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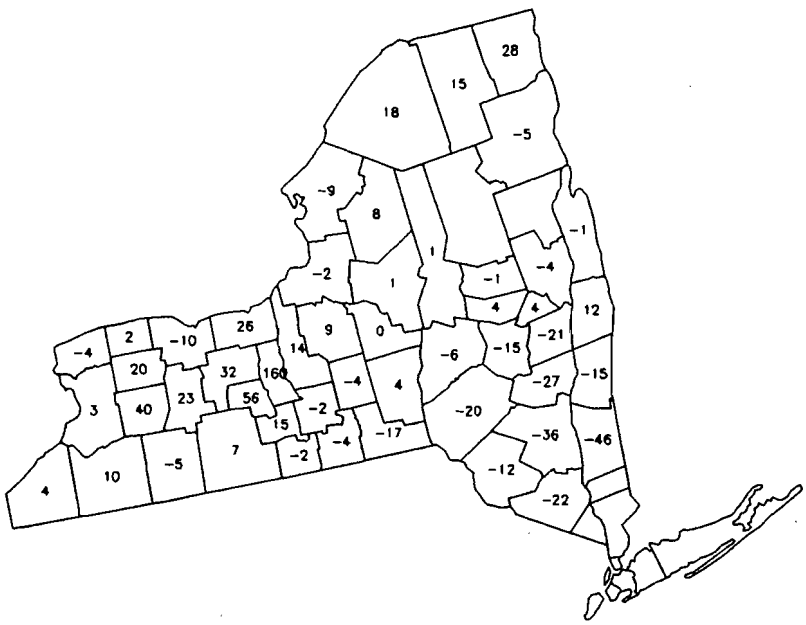
NEW YORK MILK PRODUCTION FROM 1979 TO 1989:
A COUNTY AND REGIONAL ANALYSIS

by

Kevin E. Jack and Andrew M. Novakovic

PERCENT CHANGE IN MILK MARKETINGS
December, 1979 to December, 1989



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PREFACE

The authors are members of the Department of Agricultural Economics at Cornell University. Kevin E. Jack, who is the principal author, is an Extension Associate. Andrew M. Novakovic is the E.V. Baker Associate Professor of Agricultural Economics. Walter Wasserman provided the original encouragment to write this report and assembled the original data on milk marketings from New York producers under federal and state milk marketing orders. Nelson Bills supplied background information on the major land resource area groupings used in this report. This manuscript was prepared for publication by Wendy Barrett, with graphics by Wendy Barrett and Maura Keniston.

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Introduction

The 1980s were a time of change for dairy farms in New York and elsewhere. Major initiatives in national dairy policy, such as the Milk Diversion Program and the Dairy Termination Program of the mid-1980s, and the record farm-level prices experienced in late 1989 have caught the lion's share of public attention. In the midst of all this excitement, other subtle changes in the size, structure, and geographic orientation of dairy production occurred, most of which reflect longer-term trends which ultimately are probably of greater consequence than federal price support policy. This paper is a discussion of changes in the volume and structure of milk production in New York during the 1980s.[1]

Throughout most of the 1980s, New York experienced steady reductions in dairy farm numbers with rising milk sales per farm, and these trends were paralleled by decreased cow numbers and simultaneous increases in milk production per cow. Rather than merely isolated events, these were actually continuations of longer-term adjustments in production patterns that began in earlier decades.

As a background to the broader trends mentioned above, Tables 1 and 2 present Census of Agriculture data. These tables illustrate that structural change in New York dairy farming--meaning fewer, but larger dairy farms--has been ongoing for an extended period. Indeed this trend has no doubt existed since sometime in the 1800s, although it became more pronounced after the 1930s.

Table 1. PERCENT OF ALL DAIRY FARMS BY SIZE OF HERD, New York, 1969, 1978 and 1987

Size of Herd	1969	1978	1987
		(percent)	
Under 20	24.6	24.8	15.3
20-49	52.8	39.7	34.2
50-99	19.6	28.5	37.4
100-199	2.8	6.1	10.8
200 or more	0.2	0.9	2.3
Total Number of Dairy Farms	24,775	19,674	13,840

Source: U.S. Department of Commerce, Census of Agriculture.

[1] The current status of milk production and historical trends for U.S. and major milk producing states is discussed in: National and State Trends in Milk Production, 1991, by A. Novakovic, K. Jack, and M. Keniston, A.E. Ext. 91-20, Dept. of Agr. Econ., Cornell University, August 1991.

Table 2. PERCENT OF ALL DAIRY COWS BY SIZE OF HERD, New York, 1969, 1978 and 1987

Size of Herd	1969	1978	1987
	----------(percent)----------		
Under 20	5.5	2.7	1.4
20-49	49.1	31.9	21.1
50-99	34.1	42.3	42.2
100-199	9.4	17.4	23.4
200 or more	1.9	5.7	11.9

Source: U.S. Department of Commerce, Census of Agriculture.

Although the Census has a very loose definition of what it classifies as a "dairy farm" (i.e. possessing one or more dairy cows), it is clear that the largest growth has been in herds with at least 100 cows. Twenty years ago, these herds accounted for three percent of the farms and 11.3 percent of the cows, but as of 1987, they accounted for 13.1 percent of the farms and 35.3 percent of the cows. There has been a corresponding decline in the share of dairy cows on smaller farms. This is most evident in the 20-49 cow herd size category, whose share declined from 49.1 percent to 21.1 percent between 1969 and 1987.

Significant improvement in milk production per cow over the past several decades also underscores the structural change that has been occurring in New York dairy farming. Data in Table 3 show that while milk production per cow increased over 50 percent between 1965 and 1990, cow numbers declined over one-third contemporaneously. The long-run implication is that, as technological and managerial improvements make dairy cows more productive, fewer, but more efficient cows will be required to produce a given supply of milk. Just as farm numbers have declined and remaining farms have gotten more productive, dairy cows produce more and their numbers have declined accordingly.

Table 3. MILK PRODUCTION PER COW AND DAIRY COW NUMBERS, New York, Selected Years

Year	Milk Production Per Cow	Number of Dairy Cows
	(pounds)	(thousands)
1965	9,485	1,164
1970	10,885	950
1975	10,866	917
1980	12,013	911
1985	12,836	914
1990	14,456	768

Source: USDA, Milk Production, Disposition and Income, various years.

Analysis of Farm Numbers and Marketings by County

This paper describes the nature of county-level changes in milk production and producer numbers which have occurred during the 1980s against the background outlined above. Data were compiled from December, 1979 and December, 1989 reports issued by the administrators of the Western New York State Milk Marketing Order and the three Federal Milk Marketing Orders (FMMOs) which regulate dairy farms in New York. (The basic data are presented in Appendix Table 1.)

Even though this analysis is based only on a "snapshot" of two months, one at the beginning and one at the end of the 1980s, this approach does give an inkling of where major changes in milk production patterns occurred during the decade. Market order data have an advantage over Census of Agriculture data in that only farms actually selling milk are enumerated. Not all commercial New York dairy farms market milk under a marketing order; however, because orders did cover approximately 92% of all milk production in New York in December, 1989, these data should be considered representative of overall trends experienced in the state.[2]

Farm Numbers

Figure 1 presents December data from 1979 through 1989 on New York dairy farm numbers. In December, 1989, 10,503 New York dairy producers marketed over 852 million pounds to handlers regulated under a marketing order. In contrast, in December, 1979, 822 million pounds was marketed by 14,715 New York dairy producers; they accounted for 95% of state production that month. Thus, in relative terms, at the end of the 1980s, 28.6% fewer New York producers shipped 3.7% more milk compared to a decade earlier.

