The Dairy Industry in the U.S. and Northern New York

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Introduction

Never before has the issue of the long-term viability of the dairy industry in both the State and region been of greater importance. Even though the dairy industry is one of several critical industries in the Northern New York economy, professional economic developers have sometimes been accused of neglecting the dairy industry – from farm through farm services to processors. In the late 90s, Empire State Development (ESD), and especially its North Country regional office, began to focus on the increasingly uncertain status of the dairy manufacturing industry in the State. Realizing that the dairy value chain – from raw materials to finished product – was just as strong as its weakest link, ESD began to get acquainted with other industry players including New York State Ag & Markets, Cornell University, and Cornell Cooperative Extension.

Beginning in 2001 many dairy industry participants interested in the status and stability, not to mention the future, of the North Country dairy industry held a series of meetings in four of the North Country's six counties. ESD participated in these meetings and collaborated with the other participants to form the North Country Dairy Viability Initiative. The Initiative described itself as "a grassroots effort to achieve the ideal future for the North Country Dairy Industry" and attempted to be "representative of all sectors of the dairy value chain and key supporting organizations."

The Initiative created a number of committees that it charged with the task of "researching options and ideas to improve the viability of the dairy industry in the North Country." One of the committees focused on manufacturing and processing issues. Many of the region's manufacturers, together with some producers, cooperative personnel, and economic developers, participated in this committee's deliberations. Ms. Judy Tomlinson of Empire State Development's regional office not only played a major role in the committee but also helped to lead it.

The committee realized early that the Initiative required some sort of disciplined review of the region's dairy processing industry, together with some comparison to the status of the dairy processing industry elsewhere in the United States. Therefore, in December 2002 Empire State Development Corporation (ESDC) signed a contract with the Adirondack North Country Association, which in turn contracted with CITEC (the Council for International Trade, Technology, Education, and Communication, Inc), for a study that would "address the critical economic development issue of the viability of the region's dairy industry from the manufacturing perspective." ESD expected the study to "identify and define specific options that the manufacturers could explore" and to assess what the chances were for expanding production at the region's processing plants. ESD also expected that CITEC would also collect data that would lay a foundation for future analyses (if appropriate) for "a whey drying plant, a milk balancing plant, and necessary community infrastructure improvements." Originally, CITEC was to have completed the study in November 2003.

To do these tasks CITEC needed to develop a significant amount of local data not available in published sources. CITEC spent most of the next nine months attempting to develop statistically significant local data sets about the region's manufacturing plants' operations. The dramatic differences among the plants' operations, the fact that at least three plants closed or changed ownership during the study period, and the competitive concerns for privileged information created a period of extended negotiations among CITEC, ESD, and the various plants. Finally, in late 2003, CITEC was able to begin the bulk of its local data collection (see The Nature of the Sources below) and its time for completion of the study was extended to December 2004.

It is absolutely essential that the reader understand at the outset that the report that follows has been prepared primarily from the point of view of the manufacturers. This is *not* to say that it simply a repeats

the manufacturer's positions on the many issues that have characterized discussions about the state of the dairy value chain in the North Country. What it *does* mean is that CITEC has done its best to do two things. First, it has observed and listened very carefully to the manufacturers' analyses of the problems and opportunities that their present operations face. Secondly, CITEC has tried to test these contentions by examining some of the data from the region, State, and nation that would help to confirm, deny, or reorient the manufacturers' analyses. The result, we hope, will give the reader an idea of the state of the dairy industry in the North Country from the point of view of the processing plants that provide a major market for the output of the rest of the dairy value chain.

Thank You's

Empire State Development selected CITEC to prepare this study because of CITEC's expertise in manufacturing generally and its familiarity with North Country manufacturing companies, not because of any specific expertise it may have had in dairy products manufacturing. The fact that CITEC had previously done technical work for several of the region's dairy processing firms did not and does not make CITEC a dairy industry expert. Therefore, virtually all of the data – and most of the conclusions drawn from that data – included in this study, have derived from the expertise and industry knowledge of many other participants.

It is risky to single out individuals and organizations for special attention because, since CITEC relied on so many for assistance in preparing this document, there is certainty that some people who contributed to the effort and should be thanked for their efforts will be omitted. Suffice it to say that CITEC consulted with well over a hundred individual and organizational sources at one time or another in the preparation of this report. Some of the ones who played a major role, and to whom CITEC is deeply grateful, are:

- Participants in the North Country Dairy Viability Project, including people from dairy farms, dairy manufacturers, dairy cooperatives, Cooperative Extension offices, economic development agencies, and many others
- State government departments, especially Empire State Development (who funded the bulk of this study and provided the outstanding services of its project manager, Ms. Judy Tomlinson, to it) and the Department of Agriculture and Markets
- Representatives from the eight dairy manufacturers operating in the region during the study who participated in either the assessments, the questionnaire process, or in meetings that accompanied the study process
- Personnel from Cornell University, in particular Drs. Mark Stevenson and Dave Barbano as well as David Smith and Frank Welcome
- The Adirondack North Country Association who provided administrative services to CITEC by contracting with Empire State Development for the production of this report
- The New York State Office of Science, Technology, and Academic Research, who provided a substantial part of the funding for this project.

Disclaimer

All views expressed in this report are those of CITEC and do not necessarily reflect those of the participants in the North Country Dairy Viability Project, State government departments, Cornell University, or the Adirondack North Country Association.

Executive Summary

The dairy industry is an important component of New York's North Country economy. Every link in the value chain – from the farmers (producers) to the milk haulers to the cheese plants (processors) – is dependent on the others for stability and growth. Shrinkage in the number of dairy farms and the number of cows in the North Country has threatened the cheesemaking operations in the region. And the reduction in the number of cheese plants operating in the North Country has had a negative impact on the dairy farmers. If milk has to be hauled into or out of the region, costs to the cheesemakers increase (in the case of the former) or the farmers' expenses go up (in the case of the latter). A fine balance must be maintained to preserve a viable economy.

The North Country is not alone in this dilemma. Other regions face the same issues, so this report takes a look at other parts of the country as well to see what has happened elsewhere and how New York and the North Country can benefit from their experiences.

Nationwide, the number of farms has shrunk and the total number of cows has also decreased, but milk production per cow has increased leading to overall growth in milk production to match the expanding population. This trend is expected to continue, but milk prices need to become more stable so that the number of dairy farms that cease operating doesn't create great dislocations in local economies.

The same phenomenon that milk producers have experienced has occurred with processors as well, resulting in fewer plants, but higher output. This movement is expected to persist, requiring manufacturers either to increase the size and efficiencies of their operations to stay competitive or to exit the business. Manufacturers who cannot expand must seriously consider producing specialty products to maintain or improve their operating margins, particularly since expansion is dependant on a steady or growing milk supply in the region, which appears doubtful unless local farmers are willing and able to make changes in the way they operate.

Some of the specific steps that can be taken in the North Country to support and grow the local dairy industry are as follows:

- Better communication and cooperation amongst the dairy farmers and cooperatives could reduce their costs by sharing best practices and challenging each other to become more progressive as has occurred in Wyoming, Genesee, and Cayuga Counties in the Finger Lakes region of New York.
- Lower property taxes for farmers would help them cut costs, as would lower inheritance taxes and energy and fuel costs.
- Consolidation of dairy farms would allow them to spread capital costs over larger numbers of cows and receive more attention from agricultural representatives, reducing their costs per hundredweight of milk. Alternatively, they could choose to work with local crop growers to share land for manure disposal, allowing them to raise more cows on less acreage.
- Dairy farmers could specialize and produce organic milk to earn 4% to 7% more for their milk. Many of the local dairy farms could also increase their income just by improving the quality of their milk by reducing the somatic cell counts.
- The local dairy processors could increase production to take advantage of economies of scale, but this would require either significant capital improvements at many of the plants to improve old and faulty equipment or different marketing strategies or products at some of the other plants.
- Producing more specialty cheeses and less commodity cheese would allow the dairy plants to receive higher prices for their cheese and take advantage of the growing markets for unique cheese varieties.
- An improved local highway system would allow the dairy plants to cut costs by reducing the amount of inventory they must keep on hand and the overtime costs that occur when truckers cannot reach the plants on schedule. Additional passing lanes on the major east-west corridors could be a temporary solution until a "rooftop" highway materializes.
- Significant public infrastructure improvements are needed in some of the communities to improve the water supply and waste disposal facilities before the plants can expand.

- A local whey dryer and/ or the deployment of other whey disposal technologies would cut costs for some of the plants significantly.
- All of the dairy plants would benefit from lower energy and workers' compensation costs.
- Balancing of the milk supply must be addressed, particularly since the loss of the Kraft plant in Canton has reduced the potential "flex" in the regional supply network. An ultra-filtration plant in the region may be a good solution to this problem while also alleviating some of the waste disposal issues and transportation costs.

The Nature of the Sources

This study is essentially based on two kinds of research. First, CITEC did substantial local research in cooperation with most of the cheese plants operating in Northern New York. That research was done on at least three levels. Five companies participated in individual site-specific competitive analyses through which CITEC was able to develop data about the participants' operations, some of which the companies allowed CITEC to use in preparing this report. Doing these assessments also enabled CITEC to develop a "feel", albeit anecdotal and impressionistic, about the competitive situation of the region's plants.

CITEC's second local data set was developed from a general questionnaire that was sent to all of the regions' milk processing plants. This questionnaire was more general and much less detailed than the individual site-specific assessments and was designed to develop more general information about the status of the dairy processing sector in the region. Only five plants responded in whole or in part to this questionnaire and CITEC had to search elsewhere for the answers to these questions for the other plants.

Finally, the third level of CITEC's local research involved participation in numerous meetings going back to late 2002 with representatives from all of the diary processing plants operating in the region. CITEC developed additional impressionistic and anecdotal information from these meetings which allowed CITEC to "fill in the blanks" where its other research came up short.

It is important to stress that the local data that CITEC developed is by no means complete or systematic. As the reader can well imagine, many of the region's processing plants, not to mention their parent corporations, are in direct competition with one another. The major issue from the very beginning was the degree to which the companies' participation in the local data gathering portion of the project would imperil their competitive positions *vis-à-vis* other players in the dairy products industry. Consequently, even though CITEC has been careful to point out that its conclusions should not be considered more robust than the data that underlies them, it is important for the reader to understand that mathematical proof of many of the observations and recommendations made herein is an impossibility given the nature of the data and wishes of the companies that participated in its production.

The second basic data set on which this study is based is national, state, and regional data that have been gleaned by CITEC from a variety of national, state, regional, and local sources Most, if not all, of this data is in the public domain. The most important sources that CITEC has relied on are listed in the Bibliography. Some of this data came from national and local governmental sources. Other important data came from university sources.

The National Dairy Industry

The U.S. farm milk supply has tightened severely in recent months due to low prices received by farmers for their milk over the last two years, a U.S. ban on the importation of replacement cows from Canada, a problem in the manufacture of recombinant bovine somatropin (rBST), and introduction of the Cooperatives Working Together (CWT) program. (CWT expects to reduce the milk supply by 1.2 billion pounds in a 12-month period by herd retirements, reduced milk marketings, and export assistance.) This has resulted in higher milk ingredient costs for U.S. manufacturers of dairy products and the cash price for cheddar cheese reaching an all-time record high on March 26, 2004. The higher wholesale milk prices are likely to result in increased milk production, leading to another drop in prices. The cyclicality of the dairy industry is due to the short shelf life of milk and the length of time it takes for farmers to adjust to changes in demand. This makes it difficult for both producers (farmers) and processors (cheese makers*) to plan for the future. In fact, neither producers nor processors know the price of the milk they are selling/using until some time after the sale. So a processor doesn't know the precise cost of the goods being produced until after the milk has been used.

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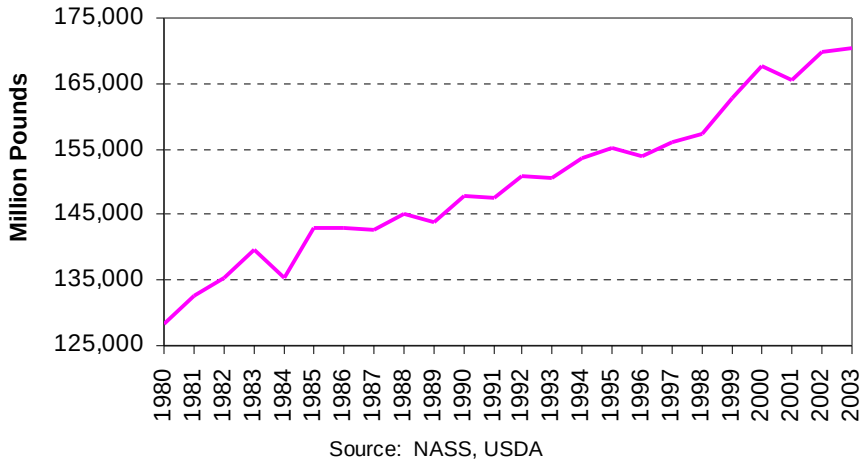
* "Cheese makers" as used in this study should be understood as including establishments that make hard and soft cheeses, as well as butter, dry milk, yogurt, cream cheese, cottage cheese, and ice cream.

Milk Production

Figure 1: U.S. Milk Production, 1980-2003



Source: NASS, USDA

As seen in the chart above, U.S. milk production has increased fairly steadily over the years to match the growth in the U.S. population.

Table 1: Milk Production by State and Region

State	1975 Million Pounds	1975 Share	2003 Million Pounds	2003 Share	% Change
CA	10,853	9%	35,437	21%	227%
WI	18,900	16%	22,266	13%	18%
NY	9,964	9%	11,952	7%	20%
PA	7,140	6%	10,338	6%	45%
ID	1,555	1%	8,774	5%	464%
MN	8,946	8%	8,258	5%	-8%
NM	366	0%	6,666	4%	1721%
MI	4,411	4%	6,360	4%	44%
TX	3,208	3%	5,630	3%	75%
WA	2,322	2%	5,581	3%	140%
OH	4,259	4%	4,490	3%	5%
IA	3,893	3%	3,780	2%	-3%
AZ	840	1%	3,454	2%	311%
IN	2,210	2%	2,944	2%	33%
VT	2,009	2%	2,637	2%	31%
CO	845	1%	2,177	1%	158%
OR	990	1%	2,177	1%	120%
FL	1,956	2%	2,161	1%	10%
KS	1,392	1%	2,115	1%	52%
IL	2,446	2%	2,047	1%	-16%
MO	2,840	2%	1,886	1%	-34%
VA	1,755	2%	1,731	1%	-1%
UT	919	1%	1,615	1%	76%
KY	2,319	2%	1,464	1%	-37%
GA	1,221	1%	1,444	1%	18%
SD	1,556	1%	1,325	1%	-15%
OK	1,060	1%	1,312	1%	24%
MD	1,550	1%	1,232	1%	-21%
TN	2,031	2%	1,205	1%	-41%
NE	1,431	1%	1,129	1%	-21%
NC	1,498	1%	1,044	1%	-30%
Other States*	8,713	8%	5,682	3%	-35%
US Total	115,398		170,312		48%
North Atlantic	10,202	9%	14,539	9%	43%
South Atlantic	14,142	12%	20,694	12%	46%
East North Central	5,036	4%	8,636	5%	71%
West North Central	7,620	7%	10,022	6%	32%
South Central	25,156	22%	52,557	31%	109%
West	53,242	46%	63,865	37%	20%

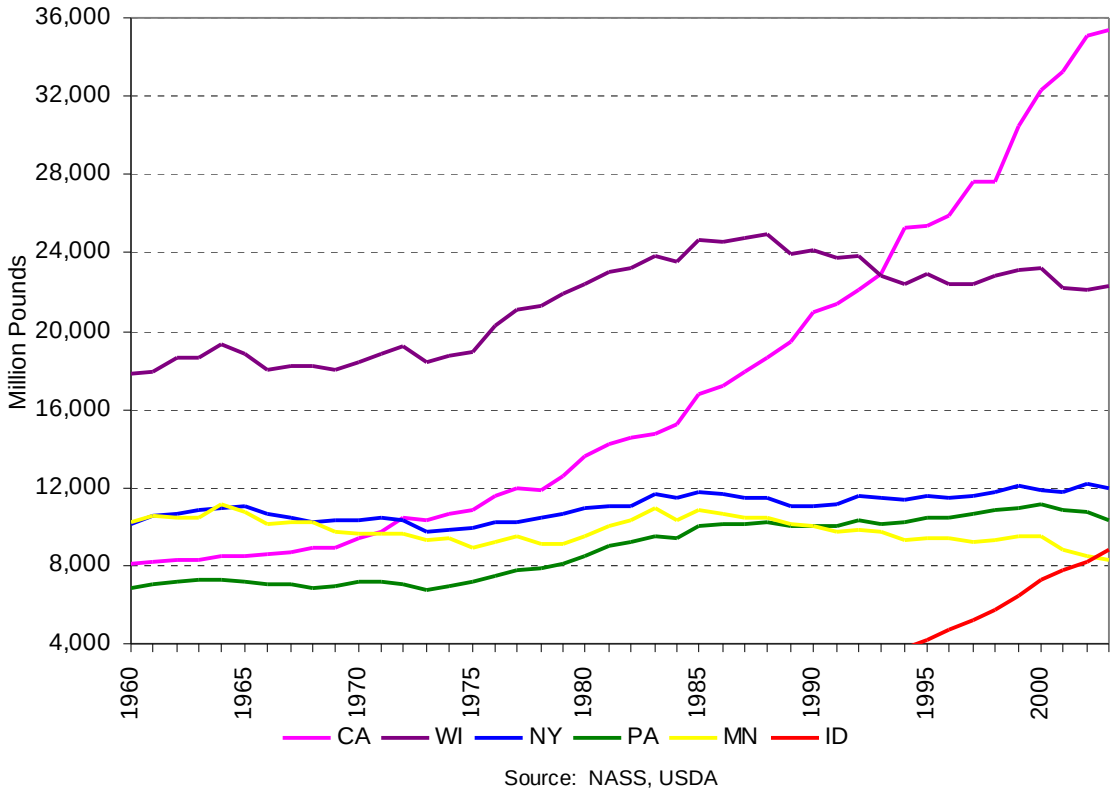
*States with <1 billion pounds milk production in 2003

Sources: Milk Final Estimates, February 1981, and Milk Production, February 2004, Agricultural Statistics Board, NASS, USDA

The five largest milk-producing states have since World War II been California, Wisconsin, New York, Pennsylvania, and Minnesota. As shown in both the table above and the chart below, Idaho overtook Minnesota's production in 2003, putting it in the top five. Since Minnesota's production appears to be on a steady decline and Idaho's on a rise almost as steep as California's, this switch will probably be permanent. It is also interesting to note that New Mexico's milk production soared 1721% during the period. If they keep up the pace, they will also jump ahead of Minnesota. While New Mexico is one of

the few states that increased its number of dairy plants from 1990 to 2002, it is probably exporting much of its milk to other states since its per capita milk production is fourth in the nation. (See Table 6.)

Figure 2: Milk Production in the Six Largest Dairy States, 1960-2003



Source: NASS, USDA

In dollar terms, milk is the number one agricultural commodity produced in California and is also one of the most heavily regulated and supported agricultural industries in California. California's milk production has increased 227% since 1975 to over 35 billion pounds per year.

California became exempt from the federal milk marketing order system through passage of the Young Act in 1935. This has resulted in a unique system for distributing milk revenue in the state and allows California to act quickly to respond to dairy market problems. According to an article from the University of California[1], "the Young Act was an emergency response to the marketing conditions of the 1930s." It created a system for pooling milk that worked for over 30 years. Problems arose with Class 1 contracts and as milk production expanded even faster than Class 1 demand after World War II, a new system for distribution of these contracts was needed. Thus, the Gonsalves Act of 1967 created a quota policy to further stabilize prices and provide a more equitable market for producers. The quota policy has been further refined, but still remains in place today. Quota can be bought and sold, making it an asset with a market price that has ranged from a peak of over $800 per pound of quota in 1973 to a low of about $250 per pound of quota in 1997, measured in inflation-adjusted 1992 dollars. The value of quota is significant and has created a milk marketing policy in California that is unlike the policy in other parts of the U.S. Most dairy farmers in California own some quota and it is traded in an active market that is much like that for other financial assets. The average annual rate of return, about 26%, is high relative to that for other assets, probably mainly due to the skepticism from dairy farmers that the program will continue to provide higher milk revenue and avoid severe capital loss, despite more than 30 years of experience.

