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COMPETITIVENESS OF NORTHEAST MILK PRODUCERS IN THE NATIONAL MARKET

by

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Milk supply has outpaced demand in much of the Western world for more than a decade. Improvements in technology continue to be adopted by dairymen and rates of production have grown apace. It seems clear that in the immediate future the number of dairy cows needed in the United States to provide an adequate supply of milk to meet domestic demand must decrease. One key question for the dairy industry is where these reductions will take place. Will some areas become more important in the dairy industry? What is ahead for the major dairy regions of the country?

One set of answers to these questions was provided recently by the Office of Technology Assessment, a research group working for the U.S. Congress. They issued a major report in March 1986, Technology, Public Policy, and the Changing Structure of Agriculture. One of the major chapters was devoted to expected changes in the dairy industry. Two paragraphs from that section indicate some of the flavor of their forecasts for the next 20 years.

> "Emerging technologies promise to dramatically increase milk production per cow by the year 2000, from a national average of 12000 pounds in 1982 to over 24000 in the year 2000. As discussed in Chapter 3, a reduction of approximately 30 percent in cow numbers will be needed by the year 2000 to counteract the effect of emerging technologies and the static demand for milk and milk products."

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> "One of the changes will be a major regional shift in milk production: the Midwest and the Northeast will lose their comparative advantage to the Southwest. During the 1970s, milk production increased 41 percent in the Southwest region of the United States (California, Nevada, Utah, Arizona, New Mexico, and Texas), while U.S. Production increased only 11 percent. Much of the increased production came from dairies with more than 500 cows, with herds of 1500 to 2000 cows being common. Although 303,710 farms in the U.S. reported having cows in 1983, all the milk sold that year could have been produced by less than 5000 well-managed dairies with 1500 cows each."

It is not surprising that this report has not been received with great enthusiasm in the Northeast or the Upper Midwest. Jesse and Cropp at the University of Wisconsin have written a rebuttal and commentary to that report for Wisconsin. They agree that technology will require many changes but argue that Wisconsin will not lose its market share as family farms grow larger. My intent in this report is to examine the current data and evidence for the Northeast relative to the rest of the country about competitive position, production costs and response to technical change. Substantial change has occurred here in the past 25 years and will continue. Both the challenges and the possibilities for this region relative to the rest of the country get central attention.

Production Changes Since 1960

At the outset, it is important to examine more fully than did OTA the shifts in milk production that have occurred in the past 25 years. Let's not forget that national production was reduced in the 1970s from the totals in the 1960s when other alternatives were more profitable on some farms. Relative prices could have a similar influence again in the years ahead.

Over the 25 year span, 1960-1985, the Northeast has maintained its share of national production (Table 1) even though population has shifted away from the region to the South and West. The Lake States (Michigan, Minnesota and Wisconsin) have also held their share of the national market. The Mountain and Pacific regions plus Texas have gained at the expense of dairy farming in all the other areas of the country. The loss in market share is especially noticeable in the Corn Belt, Great Plains and Southeast. Conclusions drawn in the OTA report about future loss of market share for the Northeast and Lake States must be based on something other than trends in the past 25 years for these traditional dairy areas.

Table 1. MILK PRODUCTION BY REGION
United States, 1960-1985

State or region	1960	1965	1970	1975	1980	1985
			million pounds			
Northeast	24,501	25,703	24,224	23,515	26,139	28,727
Lake States	33,037	35,100	32,673	32,257	36,885	41,515
Mountain and Pacific	15,962	15,943	17,180	19,246	23,819	29,923
All other	49,303	47,427	42,885	40,316	41,682	43,502
United States	122,803	124,173	116,962	115,334	128,525	143,667
			percent of total			
Northeast	19.9	20.7	20.7	20.4	20.4	20.0
Lake States	26.9	28.3	27.9	28.0	28.7	28.9
Mountain and Pacific	13.0	12.8	14.7	16.7	18.5	20.8
All other	40.2	38.2	36.7	34.9	32.4	30.3
United States	100.0	100.0	100.0	100.0	100.0	100.0

Source: ERS, USDA, Dairy Situation and Outlook.

Location of Cows by Farm Size

While the number of milk cows remained relatively stable nationally between 1960 and 1980, and then increased in the decade of the 1980s, the number of dairymen shipping milk has declined sharply. An important shift to larger dairy herds has been encouraged by the adoption of new, labor saving technology. These changes are currently moving at a relatively rapid rate in Northern States on farms where most of the roughage consumed by the dairy herd is produced where the cows are milked.

The most recent data on the location of milk cows by size of herd for important dairy states is presented in Table 2. In the Northeast, there has been an important shift of cows to units with 50 cows or more in the last ten years. Nevertheless, in both Pennsylvania and Ohio a majority of the producers have less than 50 cows and a total of 40 percent of all cows. The shift to herds of 100 or more cows has been most pronounced in the 1980s and continues despite changes in national programs and prices received.

The major differences by region is readily evident. In the Upper Midwest, particularly Minnesota, Wisconsin, and Iowa, the proportion of total cows on farms with 100 or more in the milking herd is still small. Major shifts from herds of less than 50 cows either to larger herds or out of dairy production are in process. In contrast, in states like Texas, California or Florida most of the cows are already in units of 500 or more.