By way of comparison, the number of federal order producers outside of New York declined 16.7%.[3] Between December, 1979 and December, 1989, aggregate milk marketings by non-New York federal order producers were up 10.9%. Thus, New York farm numbers have declined at about twice the rate elsewhere in federal order areas, and total marketings have increased at almost one-third the rate elsewhere.

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[2] According to data from the New York Department of Agriculture and Markets, 97.8% of the milk produced in New York in 1989 was marketed by farmers to processors, most of whom are regulated under a federal or state milk marketing order. Of the remaining milk produced, 1.9% is estimated to have been used on the farm where it was produced and 0.3% was sold directly to consumers.

[3] This figure nets out producers added with the creation of the new Southwestern Idaho-Eastern Oregon Order in 1981 and the Alabama-West Florida Order in 1982. *The marketing areas of a few orders were changed between 1979 and 1989, such as in the Great Basin and Southern Illinois orders, but in these cases the milksheds associated with the order or predecessor orders were not significantly affected.*

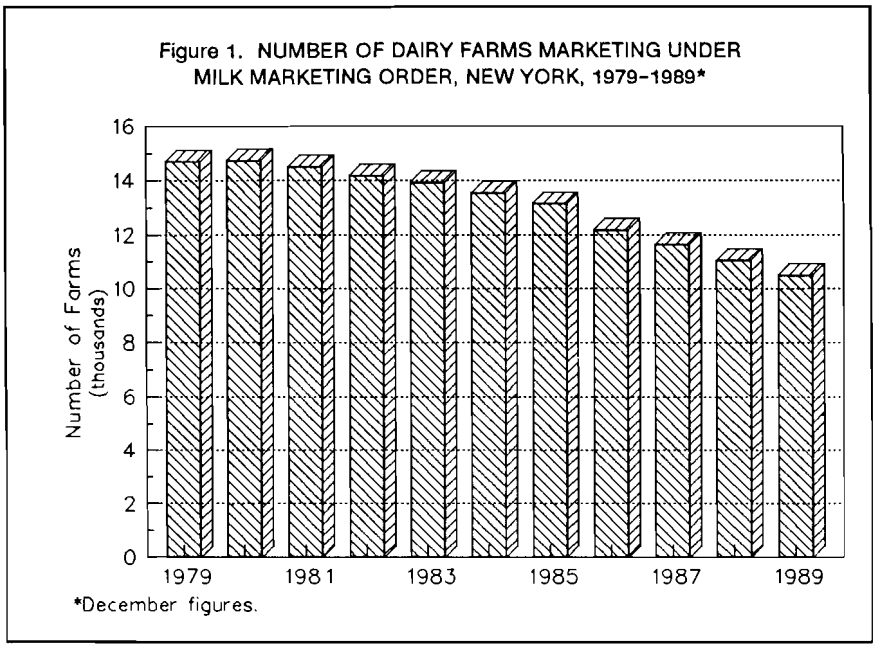

Figure 2 presents the 1989 data on farm numbers in map form. The ten counties with the most dairy farms in December, 1989 accounted for 42.7% of the state's total farms.[4] These counties are ranked in Table 4 with their December, 1979 ranking in parentheses. The top five counties on this list represented 23.9% of all dairy operations; of these, only St. Lawrence maintained the same rank compared with ten years earlier. Oneida moved up one notch from #3 in 1979 to #2 in 1989, and Otsego did the same going from #4 to #3. Rounding out the top 5, Lewis moved up two places from #6 to #4 and Jefferson slid from #2 to #5.

All of the counties in the "second five" ranked higher than ten years earlier, and of these, Wyoming posted the largest increase, up five places. The increase in rank experienced by most of the top 10 counties over the 1980s was made possible, in part, by the relatively large declines in farm numbers experienced by Delaware and Madison counties. Ranked respectively #5 and #9 in December, 1979, Delaware fell to #13 and Madison to #11 in December, 1989.

Schenectady had the fewest number of operating dairy farms in December, 1989.[5] The other counties with the least number of dairy operations are listed in Table 5 with their December, 1979 rank in parentheses. These ten smallest counties average 44 dairy farms per county. If all the farms in these counties were summed up, they would almost equal the number found in Jefferson, the #5 county in the state.

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[4] It should be understood throughout this paper that, unless otherwise stated, reference to state county farm numbers mean the number of farms whose milk is priced under a milk marketing order. Strictly speaking, this number will be slightly less than the number of total New York dairy farms; however the difference is trivial for all practical purposes.

[5] County rankings pertain only to the 50 counties listed in Appendix Table 1. Farms in the remaining seven counties (and five boroughs of New York City) are included in the "unspecified" category.

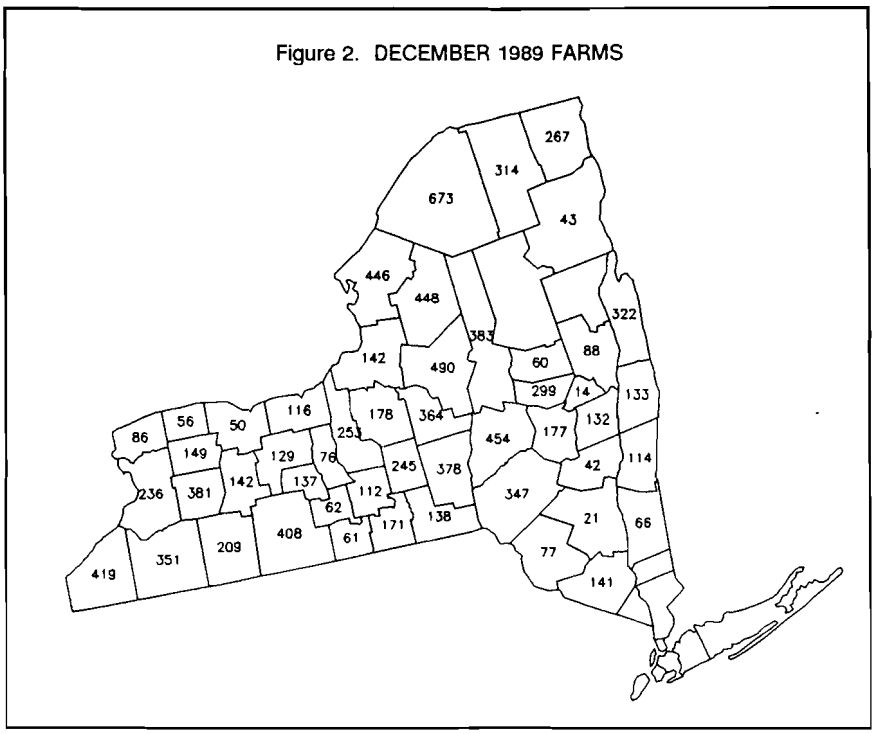


Table 4. COUNTIES WITH LARGEST NUMBER OF DAIRY FARMS, New York, December, 1989

County	Number of Farms	Rank 1989	Rank 1979
St. Lawrence	673	1	(1)
Oneida	490	2	(3)
Otsego	454	3	(4)
Lewis	448	4	(6)
Jefferson	446	5	(2)
Chautauqua	419	6	(7)
Steuben	408	7	(8)
Herkimer	383	8	(10)
Wyoming	381	9	(14)
Chenango	378	10	(11)

Finally, county data for December, 1979 and December, 1989 were grouped into quintiles by number of dairy farms per county. For each quintile, the mean number of dairy farms per county is listed in Table 6.