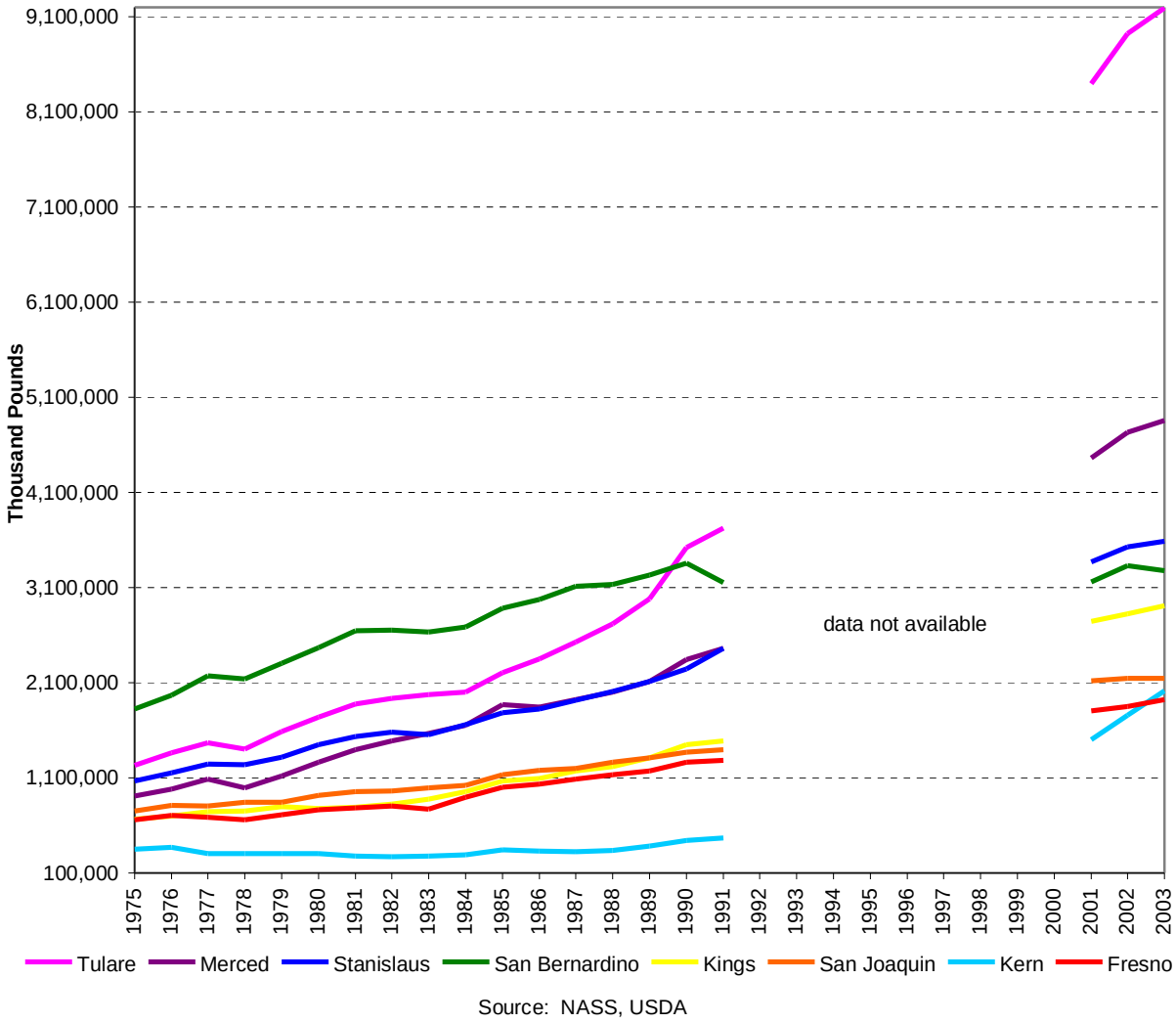
[1] "The Evolution of Dairy Price Policy in California: Our Unique System for Distributing Milk Revenue", Daniel A. Sumner and Norbert L. W. Wilson, Agricultural and Resource Economics, Vol. 3 No.3, Spring 2000, University of California, Davis.

As a result of low farm prices for milk in California, a public hearing was held in January 2003 that resulted in a number of changes in the Class 4a (butter and dried milk products) and Class 4b (cheese) pricing formulas which in sum total increased prices paid to producers by $0.10 per cwt. Due to regional changes in milk use, another hearing was held in June 2003 that liberalized both transportation allowances and transportation credits for California producers. A third hearing was held in 2003 that resulted in stricter depooling and repooling regulations for both plants and producers. These actions were taken to increase the milk supply and stabilize the market. California's ability to respond quickly to market pressures is unique and gives it an advantage the states in the Federal Marketing Orders do not have.

California's latest dairy initiative is a 90,000-cow dairy-energy farm that could eventually generate 1,500 new jobs, according to a story in The Desert Dispatch on March 21, 2004. This ambitious project will consolidate existing dairies into 30 $10 million barns, each owned by a different dairyman, "kept indoors in a hygienic environment, with bovine waste rinsed every four hours into a $100 million manure cooker. The methane produced by the cooker would generate commercial power from a $50 million, 49-megawatt gas turbine generator. The cows would feed on distiller's grain, the corn leftovers from a $50 million factory on site that would produce ethanol. A $50 million Scott's fertilizer plant on the site will use the cooked cow manure, a $50 million cheese factory will use some of the milk, and the rest of the milk would go to markets like Las Vegas and Los Angeles. There would be a meat packing facility on the premises, too. The dairy operation aims to eliminate the pollution and health risks associated with traditional dairy farming." Over $6 billion will be invested to create the state-of-the-art facility. Even if this project ends up being less grandiose than its press notices, the fact that it has been seriously proposed demonstrates the ambitious horizons that characterize milk production in California – suggesting that the steep rise in California's milk production curve since the 60s is caused by more than simply California's population increase.

Milk production in California varies by county, with Tulare County producing significantly more milk than any other county in the U.S. The next three charts depict the growth in production in various top milk-producing counties.

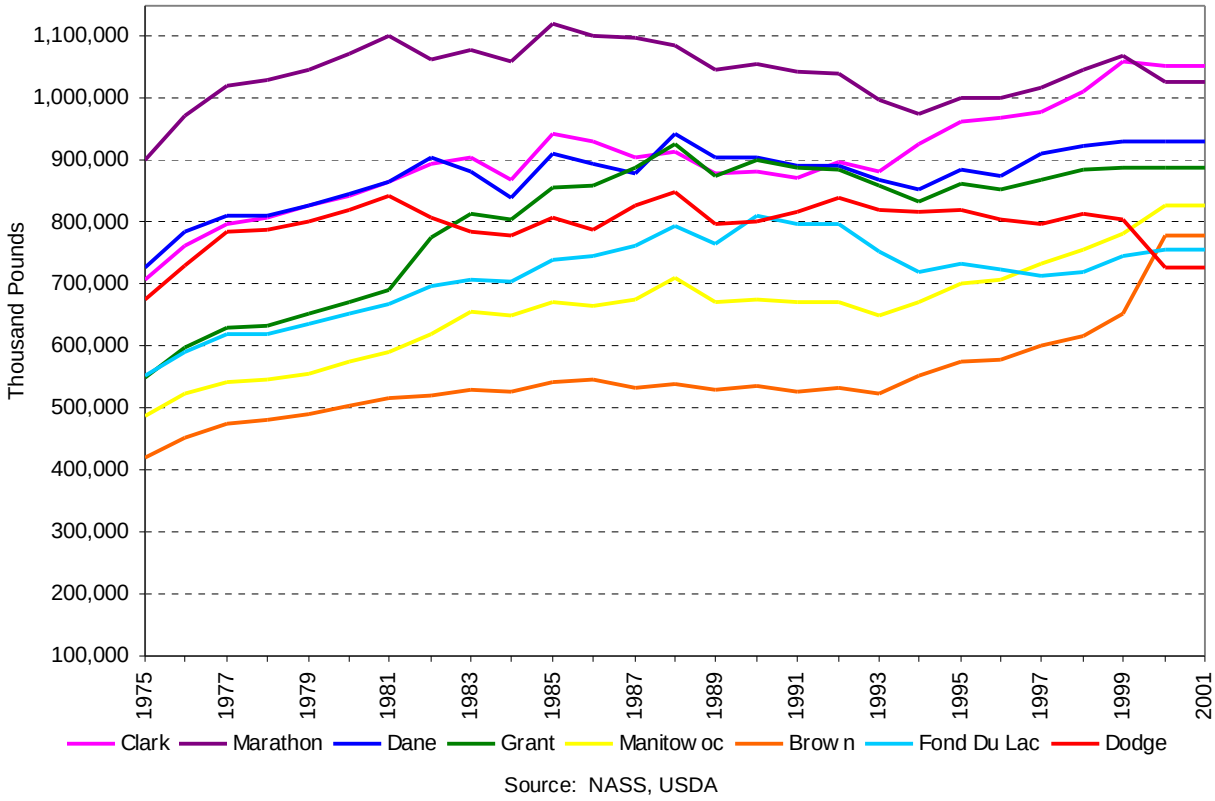
Figure 3: Milk Production by Top Eight Counties in California, 1975-2003



Source: NASS, USDA

Note that the slopes of the milk production figures on the chart above and the next two charts differ significantly. One does not need to be a statistics maven to notice that the California figures are all sloped dramatically upward, while most of the lines in Wisconsin and New York, with the exceptions of Brown County in Wisconsin and Wyoming County in New York, are pretty much flat.

Figure 4: Milk Production by Top Eight Counties in Wisconsin, 1975-2001

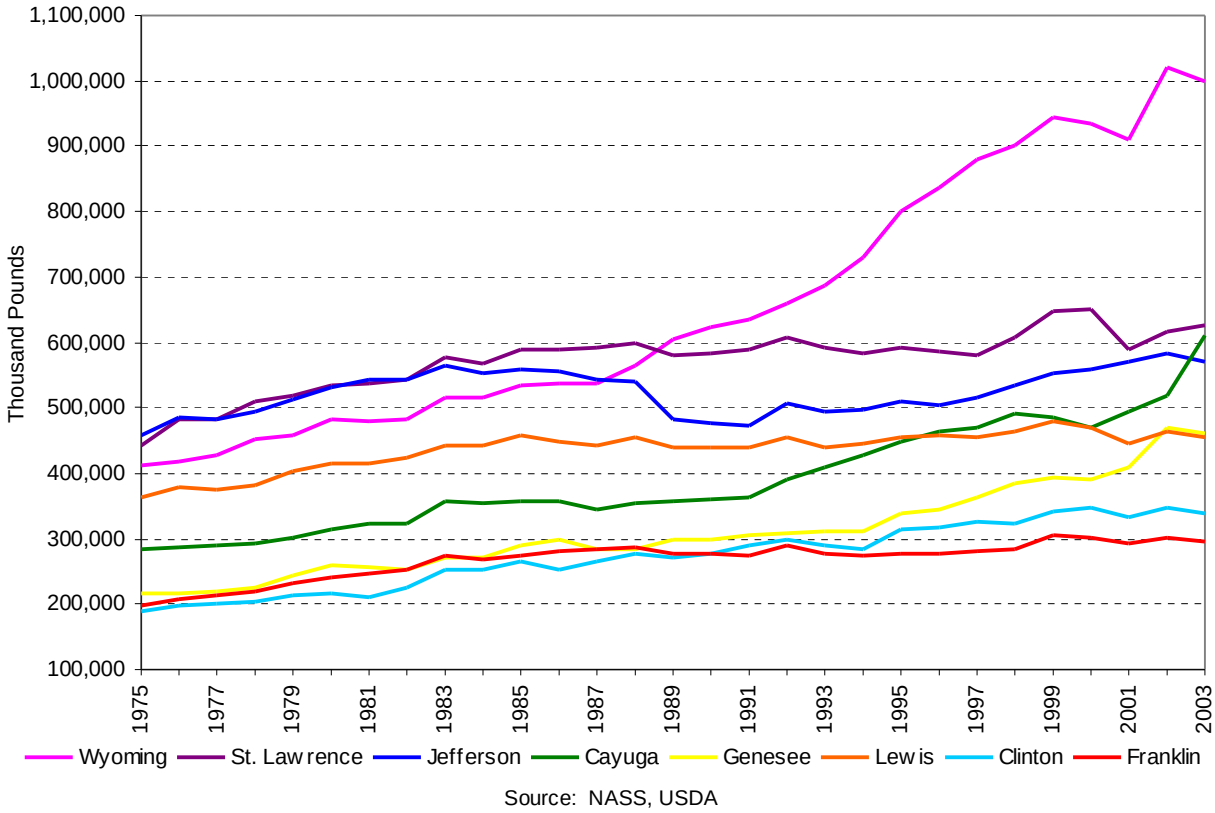


Source: NASS, USDA

In May 2002, the Wisconsin Agricultural Statistics Service mailed a Dairy Opinion survey to 3,000 dairy farmers in Wisconsin. The four-page questionnaire asked farmers about their plans for the next five years and what the Wisconsin state government could do to help them remain in the dairy business. About 1,000 surveys were returned, 650 of which commented on the assistance the state could provide. Milk price comments were the most frequent type and included suggestions such as setting a price floor, implementing a quota system, and reducing imports of dairy products and dairy ingredients. Most comments about taxes advocated keeping use-value assessments, keeping sales tax exemptions, and expanding tax incentives. Land issues included concern about urban sprawl, creating consistent statewide agricultural zoning, and standardizing manure and environmental regulations across the State. They also asked for more financing for dairy farms and to expand cost-sharing assistance for manure facilities and environmental practices. Increasing the availability and affordability of health insurance was also frequently mentioned. Other comments included keeping the dairy infrastructure in Wisconsin, keeping the "right to farm", resolving stray voltage problems, and creating worker or labor programs.

The Wisconsin legislature in October 2003 proposed an Agricultural Renewal Initiative, a compilation of several legislative proposals designed to encourage growth in Wisconsin's agricultural economy. Among the proposals are the Dairy Investment Tax Credit (encourages modernization and efficiency through investing in new technologies and updating facilities at the farm level), the Livestock Facility Siting Standards (allows producers to grow in an environmentally and socially sensitive manner), a Wisconsin Rural Finance Authority (modeled after the successful Minnesota Rural Finance Authority), and "Co-op Care" (a cooperative health care purchasing alliance). This was publicized on the heels of Governor Doyle's announcement of a "Grow Wisconsin" plan a month earlier. Many of these initiatives were proposed by the Wisconsin Federation of Cooperatives and supported by the Dairy Business Association. Some of them were signed into law on April 14, 2004 along with other legislation aimed at improving conditions for farmers in the State.

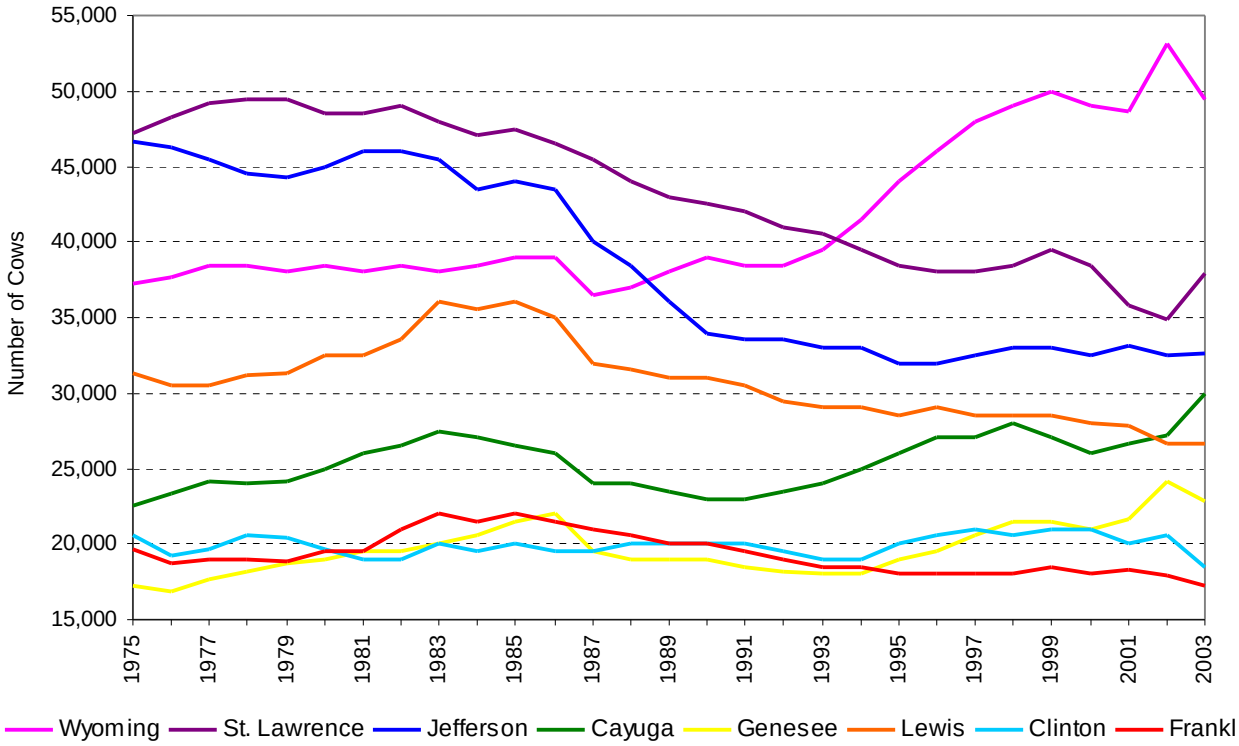
Figure 5: Milk Production by Top Six Counties in New York and Clinton & Franklin Counties, 1975-2003



Source: NASS, USDA

While Clinton and Franklin Counties are not in the top eight, they are included here because they are North Country counties. Clinton County ranks 13th, Franklin County ranks 19th, and Essex County (not shown) ranks 46th among the milk-producing counties in New York State in 2003. Note that Wyoming County's milk production has soared above the rest of the New York counties for the past several years. Genesee and Cayuga counties show what might be the beginnings of similar trends. According to several people at Cornell, this is due to the progressive outlook of the farmers in the region. This is discussed in more detail below.

Figure 6: Number of Cows in Top Six Counties in New York and Clinton & Franklin Counties, 1975-2003



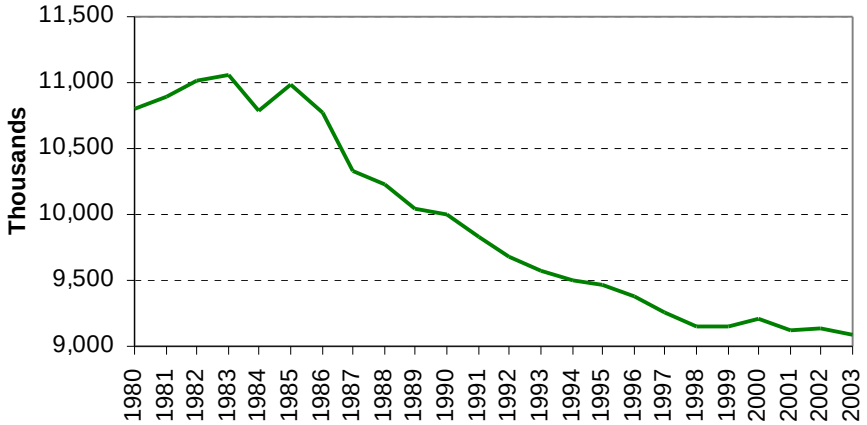
Source: NASS, USDA

Note that of the eight counties shown above, only three of them, Wyoming, Cayuga, and Genesee, have increased the number of cows since 1975. The North Country counties all have fewer cows than they had three decades ago.

Milk Production per Cow/Operation Efficiencies

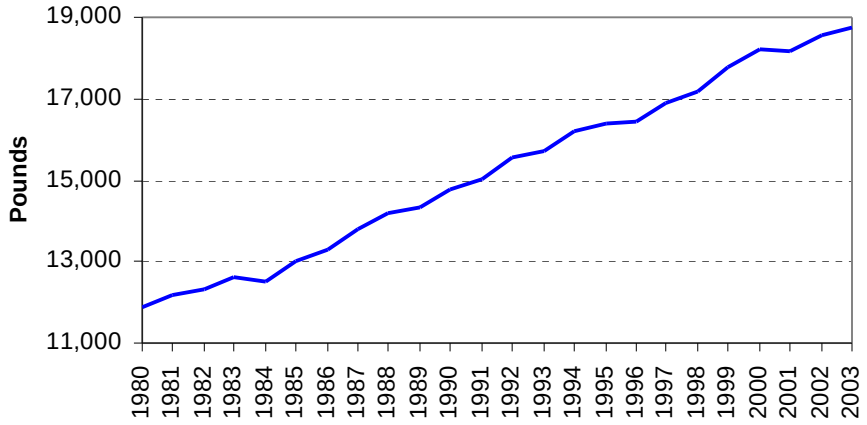
Due to technological innovations and better cow management, the number of dairy cows in the U.S. has decreased while the milk per cow has increased, leading to higher milk production over the long term. This trend is expected to continue, with a decrease in both the number of farms and cows, but a steady increase in the milk supply.

Figure 7: Number of Milk Cows in the U.S., 1980-2003



Source: NASS, USDA

Figure 8: Milk Produced per Cow in the U.S., 1980-2003



Source: NASS, USDA

From data gathered by us USDA, it appears as if milk production per cow in 2004 may be lower than 2003 figures, reversing the current trend to improve production per cow. This is likely to be because the current higher prices encourage dairy farmers to keep older, less productive animals and feed quality has been poor in some parts of the country.

As seen in the table below, six of the top seven states in milk production per cow are in the West. Some authorities believe this is due to the newer, more modern technology used on the farms in those states – and perhaps in the more aggressive mindset of those states' farm entrepreneurs.

Table 2: Milk Production per Cow and Number of Milk Cows by State and Region, 2003

State	Milk/Cow* Pounds	# of Milk Cows**
WA	22,780	245,000
AZ	22,284	155,000
CO	21,770	100,000
ID	21,718	404,000
MI	21,060	302,000
NM	21,028	317,000
CA	20,993	1,688,000
IN	19,758	149,000
MT	19,222	18,000
NH	19,063	16,000
KS	19,054	111,000
IA	18,806	201,000
CT	18,773	22,000
NV	18,654	26,000
IL	18,441	111,000
OR	18,294	119,000
PA	17,979	575,000
ME	17,829	35,000
NY	17,812	671,000
UT	17,747	91,000
WI	17,728	1,256,000
VT	17,698	149,000
TX	17,649	319,000
NE	17,641	64,000
MA	17,474	19,000
MN	17,459	473,000
OH	17,269	260,000
NC	17,115	61,000
Other States* **	14,973	1,131,200
US Average/Total	18,749	9,084,000
North Atlantic	18,991	3,924,300
South Atlantic	16,443	571,300
East North Central	16,880	308,000
West North Central	17,538	925,000
South Central	19,310	1,533,800
West	19,363	1,825,800

*Excludes milk sucked by calves
**Average number during year, including dry cows, but excluding heifers not yet fresh
***States with <17,000 pounds of milk produced per cow

Sources: Milk Production, February 2004, Agricultural Statistics Board, NASS, USDA

Many authorities believe that milk production per cow is a good measure of the progressiveness of the farmers in an area and therefore an indicator of the future viability of dairy enterprises in that region. As seen in the table below, those states with the higher milk production per cow tend to be the states that gained the most milk production from 1975 to 2003. While New York's milk production per cow was below the national average in 2003, it still ranks 19th in the nation for milk production per cow.