Table 2. DISTRIBUTION OF MILK COWS BY HERD SIZE
United States, 1985

	Under 50 cows	50-99	100 cows or more
	percent of milk cows		
Northeast states			
New York	27	40	33
Pennsylvania	40	39	21
Ohio	40	38	22
Vermont	21	46	33
Maryland	17	32	51
Lake states			
Michigan	27	38	35
Minnesota	53	34	13
Wisconsin	46	41	13
Other leading states			
Iowa	51	42	7
Missouri	33	48	19
California	1	3	96
Texas	7	22	71
Florida	1	--	99

Source: NASS, USDA, Milk Production, July 1986.

This review of the distribution of cows by herd size in different locations is made in recognition of both the economies and possible diseconomies of size in dairying. The adoption of new technology in most cases increases labor productivity and efficiency but requires some investment of new capital. Given the basic differences in natural resources and climate between the Northeast and Lake States on one hand, and the South and West on the other, it is not clear that the distributions of farms by herd size should ever be the same. But the shift toward larger family farms in the old dairy regions of the North is likely to continue at a rapid pace.

USDA Regional Costs of Production

Since the late 1970s, Congress has required that the Economic Research Service of USDA make annual estimates of costs of production by region for the major crops and livestock produced in the United States. These are politically sensitive numbers and the analysts have worked hard to develop consistent methodology across the United States in collecting basic data and then making these estimates each year. These regional averages suggest that the Northeast and the Upper Midwest are competing effectively with other regions in terms of average production costs at the present time.

Table 3. MILK: CASH COSTS OF PRODUCTION AND RETURNS
USDA Estimates by Region, 1984 and 1985

Region	All cash receipts	Variable cash expenses	Fixed cash expenses	Total cash expenses	Net cash return
		1984 (dollars per hundredweight)			
Northeast	$14.75	$ 8.19	$2.08	$10.27	$4.48
Upper Midwest	14.35	7.00	3.22	10.22	4.13
Corn Belt	14.29	8.22	2.79	11.01	3.28
Pacific	13.71	9.01	1.53	10.54	3.17
Appalachia	14.90	9.65	2.06	11.71	3.19
Texas	15.14	10.32	1.97	12.29	2.85
United States	14.45	8.07	2.57	10.64	3.81
		1985 (dollars per hundredweight)			
Northeast	$13.91	$ 7.55	$1.96	$ 9.51	$4.40
Upper Midwest	13.42	6.41	3.01	9.42	4.00
Corn Belt	13.44	7.46	2.61	10.07	3.37
Pacific	13.08	8.13	1.46	9.59	3.49
Appalachia	14.37	8.48	1.99	10.47	3.90
Texas	14.62	9.00	1.88	10.88	3.74
United States	13.64	7.34	2.40	9.74	3.90

Source: ERS, USDA, Economic Indicators of the Farm Sector: Costs of Production, 1985, ECIFS5-1, August 1986.

Data for 1984 and 1985 are summarized for the six regions included in the USDA study in Table 3. Cash receipts include both the sale of milk and cull cows, calves and replacements. In terms of variable costs per cwt, Upper Midwest producers have the lowest costs followed by those in the Northeast and Corn Belt. In contrast, the lowest fixed costs are associated with the Pacific region where the herds are largest and costs are spread over more units of production. In terms of net cash return, what is left to pay for family labor, management and the use of owned capital, Northeastern producers ranked first each year with the Upper Midwest second. In terms of average production costs, the old traditional dairy areas are currently quite competitive.

The nature of some of the differences in costs between California and the Northeast is provided in more detail in Table 4. First, there is a small but important difference in the price received for milk which is reflected in the net cash differences. In terms of feed expenses, dairymen in the Pacific region buy much more of their roughages and a little less concentrate feed than in the Northeast. Labor costs per cwt are quite similar. There is some advantage in variable expenses in the Northeast and in cash fixed expenses per cwt for the Pacific region. One other key difference is in the calculation of depreciation per hundredweight or the estimate of capital replacement costs. Here the difference is substantial so that the calculation of receipts less cash expenses and replacement makes the "bottom line" for the two regions in 1985 so similar that a clear advantage is hard to discern.

Table 4. MILK PRODUCTION COSTS PER CWT
Northeast and Pacific Regions, 1985

Description	California and Washington	Northeast
	- costs per cwt -	
Cash receipts:		
Milk	$12.33	$12.98
Cull cows, calves, replacements	.75	.93
Total	$13.08	$13.91
Cash expenses:		
Concentrate feed	3.07	3.41
Other feed	2.41	1.03
Hired labor	1.00	1.15
Milk hauling	.30	.38
Machinery and building repairs	.37	.34
All other variable expenses	.98	1.24
Total variable expenses	$ 8.13	$ 7.55
General overhead	.36	.59
Taxes and insurance	.13	.31
Interest	.97	1.06
Total cash expenses	$ 9.59	$ 9.51
Receipts less cash expenses	$ 3.49	$ 4.40
Capital replacement (depreciation)	.70	1.49
Receipts less cash expenses and replacement	2.79	2.91
Total returns to owned inputs	3.76	3.97

Source: ERS, USDA, Economic Indicators of the Farm Sector: Costs of Production, 1985, ECIFS5-1, August 1986.