Table 5. COUNTIES WITH SMALLEST NUMBER OF DAIRY FARMS, New York, December, 1989

County	Number of Farms	Rank 1989	Rank 1979
Schenectady	14	50	(50)
Ulster	21	49	(49)
Albany	32	48	(47)
Greene	42	47	(45)
Essex	43	46	(46)
Monroe	50	45	(40)
Orleans	56	44	(43)
Fulton	60	43	(42)
Chemung	61	42	(41)
Schuyler	62	41	(44)

Table 6. MEAN NUMBER OF DAIRY FARMS, BY COUNTY QUINTILE GROUPINGS, December, 1979 and December, 1989

	Mean Number of Farms 1979	1989	Change
Top Quintile	616	448	-27.3%
Second Quintile	407	300	-26.3%
Third Quintile	237	158	-33.3%
Fourth Quintile	142	100	-29.6%
Bottom Quintile	67	44	-34.3%

The one-fifth of all New York counties having the most dairy farms averaged 448 farms per county in 1989, down from 616 in 1979. Similarly, in the smallest quintile, the average number of farms per county decreased from 67 to 44. In both 1979 and 1989, mean number of farms per county in the top quintile was approximately 50 percent larger than the second quintile, and ten times larger than the bottom quintile. Using absolute measures, the difference in mean size between the top quintile and the second quintile narrowed from 209 to 148, and from 549 to 404 between the top and bottom quintiles.

If one compares the decline in farm numbers on a percentage basis, there is a tendency for the counties with more farms to have declined relatively less. The top

quintile county average number of farms declined about 27%, whereas the counties in the bottom three quintiles averaged a decline of 30% or so.

Changes in Farm Numbers

The 1980s were a period of consolidation as virtually all counties witnessed declines in farm numbers. The two exceptions to this prevailing norm were Yates and Seneca counties, which actually had more dairy farms in 1989 due to an influx of Amish and Mennonite farmers from neighboring states.

The five counties with the largest absolute declines during the 1980s included: Jefferson, St. Lawrence, Delaware, Otsego, and, Washington. Their aggregate loss represented 26.8% of net dairy farm exits statewide during the 1980s. The magnitude of these county-level changes are illustrated in Table 7. It is interesting to note that despite sustaining some of the heaviest losses in farm numbers, Jefferson, St. Lawrence, and Otsego counties still ranked among the top five counties in dairy farm numbers in December, 1989.

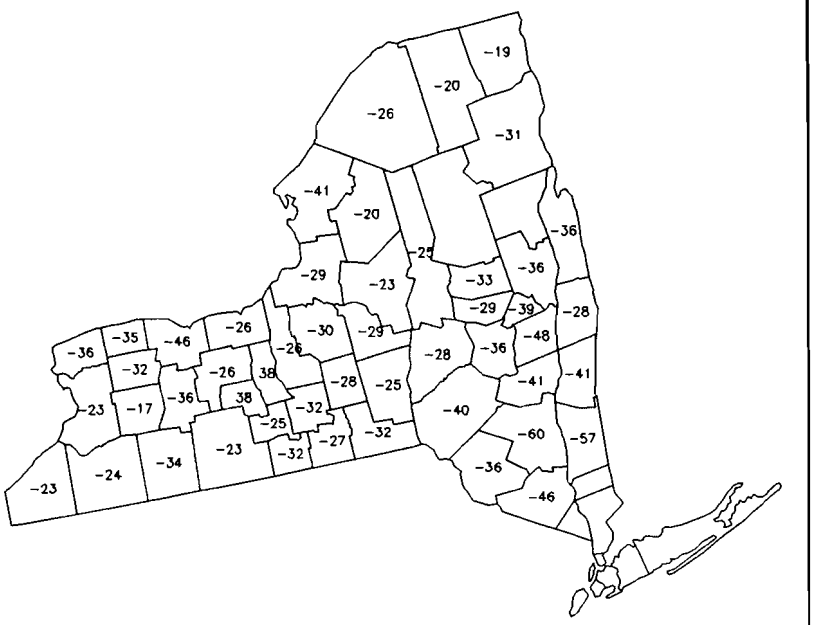
Table 7. COUNTIES WITH LARGEST DECLINE IN NUMBER OF DAIRY FARMS, New York, December, 1979 to December, 1989

County	Change in Farm Numbers	Percent Change
Jefferson	-308	-40.8
St. Lawrence	-237	-26.0
Delaware	-229	-39.8
Otsego	-178	-28.2
Washington	-178	-35.6
Oneida	-148	-23.2
Madison	-147	-28.8
Chenango	-128	-25.3
Herkimer	-127	-24.9
Chautauqua	-122	-22.6
Montgomery	-122	-29.0

A different ranking of counties emerges when farm loss is computed on a relative, rather than absolute basis as illustrated in Figure 3.

As noted above, Yates and Seneca counties were rather unique in having bucked the trend toward fewer dairy farms. Although these counties experienced impressive gains in farm numbers of 38.4% and 38.2%, respectively, these numbers need to be balanced against the total or absolute values they actually represent. For example, using

Figure 3. PERCENT CHANGE IN FARMS



1989 farm numbers, it would take an 8.9% change in Seneca farm numbers to just equal a 1% change in St. Lawrence county.

For the rest of the state, it was a matter of how few farms were lost. In this category, Wyoming, Clinton, and Lewis counties experienced the least percentage decline in dairy farm numbers over this period, with losses of 17.2%, 18.8%, and 20.3%, respectively. While these three were relatively fortunate, twenty-four counties lost at least 30% of their dairy farms, and eight of these declined more than 40%.

The counties with the steepest relative declines in dairy farm numbers were: Ulster; Dutchess; Albany; Orange; and, Monroe. These percent changes are reported in Table 8. Because the exit of one farm will have a larger percentage impact on a county with fewer farms, it is not unexpected that three of these counties (Ulster, Albany, and Monroe) were among the twelve counties reporting the smallest number of dairy farms in December, 1979.

Milk Marketings

County milk marketings for December, 1989 are presented in Figure 4. The ten counties with the largest volumes are listed in Table 9 with rank for December, 1979 milk marketings in parentheses. The top ten accounted for 40.2% of all milk marketings in December, 1989, while the top five of this group were responsible for 22.5%. Wyoming marketed the most milk in December, 1989, with over 48 million pounds. Interestingly, Wyoming ranked only ninth in total farm numbers, indicating a preponderance of larger

operations in that county. On the other hand, Otsego with the third largest number of farms only ranked eighth in milk marketings. With those two exceptions noted, the five counties with the largest number of dairy farms also shipped the most milk in December, 1989.