Table 3: Milk Production by State and Milk per Cow, Sorted by % Change in Milk Production from 1975 to 2003

State	1975 Million Pounds	2003 Million Pounds	% Change Milk Production	2003 Milk/Cow* Pounds
NM	366	6,666	1721%	21,028
ID	1,555	8,774	464%	21,718
AZ	840	3,454	311%	22,284
CA	10,853	35,437	227%	20,993
NV	168	485	189%	18,654
CO	845	2,177	158%	21,770
WA	2,322	5,581	140%	22,780
OR	990	2,177	120%	18,294
UT	919	1,615	76%	17,747
TX	3,208	5,630	75%	17,649
KS	1,392	2,115	52%	19,054
PA	7,140	10,338	45%	17,979
MI	4,411	6,360	44%	21,060
IN	2,210	2,944	33%	19,758
VT	2,009	2,637	31%	17,698
MT	278	346	24%	19,222
OK	1,060	1,312	24%	16,000
NY	9,964	11,952	20%	17,812
GA	1,221	1,444	18%	16,988
WI	18,900	22,266	18%	17,728
FL	1,956	2,161	10%	15,218
DE	127	136	7%	16,386
OH	4,259	4,490	5%	17,269
US Total/Average	115,398	170,312	48%	18,749

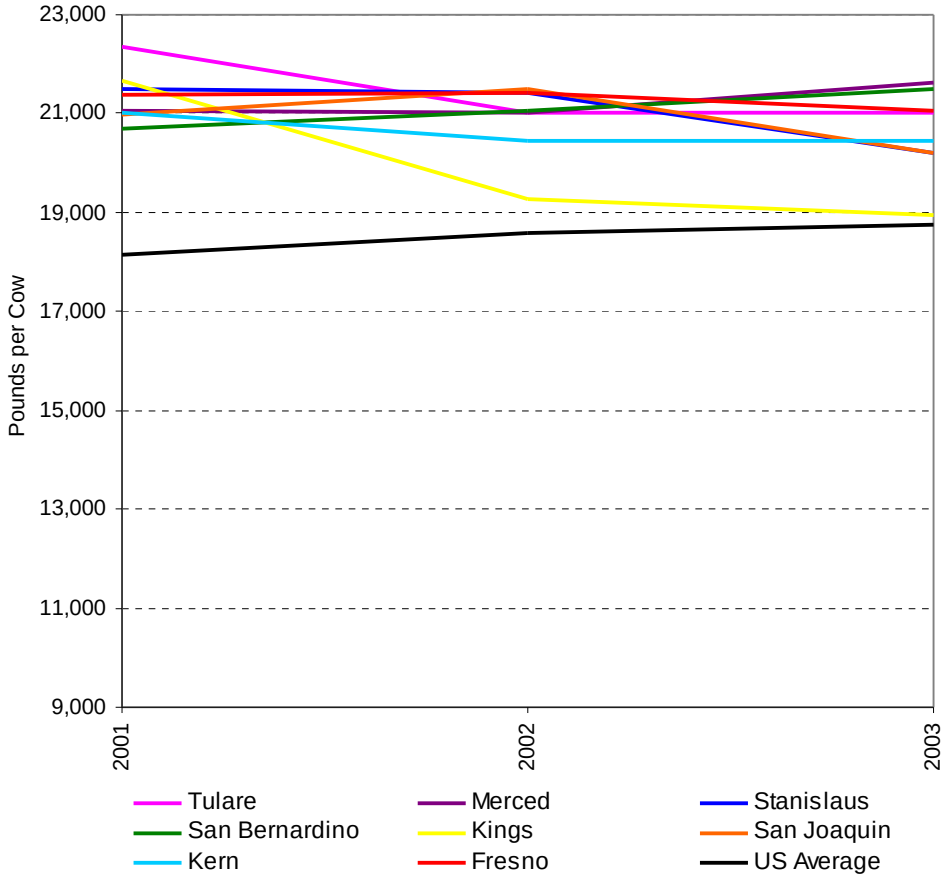
*Excludes milk suckled by calves

milk per cow > US average

milk per cow > US median

Sources: Milk Final Estimates, February 1981, and Milk Production, February 2004, Agricultural Statistics Board, NASS, USDA

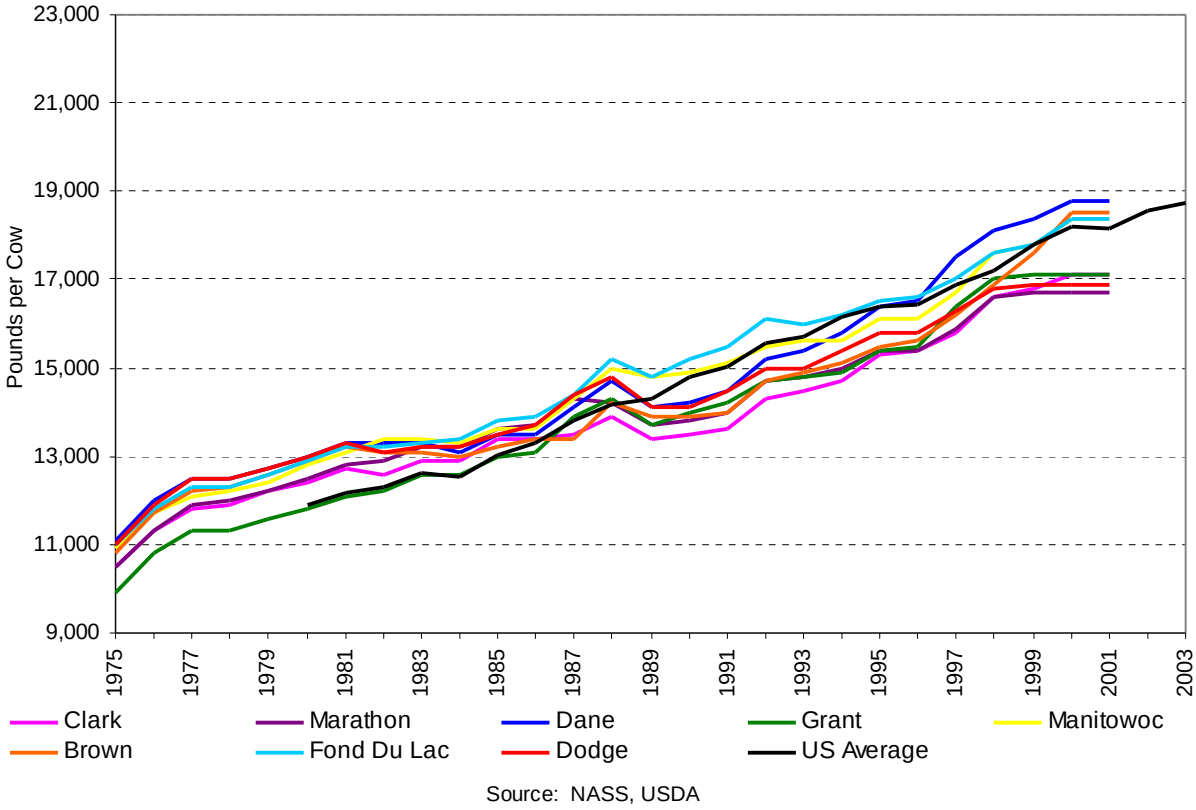
Figure 9: Milk Produced per Cow by Top Eight Counties in California, 2001-2003



Source: NASS, USDA

It comes as no surprise that the top eight milk-producing counties in California were all above the national average milk production per cow for the past three years, as seen in the graph above.

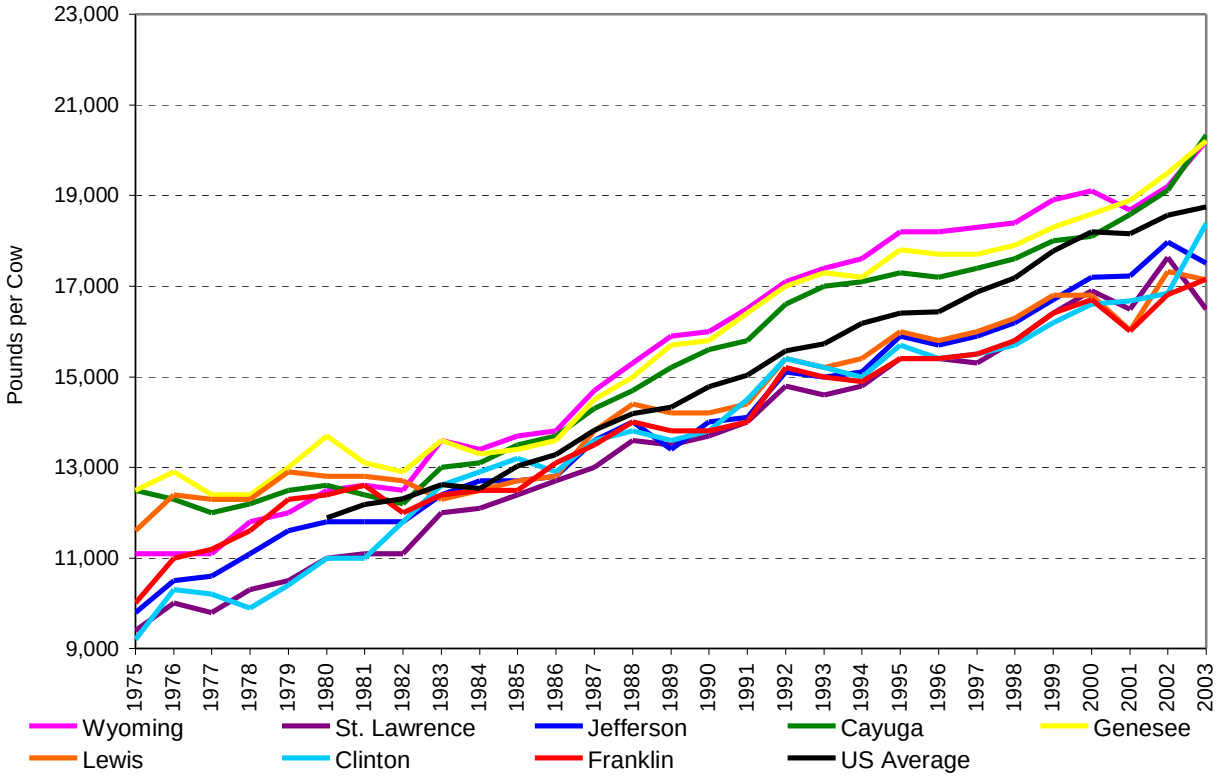
Figure 10: Milk Produced per Cow by Top Eight Counties in Wisconsin, 1975-2001



Source: NASS, USDA

The milk production per cow in the top eight milk-producing counties in Wisconsin was once above the national average, but only four counties have managed to stay above the average in recent years.

Figure 11: Milk Produced per Cow by Top Six Counties in New York and Clinton & Franklin Counties, 1975-2003



Source: NASS, USDA

Of the eight counties examined in New York, the ones in the North County have seldom (and then only for short times) had milk production per cow averages higher than the national average. Only three of the eight (Wyoming, Genesee, and Cayuga) have managed to maintain milk production per cow above the national average, clearly separating them from the rest of the pack. This suggests that those three counties are in a better position to grow their total milk production than North Country counties. According to CITEC's informants, the farmers in these three counties work together and challenge each other to become more efficient. They evaluate new technologies and recognize that herd expansion is necessary to share capital costs over larger numbers of cows. In fact, the dairy culture in the area is one that attracts farmers from outside the State to set up operations there. A milk bottling/butter plant just north of Wyoming County owned by a cooperative has been quite innovative with its products. It produces premium butter, many different types of beverages, and it even has a license to produce distilled spirits. Research and development of new products has reportedly been the key to this plant's success. Seven farms formed Cayuga Marketing in 1986 to negotiate better prices for their milk. They also formed a supply company so its members could buy supplies as directly as possible at minimal cost. And at their meetings they "brainstorm and exchange ideas together with others who are intense and into everything they do," according to Bill Cook of Aurora Dairy in Aurora, New York. Cook says to become a member "they have to be aggressive and bring some advantage to the group in energy and thought." "Sometimes it's easier to be aggressive when you're surrounded by aggressive farms."

Table 4: Selected County Farms with Milk Cows

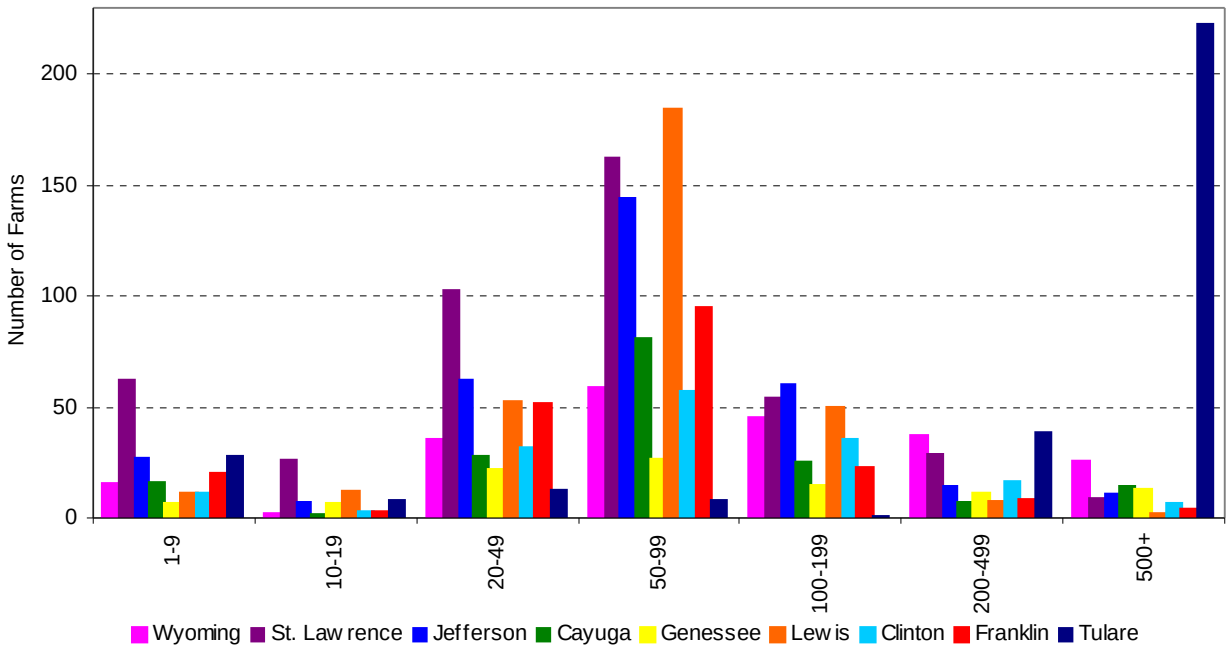
County	# of Farms			# of Milk Cows			Average # of Cows/Farm		
	1997	2002	% Change	1997	2002	% Change	1997	2002	% Change
Wyoming	298	218	-27%	45,260	49,010	8%	152	225	48%
St. Lawrence	612	445	-27%	39,532	38,018	-4%	65	85	32%
Jefferson	375	325	-13%	29,465	32,736	11%	79	101	28%
Cayuga	231	173	-25%	26,400	28,939	10%	114	167	46%
Genesee	122	98	-20%	20,738	23,089	11%	170	236	39%
Lewis	401	318	-21%	28,143	26,440	-6%	70	83	18%
Tulare	280	320	14%	278,034	412,462	48%	993	1,289	30%

Source: 2002 Census of Agriculture, NASS, USDA

The previous table looks at the number of milk cows in the top six milk-producing counties in New York and the top milk-producing county in California. Of the six New York counties listed below, St. Lawrence has the largest number of farms. It has substantially more farms than Tulare County, but nowhere near the number of cows. The three New York counties outside of the North Country have more cows per farm than the North Country counties, but none of them have nearly as many as Tulare County.

The number of cows per farm plays a significant role in operating efficiencies and the data presented below illustrates the differences in farm sizes in a few selected counties.

Figure 12: Number of Farms by Number of Cows in Top Six Counties in New York and Clinton, Franklin, and Tulare, CA Counties, 2002



Source: 2002 Census of Agriculture, NASS, USDA

Milk Prices Received by Farmers

The price that farmers receive for their milk (less their costs) is probably the biggest single factor affecting their future production decisions. The pricing structure is quite complex, with variances based on region, products made from the milk, and other factors. Low prices for the past two years due to oversupply have now resulted in high prices nationwide due to insufficient supply of milk. Some veteran observers contend that, if prices could be better stabilized, the supply would be more stable as well.

Table 5: Milk: Annual Average Prices Received by State and Region in Actual Dollars

State	1993 Dollars per Cwt	2002 Dollars per Cwt	% Change
HI	$23.13	$23.60	2%
AK	$20.30	$20.40	0%
FL	$15.10	$15.30	1%
VA	$14.00	$14.20	1%
AL	$14.20	$14.00	-1%
NC	$14.40	$13.80	-4%
PA	$13.70	$13.80	1%
SC	$14.20	$13.50	-5%
OK	$13.40	$13.50	1%
ME	$14.00	$13.30	-5%
RI	$13.70	$13.30	-3%
DE	$13.40	$13.30	-1%
GA	$14.70	$13.20	-10%
MA	$13.80	$13.20	-4%
AR	$13.60	$13.20	-3%
CT	$13.60	$13.20	-3%
TN	$13.60	$13.20	-3%
KY	$13.40	$13.20	-1%
MD	$13.40	$13.20	-1%
MS	$14.00	$13.10	-6%
LA	$14.00	$13.00	-7%
NH	$13.70	$13.00	-5%
TX	$13.30	$12.90	-3%
NJ	$13.50	$12.80	-5%
NY	$13.00	$12.80	-2%
SD	$12.90	$12.80	-1%
VT	$13.40	$12.70	-5%
WV	$13.10	$12.70	-3%
OH	$13.00	$12.60	-3%
OR	$12.60	$12.50	-1%
MT	$13.30	$12.30	-8%
IN	$13.00	$12.30	-5%
MO	$12.80	$12.30	-4%
WI	$12.89	$12.20	-5%
IA	$12.80	$12.20	-5%
NE	$12.50	$12.20	-2%
MI	$13.10	$12.10	-8%
MN	$12.80	$12.10	-5%
WA	$12.30	$12.00	-2%
IL	$12.60	$11.90	-6%
NM	$11.70	$11.90	2%
CO	$13.00	$11.80	-9%
UT	$12.10	$11.80	-2%
ND	$12.00	$11.80	-2%
AZ	$13.10	$11.70	-11%
KS	$12.70	$11.70	-8%
WY	$12.40	$11.40	-8%
ID	$12.20	$11.30	-7%
CA	$11.45	$10.94	-4%
NV	$12.30	$10.70	-13%
US Average	$12.84	$12.19	-5%

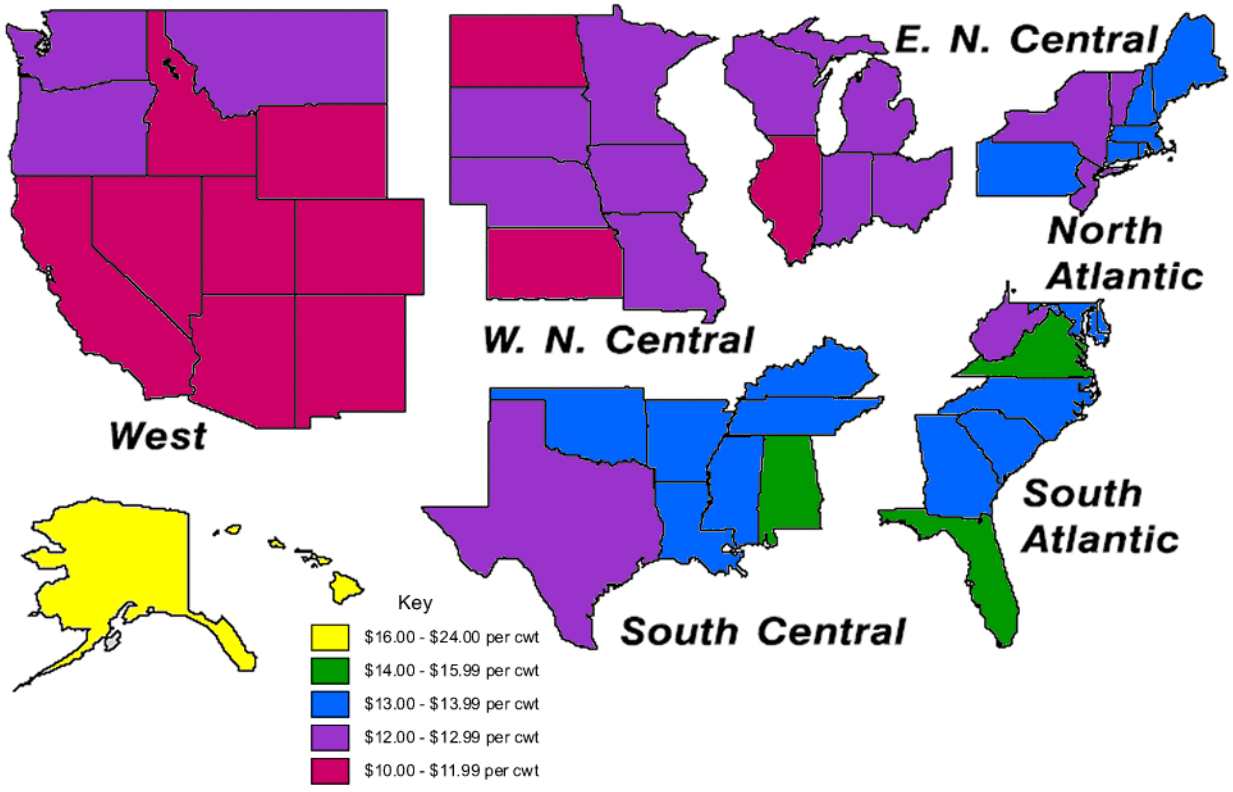
Region*	1993 Dollars per Cwt	2002 Dollars per Cwt	% Change
North Atlantic	$13.10	$12.58	-4%
South Atlantic	$13.24	$12.58	-5%
East North Central	$13.29	$12.51	-6%
West North Central	$13.07	$12.70	-3%
South Central	$14.40	$14.10	-2%
West	$13.86	$13.38	-3%

*Regional figures are not weighted averages.