Effect of Herd Size on Production Costs

Much of the argument in the OTA report indicating that dairy farming in the Northeast and Lake States was going to lose market share relative to the South and West was based on the idea that small dairy farms could not compete with larger ones. In general, it has been found that production costs per unit decline steadily as size of enterprise increases up to some point and then levels off. The question is not about whether this has been found to be true in

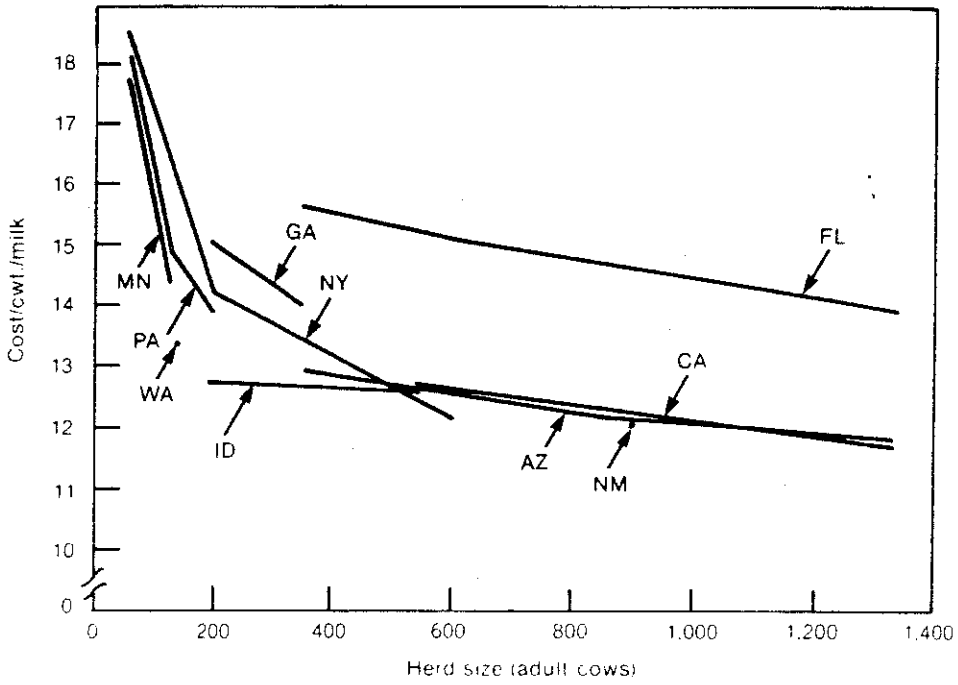
dairying. It has! The important issue is about when most of the economies of increased size have been achieved for any given production system. Must all farms have 500 or 1000 cows to achieve production efficiencies or can this be done as well or nearly so on much smaller units? If so, how small can these units be and still compete effectively?

One of the figures summarizing an important part of the analysis in the OTA report is reproduced here (Figure 1). It relates herd size to production costs based on calculations from a series of budgets for different sizes of farms developed for key regions. These were intended to represent "typical" farms using current or "anticipated" future technology. A few observations from the OTA report about these results are in order. Costs on small farms in Minnesota, Pennsylvania, New York, and Washington were generally higher than the milk prices received in 1982. The rates at which costs decreased per cwt were very great when the 52 cow herds budgeted were compared with 125 cow units. Most, if not all, the size economies shown in the diagram were obtained when herd size reached 200 cows.

Size and Cost Relationships in New York Farm Record Data

One source of information about changes in costs and returns on specialized dairy farms is provided by the annual business management summary made for cooperating farms in New York. These farmers cannot be described as typical, but they do represent a wide range of experiences where detailed records can be examined in some detail. Some average statistics for three different sizes of farms are presented in Table 5.

Figure 9-2.—Total Cost per Hundredweight of Milk by Herd Size and State, 1982



SOURCE: Office of Technology Assessment

FIGURE 1. RELATIONSHIP BETWEEN SIZE OF HERD AND PRODUCTION COSTS
Budget Data, OTA, 1982

The most striking and consistent difference across the three size groups is in labor productivity. For both cows per worker and milk sold per worker, the increases are regular and significant. Much of the economies of size are reflected in these numbers. Part of these economies results from the use of different technologies. The majority of the 40 to 54 cow farms use conventional stall barns while all but a few in the two groups with 100 or more cows use free stall systems and milking parlors. The differences in capital investment per cow are smaller than one might have expected. Outlays for purchased feed and crop expense per cwt do not differ in

any important way between the three groups. Even total cash operating costs per cwt of milk sold are not substantially different. But when whole farm estimates of production costs are made, charging for the use of all labor, management and capital at market rates, then important differences among the three size groups become evident.