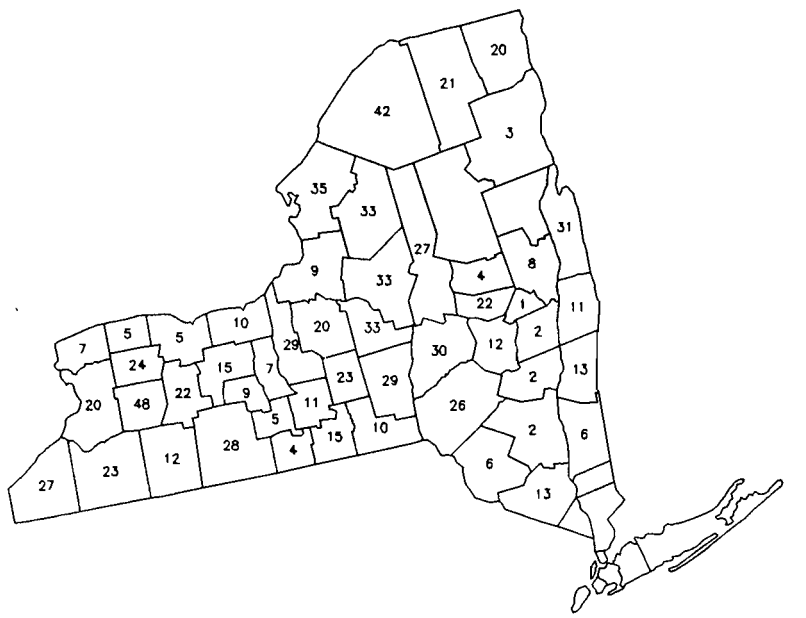
Table 8. COUNTIES WITH LARGEST PERCENT DECLINE IN DAIRY FARMS, New York, December, 1979 to December, 1989

County	Percent Decline	Change in Farm Numbers
Ulster	-60.4	-32
Dutchess	-56.6	-86
Albany	-47.5	-29
Orange	-46.2	-121
Monroe	-45.7	-42
Columbia	-41.2	-80
Jefferson	-40.8	-308
Greene	-40.8	-29
Delaware	-39.8	-229
Schenectady	-39.1	-9

Table 9. MILK MARKETINGS, TOP 10 COUNTIES, New York, December, 1989

County	Milk Marketings (million pounds)	Rank Marketings	Rank Farms
Wyoming	48.4	1	9
St. Lawrence	42.3	2	1
Jefferson	34.5	3	5
Lewis	33.4	4	4
Oneida	33.2	5	2
Madison	32.7	6	11
Washington	30.9	7	14
Otsego	30.2	8	3
Cayuga	28.8	9	18
Chenango	28.5	10	10

Figure 4. COUNTY MILK MARKETINGS (million lbs)



For both December, 1979 and December, 1989, counties were ranked by milk marketings, grouped into quintiles of ten counties each, and average county milk marketings per quintile calculated. These results are found in Table 10. Of interest here is that the top twenty dairy counties in New York increased their milk marketings by about 1.5 million pounds per county, while average growth in the remaining counties was small or non-existent. (This is consistent with the earlier observation that farm numbers declined relatively less in the counties that had the greatest number of farms.)

Table 10. MEAN MILK MARKETINGS, BY COUNTY QUINTILE GROUPINGS, December, 1979 and December, 1989

	Milk Marketings		Percent
	1979	1989	Change
	(million pounds)		
Top Quintile	32.8	34.3	+4.6
Second Quintile	22.8	24.3	+6.6
Third Quintile	15.0	15.0	0.0
Fourth Quintile	8.1	8.2	+1.2
Bottom Quintile	3.4	3.4	0.0

Changes in Milk Marketings

Total milk marketings increased in twenty-five counties during the 1980s. Counties were ranked by change in total milk pounds delivered between December, 1979 and December, 1989. Table 11 lists the ten leaders and Table 12 the ten lowest.

There appears to be little correlation between a county's rank for change in pounds marketed and rank for December, 1979 milk marketings. Only two of the ten counties gaining the most in milk marketings were also among the top ten in total milk marketings in December, 1979. In fact, only five of these counties ranked among the top twenty for milk marketings in December, 1979. Conversely, six of the counties losing the most milk were in 23rd place or lower in terms of total milk marketings for December, 1979.

Table 11. COUNTIES WITH LARGEST INCREASE IN MILK MARKETINGS, New York, December, 1979 to December, 1989

County	Change in Milk Marketings (million pounds)	Rank: Change in Marketings 1979-1989	Rank: Dec. 1979 Mktgs.
Wyoming	13.8	1	3
St. Lawrence	6.3	2	2
Seneca	4.5	3	47
Clinton	4.5	4	24
Livingston	4.1	5	22
Genesee	4.0	6	18
Ontario	3.7	7	31
Cayuga	3.6	8	14
Yates	3.3	9	39
Franklin	2.7	10	20

Change in production statistics may also be measured on a percentage basis or on a per-farm basis, thus providing two alternate methods for comparing individual county dairy statistics or to measure county-level changes relative to state averages. Percent changes in county milk marketings are presented in Figure 5.

Milk marketings increased more than 10% in thirteen counties, and, of these, it was up more than 20% in eight. Of counties with declining milk deliveries, ten lost at least 10%, and six of these were down more than 20% between December, 1979 and December, 1989. Similarly, the tables below highlight the leading and lagging counties in terms of percentage change in total milk marketings. *(Here, as well as later in the paper, when New York's overall performance is included, the state as a whole is ranked relative to those of individual counties, thus making for a total of 51 possible rankings.)*

Table 12. COUNTIES WITH LARGEST DECLINE IN MILK MARKETINGS, New York, December, 1979 to December, 1989

County	Change in Milk Marketings (million pounds)	Rank Change in Marketings 1979-1989	Rank Dec. 1979 Mktgs.
Delaware	-6.7	50	6
Dutchess	-5.4	49	30
Orange	-3.6	48	23
Jefferson	-3.4	47	1
Columbia	-2.3	46	26
Otsego	-2.1	45	7
Broome	-2.0	44	29
Schoharie	-2.0	43	27
Ulster	-1.0	42	49
Cortland	-0.9	41	15

Figure 5. PERCENT CHANGE IN MILK MARKETINGS

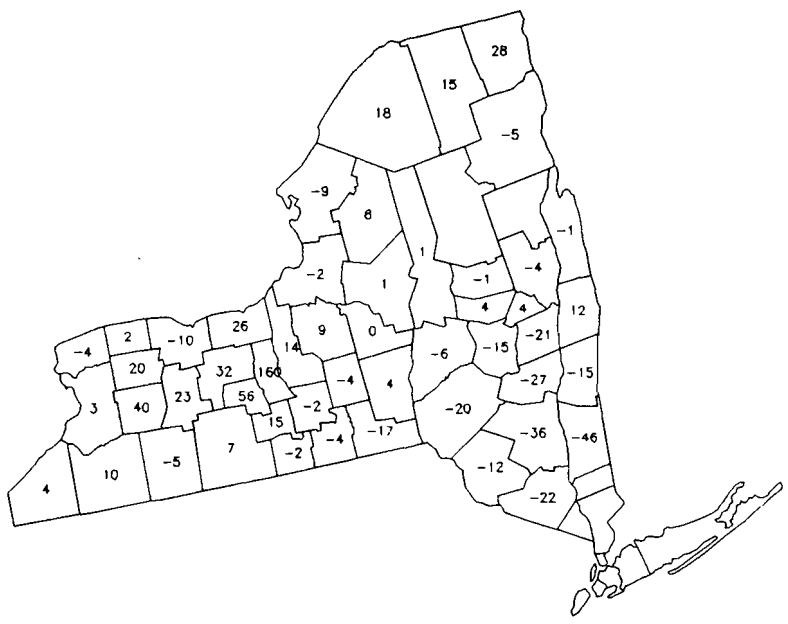


Table 13. PERCENT CHANGE IN MILK MARKETINGS,
Top 5 and Bottom 5 Counties, New York,
December, 1979 to December, 1989

