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THE DAIRY INDUSTRY IN TRANSITION

by

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The Dairy Industry In Transition^{a/}

by

Boyd M. Buxton*

I am pleased to speak at your annual conference. Yet the assignment is humbling because of the many changes that are occurring in an industry that is so crucial to the health and nutrition of this country. It is an industry in transition and the stakes are high for many farmers, processors, and consumers. The long standing price support and milk order programs are being questioned in part and in some cases in total. The milk supply continues to come from fewer but larger dairies with more than a little concern about the long term survival of the small family dairy farm. Recent shifts in the geographic location of milk production and in the location of the manufacturing industry may be of special concern for you in the north central region--the more traditional dairy area. These changes cast some shadows of uncertainty over what the future dairy industry will look like.

Much of today's concern focuses on the immediate question of what to do about high government costs and government inventories of dairy products purchased under the price support program. Many suggestions have been offered. The 1981 Agricultural Act lasted only a few months being replaced by the check-off program in the Omnibus Reconciliation Act of 1982. A great deal of concern is now being expressed about this act. I'm not going to discuss the current dairy situation or specifically evaluate the

^{a/} Speech before the 91st Annual Conference of Wisconsin Cheese Makers Association and Trade Show, LaCrosse, Wisconsin, Nov. 3, 1982.

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dairy provisions in the Omnibus Reconciliation Act or other specific proposals. I would like to spend the time available to me to discuss four questions:

1. Where will milk be produced in the future given the recent shifts in the geographic location of milk production?
2. What might the dairy industry look like given the changes occurring in farm size and production practices?
3. Is the dairy price support program in trouble because of the nature of the program or because of what is expected of it?
4. What alternatives exist to solve the present high government cost of purchasing dairy products that will not clear commercial channels

Let me say from the start that I do not have the answers to these questions. My intent is to raise them as questions and discuss some of the issues involved.

Shifts in Location of Dairy Industry

An important change is underway that may alter the location of milk production and, thereby, the location of manufacturing plants.

Over the last decade milk production has decreased in most north central, central and plains states, while it has increased in many western, southern, and eastern states.^{1/} Milk that is not marketed as a fluid beverage is used to make manufactured products such as ice cream, nonfat dry milk, butter, and cheese. When fluid milk consumption on a fat solids basis is considered along with the increased milk production, some major regional shifts in the amount of milk used to make manufactured products emerge. The areas with greatest gains in milk production are also becoming more important sources of manufactured dairy products. When accounting for

^{1/} Lynn Stalbaum, "Milk Production Goes West...Farm Belt Area Loses," Hoard's Dairyman, December 10 and 15 issues, 1980, p. 1572.