Table 5. SIZE OF DAIRY HERD AND EFFICIENCY
New York Farm Business Summary, 1985

Description	40-54 cows	100-149 cows	200 or more cows
Number of farms	93	54	29
Tillable acres	165	364	706
Number of cows	47	119	285
Tillable acres per cow	3.5	3.1	2.5
Worker equivalent	2.1	3.8	7.2
Cows per worker	23	31	40
Milk sold per worker	332,000	480,000	691,000
Labor cost per cow	$412	$357	$393
Total farm assets	$305,000	$731,000	$1,462,000
Percent equity	58%	65%	60%
Debt per cow	$ 2,382	$ 1,977	$ 1,974
Capital per cow	$ 5,960	$ 5,793	$ 5,139
Milk sold per cow, lbs.	14,722	15,524	17,393
Price/cwt of milk sold	$ 12.79	$ 12.83	$ 12.89
Purchased dairy feed per cwt.	$ 3.33	$ 2.91	$ 3.14
Purchased feed and crop expense per cwt.	$ 4.25	$ 3.97	$ 4.23
Operating costs of producing milk per cwt.	$ 9.75	$ 9.63	$ 9.49
Whole farm estimate of total cost per cwt.	$ 15.46	$ 14.04	$ 12.59

Source: Smith, S. F., et al, New York Business Summary 1985, A.E. Res. 86-25, October 1986.

Study of these farm records suggest that operators of smaller farms in the Northeast, that is dairymen with herds of 30 to 70 cows in conventional stall barns, compete with larger operators either by accepting less returns for the use of their own labor, capital, and

management or by increasing their levels of efficiency with the resources they have. Differences in milk prices or in debt levels do not account for the differences in total costs. The higher levels of output per cow on the farms with 200 cows or more is an important difference as well.

Effects of Herd Size and Milk Sold per Cow on Costs

When the annual farm business summary was completed in New York, two rather standard relationship tables were developed examining the general effect of size of herd on whole farm costs per hundredweight of milk sold and the effect of milk sold per cow on costs as well. The effect of the many other variables affecting costs were not held constant so this represents the cumulative impact of the factors closely associated with size, not just size alone.

There is some positive association between herd size and average milk sold per cow so that the differences in costs observed in Table 6 are a result of both size and rates of production. Nevertheless, the reduction in total costs per cwt, where the operators' resources have been charged at market rates, is consistent for each of the size classes. The differences in cash operating costs per cwt by size classes are small and no clear tendency is evident. This lack of a clear relationship is also the case between size and all costs except the operators' own labor, capital, and management. As size increases there are important gains from spreading the fixed commitment of family resources over more units of production, thus reducing total costs per unit sold.

Table 6. COSTS OF MILK PRODUCTION BY HERD SIZE
Whole Farm Data, 404 New York Farms, 1985

Number of cows	Number of farms	Milk sold per cow	Cost per cwt: Cash operating	Cost per cwt: All costs except operators' labor, mgt, cap.	Cost per cwt: Total costs*
				- per cwt -	
Under 40	33	14,113	$ 9.53	$11.88	$16.67
40 - 54	93	14,722	9.75	11.69	15.46
55 - 69	82	14,897	9.70	11.65	15.37
70 - 84	55	15,346	9.52	11.77	15.00
85 - 99	38	15,485	9.31	11.29	14.26
100 - 149	54	15,524	9.63	11.35	14.04
150 - 199	20	15,295	9.64	11.77	13.97
200 - 249	14	16,233	10.10	11.52	13.35
250 and over	15	18,099	9.17	10.74	12.22
Total	404	15,679	$ 9.57	$11.45	$14.23

*Total costs include use of operator's own resources valued at market rates.

Source: Smith, et al. Dairy Farm Management Business Summary, New York, 1985, A.E. Res. 86-25, October 1986.

Table 7. COSTS OF MILK PRODUCTION BY MILK SOLD PER COW
Whole Farm Data, 404 New York Farms, 1985

Milk sold per cow	Number of farms	Average number of cows	Cost per cwt: Cash operating	Cost per cwt: All costs except operators' labor, mgt., cap.	Cost per cwt: Total costs*
- lbs. -					
Under 11,000	15	64	$12.26	$15.09	$19.93
11,000 - 11,999	22	72	11.01	13.07	16.51
12,000 - 12,999	30	64	10.40	12.50	16.08
13,000 - 13,999	49	68	10.44	12.47	15.57
14,000 - 14,999	75	76	9.51	11.56	14.96
15,000 - 15,999	65	94	9.68	11.52	14.27
16,000 - 16,999	64	98	9.34	11.12	13.65
17,000 - 17,999	42	113	9.01	10.63	13.02
18,000 and over	42	129	9.15	10.93	13.16
Total	404	89	$ 9.57	$11.45	$14.23

*Total costs include use of operator's own resources valued at market rates.

Source: Smith, et al. Dairy Farm Management Business Summary, New York, 1985, A.E. Res. 86-25, October 1986.

When the effect of milk sold per cow and the other factors closely associated with it was used to examine its effect on costs per cwt as shown in Table 7, the apparent relationships were stronger than those shown in Table 6. Cash operating costs decreased steadily as milk sold per cow increased up to 17,000 pounds per cow. Likewise, all costs except operators' labor, management, and capital decreased steadily down to the last two intervals as milk sold per cow increased. The same pattern held for total costs. These results suggest that milk sold per cow is a critical determinant of reduced production costs per cwt. On the other hand, just getting high production by itself will not bring costs down either.