Sources: Milk Disposition and Income Final Estimates 1993-97, May 1999, and Agricultural Prices 2002 Summary, July 2003, Agricultural Statistics Board, NASS, USDA

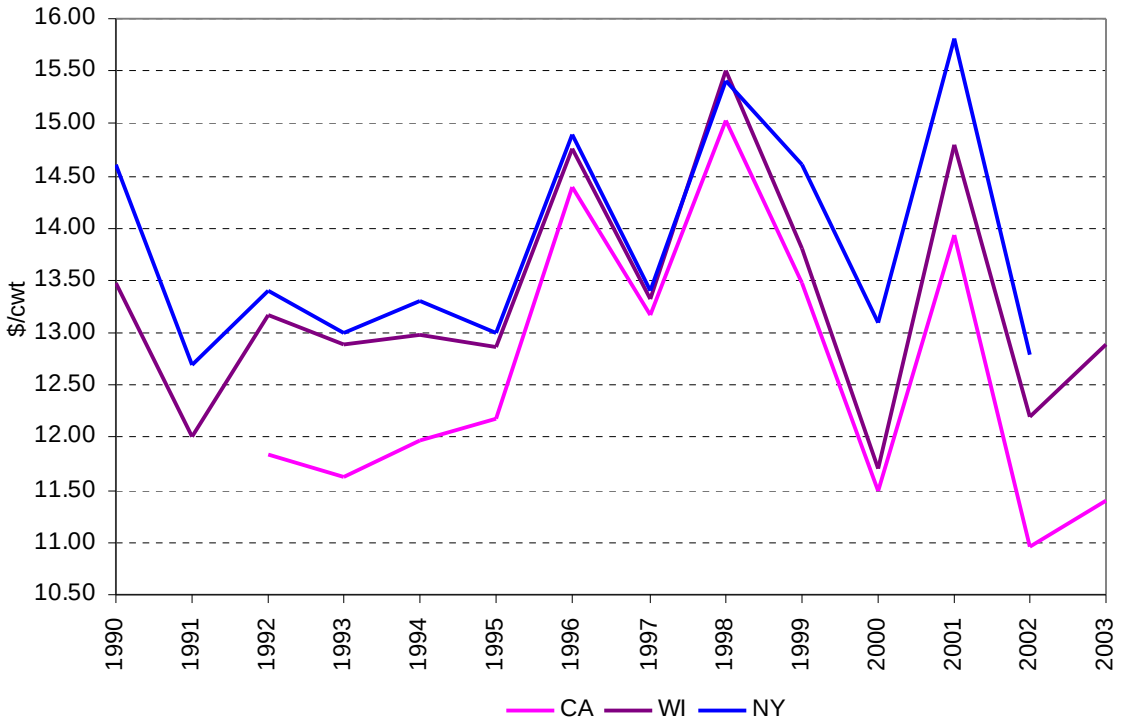
As seen above, during a nine-year period the majority of states saw a decrease in the price that farmers receive for their milk. Only seven states -- Hawaii, Alaska, Florida, Virginia, Pennsylvania, Oklahoma, and New Mexico – saw an increase in price. With costs to farmers increasing every year, they must continually improve the efficiencies of their operations to stay afloat. It is interesting to note that California prices were the lowest in the nation in 1993 and the second lowest in 2002.

Figure 13: 2002 Average Annual Milk Prices



Source: Agricultural Prices 2002 Summary, July 2003, Agricultural Statistics Board, NASS, USDA

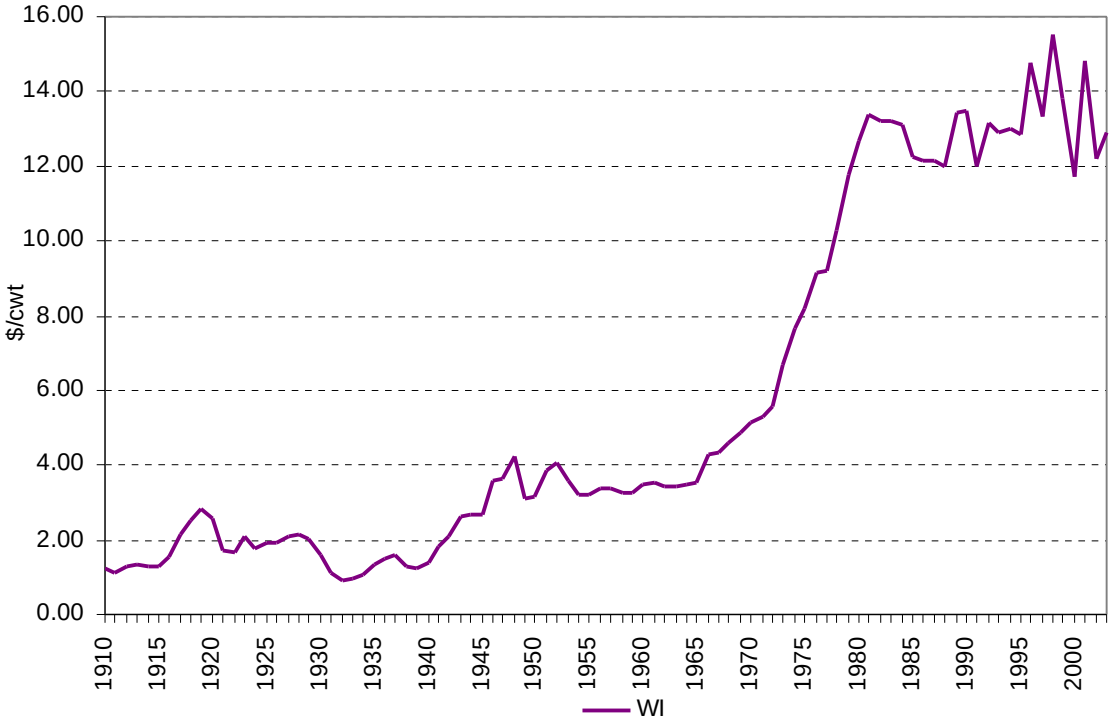
Figure 14: Milk Prices Received by Farmers in Three States in Actual Dollars, 1990-2003



Source: Wisconsin Agricultural Statistics Service, California Agricultural Statistics Service, New York Agricultural Statistics Service

As seen above, while the pricing relationship among the three states has remained relatively constant, the difference between prices in California and New York has widened since 1998.

Figure 15: Milk Prices Received by Farmers in Wisconsin in Actual Dollars, 1910-2003



Source: Wisconsin Agricultural Statistics Service

Wisconsin has kept track of milk prices for over 90 years, providing some interesting data. Steady increases in prices from 1963 to 1982 gave way to drastic fluctuations beginning in 1985, swinging up and down wildly in recent years. This variability has made dairy farming increasingly difficult.

Costs of Producing Milk

The region's dairy manufacturers report that the costs of raw materials are between 75% and 85% of the total operating costs of their plants. Some of those costs are certainly for inputs like fruits and flavorings but by far the greatest components are milk and milk products.

CITEC found that it was impossible for them to define the actual costs of milk production in the region (and the State) compared with the costs elsewhere in the nation (especially in the West) because different data sources yield different conclusions. The scope of this project did not allow CITEC the resources to come to a conclusion about the relationship between the costs of milk production in the North Country (and New York State) and the competitive position of the region's manufacturing plants. There is no doubt that further research needs to be done on this issue as soon as possible by knowledgeable and dispassionate investigators.

Imports and Exports of Milk

According to the National Milk Producers Federation (NMPF), the U.S. imported 850 million pounds of milk on a total milk solids basis in 2002. The largest import product categories are cheese and casein. In 2002, the U.S. exported 1.1 billion pounds of milk on a milk equivalent, total solids basis. The largest dairy product categories for export are dry whey and nonfat dry milk. Total dairy exports account for approximately 8% of the milk produced domestically each year.

The table below looks at per capita milk production by state and lists the states that generally export milk because they produce more than their population consumes in all dairy products combined. It does not take into consideration, however, the amount of milk used by the processors in each state. New York produces just slightly more milk than its population consumes in dairy products, assuming average U.S. per person consumption of 586 pounds of milk-equivalent per year.

Table 6: Per Capita Milk Production by State, 2003

State	Milk Production	Population	Per Capita Milk Production
ID	8,774,000,000	1,366,332	6,422
VT	2,637,000,000	619,107	4,259
WI	22,266,000,000	5,472,299	4,069
NM	6,666,000,000	1,874,614	3,556
SD	1,325,000,000	764,309	1,734
MN	8,258,000,000	5,059,375	1,632
IA	3,780,000,000	2,944,062	1,284
CA	35,437,000,000	35,484,453	999
WA	5,581,000,000	6,131,445	910
ND	554,000,000	633,837	874
PA	10,338,000,000	12,365,455	836
KS	2,115,000,000	2,723,507	777
UT	1,615,000,000	2,351,467	687
NE	1,129,000,000	1,739,291	649
MI	6,360,000,000	10,079,985	631
NY	11,952,000,000	19,190,115	623
AZ	3,454,000,000	5,580,811	619
OR	2,177,000,000	3,559,596	612
Other States	35,894,700,000	172,869,717	208
US Total	170,312,000,000	290,809,777	586

Sources: US Census Bureau, Agricultural Statistics Board, NASS, USDA

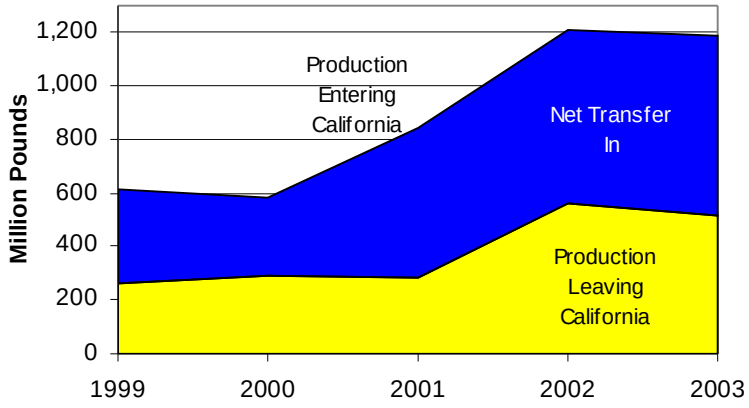
Table 7: California Milk Production, Entering California, Leaving California, and Net Milk Available

Year	California Milk Production	Production Entering California	Production Leaving California	Net Transfer In	Net Milk Available in California
			Thousand Pounds		
1999	30,409,896	609,224	264,414	344,810	30,754,706
2000	32,207,577	582,026	289,187	292,839	32,500,416
2001	33,183,393	840,655	285,282	555,373	33,738,766
2002	35,026,340	1,208,973	560,900	648,073	35,674,413
2003	35,396,854	1,187,717	517,750	669,967	36,066,821

Source: California Dairy Statistics Annual 2003, CDFA

California, since it is not part of the Federal Milk Marketing Order, is able to track the milk entering and leaving the state. So, even though it produces almost twice its consumption needs, California imports even more milk from neighboring states. California plants regularly receive milk from Oregon, Nevada, and Arizona, or from further afield if necessary. The same information in the table above is depicted graphically below.

Figure 16: California Milk Transfers, 1999-2003

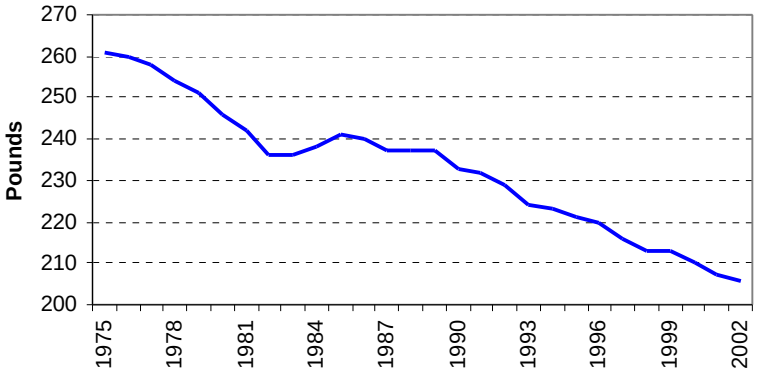


Source: California Dairy Statistics Annual 2003, CDFA

Dairy Product Manufacturing

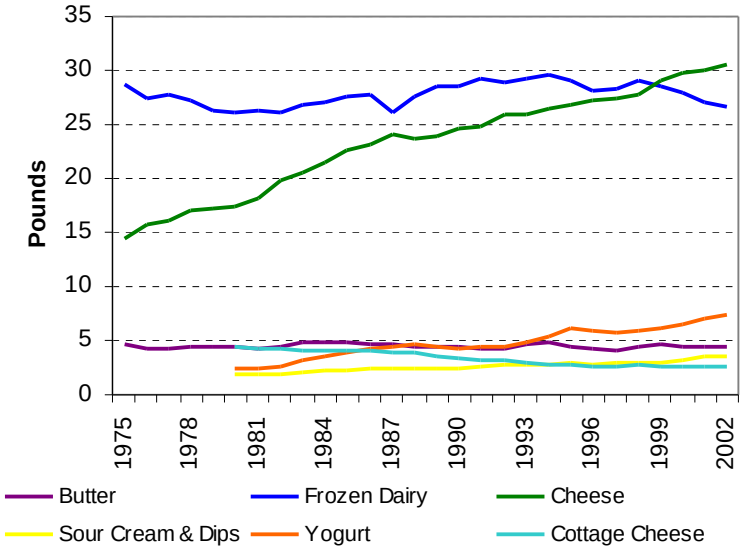
When discussing dairy product manufacturing, we include all of the products made from milk in this general category, i.e., hard and soft cheeses, butter, fluid and dry milk, yogurt, cream cheese, cottage cheese, and ice cream.

Figure 17: U.S. per Capita Consumption of Fluid Milk & Cream, 1975-2002



Source: Livestock, Dairy, and Poultry Situation & Outlook, ERS, AMS, USDA

Figure 18: U.S. per Capita Consumption of Selected Dairy Products, 1975-2002



Source: Livestock, Dairy, and Poultry Situation & Outlook, ERS, AMS, USDA

As can be seen in the graphs above, while Americans have decreased their fluid milk consumption, cheese and yogurt purchases have increased. Since it takes approximately ten pounds of milk to make one pound of cheese, the increased cheese consumption more than makes up for lower milk drinking – by about a factor of three.

2002 Milk Supply Utilization by Product

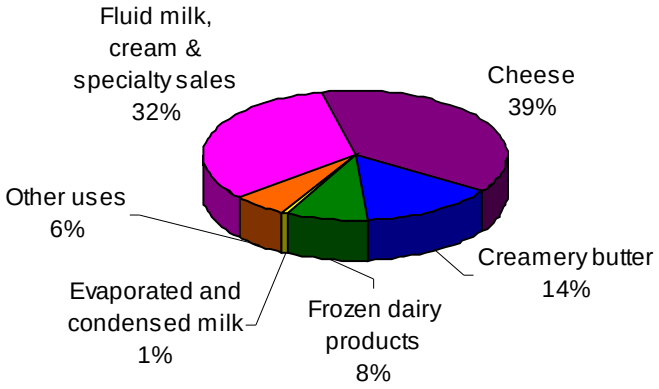


Figure 19:

Source: NASS, USDA

As seen above, more milk is used in cheese production than any other dairy product, including fluid milk. It takes a lot of milk to produce cheese and other dairy products, as shown in the table below.

Table 8: Pounds of Milk Required to Produce One Pound of Product

Cheddar Cheese	10
Butter	9
Ice Cream	3
Yogurt	2
Nonfat Dry Milk	7

Source: National Milk Producers Federation

The USDA uses data similar to that found in the table above to calculate the “milk equivalence” in the following two tables.

Table 9: Whole Milk Equivalent: Calculated Quantities Used in Products by State and Region*

State	1994 Pounds Used	2002 Pounds Used	% Change Pounds Used
WI	20,728,839,000	22,911,390,000	11%
CA	16,023,786,000	22,579,093,000	41%
MN	7,437,693,000	7,455,466,000	0%
NY	4,711,262,000	5,651,342,000	20%
ID	3,154,217,000	5,335,342,000	69%
PA	5,313,469,000	4,889,200,000	-8%
WA	3,646,351,000	4,116,664,000	13%
IA	2,722,226,000	3,486,558,000	28%
TX	2,992,870,000	3,017,973,000	1%
OH	2,050,185,000	2,700,804,000	32%
OR	995,868,000	1,706,107,000	71%
MA	780,517,000	1,660,997,000	113%
MO	2,642,802,000	1,563,091,000	-41%
IL	1,317,800,000	1,383,982,000	5%
IN	1,422,236,000	1,349,668,000	-5%
MI	1,575,996,000	1,293,835,000	-18%
NE	1,807,284,000	1,147,198,000	-37%
TN	978,827,000	1,076,938,000	10%
Other States	11,522,682,000	12,635,349,000	10%
US Total	91,824,910,000	105,960,997,000	15%
North Atlantic	12,822,453,000	14,360,448,000	12%
South Atlantic	2,397,541,000	1,906,384,000	-20%
East North Central	27,095,056,000	29,639,679,000	9%
West North Central	16,766,572,000	15,018,318,000	-10%
South Central	5,549,589,000	5,374,042,000	-3%
West	27,193,699,000	39,662,126,000	46%

*Products manufactured in each state do not necessarily show utilization of milk produced in the state because of interstate shipments of milk. No adjustment has been made for shipments of milk and cream between states differing in the test of milk produced. Net total accounts for fat recovered from whey cream and used for making butter and the amount of fat from butter and condensed milk used in making ice cream.

Source: Dairy Products 1994 and 2002 Summary, Agricultural Statistics Board, NASS, USDA

Even though California produces more milk, Wisconsin uses more whole milk because it produces more cheese, each pound of which requires ten pounds of whole milk. The difference between the two states is decreasing, though.

Table 10: Skim Milk Equivalent: Calculated Quantities Used in Products by State and Region*

State	1994 Pounds Used	2002 Pounds Used	% Change Pounds Used
CA	7,093,050,000	10,550,893,000	49%
WA	2,330,883,000	2,258,386,000	-3%
NY	987,369,000	1,098,092,000	11%
TX	1,223,700,000	1,085,019,000	-11%
ID	27,175,000	1,018,134,000	3647%
AZ	498,860,000	1,015,899,000	104%
PA	692,088,000	949,165,000	37%
IA	590,534,000	700,333,000	19%
MI	863,631,000	630,444,000	-27%
WI	1,269,370,000	450,164,000	-65%
MD**	753,602,000	446,798,000	-41%
IN	384,810,000	433,770,000	13%
TN	199,460,000	230,681,000	16%
OR	198,008,000	223,893,000	13%
IL	200,006,000	219,681,000	10%
SD	195,078,000	202,720,000	4%
MN	543,192,000	186,839,000	-66%
OH	340,398,000	167,631,000	-51%
LA	96,485,000	126,756,000	31%
KY	182,753,000	121,403,000	-34%
MO	337,817,000	110,657,000	-67%
Other States	2,041,716,000	1,849,671,000	-9%
US Total	21,049,985,000	24,077,029,000	14%
North Atlantic	2,629,038,000	2,773,089,000	5%
South Atlantic	1,012,667,000	669,782,000	-34%
East North Central	3,058,215,000	1,901,690,000	-38%
West North Central	2,038,276,000	1,264,480,000	-38%
South Central	2,004,024,000	1,604,243,000	-20%
West	10,307,765,000	15,863,745,000	54%

*Products manufactured in each state do not necessarily show utilization of milk produced in the state because of interstate shipments of milk. No adjustment has been made for shipments of milk and cream between states differing in the test of milk produced.
**Includes District of Columbia

Source: Dairy Products 1994 and 2002 Summary, Agricultural Statistics Board, NASS, USDA

California uses by far more skim milk than any other state. Idaho has greatly increased its use of skim milk over the last eight years.

Table 11: Percent of Milk Production Used in Dairy Products by State, 2002

State	Milk Production	Whole Milk Equivalent	Skim Milk Equivalent	Total Milk Equivalent	Percent Used in Manufacturing
	Million Pounds				
CA	35,065	22,579	10,551	33,130	94%
WI	22,074	22,911	450	23,362	106%
MN	8,458	7,455	187	7,642	90%
NY	12,218	5,651	1,098	6,749	55%
WA	5,620	4,117	2,258	6,375	113%
ID	8,155	5,335	1,018	6,353	78%
PA	10,775	4,889	949	5,838	54%
IA	3,804	3,487	700	4,187	110%
TX	5,300	3,018	1,085	4,103	77%
OH	4,475	2,701	168	2,868	64%
OR	2,093	1,706	224	1,930	92%
MI	6,120	1,294	630	1,924	31%
IN	2,658	1,350	434	1,783	67%
MO	1,946	1,563	111	1,674	86%
MA	361	1,661		1,661	460%
IL	2,051	1,384	220	1,604	78%
TN	1,315	1,077	231	1,308	99%
NE	1,167	1,147		1,147	98%
AZ	3,430		1,016	1,016	30%
MD	1,301		447	447	34%
SD	1,289		203	203	16%
LA	579		127	127	22%
KY	1,614		121	121	8%
US Total	170,063	105,961	24,077	130,038	76%

Source: Agricultural Statistics Board, NASS, USDA

The table above combines the data in the two tables that precede it. The percent of milk produced that is used in manufacturing by the state is not completely accurate, though, because it does not take into account the milk coming into and leaving the state. That said, the table does give a rough idea of which states must import a significant amount of milk to meet their manufacturing needs.

As the nation's largest user of milk in its manufacturing operations, California's cheese production has soared almost 10,000% since 1970 to 1.722 billion pounds per year. California also leads all other states in production of butter, nonfat dry milk, yogurt, and ice cream. According to the California Department of Food and Agriculture (CDFA), while six varieties of cheese have significant production in California (there are a total of 200 varieties), Mozzarella, Cheddar and Jack cheeses represent more than 87% of all cheese produced. Combined, butter and nonfat dry milk accounted for 30% of all milk solids produced in 2002. Nonfat dry milk has posted the most significant production gains across all dairy products, increasing by nearly 50% since 1998.