INCREASED FASTER THAN U.S. AVERAGE INCREASE OF 25.5 PERCENT

LESS THAN U.S. AVERAGE

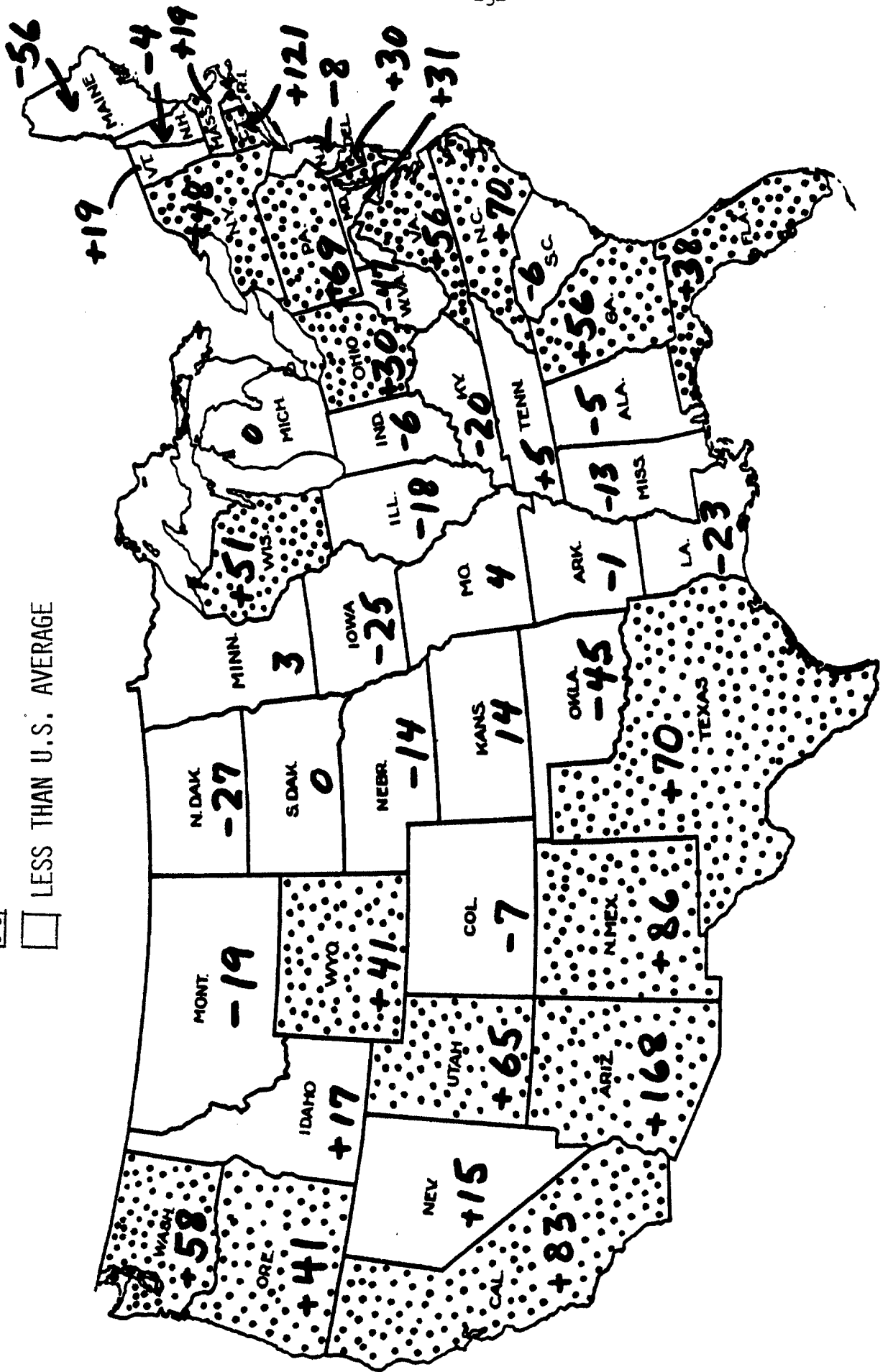


FIGURE 1. PERCENTAGE CHANGE IN WHOLE MILK EQUIVALENTS USED IN MANUFACTURED DAIRY PRODUCTS FROM 1970-71 TO 1980-81.