Variability of Production Costs within Size Classes

The cross classification tables just presented show average relationships and only hint at the variability to be found among producers within each of the size classifications. To get some visual sense of the degree of variation from farm to farm, Figures 2-4 were prepared for three different size groups. These scatter diagrams show individual observations for milk sold per cow related to all costs of production except charges for the use of operators' labor, capital, and management for each of the three largest size groups.

While there is some evidence that costs tend to decrease as milk sold per cow increases in Figure 2 for herds of 100-149 cows, the important thing to note is the degree of variation from farm to farm within each production level. Some of this variability can be

attributed to potential errors in accounting or year to year variability on individual farms in the timing of some purchases or cash payments. But the range remains large and important. Within any size grouping there are important differences in costs that go beyond technology or the quality of the resources available on each farm.

There is some evidence in these data that the degree of variability in costs per cwt is somewhat less for the group with 200 cows or more (Figure 4). Of course, the number of observations is smaller than for the farms with 100-149 cows (Figure 2). One might speculate that lack of control over costs might hasten the exit of large farms more rapidly than for smaller operations. Conversely, it might signal that operators, who have chosen to increase herd size, are those who are or have earlier demonstrated production efficiency with smaller herds. The overriding lesson from the scatter diagrams is that substantial variability exists among farms even when size and milk sold per cow are held constant. Many other factors are also at work.