Table 12: Dairy Plants: Number Manufacturing One or More Dairy Products and Number of Employees, by State and Region

State	1990 # of Plants	2002 # of Plants	% Change # of Plants	2003 # of Employees	2003 Share
WI	286	202	-29%	19,318	14%
CA	255	118	-54%	13,578	10%
TX	49	27	-45%	9,638	7%
NY	129	122	-5%	8,402	6%
PA	99	61	-38%	7,715	5%
OH	80	54	-33%	6,568	5%
IL	81	40	-51%	6,368	4%
MN	58	42	-28%	5,601	4%
MO	34	19	-44%	5,516	4%
FL	30	48	60%	5,311	4%
MI	48	35	-27%	4,446	3%
IA	45	29	-36%	3,678	3%
MD*	17	13	-24%	2,943	2%
MA	27	24	-11%	2,802	2%
UT	21	18	-14%	2,782	2%
NJ	21	12	-43%	2,777	2%
VA	13	7	-46%	2,516	2%
IN	35	23	-34%	2,451	2%
TN	19	10	-47%	2,277	2%
OR	23	20	-13%	2,135	1%
KY	25	17	-32%	1,924	1%
CO	15	9	-40%	1,875	1%
NC	18	10	-44%	1,742	1%
WA	29	15	-48%	1,729	1%
VT	19	18	-5%	1,620	1%
NM	2	6	200%	1,518	1%
ID	22	19	-14%	1,515	1%
AL	14	7	-50%	1,507	1%
AZ	8	3	-63%	1,129	1%
CT	16	24	50%	1,075	1%
NV	4	2	-50%	1,049	1%
LA	16	6	-63%	1,023	1%
Other States**	165	93	-44%	8,103	6%
US Total	1,723	1,153	-33%	142,631	
North Atlantic	336	283	-16%	15,184	11%
South Atlantic	99	91	-8%	20,362	14%
East North Central	530	354	-33%	8,471	6%
West North Central	200	120	-40%	11,841	8%
South Central	156	82	-47%	35,948	25%
West	402	223	-45%	50,825	36%

*Includes District of Columbia

**States with <1,000 employees

Sources: Dairy Products 1994 and 2002 Summary, Agricultural Statistics Board, NASS, USDA
Dairy Production Industry Report, 2003, Harris InfoSource

All states shown in the table above, with the exception of New Mexico, Florida, and Connecticut, have lost dairy plants over the past 12 years. Interestingly, though, New York and Vermont had the smallest percent reductions in number of plants, while California's number of plants declined by an astonishing 54%. The literature suggests that the decrease in the number of plants signifies that the plants have become more productive and more efficient due to economies of scale. Therefore, the number of plants is less significant than the size of the plants. This can be assessed more accurately, but not absolutely, by the number of people employed in dairy manufacturing in the state. The largest plants are probably located in Nevada, Arizona, Virginia, Texas, Missouri, New Mexico, New Jersey, Tennessee, Maryland, Alabama, and Colorado. New York most likely has some of the smallest plants.

There are various pressures on manufacturers to change the products that they are producing or to relocate, close, or open plants. As seen below, prices vary widely per pound for different dairy products. And they vary by region as well. For example, Monterey Jack is worth more than Cheddar and Northeast Swiss is worth more than Western Swiss. This is due to several factors: demand for product vs. supply, location of demand, cost of production, etc. The more "special" the product, the higher price it can command.

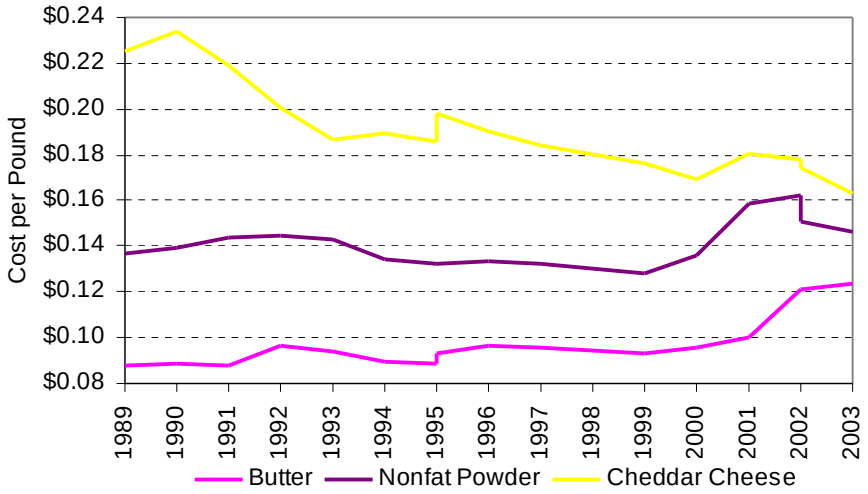
Table 13: Wholesale Prices for Selected Dairy Products, 2003

Product & Area	Annual Average $/Pound	Product & Area	Annual Average $/Pound
Butter - CME	1.1450		
Grade A Swiss Cuts 10-14# - Northeast	2.4500	Rennet	2.0659
Grade A Swiss Cuts 6-9# - Wisconsin	2.3660	Acid Casein	2.0200
Grade A Swiss Cuts 6-9# - West	2.3297	Dry Whole Milk - National	1.1180
Blue 5# - Wisconsin	2.2363	Nonfat Dry Milk High Heat - Central/East	0.8980
Monterey Jack 10# - Wisconsin	2.0061	Nonfat Dry Milk Extra and Grade A - CME	0.8486
Mozzarella 5-6# - Wisconsin	1.9108	Nonfat Dry Milk Low/Medium Heat - Central/East	0.8439
Cheddar 40# Blocks - Wisconsin	1.8635	Nonfat Dry Milk Low/Medium Heat - West	0.8412
Brick and/or Muenster 5# - Wisconsin	1.8336	Nonfat Dry Milk High Heat - West	0.8409
Cheddar 10# Cuts - West	1.7347	Dry Buttermilk - Central	0.7926
Monterey Jack 10# - West	1.7147	Dry Buttermilk - Southeast	0.7900
Muenster - Northeast	1.6450	Dry Buttermilk - West	0.7700
Cheddar 10# Prints - Northeast	1.6268	Dry Buttermilk - Northeast	0.7550
Process American 5# Sliced - Northeast	1.6218	Whey Protein Concentrate - Central & West	0.4968
Process American 5# Loaf - Northeast	1.5785	Lactose - Central & West	0.2094
Cheddar 40# Blocks - Northeast	1.5776	Whey Powder Extra Grade - Southeast	0.1980
Cheddar Single Daisies - Northeast	1.5684	Whey Powder Extra and Grade A - Northeast	0.1795
Cheddar 40# Blocks - West	1.5640	Whey Powder - West	0.1689
Process American 5# Loaf - Wisconsin	1.5569	Whey Powder - Central	0.1684
Process American 5# Loaf - West	1.5475	Milk Replacer Animal Feed - Central	0.1538
Cheese 40# Blocks - CME	1.3172		
Cheese Barrels - CME	1.2703		
Evaporated Milk	24.2443		
Class II Cream - Atlanta	1.5780		
Class II Cream - Northeast	1.5631		
Class II Cream - Upper Midwest	1.5467		
Class III Condensed Skim - Northeast	0.9508		
Class II Condensed Skim - Northeast	0.9138		

CME = Chicago Mercantile Exchange price

Source: Dairy Market News Annual Summary, April 2004, AMS, USDA

Figure 20: Weighted Average Manufacturing Costs for Selected Dairy Products in California, 1989-2003



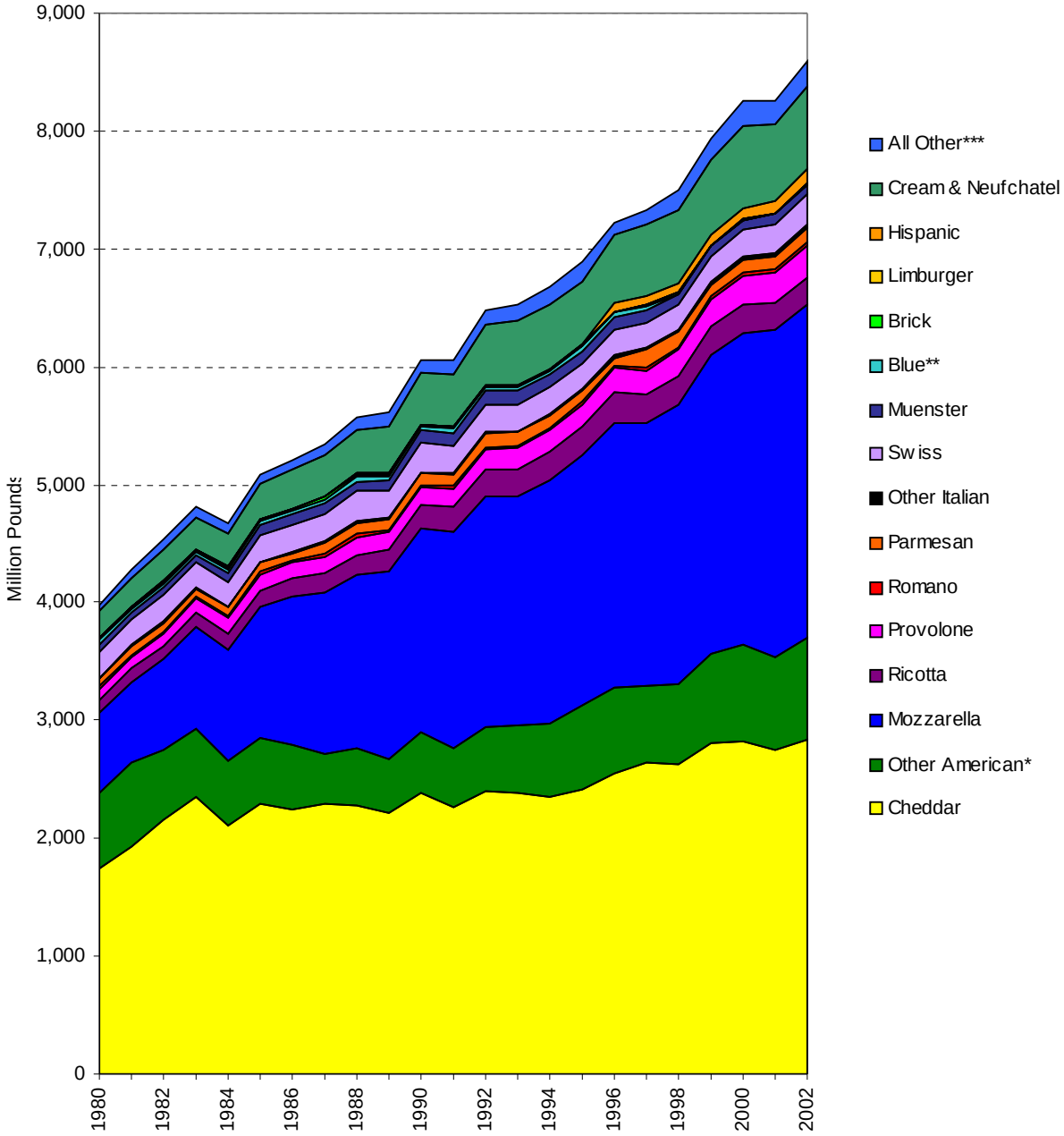
Source: CDFA

Manufacturing costs are proprietary and carefully guarded. California, however, is able to gather this information from its plants and present it in aggregate form. From the chart above, it appears that, even though the cost differentials between cheddar on the one hand and nonfat powder and butter on the other are narrowing, California will most likely continue to increase its cheese production while decreasing the relative amount of milk used in producing butter and nonfat dry milk.

Cheese Production

Sometimes the data on cheese includes cottage cheese and cream cheese; we have tried to differentiate these products whenever possible.

Figure 21: U.S. Cheese Production by Type, 1980-2002



*Includes Colby, Washed or Stirred Curd, and Monterey Jack
**Includes Gorgonzola
***Includes Part Skim

Source: Prepared by the National Cheese Institute from data collected by USDA, and NASS, USDA

Cheddar and Mozzarella are clearly the most popular cheeses. The largest percent increases have been in Mozzarella, All Other Cheeses, and Cream Cheese.

According to a report released by the California Milk Advisory Board in September 2004, U.S. per capita cheese consumption increased 15% over the past decade to 30.6 pounds per person per year. Specialty cheese consumption over the same period increased 75% to 2.8 pounds per person per year. Imports account for only 8% of the total growth in cheese consumption. Specialty cheeses are defined as "natural

cheese that commands a higher price than a commodity cheese because of its high quality, limited production and value-added production techniques or ingredients." This includes:

- Varieties commonly designated as specialty cheeses
- Commodity-type cheeses aged 12 months or longer (i.e. Cheddar, Jack)
- Cheeses flavored with vegetables, fruits or herbs/spices
- Mozzarella packed in water or oil, less than two weeks old

Table 14: Total Cheese (Excluding Cottage Cheese) Production by State and Region

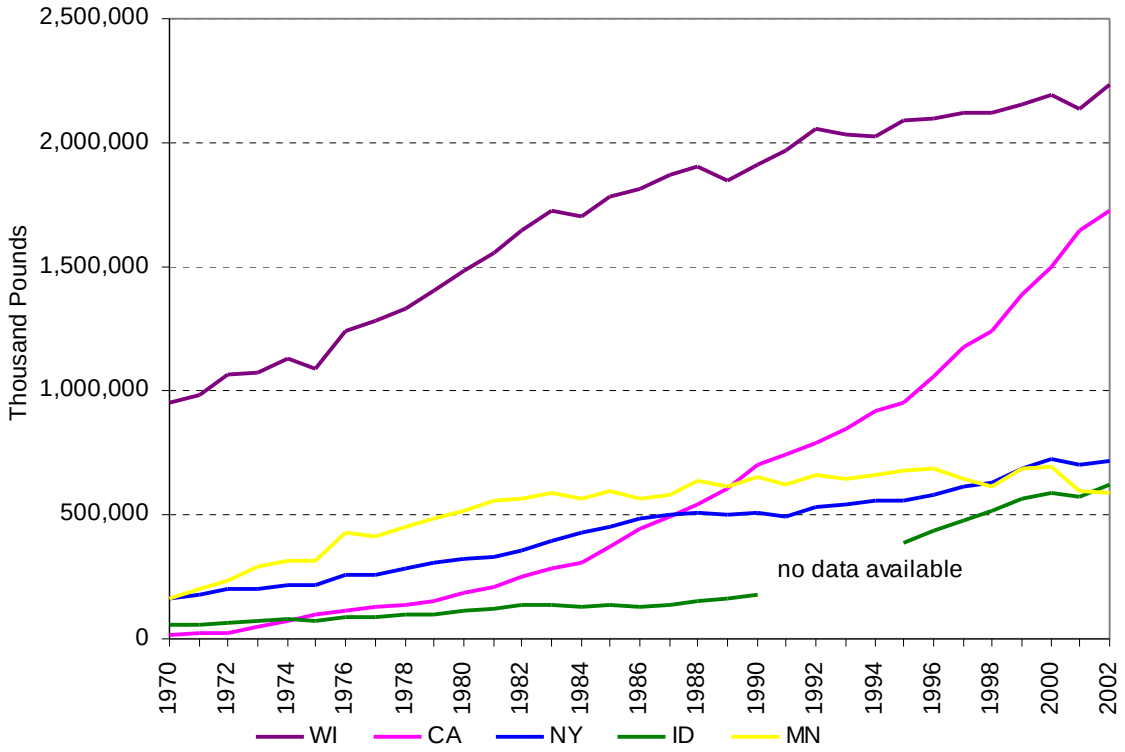
	1993			2002			% Change	
State	Pounds Produced	Share	# of Plants	Pounds Produced	Share	# of Plants	Pounds Produced	# of Plants
WI	2,030,021,000	31%	158	2,235,639,000	26%	116	10%	-27%
CA	848,436,000	13%	48	1,722,190,000	20%	63	103%	31%
NY	537,667,000	8%	32	716,822,000	8%	45	33%	41%
ID				619,943,000	7%	10		
MN	646,974,000	10%	17	590,843,000	7%	14	-9%	-18%
PA	325,328,000	5%	22	374,051,000	4%	19	15%	-14%
IA	270,328,000	4%	9	272,109,000	3%	8	1%	-11%
OH	101,885,000	2%	18	159,527,000	2%	15	57%	-17%
SD	159,202,000	2%	12	155,664,000	2%	6	-2%	-50%
WA	76,557,000	1%	7	153,901,000	2%	3	101%	-57%
MO	205,944,000	3%	8	98,521,000	1%	3	-52%	-63%
IL	98,339,000	2%	21	95,055,000	1%	13	-3%	-38%
UT	78,353,000	1%	9	66,296,000	1%	6	-15%	-33%
MA	797,000	0%	4	841,000	0%	6	6%	50%
VT	132,851,000	2%	12					
NE	130,802,000	2%	7					
MI	107,849,000	2%	11					
OR	44,732,000	1%	3					
KS	44,268,000	1%	5					
ND	33,716,000	1%	6					
NJ	11,886,000	0%	4					
CO	607,000	0%	1					
Other States*	641,630,000	10%	50	1,337,647,000	16%	76	108%	52%
US Total	6,528,172,000		464	8,599,049,000		403	32%	-13%
North Atlantic	1,017,907,000	16%	80	1,320,287,000	15%	97	30%	21%
South Atlantic	17,817,000	0%	5	39,356,000	0%	5	121%	0%
East North Central	2,355,356,000	36%	212	2,656,181,000	31%	157	13%	-26%
West North Central	1,491,234,000	23%	64	1,218,611,000	14%	38	-18%	-41%
South Central	175,731,000	3%	18	70,062,000	1%	12	-60%	-33%
West	1,470,127,000	23%	85	3,294,552,000	38%	94	124%	11%

*States not shown when fewer than 3 plants reported or individual plant operations could be disclosed.

Source: Agricultural Statistics Board, NASS, USDA

Wisconsin produces the most cheese, but California is quickly catching up and is expected to out-produce Wisconsin in 2006. New York is maintaining its share of the cheese production at 8% of the U.S. total. California, New York, Idaho, and Massachusetts all increased the number of cheese plants in their states from 1993 to 2002.

Figure 22: Total Cheese Production by Top Five States, 1970-2002



Source: Agricultural Statistics Board, NASS, USDA

Wisconsin has been the clear leader in cheese production for at least three decades.

Table 15: Cream and Neufchatel Cheese Production by State

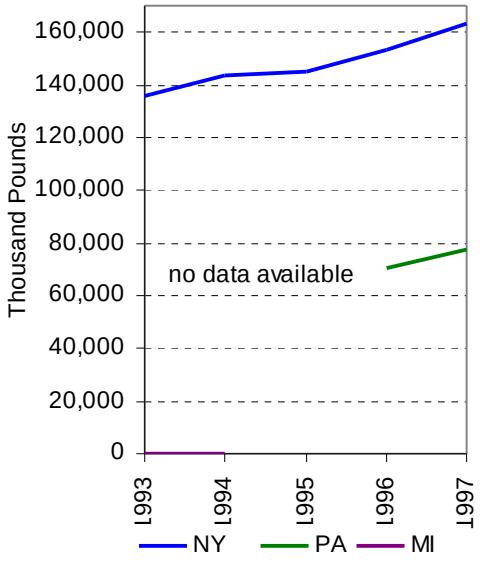
State	1993 Pounds Produced	1993 Share	1993 # of Plants	1997 Pounds Produced	1997 Share	1997 # of Plants	% Change Pounds Produced	% Change # of Plants
NY	135,702,000	25%	5	163,314,000	27%	6	20%	20%
PA				77,198,000	13%	5		
MI	199,000	0%	1					
Other States*	404,006,000	75%	27	374,409,000	61%	21	-7%	-22%
US Total	539,907,000		33	614,921,000		32	14%	-3%

*States not shown when fewer than 3 plants reported or individual plant operations could be disclosed.

Source: Dairy Products 1994 and 1998 Summary, Agricultural Statistics Board, NASS, USDA

Cream cheese production is difficult to measure because there are very few plants and it is often included in total cheese production. It is unclear whether New York is the leading producer, but the North Country is home to the largest cream cheese manufacturer nationwide.

Figure 23: Cream and Neufchatel Cheese Production by Top Three States, 1993-1997



Source: NASS, USDA

Consistent cream cheese production statistics are hard to obtain.