County	Percent Change in Milk Marketings	Absolute Change (million pounds)	Rank
Seneca	+159.5	4.5	1
Yates	+55.9	3.3	2
Wyoming	+39.8	13.8	3
Ontario	+31.7	3.7	4
Clinton	+28.1	4.5	5
New York	+3.7	30.7	20
Albany	-20.7	-0.6	47
Orange	-22.1	-3.6	48
Greene	-26.6	-0.9	49
Ulster	-35.9	-1.0	50
Dutchess	-46.4	-5.4	51

Table 13 lists the five leading percentage gainers in pounds shipped. Only Ontario was not also among the top five on the percentage change in farm numbers. Not unexpectedly, the five counties with the largest percentage decline in milk marketings were all among the ten counties with the largest percentage decline in farm numbers. Also notable is that all five counties are contiguous to one another, and in a region of increasing urban sprawl. Again this phenomenon is not an isolated event, but rather the continuation of a long-standing trend.

Milk Marketings Per Farm

County averages for milk marketings per farm give one indication of the relative size of dairy farms in an area. These are reported in Figure 6. The state average for pounds of milk sold per farm in December, 1989 was just over 81,000 pounds. The counties with the highest and lowest averages are listed in Table 14.

Genesee possessed the highest average with 160,000 pounds sold per farm. It was closely followed by Livingston at 156,000 pounds. The other counties rounding out the top five are listed below. In addition to those listed, other counties averaging over 100,000 pounds included Columbia at 113,000, and Onondaga with 112,000. The five lowest ranking counties for average milk marketings per farm in December, 1989 had deliveries ranging between 56,000 and 64,000 pounds per farm, and included: Greene, Allegany, Oswego, St. Lawrence, and Chautauqua.

Figure 6. MILK MARKETINGS PER FARM (thousand lbs)

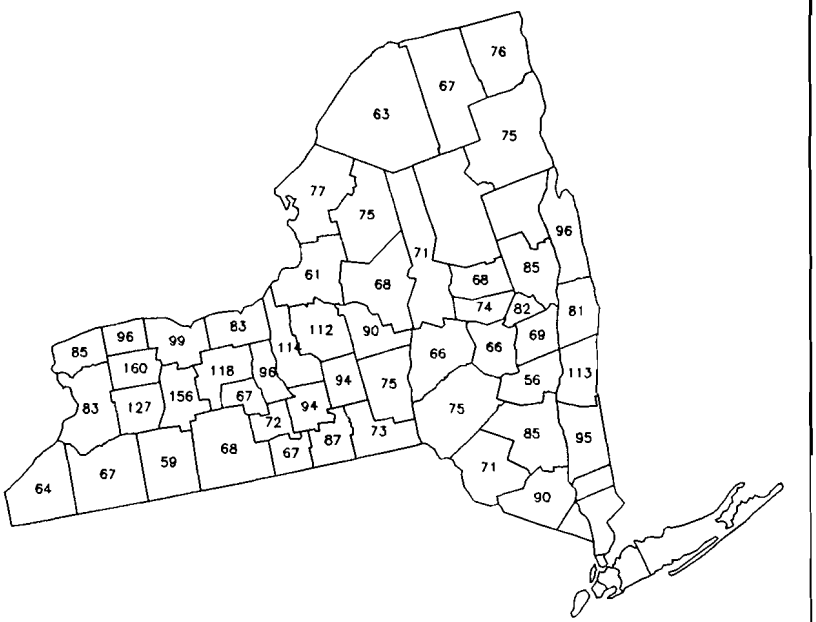


Table 14. AVERAGE MILK MARKETINGS PER FARM,
Top 5 and Bottom 5 Counties, New York, December, 1989

County	Average Per Farm Milk Marketings (thousand pounds)	Rank Per Farm Marketings	Rank Total Marketings	Rank Number of Farms
Genesee	160	1	15	25
Livingston	156	2	19	26
Wyoming	127	3	1	9
Ontario	118	4	24	32
Cayuga	114	5	9	18
New York	81	24	n.a.	n.a.
Chautauqua	64	47	13	6
St. Lawrence	63	48	2	1
Oswego	61	49	35	26
Allegany	59	50	28	21
Greene	56	51	47	47

Table 15. CHANGES IN AVERAGE MILK MARKETINGS PER FARM,
Top 5 and Bottom 5 Counties, New York, December, 1979 to December, 1989

County	Change Per Farm (thousand pounds)	Rank
Livingston	75	1
Genesee	69	2
Ontario	52	3
Wyoming	52	4
Seneca	45	5
New York	25	23
Chautauqua	16	47
Otsego	15	48
Broome	13	49
Greene	11	50
Yates	7	51

The data in Table 15 indicate that average milk sales per farm increased in all counties over the decade, with the state average increasing just over 25,000 pounds per farm. Livingston registered the largest increase with a gain of just under 75,000 pounds sold per farm. Farms in that county averaged 81,000 pounds in December, 1979, and increased to 156,000 pounds in ten years. Other counties rounding out the top five, include Genesee, Ontario, Wyoming and Seneca.

Yates farms saw the flattest increase in average pounds sold, increasing 7,000 pounds per farm from 59,000 to 66,000. This increase is approximately one-tenth the change in Livingston. Greene and Chautauqua counties were also among the five smallest counties for average pounds sold per farm in December, 1989.

Changes in average milk marketings per farm were also measured on a percentage basis. The counties experiencing the largest and smallest changes are listed in Table 16. Milk marketings per farm were up 45.3% statewide, from 56,000 to 81,000 pounds per farm. At the high end, Livingston was up 92.7%, while Yates lagged at 12.6%. Not very surprisingly, the top five percentage gainers also topped the list for pounds of increase. It was much the same story at the bottom, except that Dutchess replaced Chautauqua. The counties with the largest and smallest percentage gains in this category are listed in the following table.