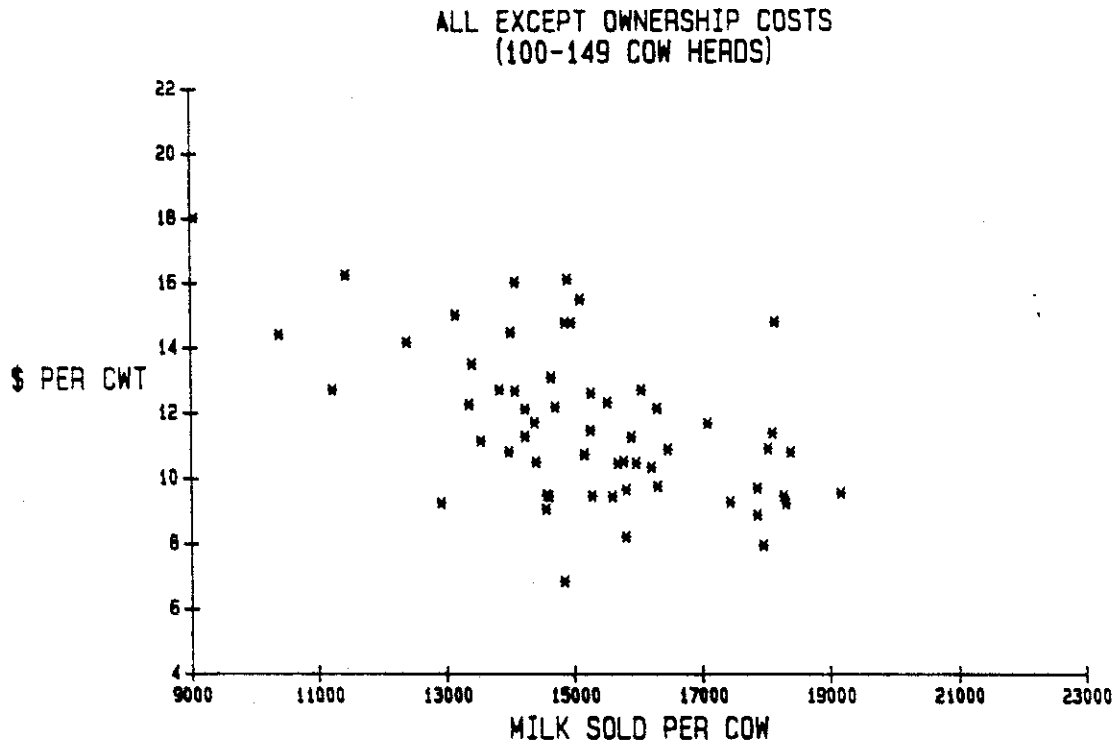


FIGURE 2. RELATIONSHIP BETWEEN MILK SOLD PER COW AND COST PER CWT 100-149 Cow Herds, New York, 1985

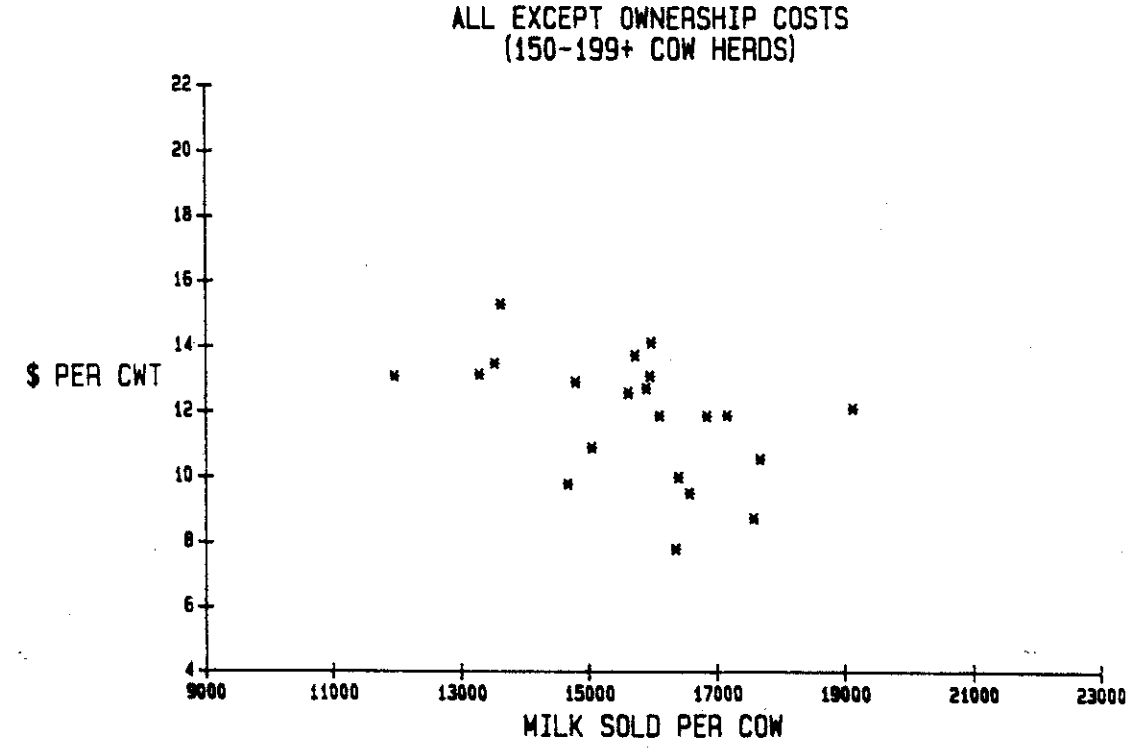


FIGURE 3. RELATIONSHIP BETWEEN MILK SOLD PER COW AND COST PER CWT 150-199 Cow Herds, New York, 1985

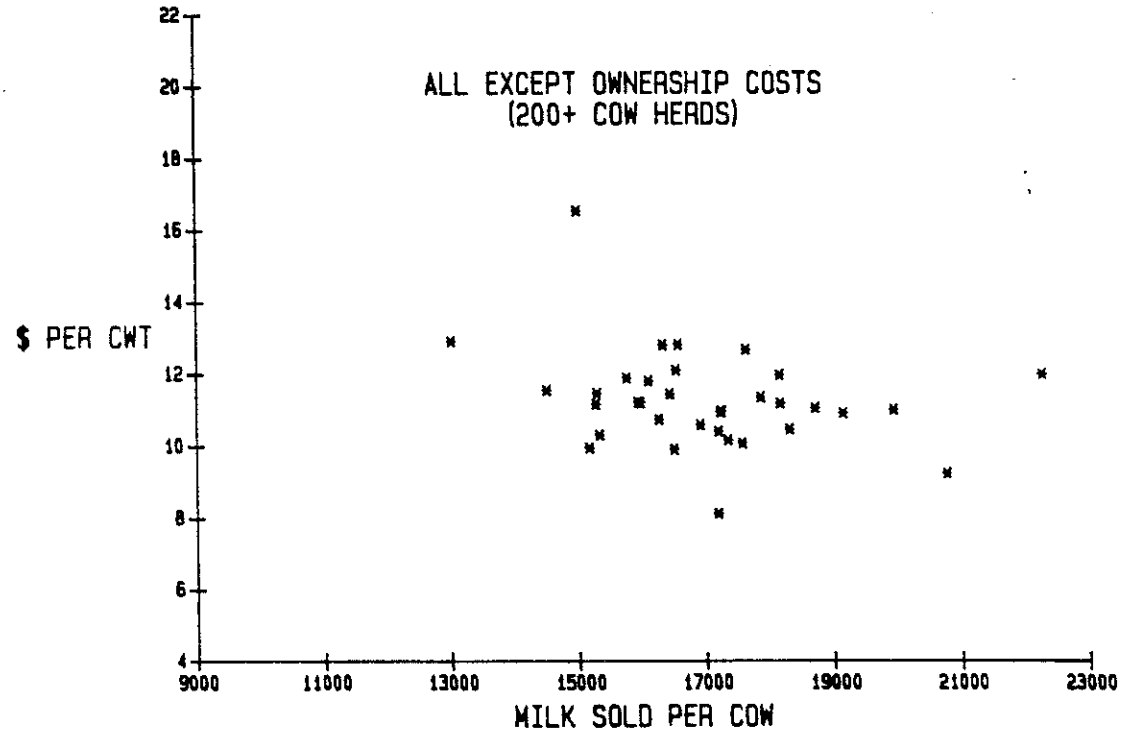


FIGURE 4. RELATIONSHIP BETWEEN MILK SOLD PER COW AND COST PER CWT
200 Cow or More Herds, New York 1985

New York Farm Business Summary Data Compared to USDA Costs

How representative are the farms considered in the New York business management summary program? It is difficult to say, objectively. Surprisingly, in many respects, they are not very different in terms of operating results from the group of farms used by the USDA to calculate costs of production for the Northeast region in 1985.

