through a feedback effect. With more milk being utilized for manufactured products and since the prices for these products are part of the Compact region's blend price, as manufacturing prices fall, so will the blend price in the Compact region. The implication is that while producers in the Compact region benefit from the Compact premium, this is offset, to a small extent, by a decrease in blend prices, resulting from increased production.

SECTION VII
SUMMARY AND CONCLUSIONS

The purpose of this study was to examine the economic impact of Kentucky's joining the SDC. The results from the analysis presented in Section VI indicate there are a number of interrelated effects within a Compact region and in non-Compact regions that could occur as the SDC is implemented.

The impacts of Kentucky's joining the SDC can be summarized as follows:

- Milk marketings, in terms of quantity and value, should increase in response to higher farm milk prices;
- Percent of milk used for fluid purposes and the per capita consumption of fluid milk should fall as fluid prices increase;
- Retail expenditures on fluid milk should increase as fluid prices increase;
- Percent of milk used in manufacturing purposes should increase as milk production increases;
- The increase in the fluid prices will be offset to some extent by a price decrease for manufacturing products; and
- Farm price of milk will increase by a smaller amount than the Compact premium due to diverting more milk to manufacturing purposes, less to fluid purposes, and lower manufacturing milk prices.

The extent in which a dairy compact can raise farm milk prices is dependent on the Compact premium, fluid utilization in the market, and feedback effects. Farmers in Kentucky, where fluid utilization is high, will benefit more than lower fluid utilization states. However, as more milk comes under Compact pricing, the more milk production should increase. The subsequent surge in surplus milk could depress national dairy commodity prices, which serve as the basis for class I prices; therefore, Compact premiums will be offset to some extent by lower class prices.

A portion of the Compact premium could be passed through to consumers through fluid processors and retailers. Higher retail fluid milk prices reduce fluid milk consumption and fluid milk utilization, raising retail milk expenditures in Compact states. Also, if a fixed dollar markup is used, with lower fluid milk sales, retailers and processors also share a small portion of the burden associated with the Compact premium.

As milk now moves over different regions, once the SDC is implemented, feedback effects could occur in non-Compact regions. These effects can be summarized as follows:

- As more surplus milk reaches non-Compact regions, milk prices will fall;
- As milk prices fall in the non-Compact region, production declines could occur;
- Consumers in non-Compact regions should increase their purchase as milk prices fall;
- Fluid utilization should increase, in the non-Compact regions, as milk prices fall; and

- Estimated net negative effect on milk prices as price increase due to higher fluid utilization is not enough to offset the price decrease associated with more milk moving into the non-Compact region.

As the Compact premium leads to higher fluid prices and production within the Compact region, fluid consumption will likely decline. The result is that more milk flows into manufactured dairy products. Simply put, Compacts sell some of their excess production in non-Compact regions. This excess production affects non-Compact states and, to some extent, Compact states.

Greater supplies of dairy commodities result in lower class prices in federal orders. For farmers in the Compact region, these lower class prices are offset by Compact premiums; however, farmers in non-Compact regions and states face the full impact of lower class prices. With lower farm milk prices, dairy farmers outside of the Compact are likely to lower production, leading to lower milk sales (marketings). A small offset in the non-Compact regions occurs as consumers increase their purchases of fluid milk in response to lower prices.

Overall, if Congress grants approval to the SDC, significant changes are likely to occur within the U.S. dairy industry and in the South, as over one-quarter of the nation's milk production will fall under Compact pricing. While the focus of this study has been to estimate the impact of the SDC on Kentucky, it is important to note that the Commonwealth would have likely experienced the same outcome--lower milk prices for consumers and farmers, along with reduced milk production--as non-Compact states, if Kentucky had chosen not to join the SDC. By participating in the SDC, Kentucky consumers of fluid milk products will likely face higher prices, while farm sales of milk in Kentucky will likely increase. Processors in Kentucky could experience lower volumes of fluid sales and higher volumes of manufactured dairy products and, therefore, could bear a small portion of the increased costs due to the Compact premium. Given the price elasticity of fluid milk, however, there is a strong incentive to pass along these increased costs to consumers.