Table 16. PERCENT CHANGE IN AVERAGE MILK MARKETINGS PER FARM, Top 5 and Bottom 5 Counties, New York, December, 1979 to December, 1989

County	Change Per Farm (percent)	Rank
Livingston	92.7	1
Seneca	87.8	2
Ontario	78.7	3
Genesee	75.6	4
Wayne	70.8	5
New York	45.3	24
Otsego	30.2	47
Greene	24.2	48
Dutchess	23.5	49
Broome	22.5	50
Yates	12.6	51

Analysis of Farm Numbers and Milk Marketings by State Regions

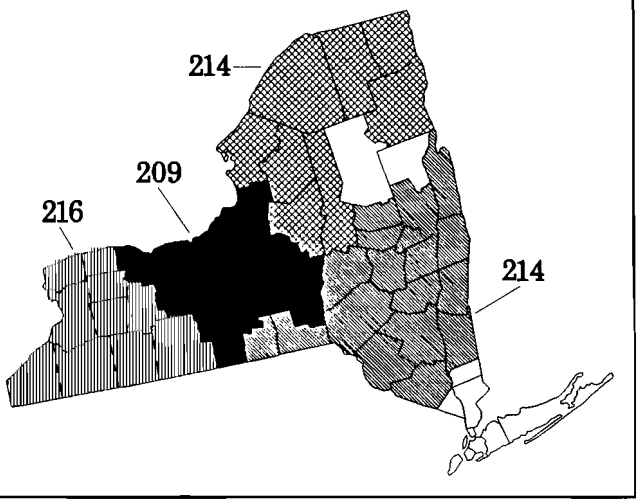
For some purposes it may be useful or more convenient to explore the size and changes in New York's milk supply on the basis of regions within the state. New York counties could be grouped into regions in any number of ways. Two groupings are illustrated here.

Figure 7 divides New York into four regions which had approximately equal milk marketings in December, 1989. This map indicates that despite the many changes discussed above, milk production is still rather evenly distributed across the state. For example, the southeastern region is not substantially larger in area than the western region.

Although this approach is useful in some regards, it is strictly based on production volumes. Wide variation in agricultural resources may exist for counties found in a particular grouping. Thus, it is perhaps more instructive to group together counties with similar resource bases, and then observe how various regions fared during the 1980s.

Any attempt at regional aggregation of counties into relatively homogeneous agricultural zones is arbitrary. Government agencies such as the New York Agricultural Statistics Service do not publish data in regional groupings. Similarly, the task is complicated by the fact that county boundaries rarely follow major divisions in climate or soil classifications.

Figure 7. REGIONS WITH EQUAL MILK MARKETINGS
(million pounds)



A previous U.S. Department of Agriculture survey delineated regions using major land resource areas (MLRAs) which are associations of land with a particular pattern of physiographic characteristics including soils, climate, water resources, and land use.[6] MLRAs have drawbacks in that they do not divide neatly along county boundaries nor are they specifically intended to delineate dairy production regions. Boisvert, et al. grouped Upstate New York counties into four contiguous MLRAs with county boundaries intact between regions.[7] These groupings will form the basis for county aggregation in this paper.

Figure 8 presents an outline of the four broad MLRAs Upstate New York divides into. The four major regions are: Ontario Plain & Finger Lakes, Allegheny Plateau & Catskill Mountains, St. Lawrence-Champlain Plain, and, Eastern NY Upland.

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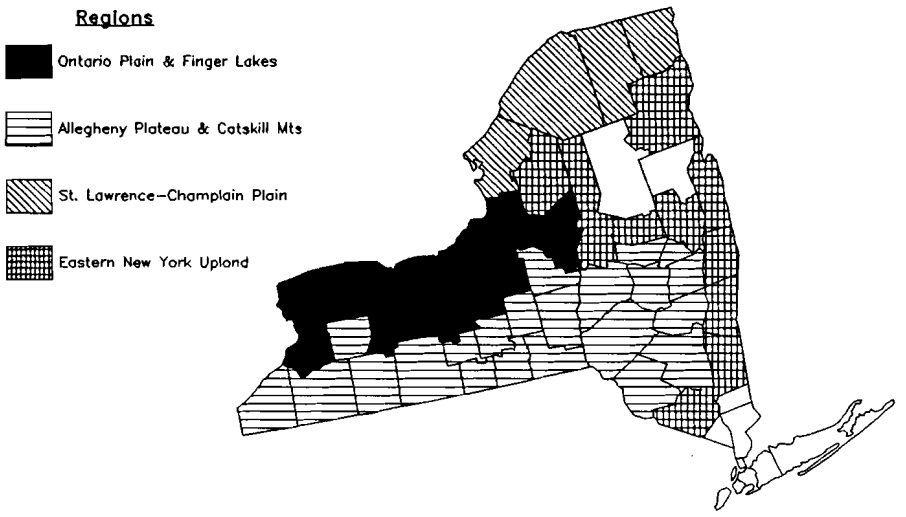
[6] U.S. Department of Agriculture, Soil Conservation Service, Land Resource Regions and Major Land Resource Areas of the United States, Agriculture Handbook No. 296. Revised December, 1981.

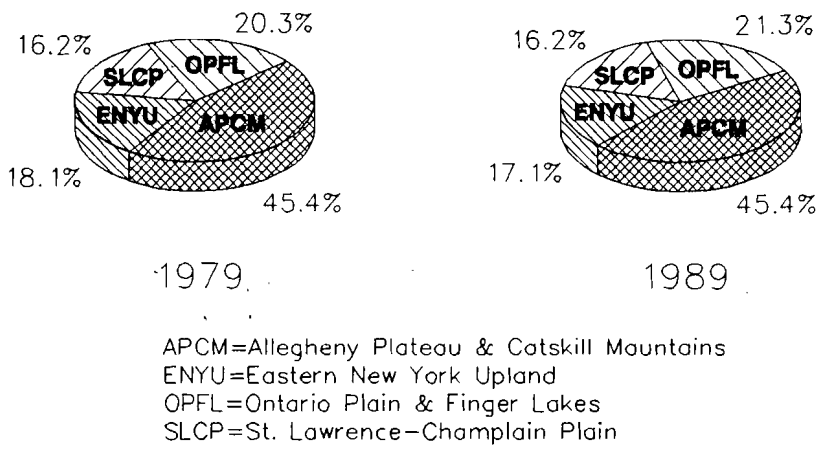
[7] R.N. Boisvert, N.L. Bills, and E. Bailey, "A Model to Explain Participation in New York's Agricultural Districts and Use-Value Assessment Programs," Northeastern Journal of Agricultural and Resource Economics (17:167-177), October 1988.

Figure 8. MLRA REGIONAL GROUPINGS



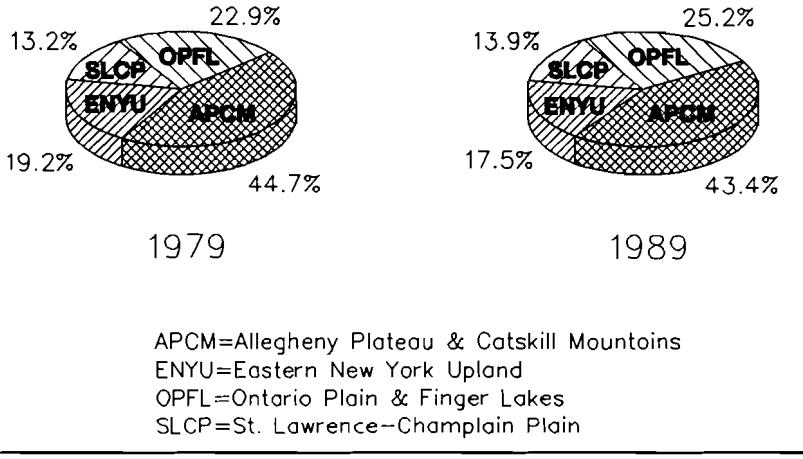
The following figures and table provide additional information on regional shares of farm numbers and milk marketings, percentage changes in farm numbers and milk marketings, and average marketings per farm by region. Regional shares of both dairy farm numbers and milk marketings were remarkably stable over the 1980s. For farm numbers, only the Eastern NY Upland region deviated at least one percentage point over this period, as shown in Figure 9. Changes in milk marketing shares are somewhat more interesting. The Eastern NY Upland region lost almost two percent market share, while the Allegheny Plateau & Catskill Mountains region lost over one percentage point, as shown in Figure 10.