Table 8. COMPARATIVE COSTS OF MILK PRODUCTION
Whole Farm Data, 404 New York Dairy Farms and USDA Averages, 1985

Description	Average cost per cwt New York	USDA production costs per cwt Northeast
Cash expenses:		
Purchased feeds	$ 3.09	$ 4.44
Net crop expense	.94	
Hired labor	1.38	1.15
Machinery expenses	1.26	.68
Livestock expenses	.99	.79
Milk marketing	.80	.12
Taxes, insurance, rent, repairs to real estate	.96	.90
Interest paid	1.25	1.06
Telephone, electricity, miscellaneous	.53	--
Total cash expenses	$11.20	
Deductions:		
Other non-milk receipts	-1.51	
Net cash costs per cwt	$ 9.69	$ 9.51
Other costs:		
Building depreciation	.56	1.49
Machinery depreciation	1.08	
Total costs excluding payment for use of family resources	$11.33	$11.00
Ownership Costs:		
Interest on equity @ 5%	1.16	1.27
Operators' labor, management, and family labor	1.74	1.70
Total costs per cwt	$14.23	$13.97

Sources: ERS, USDA, ECIFS5-1 and Cornell A.E. Res. 86-25.

Insofar as possible, comparable details of average costs, as reported by USDA in its summary publication, are presented in Table 8. The whole farm cost procedures used in the New York Summary require that non-milk receipts be deducted from cash operating costs on the assumption that there is neither a gain nor a loss from these non-dairy operations. The itemized averages for the two reports are quite similar after these adjustments. While there

are differences in a number of the details of the cash operating expenses, the two sets of data tend to reinforce each other. After a charge for depreciation is added to both totals, the total costs except for payments for the use of the operators' own resources are also quite similar. Calculation of ownership costs or returns for the use of family resources requires a number of assumptions. Yet the calculations yield similar kinds of results. All in all, the two sets of information support each other rather than provide conflicting evidence on the current structure of production costs in the Northeast.

Future Competitiveness of Northeast Milk Producers in a National Market

The preceding discussion has tried to present some current information which examines the position of milk producers in the Northeast and the structure of costs within the industry. There is great variability in productivity within the region both within and between size classes. Some producers in the region are doing very well. Others are facing substantial financial difficulties. Overall, Northeast producers seem to be holding their own right now in a competitive national environment.

The position of this region in the national market is determined by much more than the relative efficiency of its farm producers, although their performance is basic to all the rest. The efficiency of the assembly, processing and distribution system for milk once it leaves the farm is of major importance. The signals sent by the pricing systems both within the region and between regions affect decision makers at every level. The quality and

perceived attractiveness of milk and dairy products by consumers in the region may make a difference in investment for innovation, the attitudes of distributors, and the environment in which all sectors of the industry work. A dynamic industry with a positive outlook is much more likely to provide capital for cost reducing technology, consolidation of facilities, and a competitive environment than one where the general atmosphere is dominated by maintaining past positions and holding on to the status quo.

Performance and leadership by dairymen and their cooperatives in the region will have much to do with attitudes, outlook, and efficiency of production in this region in the future. A generation ago there was a major reduction in the number of dairymen at the time when the shift from cans to bulk occurred, and when combining milking machines with pipelines in stall barns, or milking parlors and loose housing systems were new ideas. While change and the adoption of new technology has continued steadily in the dairy industry for the past 30 years, it appears that the pace will quicken in the years ahead. The competitive position of the region will depend heavily on how well decision makers at all levels in the industry respond to the challenge of change.

Herd Size Will Increase

While there is good reason to have intelligent concern for what lies ahead, there are also positive signs that the industry can respond effectively to current challenges despite great change for many along the way. As the farm records data indicate, there is great diversity in performance and capacity among Northeastern

producers. Important shifts have already been made away from herds of 50 cows or less to larger units, even though 21 percent of the cows in Vermont, 27 percent in New York, and 40 percent in Pennsylvania in 1985 (Table 2) were still in units of this size. This contrasts with 53 percent in Minnesota and 46 percent in Wisconsin that were still on farms with less than 50 cows.

An industry with fewer, but larger farms will increase efficiency in assembly and distribution. Larger farms should be interpreted initially as those over 50 or 60 cows. In a few years, the logical lower limit may well be 80 or 100 cows. But a shift to larger farms does not mean the kind of massive change that gets headlines where someone talks only of units with 500 cows or more. At present, that is not a realistic way to use many of the natural and human resources in this region. Consolidation and realignment must proceed as individuals see change in their own best interests. A wide distribution in herd sizes will continue to be the rule, but the lower limit will continue to rise at a more rapid rate. Producer numbers in this setting must fall with concentration of cows at fewer locations.

Midsized Farms the Low Cost Producers

If a quite diverse distribution of farms in terms of number of cows is expected, it is natural to question at what size lowest cost production will occur; who will be the most efficient producers? In the Farm Sector Review released in January 1987, ERS analysts looked at production costs by size of operation for major types of crop and livestock farms. Their summary for dairy farms was as follows:

> "The midsized dairy farms had the lowest overall cost ratio of 85 cents per dollar of production. The overall cost ratios for the largest and smaller dairy farms, respectively, were 88 and 90 cents per dollar of production. The cost structures were generally similar among the three size categories. The smaller farms had a higher cost ratio for livestock purchases and leases. The largest farms had higher cost ratios for feed, other livestock expenses, and labor but a lower cost ratio for capital purchases."