Cottage Cheese Production

Table 16: Cottage Cheese (Lowfat and Creamed) Production by State and Region

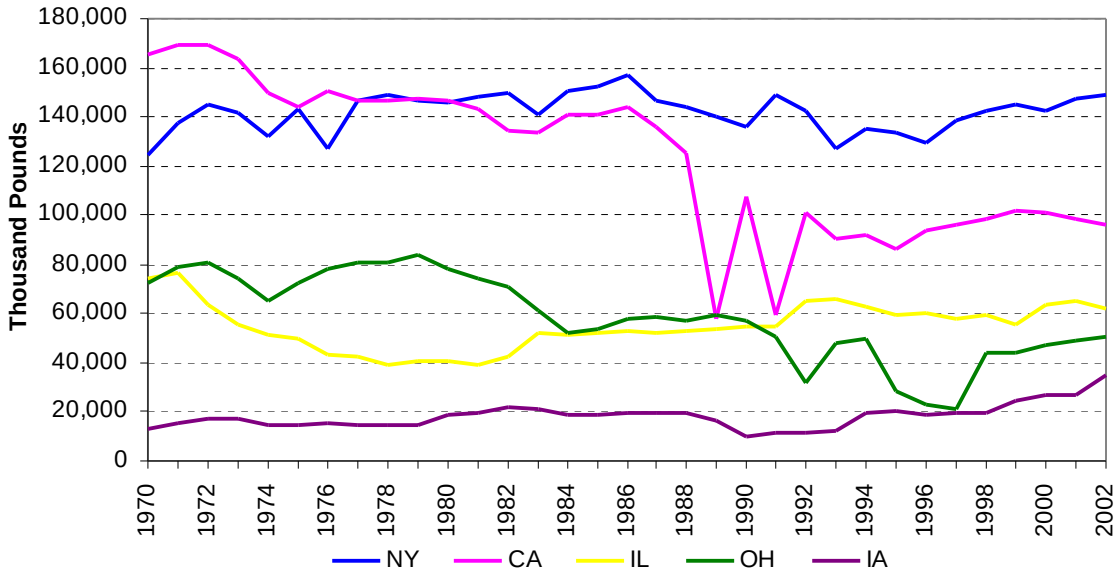
State	1993			2002			% Change	
	Pounds Produced	Share	# of Plants**	Pounds Produced	Share	# of Plants**	Pounds Produced	# of Plants
NY	127,381,000	17%	10	148,928,000	20%	9	17%	-10%
CA	90,426,000	12%	9	96,416,000	13%	8	7%	-11%
IL	66,127,000	9%	7	62,133,000	8%	4	-6%	-43%
OH	47,663,000	6%	12	50,366,000	7%	8	6%	-33%
IA	12,112,000	2%	4	34,833,000	5%	3	188%	-25%
KY	26,175,000	4%	3	22,962,000	3%	3	-12%	0%
TX	17,397,000	2%	6	22,181,000	3%	5	27%	-17%
WI	30,576,000	4%	6	22,079,000	3%	3	-28%	-50%
PA	21,209,000	3%	5	20,847,000	3%	3	-2%	-40%
MO	5,840,000	1%	4	20,211,000	3%	4	246%	0%
TN	5,988,000	1%	4	16,778,000	2%	3	180%	-25%
IN	17,656,000	2%	5	14,930,000	2%	3	-15%	-40%
OR	12,356,000	2%	10	5,647,000	1%	5	-54%	-50%
WA	34,381,000	5%	5					
MI	22,808,000	3%	2					
CO	15,325,000	2%	3					
OK	13,614,000	2%	5					
VA	11,499,000	2%	3					
MT	3,934,000	1%	5					
ND	3,287,000	0%	2					
Other States*	161,773,000	22%	31	208,384,000	28%	34	29%	10%
US Total	747,527,000		141	746,695,000		88	0%	-38%
North Atlantic	178,668,000	24%	20	175,861,000	24%	14	-2%	-30%
South Atlantic	39,468,000	5%	10	32,306,000	4%	6	-18%	-40%
East North Central	190,605,000	25%	31	176,909,000	24%	19	-7%	-39%
West North Central	79,518,000	11%	14	93,164,000	12%	12	17%	-14%
South Central	71,589,000	10%	21	69,883,000	9%	14	-2%	-33%
West	187,679,000	25%	45	198,572,000	27%	25	6%	-44%

*States not shown when fewer than 3 plants reported or individual plant operations could be disclosed.
**Estimated

Source: Dairy Products 1994 and 2002 Summary, Agricultural Statistics Board, NASS, USDA

New York leads all other states in cottage cheese production with a 20% share of the market in 2002. It lost one plant, but increased production by 17% from 1993 to 2002.

Figure 24: Cottage Cheese Production by Top Five States, 1970-2002



Source: NASS, USDA

California was once the leader in cottage cheese production, but has declined well below New York State's production.

Yogurt Production

Table 17: Yogurt (Plain and Flavored) Production by State and Region

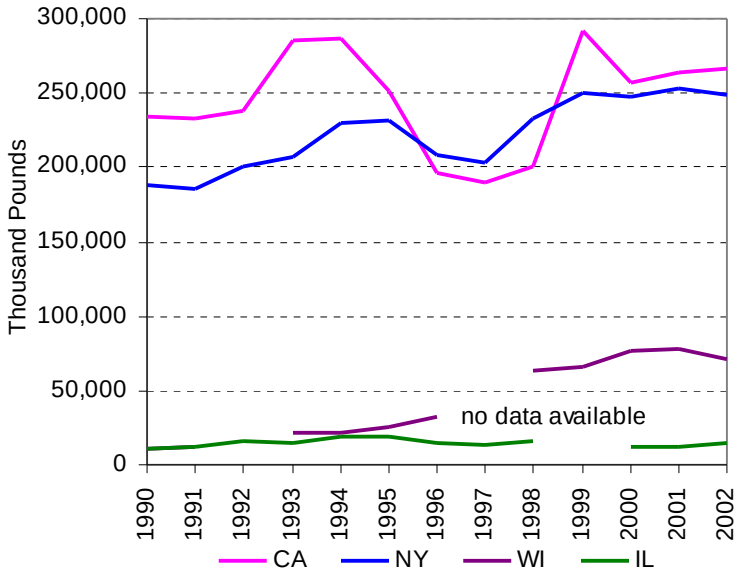
State	1993			2002			% Change	
	Pounds Produced	Share	# of Plants	Pounds Produced	Share	# of Plants	Pounds Produced	# of Plants
CA	284,944,000	22%	39	266,804,000	12%	20	-6%	-49%
NY	207,202,000	16%	13	248,785,000	12%	16	20%	23%
WI	21,246,000	2%	3	71,461,000	3%	5	236%	67%
IL	15,267,000	1%	7	14,392,000	1%	4	-6%	-43%
IA				12,875,000	1%	3		
TX	31,071,000	2%	6					
CO	27,097,000	2%	2					
NC	4,697,000	0%	3					
ND	25,000	0%	1					
Other States*	694,287,000	54%	103	1,520,789,000	71%	44	119%	-57%
US Total	1,285,836,000		177	2,135,106,000		92	66%	-48%
North Atlantic	335,357,000	26%	27	554,209,000	26%	27	65%	0%
South Atlantic	18,444,000	1%	12	34,930,000	2%	2	89%	-83%
East North Central	452,910,000	35%	23	816,802,000	38%	16	80%	-30%
West North Central	51,083,000	4%	13	83,403,000	4%	9	63%	-31%
South Central	42,193,000	3%	11	177,912,000	8%	5	322%	-55%
West	385,849,000	30%	91	467,850,000	22%	33	21%	-64%

*States not shown when fewer than 3 plants reported or individual plant operations could be disclosed.

Source: Dairy Products 1994 and 2002 Summary, Agricultural Statistics Board, NASS, USDA

California and New York both had a 12% share of the yogurt market in 2002, but California's production fluctuates more than New York's. From the regional data, it appears that yogurt production is widely distributed across the nation.

Figure 25: Yogurt Production by Top Four States, 1990-2002



Source: NASS, USDA

Ice Cream Production

Table 18: Frozen Dairy Products (includes ice cream, ice milk, and sherbet) Production by State and Region

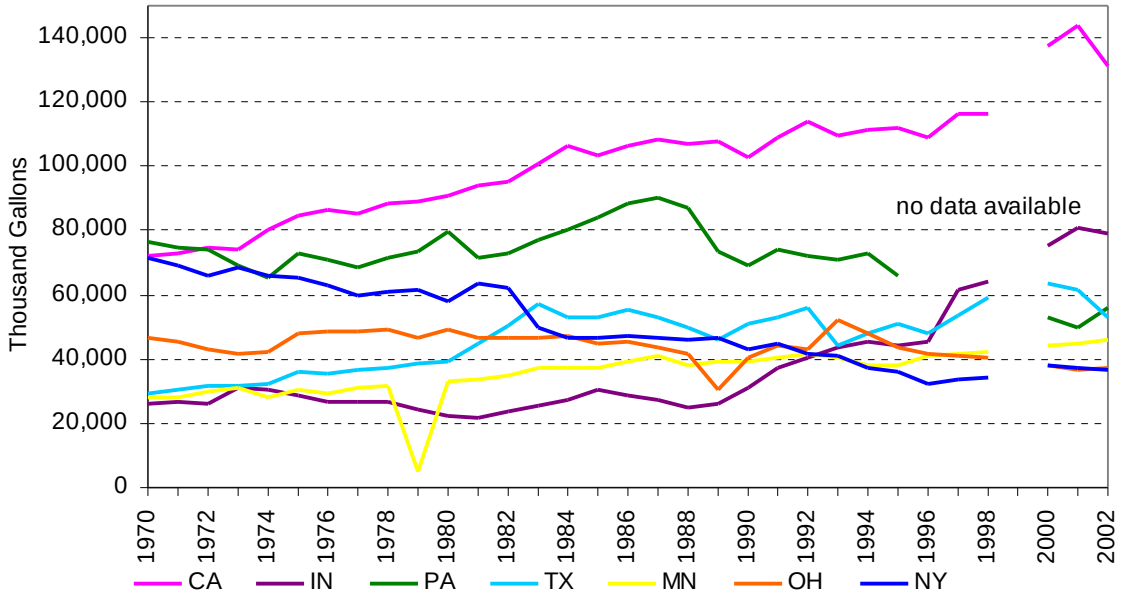
State	1993 Gallons Produced	1993 Share	2002 Gallons Produced	2002 Share	% Change Gallons Produced
CA	151,897,000	12%	171,114,000	12%	13%
IN	71,793,000	6%	113,828,000	8%	59%
PA	98,093,000	8%	70,190,000	5%	-28%
OH	66,092,000	5%	63,039,000	4%	-5%
TX	74,691,000	6%	54,850,000	4%	-27%
MN	49,149,000	4%	46,136,000	3%	-6%
NY	46,124,000	4%	45,065,000	3%	-2%
FL	42,686,000	3%	39,697,000	3%	-7%
MO	15,426,000	1%	39,454,000	3%	156%
MI			35,997,000	3%	
NC	40,918,000	3%	34,332,000	2%	-16%
TN	22,720,000	2%	24,021,000	2%	6%
WA	29,235,000	2%	22,366,000	2%	-23%
UT	14,104,000	1%	21,982,000	2%	56%
MD			21,630,000	2%	
OR			12,368,000	1%	
MT			1,561,000	0%	
SD			50,000	0%	
WI	20,049,000	2%			
AL	19,551,000	2%			
KS	7,013,000	1%			
ME	1,910,000	0%			
ND	1,854,000	0%			
Other States*	644,205,000	50%	587,429,000	42%	-9%
US Total	1,291,100,000		1,405,109,000		9%
North Atlantic	261,085,000	20%	269,751,000	19%	3%
South Atlantic	167,824,000	13%	152,575,000	11%	-9%
East North Central	260,019,000	20%	298,500,000	21%	15%
West North Central	172,480,000	13%	215,919,000	15%	25%
South Central	158,224,000	12%	176,990,000	13%	12%
West	271,468,000	21%	291,374,000	21%	7%

*States not shown when fewer than 3 plants reported or individual plant operations could be disclosed.

Source: Dairy Products 1994 and 2002 Summary, Agricultural Statistics Board, NASS, USDA

Ice cream production is also widely distributed, but California maintained its 12% share in both 1993 and 2002. This distribution is probably due to additional transportation requirements.

Figure 26: Ice Cream Production by Top Seven States, 1970-2002



Source: NASS, USDA

Butter Production

Table 19: Butter Production by State and Region

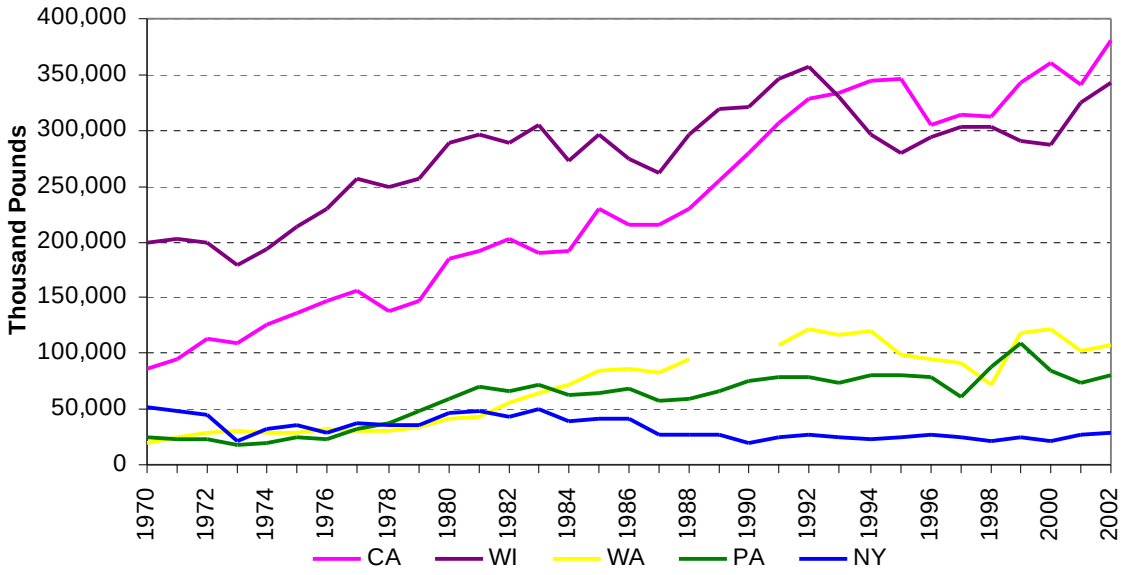
State	1993 Pounds Produced	1993 Share	1993 # of Plants	2002 Pounds Produced	2002 Share	2002 # of Plants	% Change Pounds Produced	% Change # of Plants
CA	333,468,000	25%	18	379,462,000	28%	11	14%	-39%
WI	329,198,000	25%	14	342,503,000	25%	11	4%	-21%
WA	117,445,000	9%	3	107,511,000	8%	1	-8%	-67%
PA	73,152,000	6%	7	80,603,000	6%	3	10%	-57%
NY	25,103,000	2%	8	28,292,000	2%	8	13%	0%
MN	52,908,000	4%	10					
OH	46,000,000	3%	5					
KS	23,075,000	2%	2					
MI	20,312,000	2%	6					
OR	18,765,000	1%	9					
ND	8,074,000	1%	5					
MT	1,067,000	0%	4					
Other States*	266,631,000	20%	32	416,777,000	31%	38	56%	19%
US Total	1,315,198,000		123	1,355,148,000		72	3%	-41%
North Atlantic**	123,146,000	9%	18	149,355,000	11%	14	21%	-22%
South Atlantic	41,584,000	3%	4					
East North Central	421,624,000	32%	28	388,236,000	29%	19	-8%	-32%
West North Central	140,668,000	11%	22	113,999,000	8%	11	-19%	-50%
South Central	101,263,000	8%	8					
West	486,913,000	37%	43	556,773,000	41%	21	14%	-51%

*States not shown when fewer than 3 plants reported or individual plant operations could be disclosed.
**Region totals may not add to U.S. when compiled regions could not be disclosed.

Source: Dairy Products 1994 and 2002 Summary, Agricultural Statistics Board, NASS, USDA

Butter uses the excess cream that cheese producers don't need. Therefore, it makes sense that California and Wisconsin are the leaders in butter production since they lead in cheese production.

Figure 27: Butter Production by Top Five States, 1970-2002



Source: NASS, USDA

Other Dry Products

Table 20: Nonfat Dry Milk (for Human Food) Production by State and Region

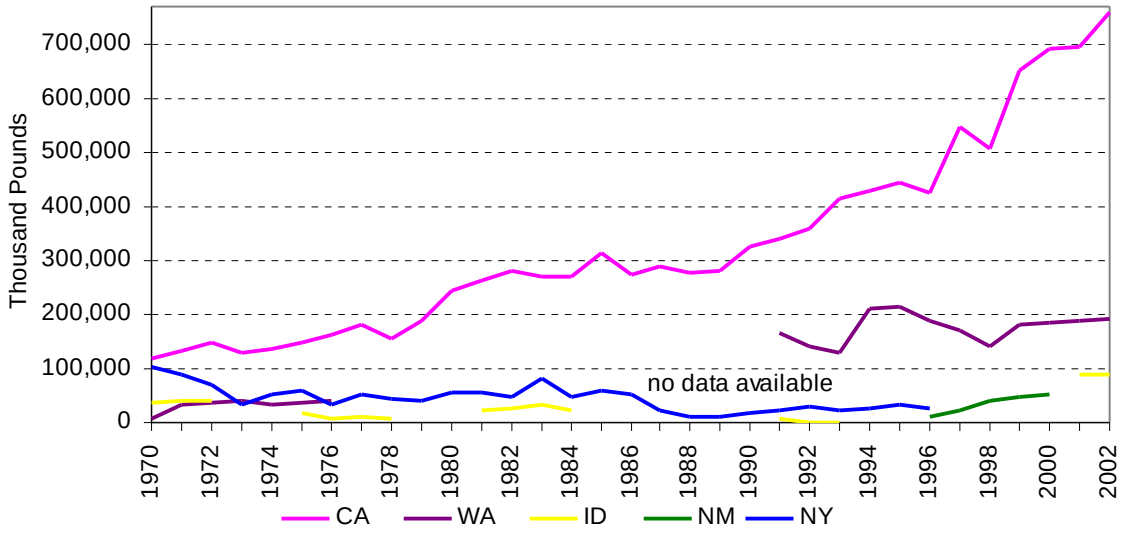
State	1993 Pounds Produced	1993 Share	1993 # of Plants	2002 Pounds Produced	2002 Share	2002 # of Plants	% Change Pounds Produced	% Change # of Plants
CA	415,496,000	44%	11	758,985,000	48%	11	83%	0%
WA	129,186,000	14%	2	191,958,000	12%	2	49%	0%
ID	20,000	0%	1	88,977,000	6%	1	444785%	0%
WI	32,405,000	3%	8					
MI	22,218,000	2%	3					
NY	21,925,000	2%	4					
MN	9,407,000	1%	4					
ND	636,000	0%	1					
Other States*	323,192,000	34%	28	529,071,000	34%	30	64%	7%
US Total	954,485,000		62	1,568,991,000		44	64%	-29%
Atlantic	141,405,000	15%	12	171,276,000	11%	9	21%	-25%
East North Central	63,860,000	7%	13	52,853,000	3%	5	-17%	-62%
West North Central	71,291,000	7%	10	75,320,000	5%	6	6%	-40%
South Central	102,783,000	11%	7	73,599,000	5%	6	-28%	-14%
West	575,146,000	60%	20	1,195,943,000	76%	18	108%	-10%

*States not shown when fewer than 3 plants reported or individual plant operations could be disclosed.

Source: Dairy Products 1994 and 2002 Summary, Agricultural Statistics Board, NASS, USDA

When there is an excess of milk in a region, it is often separated to produce butter and nonfat dry milk powder. California made almost half of the nonfat dry milk in the nation and other western states produced 28%, for a total western market share of 76% in 2002.

Figure 28: Nonfat Dry Milk Production by Top Five States, 1970-2002



Source: NASS, USDA

New York probably reduced its number of nonfat dry milk plants to less than three in 1997, so the data was not reportable after that.

Table 21: Dry Whey (for Human Food) Production by State and Region

State	1993 Pounds Produced	1993 Share	1993 # of Plants	2002 Pounds Produced	2002 Share	2002 # of Plants	% Change Pounds Produced	% Change # of Plants
WI	348,075,000	33%	13	303,604,000	29%	10	-13%	-23%
CA	63,152,000	6%	5	150,881,000	14%	6	139%	20%
NY	96,938,000	9%	6	119,967,000	11%	5	24%	-17%
PA	118,392,000	11%	3	108,237,000	10%	4	-9%	33%
WA	13,896,000	1%	1	93,977,000	9%	2	576%	100%
MN	164,796,000	16%	9	81,076,000	8%	5	-51%	-44%
OH				42,934,000	4%	3		
UT	25,283,000	2%	2					
Other States*	218,321,000	21%	13	152,009,000	14%	6	-30%	-54%
US Total	1,048,853,000		52	1,052,685,000		41	0%	-21%
Atlantic	250,189,000	24%	10	228,204,000	22%	9	-9%	-10%
Central	590,034,000	56%	30	526,672,000	50%	21	-11%	-30%
West	169,016,000	16%	11	297,809,000	28%	11	76%	0%

*States not shown when fewer than 3 plants reported or individual plant operations could be disclosed.

Source: Dairy Products 1994 and 2002 Summary, Agricultural Statistics Board, NASS, USDA

Whey is a by-product from manufacturing various dairy products. It contains some useful ingredients that can be used in other food products. The type of whey, sweet or acid, varies according to the type of cheese it comes from. As a liquid it has a short shelf life, but as a powder its shelf life can be greatly

extended and it can be shipped further away. The cost to build a whey drying plant is high, so several plants often pool their whey for drying. This becomes more complicated when combining sweet and acid whey in the same operation.

Table 22: Dry Whey (for Animal Feed) Production by State and Region

State	1993			2002			% Change	
	Pounds Produced	Share	# of Plants	Pounds Produced	Share	# of Plants	Pounds Produced	# of Plants
WI	65,567,000	44%	12	17,982,000	29%	8	-73%	-33%
NY	3,116,000	2%	6	5,248,000	8%	5	68%	-17%
WA	83,000	0%	1	1,395,000	2%	2	1581%	100%
MN	37,161,000	25%	9					
UT	1,459,000	1%	1					
Other States*	40,139,000	27%	15	38,462,000	61%	16	-4%	7%
US Total	147,525,000		44	63,087,000		31	-57%	-30%
Atlantic	6,191,000	4%	8	18,732,000	30%	8	203%	0%
Central	138,573,000	94%	30	31,468,000	50%	16	-77%	-47%
West	2,761,000	2%	6	12,887,000	20%	7	367%	17%

*States not shown when fewer than 3 plants reported or individual plant operations could be disclosed.

Source: Dairy Products 1994 and 2002 Summary, Agricultural Statistics Board, NASS, USDA

It is surprising that California dries so little whey relative to other states. Their whey may be used in liquid form in food production, energy use, fertilizer, or animal feed.

Dairy In Northern New York

The dairy value chain in the northern New York has more than two links. However, this portion of the study focuses on just two of them – the milk producers and the processors (cheese makers). While the study's overall conclusions are concerned primarily with the situation in which the region's cheese plants find themselves, this should not suggest that the producers or other links in the value chain are of less importance.

Milk

The data in the table below includes all farms in the North Country – not just dairy farms. Farms use just under 21% of the land in the region and approximately 33% of farms in the North Country are dairy farms.