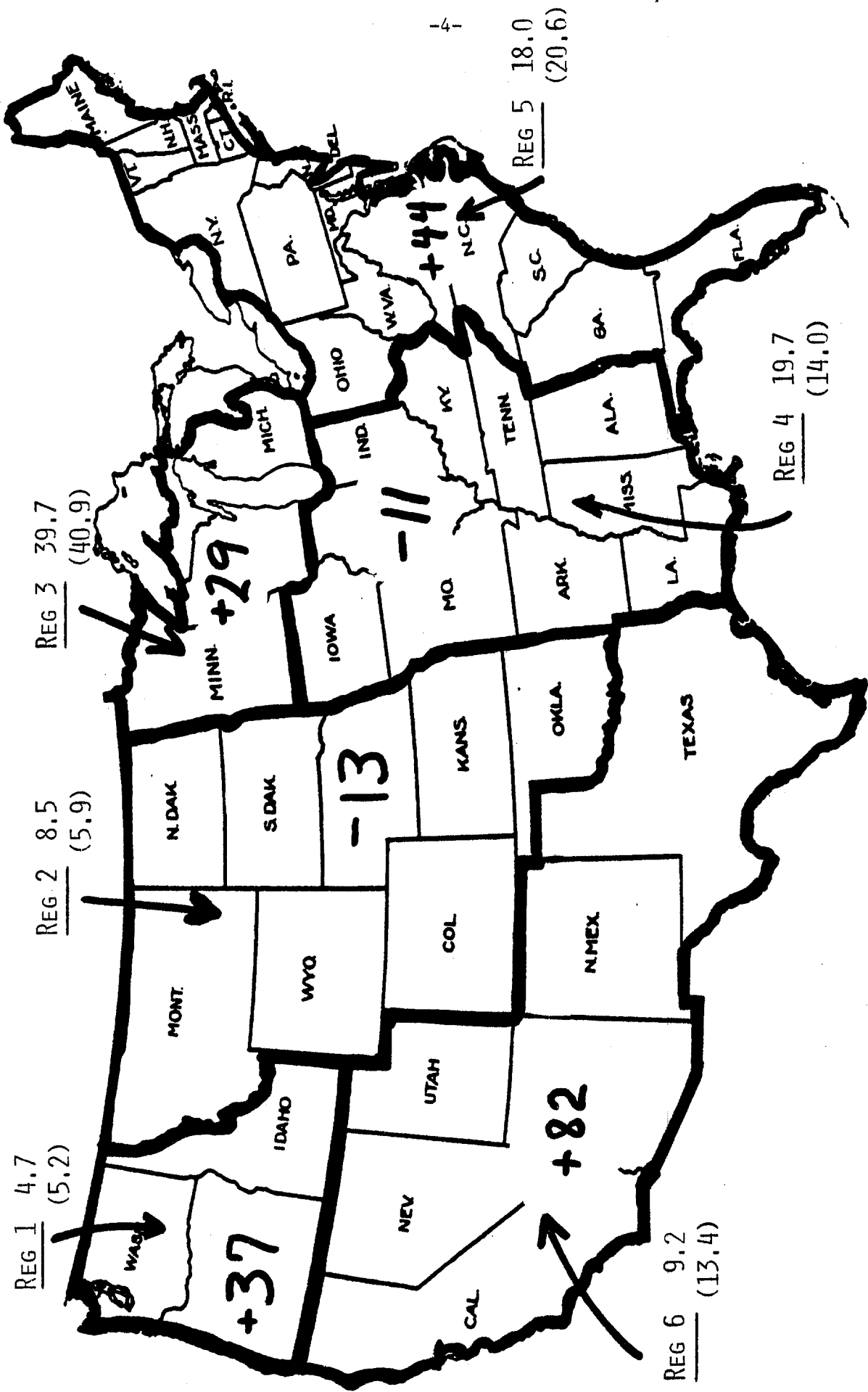


FIGURE 2. REGIONAL CHANGES (PERCENT) IN WHOLE MILK EQUIVALENTS USED IN MANUFACTURED DAIRY PRODUCTS AND PERCENT EACH REGION WAS OF TOTAL U.S. IN 1970-71 AND (1980-81).

milk on a fat solids basis the traditional manufacturing area in the north central and central areas are declining in relative importance as suppliers for the U.S. manufactured dairy product markets.

Manufactured Dairy Products' Shifts

The percentage change in the average amount of milk equivalent used for manufacturing was calculated for each state between two periods, 1970-71 and 1980-81. Whole milk equivalents used for manufacturing increased 25 percent for the continental United States. Increases of more than 25 percent occurred in most eastern, western, and southwestern states (states shaded in Figure 1). Except for Wisconsin, most north central, central and plains states decreased or increased less than the U.S. increase (states not shaded in Figure 1).

Because some milk, cream, or both may move across state boundaries to be processed, the change for individual states may be distorted. Much of this possible distortion could be eliminated by grouping states into regions as less milk would move across regional boundaries than across state boundaries. For this purpose the shift was calculated for six regions comprised of contiguous states (Figure 2 and Table 1).