Figure 9. REGIONAL SHARE OF NEW YORK DAIRY FARMS
December, 1979 and December, 1989



APCM=Allegheny Plateau & Catskill Mountains
ENYU=Eastern New York Upland
OPFL=Ontario Plain & Finger Lakes
SLCP=St. Lawrence–Champlain Plain

Figure 10. REGIONAL SHARE OF NEW YORK MILK MARKETINGS
December, 1979 and December, 1989



APCM=Allegheny Plateau & Catskill Mountoins
ENYU=Eastern New York Upland
OPFL=Ontario Plain & Finger Lakes
SLCP=St. Lawrence-Champlain Plain

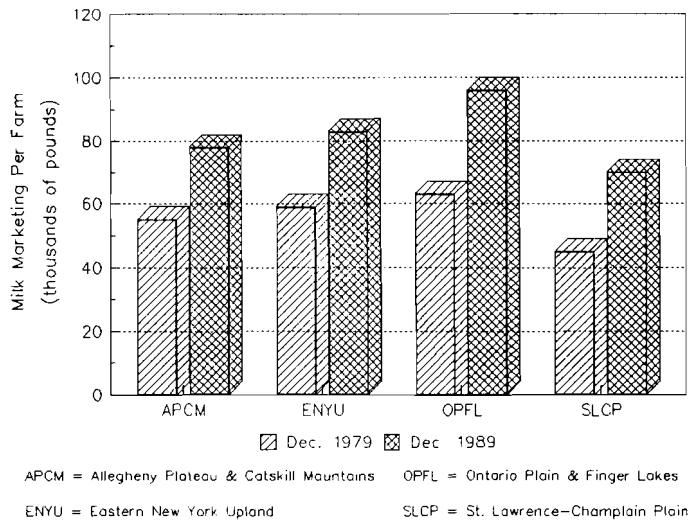
The relative changes in farm numbers and total marketings over the ten year period are listed in Table 17. Both the Ontario Plain & Finger Lakes and St. Lawrence-Champlain Plain regions experienced net increases in milk marketings. Milk marketings in the Allegheny Plateau & Catskill Mountain region were virtually unchanged as the large expansion in Wyoming production was just offset by the cumulative declines in Delaware, Otsego, Broome, Schoharie, and Ulster counties. The Eastern NY Upland MLRA was the only region to have actual milk marketings decline.

Table 17. PERCENT CHANGE IN DAIRY FARMS AND MILK MARKETINGS, Four Production Regions, New York, December, 1979 to December, 1989

Region	Dairy Farms (percent change)	Milk Marketings (percent change)
Ontario Plain & Finger Lakes	-24.8	14.2
Allegheny Plateau & Catskill Mountains	-28.6	0.8
St. Lawrence-Champlain Plain	-28.8	9.3
Eastern New York Upland	-32.3	-5.3

Regional figures for milk marketings per dairy farm are given in Figure 11. Three of the four regions show gains of from 23 to 25 thousand pounds per farm. The Ontario Plain & Finger Lakes region shows a considerably larger gain of 33 thousand pounds per farm. This is also evident in the fact that this region now averages significantly larger farms than the other three regions.

Figure 11. AVERAGE MILK MARKETINGS PER DAIRY FARM
Four Production Regions, New York
December, 1979 and December, 1989



A Look Ahead

In summary, total milk marketings on New York dairy farms grew at a modest rate during the 1980s, less than the national average. Although significant numbers of farms exited the state dairy industry during the decade, enhanced productivity and herd expansion were more than enough to keep total marketings growing.

Numerous factors are at play on the farms in the various parts of New York. Some relate uniquely to individual farms; some are the result of national economics and federal policies. Some factors have their roots in factors related more specifically to the region. One of these factors concerns the competition for land in New York.

Many of the counties experiencing the largest relative declines in farm numbers and milk sales are found in areas with large numbers of commuters or part-year residents from the greater New York City area, or they are on the edge of urban expansion in other smaller upstate cities. This is a situation common to agricultural areas throughout the Northeast.

This point is exemplified by the counties in the southeastern region of the state. County data found in Figures 3 and 5 indicate that this region lost, by far, the highest percentage of its farms, and more than a quarter of its milk marketings. It is clear that as development pressures become more commonplace in rural areas, dairy farmers in New York, and throughout the Northeast, will find themselves farming in an increasingly urban environment.

These regional trends are also confirmed by dairy farmers themselves. The New York State Legislative Commission on Dairy Industry Development conducted a

comprehensive survey of the state's dairy farmers in 1988. One survey question asked *"Is there currently much pressure in your area to sell farmland for development purposes?"* Compared to a statewide average of 41%, 87% of dairy farmers in the Northern Hudson region (Washington, Rensselaer, Columbia, Albany, Schenectady, Saratoga and Green) responded *"Yes"* as did 95% in the Southeastern region (Sullivan, Ulster, Orange, and Dutchess).

The impetus to exit dairying may also accelerate in New York and other states in the Northeast if stricter environmental regulations are enacted, such as those already in place in Florida, Texas and California. These laws, designed in large part to prevent groundwater and surface water contamination from agricultural sources, impose compliance costs that some farmers will find too expensive to bear. Given the social environment in the Northeast, it is not hard to believe that there will be substantial public support for such regulations in the future.

For example, regulations have already been proposed for agricultural areas within the New York City watershed. Among other things, these would require dairy farmers within 500 feet of waterways to construct dikes and berms on their fields and pastures. Such regulations would require major outlays of capital on some dairy farms in this region; yet they would do nothing to enhance the productive efficiency of these farms. Hence, it is quite likely that some operators would choose to exit the industry. Counties with land in the New York City watershed, including Delaware, Orange, Greene, Ulster, Dutchess, and Sullivan, were already among those with the largest percentage declines in farms and milk marketings during the 1980s.

Compounding the problems of urban sprawl and stricter environmental regulations, dairy farms that become increasingly isolated in regions with few other surrounding farms, may experience problems in arranging milk pickup. This problem may be offset to the extent even small numbers of farms may remain well-situated with respect to metropolitan area fluid milk processors. Greater difficulties may come on the input supply side as the network of feed suppliers, machinery dealers, and other suppliers dwindles. Of course, the problems outlined above are not unique to New York or the Northeast, and not all areas of the Northeast will experience such difficulties to the same degree. Nonetheless, these are some of the special challenges dairy farms in New York will face as the year 2000 approaches.