Table 23: North Country Farm Market Values

County	2002 Proportion of Land Area in Farms	Average Size of Farm (Acres)			Estimated Total Market Value of Land and Buildings ($1,000)			Average Market Value per Farm ($)			Average Market Value per Acre ($)		
		1997	2002	% Change	1997	2002	% Change	1997	2002	% Change	1997	2002	% Change
Clinton	25.3%	260	279	7%	159,445	182,346	14%	257,585	301,399	17%	1,021	1,081	6%
Essex	4.8%	215	233	8%	70,045	80,126	14%	280,180	342,420	22%	1,356	1,435	6%
Franklin	13.2%	320	260	-19%	110,986	110,877	0%	208,229	206,475	-1%	655	971	48%
Jefferson	40.6%	286	322	13%	218,961	280,266	28%	209,933	272,367	30%	767	872	14%
Lewis	24.1%	267	273	2%	136,293	158,586	16%	187,216	219,952	17%	672	820	22%
St. Lawrence	23.5%	263	278	6%	308,283	286,770	-7%	192,798	198,182	3%	708	746	5%
Totals	20.8%	272	283	4%	1,004,013	1,098,971	9%	210,397	240,317	14%	775	850	10%

Source: 2002 Census of Agriculture, NASS, USDA

Farms account for 25.4% of land use in New York State and the average farm size statewide is 206 acres, whereas North Country farms average 283 acres per farm. The average size of North Country farms increased in all counties from 1997 to 2002, except in Franklin County, where it dropped 19%. Tulare County, California's major milk producing county, has 45% of its land in use by farms and the average farm size is 243 acres – smaller than the North Country's. The regional differences are more dramatic when it comes to farm market values. The average market value per acre is $850 in the North Country, $1,708 for New York State, and $3,949 in California. This means that North Country farmland is cheaper, so there is less pressure on farmers to sell and it is easier for farmers to buy land. St. Lawrence County's land is the cheapest and Essex County's is the most expensive. While Franklin County's average market value per farm shrank by 1%, its farms' average market value per acre jumped 48% from 1997 to 2002.

Table 24: North Country Farms by Total Market Value, 2002

County	$1-$49,999	$50,000-$99,999	$100,000-$199,999	$200,000-$499,999	$500,000-$999,999	$1,000,000-$1,999,999	$2,000,000-$4,999,999	$5,000,000-$9,999,999	$10,000,000 or more
Clinton	81	80	197	153	69	17	5	3	0
Essex	22	31	58	73	31	18	1	0	0
Franklin	124	92	187	109	7	14	2	2	0
Jefferson	64	239	396	209	49	57	14	1	0
Lewis	105	151	230	198	24	8	3	1	1
St. Lawrence	271	359	430	279	72	27	7	2	0
Totals	667	952	1,498	1,021	252	141	32	9	1

Source: 2002 Census of Agriculture, NASS, USDA

The table above shows that over 75% of farm values in the North Country fall between $50,000 and $499,000. This mimics the New York average. Sixty-two percent of Tulare County's farm values are between $100,000 to $999,999. There is only one farm in the northern New York region that is worth over $10 million (located in Lewis County), whereas Tulare County has 51 farms in this category.

Table 25: North Country Farms with Pastureland

	# of Farms			# of Acres		
County	**1997**	**2002**	**% Change**	**1997**	**2002**	**% Change**
Clinton	420	448	7%	37,682	31,933	-15%
Essex	161	160	-1%	13,134	8,942	-32%
Franklin	387	376	-3%	35,704	28,609	-20%
Jefferson	818	739	-10%	67,339	59,337	-12%
Lewis	539	518	-4%	37,963	32,437	-15%
St. Lawrence	1,259	1,107	-12%	112,447	85,937	-24%
Totals	3,584	3,348	-7%	304,269	247,195	-19%

Source: 2002 Census of Agriculture, NASS, USDA

The amount of pasture land is another (though indirect) indication of the amount of dairy land in a region, although it is also available for cattle, sheep, goats, and other animals. North Country farms lost 19% of their pastureland from 1997 to 2002 and now have 247,195 acres. In contrast, Tulare County lost only 4% of its pastureland and now has a total of 569,918 acres – over twice as much as the North Country as a whole.

Table 26: North Country Dairy Products Sold

	# of Farms			$1,000		
County	**1997**	**2002**	**% Change**	**1997**	**2002**	**% Change**
Clinton	175	151	-14%	39,294	44,815	14%
Essex	35	26	-26%	4,792	4,241	-11%
Franklin	238	192	-19%	33,567	37,016	10%
Jefferson	359	306	-15%	59,018	74,746	27%
Lewis	387	313	-19%	54,151	60,030	11%
St. Lawrence	540	406	-25%	71,839	80,036	11%
Totals	1,734	1,394	-20%	262,661	300,884	15%

Source: 2002 Census of Agriculture, NASS, USDA

The table above is the best indicator of the number of dairy farms in the North Country. Essex County had the largest percentage decline in this category from 1997 to 2002 with a 26% loss, representing nine fewer farms. St. Lawrence County lost the most farms – 134 – and the North Country lost a total of 340 farms over the five-year period, or 20%. New York State lost 21% of its dairy farms; California gained 5%, and Tulare County's increased by 19% to 309 farms – less than a fourth of the number of farms in the North Country.

In contrast to the loss of farms, the value of the dairy products sold in the North Country has increased 15% over the five-year period from 1997 to 2002, with Essex County the only one to experience a decline. During the same period, New York State's dairy sales increased almost 7%, California's grew over 17%, and Tulare County's jumped 47%.

When comparing the table above with the table below, note that there are more farms with milk cows than those that sell dairy products in the North Country. The farms that don't sell their milk because it is used to raise replacement cows or to feed other animals can explain the difference.

Table 27: North Country Farms with Milk Cows

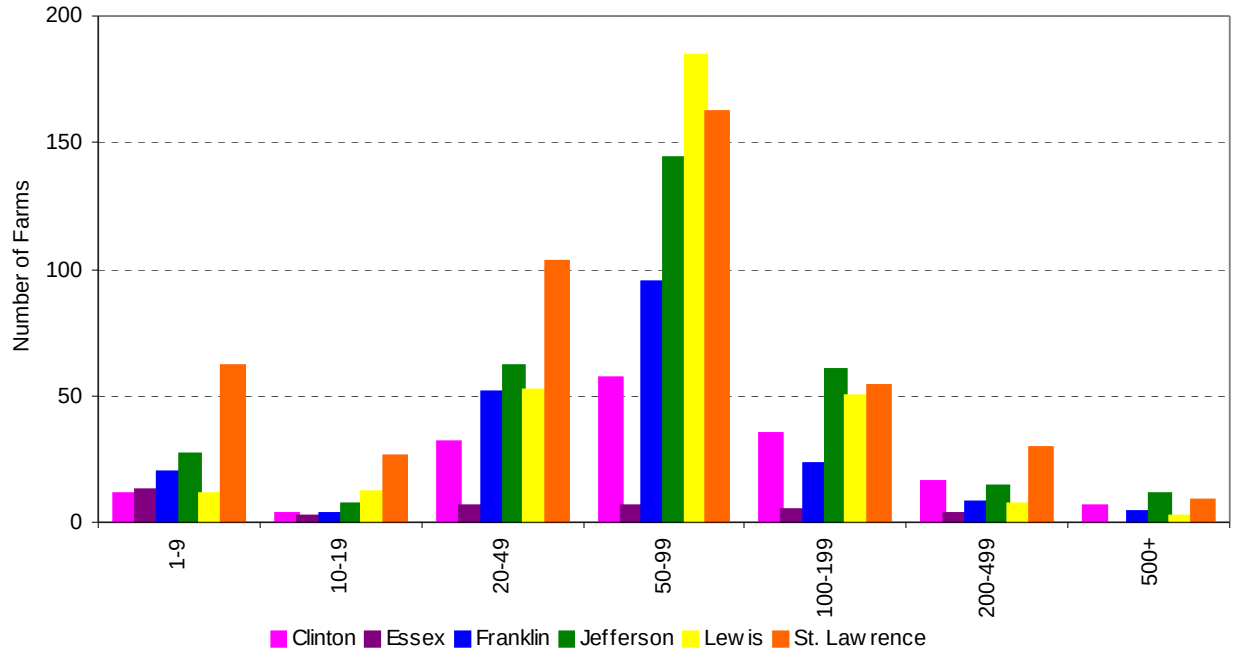
County	# of Farms			# of Milk Cows			2002 Farms by # of Cows						
	1997	2002	% Change	1997	2002	% Change	1-9	10-19	20-49	50-99	100-199	200-499	500+
Clinton	193	160	-17%	18,380	18,970	3%	11	3	32	57	35	16	6
Essex	38	35	-8%	2,542	1,983	-22%	13	2	6	6	5	3	0
Franklin	234	204	-13%	17,754	17,404	-2%	20	3	51	95	23	8	4
Jefferson	375	325	-13%	29,465	32,736	11%	27	7	62	144	60	14	11
Lewis	401	318	-21%	28,143	26,440	-6%	11	12	52	184	50	7	2
St. Lawrence	612	445	-27%	39,532	38,018	-4%	62	26	103	162	54	29	9
Totals	1,853	1,487	-20%	135,816	135,551	-0.2%	144	53	306	648	227	77	32

Source: 2002 Census of Agriculture, NASS, USDA

The change in the number of milk cows from 1997 to 2002 varied widely in the North Country, with Jefferson and Clinton Counties both showing increases and the remainder declining. The overall effect was only a loss of 265 cows – fewer cows lost than dairy farms. Jefferson County increased its herd size by 3,217, while Lewis and St. Lawrence Counties combined lost just over the same number of cows. New York State experienced a 4% loss in the number of cows during the five-year period, California's cow numbers grew 17%, and Tulare County's jumped 48% to 412,462 cows – three times as many as the North Country.

All of the North Country counties, with the exception of Essex County, predominantly have between 50 to 99 cows per farm (44%), with only a few farms in each county exceeding 500 cows (2% overall). As a whole, 38% of New York's dairy farms have 50 to 99 cows, and only 170 farms with over 500 cows (2%). California's farms tend to be much larger with 38% of its farms housing over 500 cows and 70% of Tulare County's farms falling in this range. The data on farm sizes is better illustrated below.

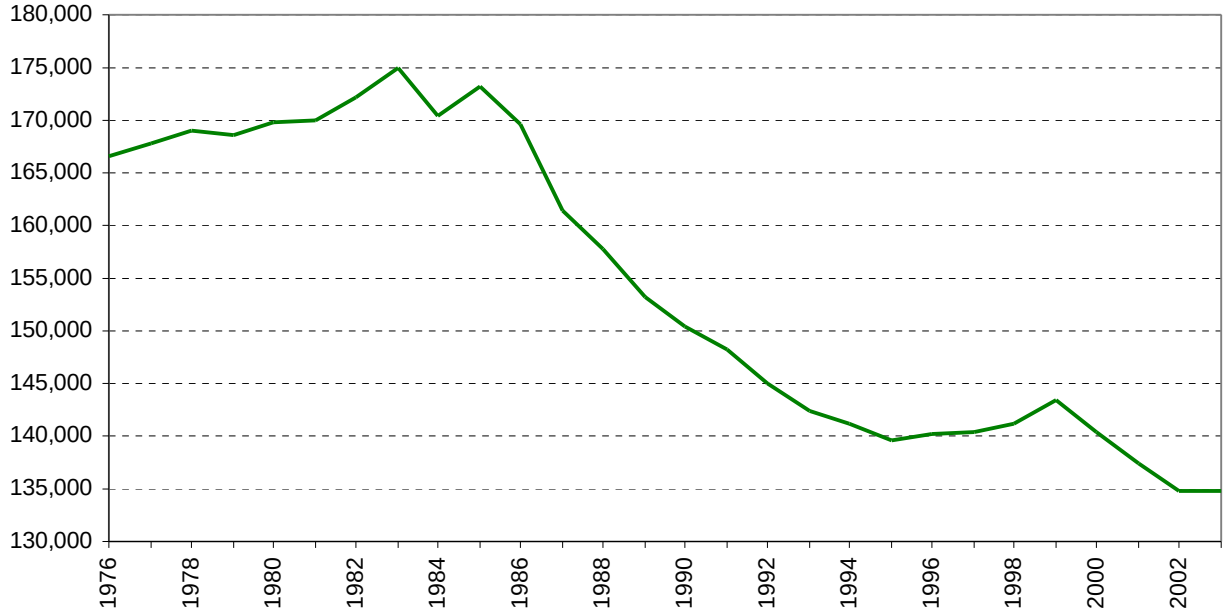
Figure 29: North Country Number of Farms by Number of Cows



Source: 2002 Census of Agriculture, NASS, USDA

The data collected for the 2002 Census of Agriculture differs slightly from the data in the next chart and is probably more accurate since it is based on farmers' direct input, rather than rounded-off estimates.

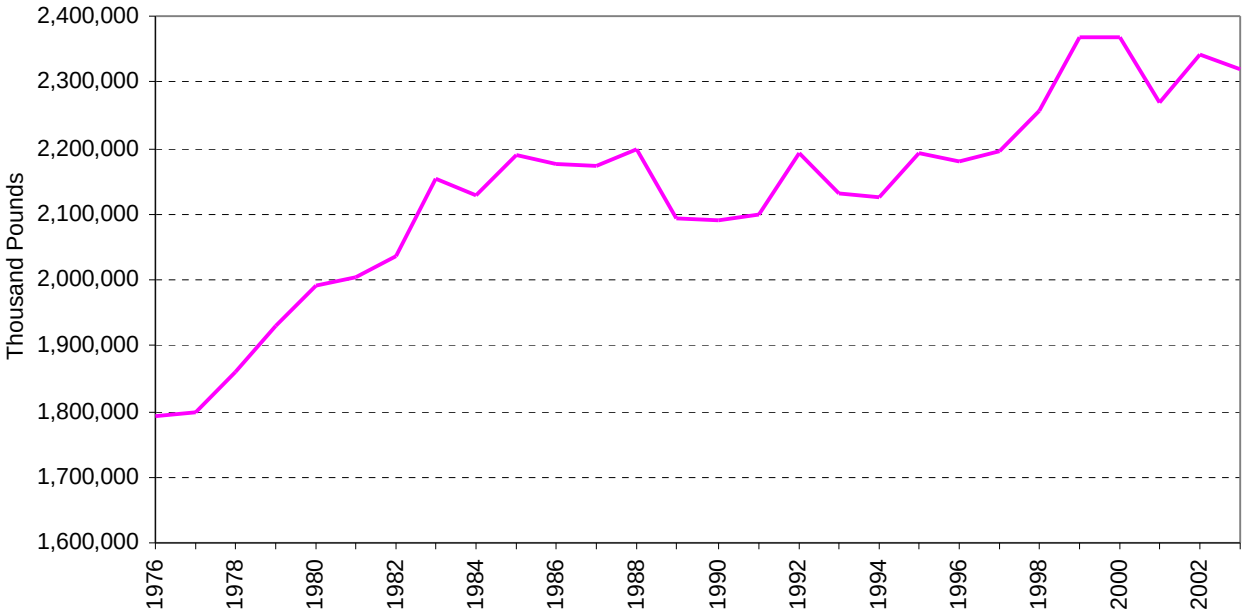
Figure 30: Annual Average Milk Cows in the North Country, 1976-2003



Source: NASS, USDA

As shown in the chart above, the number of cows in the North Country has been falling, but the graph below depicts an overall increase in milk production, which demonstrates that local farmers have been taking progressive action to become more efficient. The increase in production has not been steady, though, and it reflects the farmers' price sensitivity.

Figure 31: Annual Average Milk Production in the North Country, 1976-2003



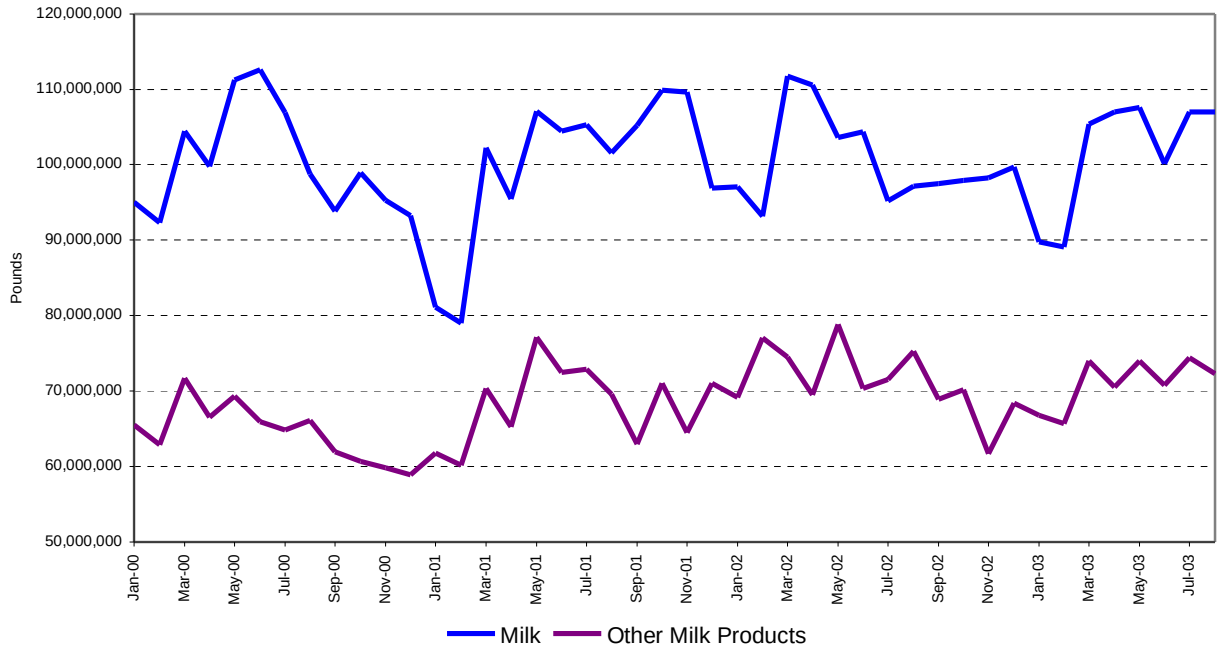
Source: NASS, USDA

Dairy Plants

There are currently eight dairy processors in the North Country. Several of them make more than one product at their establishments. Five make cheese; two produce cottage cheese; two make yogurt; one manufacturers sour cream; and two make cream cheese (including the largest manufacturer of cream cheese in the country). Two of the facilities also have specialized fluid milk processing capacity and one has a portion of its operation devoted to specialized butter production. The cheese makers produce cheddar, muenster, monterey jack, havarti, lappi, gouda, mozzarella, provolone, and ricotta. There is also an ice cream maker located less than two miles from the Lewis County line in Oneida County who was included in the CITEC survey, but its data is not included in this report because it currently does not use fluid milk in its production. One of the nine processors is in Franklin County, two are in Jefferson County, two are in Lewis County, and three are in St. Lawrence County. There are no processors in Clinton or Essex Counties and there are no regular fluid milk processors in the North Country. The specialized fluid milk and butter plants serve the kosher market.

The table below shows the monthly milk usage by North Country dairy plants from January 2000 to August 2003. Other milk ingredients include primarily reclaimed acid whey, skim milk, and cream. The dairy plants supplement with other products when insufficient milk is available. These products include sweet whey powder, condensed whey, condensed skim milk, nonfat dry milk, and whey cream.

Figure 32: Milk Used at Dairy Plants in the North Country*, January 2000-August 2003



*Excludes Kraft Canton, Lewis County Dairy, and St. Lawrence Food

Source: NYS Department of Agriculture & Markets

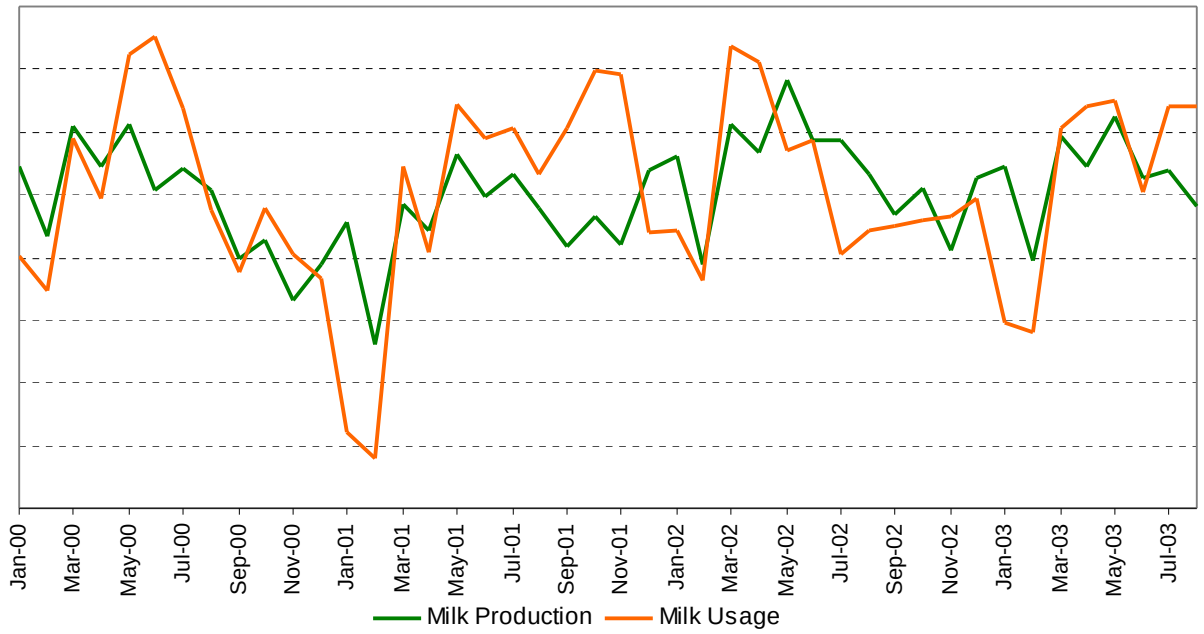
In the spring of 2004 CITEC conducted a survey of all nine North Country dairy processors (the eight mentioned above plus the Kraft Canton plant which was in operation at the time). The survey revealed that their 2003 milk usage was almost 2 billion pounds, but complete data was not provided on the amount of cream and other milk-based ingredients used. According to the NYS Department of Agriculture & Markets, the total butterfat content in the amount of cream used by the plants is equivalent to the butterfat content in the milk used by these plants, which means that total equivalent milk usage by six of the North Country plants is approximately 2.45 billion pounds annually. Though the plants insist (for obvious reasons) that their exact operating cost breakdowns be kept confidential, there is an almost

universal testimony that, at least in the North County, the costs of raw materials are between 75% and 85% of the plants' overall operating costs. This means that changes in fractions of pennies per hundredweight in the cost of milk can have, for better or for worse, major repercussions on the operating profiles of such plants – repercussions that can dwarf into insignificance all other operating cost changes.