The increase was about 44 percent for states in the far eastern United States (region 5, Figure 2). Their share of U.S. total milk used for manufacturing increased from 18.0 to 20.6 percent over the 10 years considered. In the southwest the increase was about 82 percent (region 6, Figure 2). Out of a total increase of 4.6 billion pounds in this region, California accounted for about 3.3 billion pounds. Their share of the U.S. total milk used for manufacturing increased from 9.3 to 13.4 percent over the 10 years considered (Table 1). The increase in whole milk equivalents used in manufactured dairy products was 37 percent in the northwest states (region 1,

Figure 2) or slightly more than 1 billion pounds of milk. Its share of total U.S. manufacturing market increased from 4.7 to 5.2 percent. The increase in the Lake States was 7.0 billion pounds or 29 percent (region 3, Figure 2). Its share of the U.S. total milk used for manufactured dairy products increased from 39.7 to 40.9 for the ten year period.

In contrast to the above regions, the amount of milk used for manufacturing decreased 0.7 billion pounds in the plains and eastern mountain states (region 2, Figure 2) and 1.3 billion pounds in the central and south central states (region 4, Figure 2). Their share of the U.S. total

Table 1. Changes in the amount of whole milk equivalents used in manufactured dairy products.

Region	Two year average a/		Change	
	1970-71	1980-81	million pounds	Percent
East (region 5)	10,852 (18.0)	15,586 (20.6)	4,734	44
Southwest (region 6)	5,571 (9.2)	10,154 (13.4)	4,583	82
Northwest (region 1)	2,851 (4.7)	3,898 (5.2)	1,047	37
Lake States (region 3)	23,943 (39.8)	30,921 (40.9)	6,978	29
Plains and Eastern Mountain (region 2)	5,147 (8.5)	4,489 (5.9)	-658	-13
Central and South Central (region 4)	11,874 (19.7)	10,559 (14.0)	-1,315	-11
Total U.S.	60,238 (100)	75,606 (100)	15,367	26

a/ Percent of U.S. total is in parenthesis

decreased from 28.2 percent to 19.9 percent over the 10 year period considered (Table 1).

Factors Affecting the Shift

There are many factors underlying the observed shift in the location of milk equivalent used for manufacturing dairy products. Some are factors that directly affect supply and some are factors that directly affect fluid consumption.

On the supply side the location of milk production can be affected by the profitability of dairy farming relative to alternative enterprises. Dairy has tended to decline in much of Iowa and south central Minnesota, in part, because these areas are particularly well suited for crop production. Dairy is still relatively important in southeast Minnesota and Wisconsin where the land is not as well suited to crop production as that in Iowa or south central Minnesota. Distance to markets, transportation costs and even urban pressures for agricultural land can be important factors in the location of milk production. Climate and a shift to drylot feeding have contributed to large scale dairy farms in California, Florida, and some parts of the southwest.

On the fluid demand side population shifts and changes in incomes, tastes, and preferences are important factors.

The price of milk affects both supply and fluid demand and, therefore, may be a factor in the observed shift in the amount of milk equivalent used for manufactured dairy products. Both the market price for milk on the one hand and the cost of milk production on the other affects the profitability of producing milk in any particular region. These are two sides of the profit coin.

Number and Sizes of Dairy Farms

Close examination of data shows a wide variation in the size of dairy operation and in technology employed in milk production.

The number and size of dairy farms have changed dramatically over the past decade and varies from region to region within the continental United States. Large drylot dairy farms with 1,000 to 2,000 cows each are common in parts of the south from Florida to California. Such large farms are essentially nonexistent through most of the northern states where a 150 cow herd would be considered large. Technologies and practices employed in dairy farming vary from the larger drylot operations to the smaller dairy herds. Many questions arise as the structural shift continues. How efficient are the large farms compared to the smaller more traditional dairy farms? The trend in milk production mentioned above shows that the larger farms in the south account for a larger proportion of total U.S. milk production and manufactured products while the smaller farms in the traditional dairy areas are declining in relative importance.