In this ERS study based on farm record data for 1985, a farm with under $100,000 of sales was classified as small (less than 50 cows), midsized farms had sales between $100,000 and 500,000 (50-200 cows), and larger farms had sales of $500,000 or more (200 cows or more). This was a national study with representation from all regions and current technologies. (The same data base as the ERS estimates of costs in Table 3.)

In my view, it will continue to be the farms with 100 to 300 cows who will produce the lowest cost milk in this region with current technology. In all three scatter diagrams, where the relationship between milk sold per cow and costs was examined holding size of herd steady in 50 cow intervals, the lowest cost producers sold between 14000 and 18000 pounds per cow. They were not at the extremes. Moreover, the proportion with all costs except ownership costs below $10.00 per cwt was as great or greater for the group with 100-149 cows as for those with more than 200. In a competitive environment, there will be problems of survival for poor managers in all the size groups. Obtaining high levels of sales per cow, by itself, will not insure efficiency or low cost production. Making the best use of quite different sets of natural resources will continue to be the key to success.

Real Estate Values Respond to Changing Net Returns

In the Northeast where dairying is the dominant farm enterprise at many different locations, the alternative uses of many farm resources in agriculture are relatively few. Thus, farm land values did not rise as rapidly in this region as in the Corn Belt and Midwest generally in the 1970s, nor have they fallen as rapidly in the 1980s. Often urban and suburban influences have been more important in determining local land values in the Northeast than expectations about future earnings potential from the sale of milk. One way that dairy farming in this region can compete with other regions is acceptance by dairymen of lower land values or lower payments for the use of owned capital than is acceptable to farm operators and their lenders where the dominant size of dairy farm is 1000 cows or more.

Historically, dairy farming has been a family business. Most of the labor has been provided by the family. Dairy housing and milking facilities are typically owned by the operator. At least a part of the cropland has been rented. With increases in herd sizes more of the farm labor force must come from hired labor. The ability to manage labor and delegate responsibility will be increasingly important for the region's producers in the decades ahead. At the core of the region's production base will still be a set of resources controlled and partially owned by individual farm families. They will provide the flexibility in terms of the returns they will accept for the use of their capital, labor and management that will maintain competitiveness with other regions. The dairymen of

the Upper Midwest with somewhat similar natural resources have even greater adjustments to make in terms of consolidation of their smaller units. They are somewhat further from fluid markets but may have some advantages in the organization of their processing and distribution systems. Producers in both regions will be fewer in number. Perhaps there are a few more off-farm opportunities for those leaving dairying in the Northeast and this may help the process of adjustment here.

Competing with the South and West

The regions of the country that have increased their share of total milk production the most in the last 20 years are the Mountain and Pacific States (Table 1). These are the regions where population growth has been most rapid along with some states in the South, notably Florida, Georgia and Texas. Increases in consumer demand resulting from added population are likely to continue in these regions. If one simply projected such trends, it could be argued that there will be more cows in these states because there will be more people there and the industry will go where the people are. This is a part of the explicit argument made in the OTA projections.

On the other side of the argument is the question of alternatives in both regions. The shift out of dairying in the Corn Belt in the 1970s occurred in large part because these farmers had better alternatives for the use of their own resources. One of the reasons for expecting dairying to compete effectively in the years ahead in both the Upper Midwest and the Northeast is the lack of productive alternatives for the use of these basic resources. No other

agricultural enterprise provides a good place to turn. The staying power of family owned and operated businesses is substantial, particularly when debt levels are modest or one member of the family has an important off-farm source of income. It is here that comparative budgets may not provide an effective picture of regional differences.

Nearly every budgeting study that I have ever reviewed which examines the effect of size on production costs, produces results similar to those presented in the OTA report (Figure 1). Given their assumptions, increasing the number of units produced will spread fixed costs. Thus, total production costs per unit must decrease until they appear to be almost flat or constant at some point. There is nothing in the assumptions which recognize that there are real or measurable "diseconomies of size." Yet when one studies the actual costs and returns data from farmers, it is not unusual to find some large farms that sustain sizable losses or to find large farms with above-average costs per cwt.

In both theory and practice, there is a point after which one should expect that costs will start rising because of issues such as the difficulties of manure disposal, herd health problems, assembly costs for locally produced roughages, etc. The point where this will occur will differ for individual farms depending on their resources and management. Thus, the USDA results from the Farm Costs and Returns Survey, that showing midsized farms to have the lowest costs, are not surprising. The reason that there are not more 1000 cow herds in the Northeast is not lack of capital or

knowledge about the latest technology. It is because the physical and economic resources available have not yet lent themselves to this size of operation at many locations to date. The likely and most efficient changes in the structure of dairying in the Northeast will be similar to those of the current decade. Consolidation may be hastened but concentration of cow numbers in the patterns of Florida, Arizona and California are unrealistic at present. As always, the Northeast will compete most effectively if it concentrates on what it does best: -- build on the capability and vision of its family-based dairy entrepreneurs.

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