Comparing the milk equivalent usage with milk production (Figure 31), it appears as if milk and milk-derived ingredients, mostly cream, are being imported into the region. This is difficult to quantify, however, because the movement of milk into and out of the North Country has not been documented, given that it is controlled by several different cooperatives. Unlike California, which has its own marketing order and provides information on milk transfers into and out of the state, New York is part of the Northeast Federal Marketing Order, which does not publish interstate or intrastate transfers. Nevertheless, the processors in the North Country report unanimously that they have great difficulty getting all the milk that they need at certain times of the year and must either pay a premium or substitute with dry ingredients. Cream is always in short supply and is usually shipped in from distant states. As can be seen in the chart above, the plants' milk usage varies with the seasonal milk production in the area, with the low points occurring consistently in January and February.

The seasonality of the milk production and milk usage is better illustrated in the chart below. Monthly North Country milk production data is not available, so New York State data was used to estimate the peaks and valleys during the year.

Figure 33: Average New York Milk Production vs. Milk Used at Dairy Plants in the North Country*, January 2000-August 2003



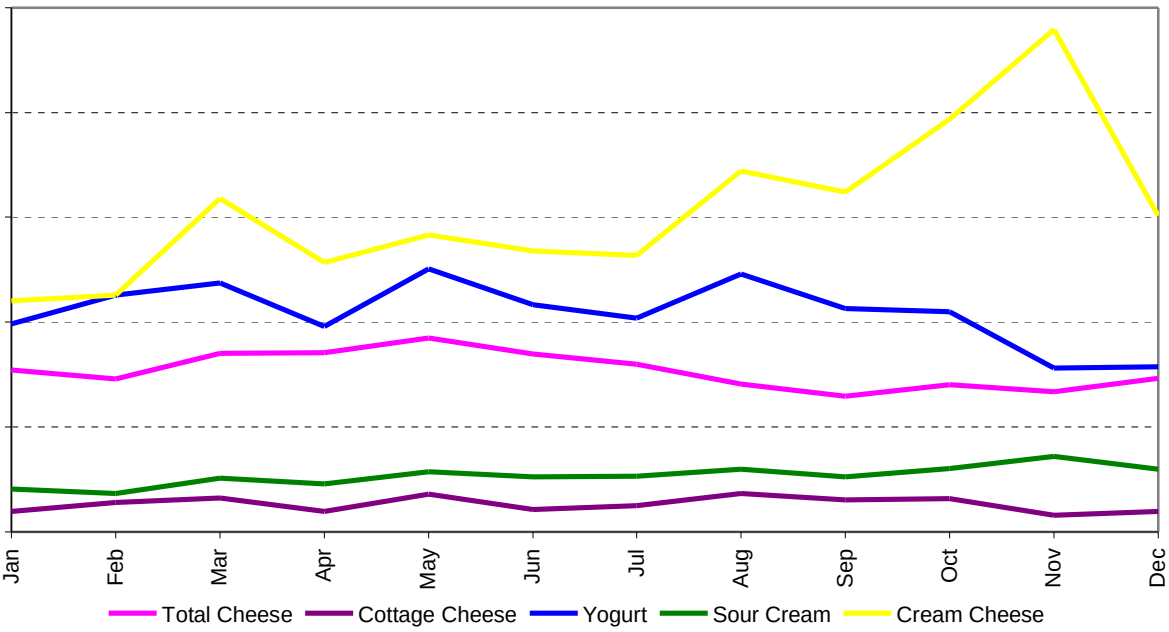
*Excludes Kraft Canton, Lewis County Dairy, and St. Lawrence Food

Sources: NASS, USDA, and NYS Department of Agriculture & Markets

When examining dairy production in the North Country, as noted in the milk used chart, three plants were excluded. The Kraft Canton plant was not included because it ceased production on July 28, 2004 and it is very uncertain whether the plant will be used for cheese production in the future. Lewis County Dairy and St. Lawrence Food (only recently reopened) were excluded because kosher dairies, both inside and outside of the North Country, supply their milk. Since these two plants get their milk from only a few dedicated farms and serve specialty niche markets, their production was excluded from the totals below and the conclusions based on them. The six plants that are included in the dairy production figures below were Crowley Foods in LaFargeville (Jefferson County), Great Lakes Cheese in Adams (Jefferson

County), Kraft in Lowville (Lewis County), Kraft in North Lawrence (St. Lawrence County), Losurdo Foods in Heuvelton (St. Lawrence County), and Agri-Mark McCadam Cheese in Chateaugay (Franklin County).

Figure 34: Average Monthly Dairy Production in the North Country*, 2000-2002

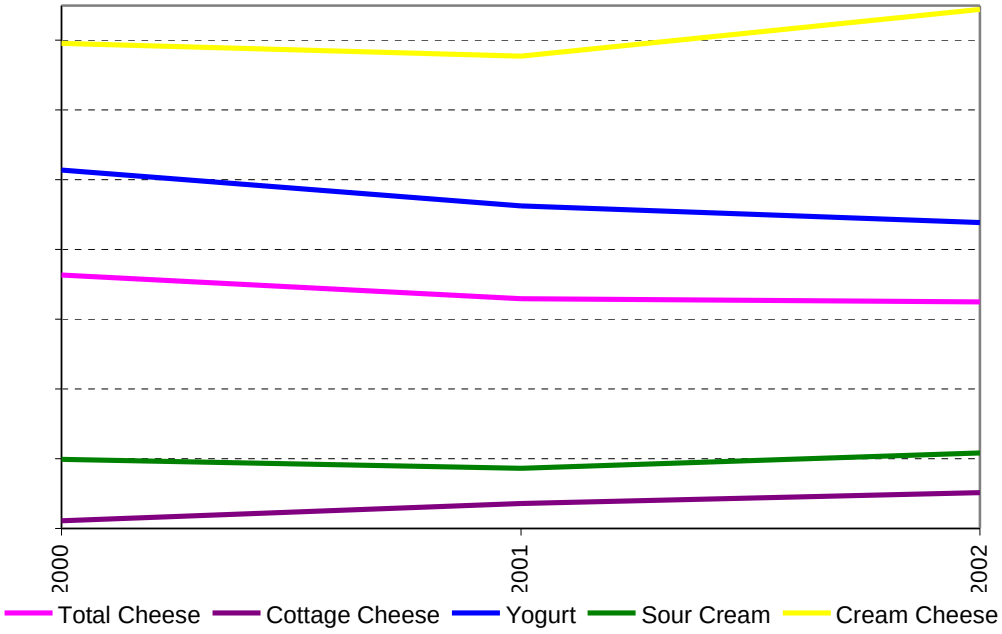


*Excludes Kraft Canton, Lewis County Dairy, and St. Lawrence Food

Source: NYS Department of Agriculture & Markets

By comparing the chart above with the previous chart, it is clear that local dairy processing varies more with seasonal demand rather than with milk availability. (Please note that for the previous figure and for the following figure, while the trend lines are accurate, CITEC deleted the actual quantities produced in order to safeguard the identity of individual plants.)

Figure 35: Total Dairy Production in the North Country*, 2000-2002



*Excludes Kraft Canton, Lewis County Dairy, and St. Lawrence Food

Source: NYS Department of Agriculture & Markets

As seen above, cream cheese, sour cream, and cottage cheese production increased from 2000 to 2002, while yogurt and cheese production declined.

Collectively, the six processors that were examined plus the two kosher plants own property with a total assessed value of $19,177,759 and total acreage is 756. They pay over $509,000 in property taxes per year. Together, they have 1,064 full-time equivalent employees with almost no seasonal lay-offs and per plant average wages ranging from $13.00 to $16.00 per hour and with total average wages of over $32 million per year, excluding management. These employers spend an average of $2,000 per employee per year on training, $600 per employee for workers' compensation, and provide benefits worth over 65% of wages. Five of the eight plants are Empire Zone Certified (the other three are ineligible due to their locations), and four of them are taking advantage of the Power for Jobs program. Two of the plants use natural gas, three of them use fuel oil, two of them use either natural gas or fuel oil depending on the current price, and one of them uses electricity exclusively. Five of the plants have private wells, two of them get their water from their villages, and one of them uses both private and public water supplies. Five of the plants dispose of their wastewater through their villages, one has its own disposal site, one uses both public and private wastewater disposal, and one of them hauls its wastewater to off site disposal. Wastewater treatment is a major issue for cheese plants and many of the current systems are inadequate or at maximum capacity. This will need to be addressed soon. CITEC was not able to determine total capital expenses at the eight plants but they reportedly collectively make millions of dollars of capital expenditures every year to improve their facilities. However, with several major exceptions, the plants' parent corporations have clearly decided not to make major, transforming capital investments at any of the region's processing plants, most probably due in large measure to the uncertain future of the raw materials' supply and price.

What Can Be Done Locally to Support the Local Dairy Industry

Almost all the players in the entire dairy value chain acknowledge that they must work together so that everyone can grow and prosper. The farmers must recognize the problems the dairy plants face and vice

versa. Better communication amongst the cooperatives could potentially reduce hauling costs, which would benefit both producers and processors, especially in the face of rising petroleum costs.

Dairy cooperatives are in business to address this problem and as milk haulers they have benefited by structuring their transportation operations to minimize cost increases in equipment, gas, and insurance. Of course, this has also made it easier for milk to leave the region. The fact is that producers can get better prices for their milk when it is shipped directly to the population centers downstate and elsewhere. The higher transportation costs are offset by the higher prices received for the milk. These "premiums" are even higher when there is a shortage of milk in the Fall when school is in session. This is also the time when many of the North Country plants need the most milk. On the other hand, when milk is most plentiful in the Spring, most processors need less milk. The Kraft plant in Canton, since it made cheddar cheese, played a major role in "balancing" this seasonality by using the extra milk when it was available and reducing operations when it wasn't. The loss of this plant will probably have a detrimental impact on the flow of the region's milk supply. Though it seems intuitive that the mismatch between milk supply and the plants' demands create additional costs for the region's dairy processors, CITEC was unable to assemble detailed information that it could make public that would calculate the costs of balancing (or lack thereof) to the region's dairy industry. Suffice it to say, that if local producers and processors can't find a way to work together to ensure there is an adequate milk supply available to the plants at a reasonable price year-round, the future of the dairy value chain in the region is not assured. If the producers send their milk out of the region seasonally, the plants cannot afford to expand and grow their markets and in the long run the milk producers will probably continue to lose local markets for their milk as more plants close or curtail operations.

One of the major concerns for farmers in New York is rising property taxes. According to the Business Council of New York State, New York has the fourth highest property taxes in the country, primarily to cover the costs of Medicaid. The New York Farm Bureau said "unlike other small businesses, farmers bear the brunt of local property taxes due to the necessity of owning land to farm – and New York's property taxes are already 50% higher than the national average." It is true that the State has adopted several programs that reduce the burden of property taxes on dairy farmers; these have reportedly had a significant impact in specific circumstances. Nonetheless, taxes and insurance for New York dairy farms average 50% more than California's.

There are two primary ways that both the local milk producers and processors can increase their profitability to enhance their chances of remaining viable. They can either increase production by taking advantage of economies of scale or they can concentrate on specialty products and/or markets to reduce their dependence on commodity products production. The data summarized earlier this report demonstrate that northern New York's dairy processors are in a competitively precarious position when producing undifferentiated commodity products.

Adjusting to this reality may not be easy. For the farmers, the size of the herds that their farms can handle may be limited by the physical and legal constraints of existing property configurations. Nonetheless, they may consider consolidating with and/or buying out their neighboring farms or developing collaborations with similar farm operations to enable them to access additional economies of scale. Farmers in Wyoming County reportedly receive lower prices for feed and supplies because their farms are larger. Those farmers have also worked with the local crop growers to share land for manure disposal, allowing them to raise more cows on less acreage and avoid some of the costs of manure disposal.

Alternatively, North Country farmers can make their own products from their milk and sell them as specialty goods, or they can produce specialty milk, such as organic or kosher. Currently, there is a handful of local farmers that make their own cheeses and there are at least 22 organic farms in the North Country: one in Essex County, three in Lewis County, eight in Jefferson County, and ten in St. Lawrence County. Organic farmers receive about 4% to 7% more for their milk. Kosher farms are in effect organic (though not necessarily certified as such) and must be large enough to support a live-in rabbi. There are two kosher cheese plants in the North Country, but they are reportedly not able to find local farms large

enough to meet all their requirements, so some of their milk supply comes from outside the North Country.

Dairy farmers are penalized when their milk quality is poor due to high bacteria and somatic cell counts. This is often due to mastitis, which can also reduce a cow's milk output. According to an article in the August 2003 issue of Northeast Dairy Business, one local dairy was able to increase its milk check by as much as $900 a month by "paying attention to details, carefully monitoring cows, maintaining the milking equipment and using sound milking prep procedures." A little extra effort can make a big difference, even on small farms. There is nothing new here; dairy educators and others have been preaching this sermon for decades. But, with increasingly margin volatility, attention to these details are becoming more important.

The dairy plants also must either step up production to increase their profitability or specialize. The latest newcomer to North Country processors makes kosher cheeses and has a strong chance of success because it serves a niche market and is presumably able to sell its products for significantly higher prices. California's commodity cheeses are reportedly moving eastward as cost reductions due to greater economies of scale allow California competitors to absorb higher transportation costs. This puts additional pressure on North Country cheesemakers to become more efficient and to differentiate their products.

During the winter of 2003 and the spring of 2004, CITEC performed full-dress competitive assessments at Agri-Mark McCadam, Crowley, and the Kraft plants in North Lawrence and Lowville to determine the internal and external events that need to occur for these plants to move to full capacity production or increase their capacity if already near full capacity. Though there is substantial variation in operating parameters and efficiencies among the four plants, they are generally very well managed. Managers at all four plants realize that they must capitalize on opportunities for efficiency improvements internally and are working diligently to achieve such improvements. At the same time, they realize that any such efficiency improvements will at best "buy time" for the plants. Even dramatic efficiency improvements – were they possible – are not likely to reverse the competitive deficit the plants find themselves in when stacked up against the increasing competition from western and other processors.

A fifth plant was also assessed, the ice cream plant outside of Lowville, Mercer's Dairy, but since they do not use fluid milk yet and are still in a start-up phase, their data has not been included here.

Collectively, the four plants in the North Country region process over 1.06 billion pounds of milk per year (about 50% of the milk processed into dairy products in the region) and are operating at an average of 84% of capacity. If they were operating at current full capacity, their total annual milk usage (excluding cream) would be about 1.3 billion pounds.

In order for these plants to increase their cheese production – which in itself would result in increasing economies of scale – the quantity of local milk available year-round to these processors must increase. As seen above, North Country dairies produced over 2.3 billion pounds of milk in 2002, yet at times the processors were unable to purchase the amount of milk that they needed at the marketing order price, requiring them either to pay a premium, substitute dry ingredients, or lay off employees and cut back production. The Kraft plant in Canton historically in effect often served as a balancing plant, turning excess milk into hard cheese in milk surplus times and reducing operations when it wasn't obtainable so that the other plants would have sufficient milk. The closure of this facility means in theory that there should be more milk available to the other plants year-round, but that the Canton plant's ability to smooth out seasonal variations in supply relative to demand has been lost. The effect of the Canton plant's closure is still unclear; perhaps the closure may mean that more milk will be available to the plants year around but the loss of the balancing capacity it provided to the whole system may create as-yet unrealized challenges.

The fact is that, even if the Canton plant had not closed, the imbalance between supply and demand at certain times of the year would surely have continued to constrain stability and growth in both the production and processing of milk. The plants that are operating near full capacity cannot justify making

significant investments to increase their production because they cannot be confident that they will be able to purchase the additional milk that would be needed if they did so. As the plants contemplate their options, both the processors and the producers are confronted by a classic chicken/egg conundrum. To expand capacity the plants must be assured of sufficient milk at a competitive price but, before the farmers will increase their production, they must be assured that they will be able to sell their milk at a price that will provide them with a reasonable return on their investments. And, all the time, both processors and producers are either directly or indirectly competing with the lower costs of commodity production in California and other areas of the country.

All of the region's dairy plants are owned by companies whose headquarters are located outside of the North Country and as a result the local plant managers often do not have complete control over their operations. Their corporate offices dictate the amount of money to be spent on equipment and infrastructure improvements. These plants also have very little control over the marketing of their products and some of them don't even know the profitability of their products – they just receive a fixed percentage over costs. Their head offices reportedly dictate how they should cut costs rather than letting the plants determine what can be done in their local circumstances to best reduce expenses. Some of the processors are hampered most by insufficient sales and marketing of their products and others are constrained by old and faulty equipment. This makes it difficult for these plants to become world-class competitors. Plans for expansion or changes in product lines are minimal at this point due to the uncertainty of the milk supply.

CITEC's review of the plants show that infrastructure improvements are sorely needed at many of them. Such improvements include upgraded waste treatment facilities, additional cooler/warehouse space, larger and more modern receiving bays, additional water supplies, new water towers, newer processing equipment, and an improved highway system. Only one of the plants is adjacent to an interstate highway, so both incoming and outgoing transportation is a problem at the other plants. This problem is exacerbated in the winter when truckers are reluctant to venture to the North Country, especially on Fridays. The plants are trying to reduce the inventories of supplies that they keep on hand to cut costs, but they have had to shut down operations when they couldn't get the supplies they needed on time. Since the proposed "rooftop" highway is far from becoming a reality, measures should be taken along the major east-west traffic corridors to make it easier for truckers to reach the plants on schedule, such as adding more passing lanes. Workers' compensation and energy costs are high and whey disposal is a major concern. Alternative local whey handling facilities that would utilize whey as a raw material for value added products would cut costs for some of the plants significantly. Some of the region's whey currently goes to Vermont for drying, some more is used for animal feed, a small amount is used in food products, and the rest is used for fertilizer. In some cases, the cost for these disposal methods can be quite substantial, but there is currently little alternative. As noted earlier, milk balancing may become more of a problem now that the Kraft plant in Canton has ceased operations. Although the plant managers have not reported any major disruptions in the six months since the Canton plant closed, they say that the milk balancing issue still needs to be addressed, since the closure of the Canton plant removes an element in the system that the plants say had given them some market flexibility in the past.

Next Steps

As suggested earlier, the overriding concern of the manufacturers is the cost and supply dependability of their major raw material, i.e., milk. It is hazardous to assume that the plants' owners will make any transforming capital investments in their North Country facilities until they are better assured that their basic raw material costs will be more attractive and that the supply will be more adequate at times of their peak production needs. The New York processors are also at a disadvantage when it comes to energy costs because they are generally higher here. And the older infrastructure in the North Country also increases the operating costs for the cheese plants. While many measures can and should be taken to improve the competitive position of the region's dairy processing facilities, they will not address the root of the problem and will not yield a long-term solution to the industry's difficult position. Until and unless the

region's dairy value chain can decrease the raw material and operating costs for the region's processing plants and/or can figure a way to reduce its dependence on commodity production, the industry will continue to be threatened by increasing competition.

Not all hope is lost, however. New York farmers and processors benefit significantly from agricultural research conducted by Cornell University's College of Agriculture and Life Sciences and the other SUNY colleges with agricultural programs to provide the competitive advantage needed to survive in an increasingly global marketplace. If increased funding for these programs was ever justified, now is the time. Now more than ever New York needs to apply its best minds to figuring out how the State's dairy value chain can deal with the cost differential between its producers and processors and those resident in competing states and regions.

An example of the valuable research done at Cornell is the university's on-going study of technologies that fraction milk to produce more valuable and useful components – in much the same way that petroleum is "cracked" into its components. Because of Cornell's work, a group of producers, processors, and people involved with economic development is exploring the possibility of implementing ultra-filtration technology that removes two-thirds of the liquid in milk, keeping only the portion that is valuable to the manufacturers of cheese and some other dairy products. This has the potential to reduce transportation costs and eliminate many of the problems with waste disposal that the manufacturers face. Both producers and processors stand to gain from the construction of a plant that uses this technology; if the deployment of such a technology could significantly reduce the processors' costs, then they could afford to pay more to the cooperatives and farmers, thereby convincing the cooperatives to keep more milk in the region and stabilize its supply. According to Cornell researchers, the sooner such a technology is implemented, the more the North Country stands to gain. And, this is only a first step towards utilizing new technologies to create added value from milk. As new products and new formulations are created (and FDA regulations are changed), advanced ultra-filtration and other new technologies can be used to create the ingredients needed in the region or elsewhere for both traditional and non-traditional products.

While ultra-filtration technology may alleviate some of the waste issues that the manufacturers have to deal with, it won't solve all of them. Whey disposal will continue to add uncompetitive costs at several plants, and several plant managers think that efforts should continue to develop a cooperative solution that would convert whey from a liability into an asset. Economies of scale could make it possible to pool unwanted whey at a whey drying facility so that it can be transformed into powder and sold. The St. Lawrence Co. Industrial Development Agency recently conducted a multi-stage study of the feasibility of such a plant, so clearly some activities are already in process on this score. Alternatively, other organizations in the region have begun to explore (on a pilot scale) the use of anaerobic digestion to combine whey with manure in order to produce energy and fertilizer for local use.

Finally, as noted earlier, insufficiencies in traditional public infrastructure – water supply, waste disposal facilities, and transportation capacity – are among the conditions that add competitively unsustainable costs to the plants' operations. Each plant has its own array of site-specific problems and there is no general improvement that would fit all plants' situations. Suffice it to say that major public investments are needed. It should not be assumed that the costs of upgrading such infrastructure should be solely the responsibility of the local communities in which the plants are located. If there were ever a justification for doing a comprehensive regional assessment of infrastructure needs – and developing broad public financing for remedial action steps – this is the one. Though the plants *are* sited in individual communities, their impacts are regional in scope because of the breadth and depth of the milk sheds they draw from. There are programs and financial resources available to assist local communities at both the state and federal levels. The Environmental Facilities Corporation, Empire State Development's Environmental Investment Program, and the Governor's Office for Small Cities all have financial resources that could and have been accessed by local communities for their public infrastructure projects. At the federal level the US Environmental Protection Agency, Clean Water Act, USDA and EDA also have programs and financial resources that could assist. The critical issue is making sure that local communities are aware of the resources available to them.

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