Federal milk order data on milk deliveries per producer for May of 1979 are used to develop a current picture of dairy farm structure across most of the United States.

A procedure was developed by which the average herd size could be estimated. The average herd size for the largest ten percent of the producers varies from 106 cows in the Upper Midwest order to 2,349 cows in the southeastern Florida order. The average herd size for all producers delivering milk varies from 46 cows in the Ohio Valley order to 810 cows in the Southeastern Florida order.

The average herd size shows a marked geographic pattern (Figure 3). Herds in the southeast, south, southwest, and northwest are substantially

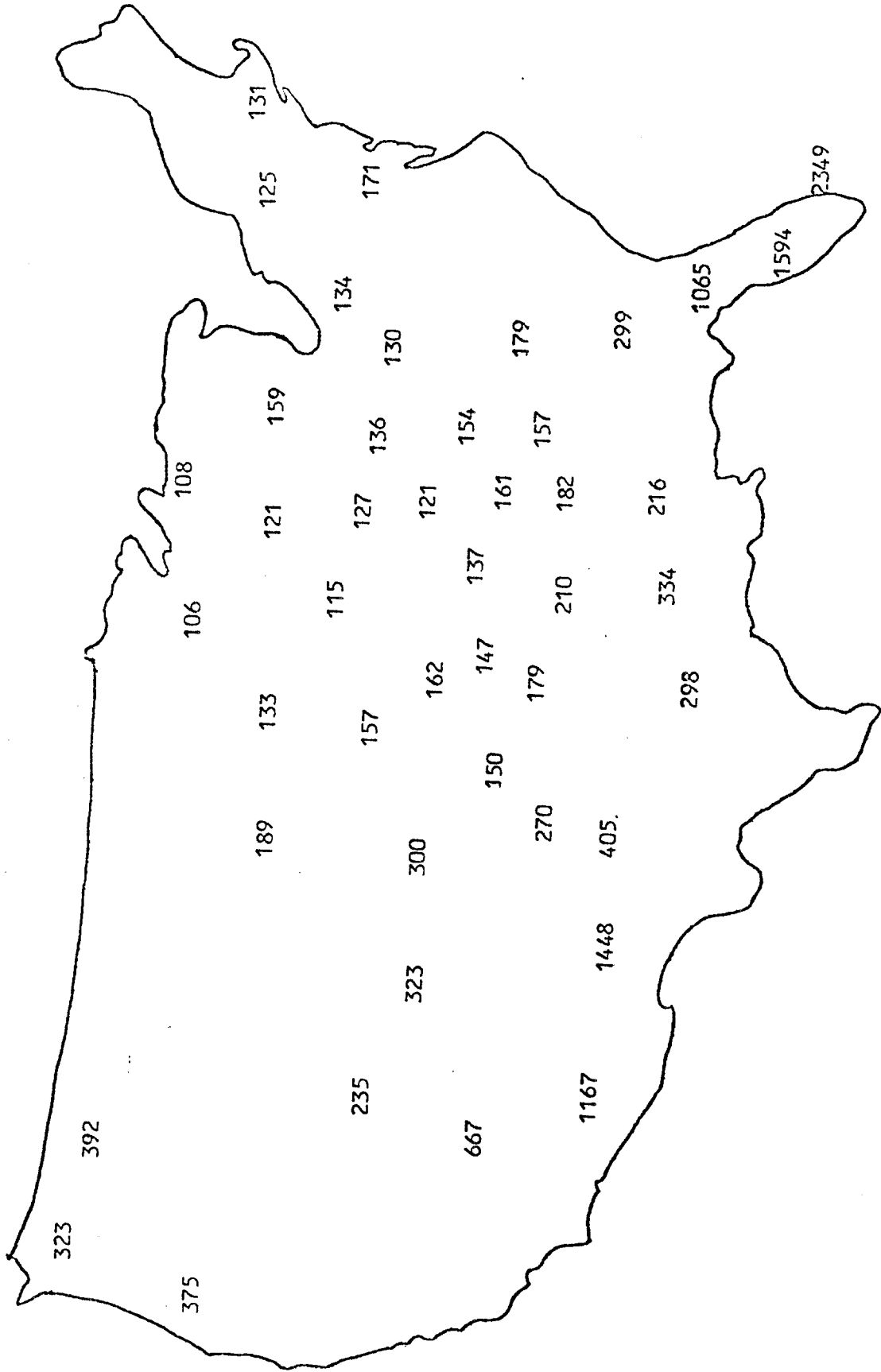


FIGURE 3. ESTIMATED AVERAGE HERD SIZE FOR THE LARGEST TEN PERCENT OF PRODUCERS DELIVERING MILK TO FEDERAL MILK ORDER AREAS, MAY 1979.

larger than herds in the Upper Midwest and northeast regions. The largest herds are located in the southeast and southwest. The largest ten percent of producers accounted for about 29 percent of all milk deliveries to federal orders.

The next largest twenty-five percent of producers (11 to 35 percentile) averaged 79 cows per farm but showed a similar geographic pattern as the average herd size of the largest ten percent of producers (Figure 4). In total these producers accounted for about 33 percent of all milk deliveries to federal milk orders.

The next largest twenth-five percent of producers (largest thirty-six to sixty percentile) averaged 48 cows but accounted for about 20 percent of all milk deliveries to federal milk orders. A similar geographic pattern also showed the largest herds being located in the southeast, south, southwest, and northwest regions.

Although only about 65 percent of total milk produced is regulated by federal milk orders the structural information on number and size of farms should still provide a reasonable basis for contrasting dairy production in various regions of the country. Only Grade A dairy farms are represented by the data which then likely would best reflect commercial dairy production in the United States. The average herd size for the largest ten percent of the dairy farms may be considered the current "leading edge" of structural change. However, the question of what the future structural changes will be is not answered with the data. It does show, however, that the large farms in the west, southwest, and southeast are becoming relatively more important suppliers of milk used for manufacturing.

An interesting side note is that slightly less than 6,000 dairies with 1,400 cows each could produce the total U.S. milk production in