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APPENDIX

SUPPLEMENTARY TABLES

Appendix Table 1. DAIRY FARMS AND MILK MARKETINGS,
Regulated By Milk Marketing Orders,
New York, December 1979 and December 1989

	Number of Farms		Pounds of Milk	
	1979	1989	1979	1989
	(thousands)		(thousands)	
Albany	61	32	2,801	2,222
Allegany	316	209	12,873	12,231
Broome	203	138	12,126	10,102
Cattaraugus	463	351	21,273	23,343
Cayuga	340	253	25,191	28,756
Chautauqua	541	419	25,656	26,662
Chemung	90	61	4,179	4,080
Chenango	506	378	27,478	28,472
Clinton	329	267	15,891	20,364
Columbia	194	114	15,204	12,857
Cortland	338	245	23,959	23,095
Delaware	576	347	32,581	25,916
Dutchess	152	66	11,657	6,251
Erie	308	236	19,045	19,667
Essex	62	43	3,388	3,208
Franklin	394	314	18,400	21,093
Fulton	90	60	4,134	4,090
Genesee	218	149	19,802	23,773
Greene	71	42	3,216	2,362
Herkimer	510	383	27,199	27,378
Jefferson	754	446	37,915	34,477
Lewis	562	448	30,913	33,422
Livingston	223	142	17,995	22,085
Madison	511	364	32,773	32,712
Monroe	92	50	5,481	4,953
Montgomery	421	299	21,304	22,188
Niagara	134	86	7,660	7,341
Oneida	638	490	32,734	33,221
Onondaga	253	178	18,291	19,918
Ontario	175	129	11,583	15,254

(Appendix Table 1 continued)

	Number of Farms		Pounds of Milk	
	1979	1989	1979	1989
	(thousands)		(thousands)	
Orange	262	141	16,289	12,697
Orleans	86	56	5,296	5,395
Oswego	201	142	8,825	8,606
Otsego	632	454	32,246	30,162
Rensselaer	185	133	9,603	10,710
St. Lawrence	910	673	36,005	42,326
Saratoga	138	88	7,837	7,514
Schenectady	23	14	1,110	1,151
Schoharie	278	177	13,760	11,746
Schuyler	83	62	3,892	4,461
Seneca	55	76	2,813	7,300
Steuben	529	408	26,012	27,887
Sullivan	120	77	6,171	5,452
Tioga	234	171	15,477	14,872
Tompkins	164	112	10,737	10,549
Ulster	53	21	2,799	1,793
Washington	500	322	31,179	30,887
Wayne	157	116	7,629	9,625
Wyoming	460	381	34,588	48,371
Yates	99	137	5,849	9,116
Unspecified*	21	3	764	159
STATE TOTAL	14,715	10,503	821,583	852,272

* Data combined to avoid revealing restricted information.

Data compiled by W. C. Wasserman, Cornell Cooperative Extension, from reports of Federal and State milk market administrators.

For each county, separate regressions were performed with annual (December) data from 1979-1989 on farm numbers, total milk marketings and milk marketings per farm regressed against a trend variable. The dependent variable is the annual value divided by the ten-year county average of the appropriate variable. The estimated regression coefficient represents the average annual percentage change in that particular variable relative to the ten-year average. County-level estimates are reported in Appendix Tables 2, 3 and 4.

Appendix Table 2. AVERAGE ANNUAL PERCENTAGE CHANGE IN DAIRY FARM NUMBERS, by County, 1979 to 1989

County	Percentage Change	County	Percentage Change
Albany	-7.24	Montgomery	-3.58
Allegany	-4.24	Niagara	-3.69
Broome	-3.83	Oneida	-2.81
Cattaraugus	-2.90	Onondaga	-3.32
Cayuga	-3.10	Ontario	-3.32
Chautauqua	-2.83	Orange	-6.22
Chemung	-3.46	Orleans	-3.85
Chenango	-2.60	Oswego	-3.64
Clinton	-2.37	Otsego	-3.38
Columbia	-5.60	Rensselaer	-3.38
Cortland	-3.40	St. Lawrence	-2.84
Delaware	-5.20	Saratoga	-4.11
Dutchess	-7.79	Schenectady	-5.37
Erie	-2.96	Schoharie	-4.71
Essex	-3.57	Schuyler	-3.12
Franklin	-2.13	Seneca	0.61
Fulton	-4.47	Steuben	-2.70
Genesee	-3.60	Sullivan	-4.54
Greene	-4.66	Tioga	-3.44
Herkimer	-2.98	Tompkins	-3.42
Jefferson	-4.65	Ulster	-9.83
Lewis	-2.27	Washington	-4.48
Livingston	-4.65	Wayne	-3.47
Madison	-3.22	Wyoming	-2.02
Monroe	-6.33	Yates	3.64
		New York	-3.42

Appendix Table 3. AVERAGE ANNUAL PERCENTAGE CHANGE IN MILK MARKETINGS, by County, 1979 to 1989

County	Percentage Change	County	Percentage Change
Albany	-3.32	Montgomery	0.27
Allegany	-0.81	Niagara	0.45
Broome	-1.50	Oneida	0.33
Cattaraugus	1.17	Onondaga	1.29
Cayuga	1.39	Ontario	2.45
Chautauqua	0.25	Orange	-1.97
Chemung	0.13	Orleans	0.71
Chenango	0.86	Oswego	-0.19
Clinton	2.58	Otsego	-0.32
Columbia	-1.31	Rensselaer	1.15
Cortland	-0.15	St. Lawrence	1.80
Delaware	-2.14	Saratoga	-0.08
Dutchess	-5.84	Schenectady	-0.52
Erie	0.72	Schoharie	-1.55
Essex	0.60	Schuyler	1.01
Franklin	1.64	Seneca	5.69
Fulton	-0.18	Steuben	0.93
Genesee	2.18	Sullivan	-1.48
Greene	-3.62	Tioga	-0.50
Herkimer	0.51	Tompkins	0.47
Jefferson	-0.35	Ulster	-5.67
Lewis	0.99	Washington	0.47
Livingston	1.57	Wayne	2.14
Madison	0.64	Wyoming	3.17
Monroe	-0.75	Yates	4.72
		New York	0.53

Appendix Table 4. AVERAGE ANNUAL PERCENTAGE CHANGE IN MILK MARKETINGS PER FARM, by County, 1979 to 1989

County	Percentage Change	County	Percentage Change
Albany	3.91	Montgomery	3.91
Allegany	3.62	Niagara	4.40
Broome	2.36	Oneida	3.22
Cattaraugus	4.26	Onondaga	4.70
Cayuga	4.63	Ontario	5.70
Chautauqua	3.07	Orange	4.39
Chemung	3.78	Orleans	4.67
Chenango	3.59	Oswego	3.40
Clinton	5.00	Otsego	3.15
Columbia	4.39	Rensselaer	4.67
Cortland	3.38	St. Lawrence	4.76
Delaware	3.23	Saratoga	4.21
Dutchess	1.84	Schenectady	5.28
Erie	3.72	Schoharie	3.26
Essex	4.35	Schuyler	4.26
Franklin	3.80	Seneca	5.48
Fulton	4.42	Steuben	3.69
Genesee	5.99	Sullivan	3.25
Greene	1.15	Tioga	3.01
Herkimer	3.51	Tompkins	4.05
Jefferson	4.44	Ulster	4.50
Lewis	3.34	Washington	5.14
Livingston	6.57	Wayne	5.89
Madison	3.97	Wyoming	5.36
Monroe	5.70	Yates	1.10
		New York	4.06

Other Agricultural Economics Extension Publications

No. 91-13	Dairy Farm Business Summary Central New York and Central Plain Regions 1990	Wayne A. Knoblauch Linda A. Putnam June C. Grabemeyer James A. Hilson Ann Peck James R. Peck
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