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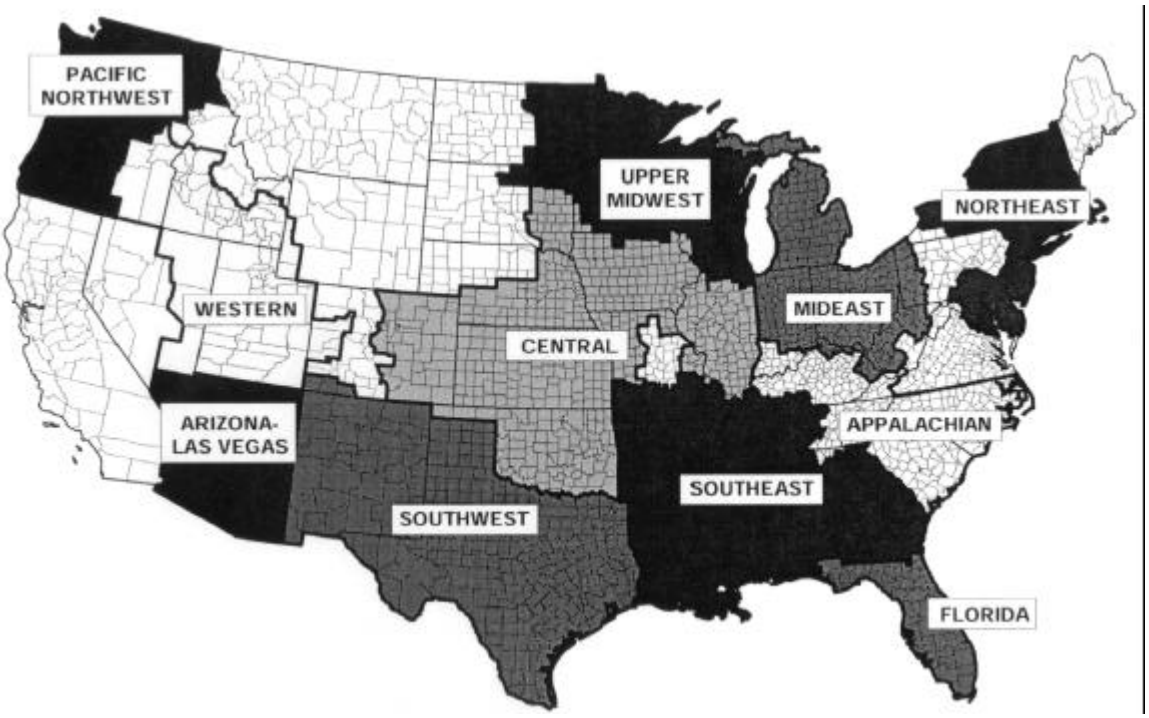
APPENDIX A
Class I Differentials and Over-Order Premiums

	Class I Differential	Over-Order Premiums
Northeast (New York City)		
New England (Boston)	$3.24	$0.95
New York-New Jersey (New York City)	$3.14	$1.01
Middle Atlantic (Philadelphia)	$3.03	$1.08
Appalachian (Charlotte)		
Carolina (Charlotte)	$3.08	$1.47
Tennessee Valley (Knoxville)	$2.77	
Louisville-Lexington-Evansville (Louisville)	$2.11	$1.10
Southeast (Atlanta)	$3.08	$1.23
Florida (Tampa)	$3.88	$2.92
Mideast (Cleveland)		
Michigan Upper Peninsula (Marquette)	$1.35	$1.25
Southern Michigan (Detroit)	$1.75	$1.25
E. Ohio-W. Pennsylvania (Cleveland)	$2.00	$1.57
Ohio Valley (Columbus)	$2.04	$1.64
Indiana (Indianapolis)	$1.90	$1.68
Upper Midwest (Chicago)		
Chicago Regional (Chicago)	$1.40	$2.17
Upper Midwest (Minneapolis)	$1.20	$1.59
Central (Kansas City)		
Iowa (Des Moines)	$1.55	$1.63
Nebraska-Western Iowa (Omaha)	$1.75	$1.53
Eastern S. Dakota (Sioux Falls)	$1.50	
Central Illinois (Peoria)	$1.61	$2.07
Southern Illinois-Eastern Missouri (Alton)	$1.92	$2.11
Southwest Plains (Oklahoma City)	$2.77	$0.62
Eastern Colorado (Denver)	$2.73	$0.15
Greater Kansas City (Kansas City)	$1.92	$1.53
Southwest (Dallas)		
Texas (Dallas)	$3.16	$0.53
New Mexico-West Texas (Albuquerque)	$2.35	$0.53
Western (Salt Lake City)		
Southwestern Idaho-Eastern Oregon (Boise)	$1.50	
Great Basin (Salt Lake City)	$1.90	$0.15
Western Colorado (Grand Junction)	$2.00	
Arizona-Las Vegas (Phoenix)	$2.52	
Pacific Northwest (Seattle)	$1.90	$0.34

Note: The areas in boldface represent the new orders as proposed under FMMO reform. Over-order premiums represent negotiated amounts over class I prices between producers and processors.

APPENDIX B

Proposed Federal Milk Marketing Order Areas



DIFFERENCES IN SHADING MERELY SERVE TO
DIFFERENTIATE BETWEEN MARKETING AREAS