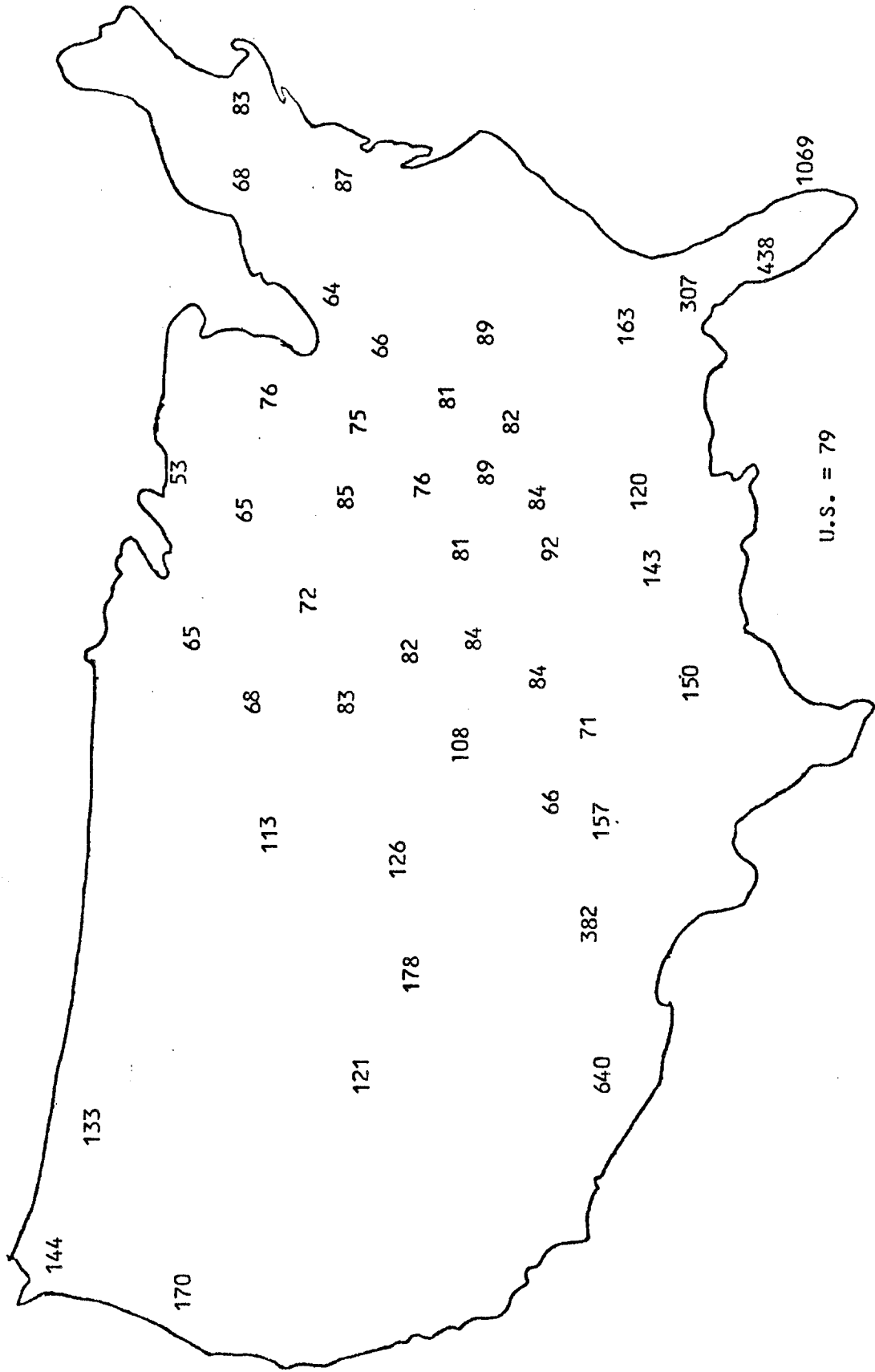


FIGURE 4. ESTIMATED AVERAGE HERD SIZE FOR THE LARGEST ELEVEN TO THIRTY-FIVE PERCENT PRODUCERS DELIVERING MILK TO FEDERAL MILK ORDERS, MAY 1979.

1981--132.6 billion pounds. Although the trend is marked, the potential for this to happen is not clear as no large scale dairies have been introduced into the Upper Midwest nor the potential for dairy expansion in the south has not been examined. A complete analysis is complex and will quickly raise questions about possible indirect subsidies such as the cost of irrigation water in the more dry regions of the country. A closer examination of these issues will be made in the comparative advantage study now underway.

The Price Support Issue

In my view the present surplus and record cost of the dairy price support program is not a fault of the program itself but rather it is the result of asking more of the program than it was designed to deliver. Eliminating the program because it has become too expensive is like junking a car because it is going too fast. What is really needed is a clear understanding of what the program is designed to accomplish. It can't do everything without getting into trouble.

The main characteristics of the program dictate what the program can and can't do. Under the present program, a dairy operator is free to produce any amount of milk he or she desires at the prevailing market or support price. There are no restrictions on the amount of milk produced either directly or as a condition for price support. This characteristic greatly limits the program's ability to set support prices above market clearing levels. Decisions to set the support price permanently above the market clearing levels would generate chronic surpluses as supply would consistently outstrip demand.

What does this mean? This means that, in the long-run, the support price cannot exceed a free market level. Support prices must explicitly

reflect supply and demand conditions or the market will become seriously out of balance. In the long-run the general level of prices must be about equal to those prices that would prevail under free markets.

In the short-run support prices can be set to avoid sharp drops in price but still must be set below the long-run supply-demand equilibrium level.

The purpose of this discussion is to clarify that the present program is designed to stabilize milk prices in the short-run. It is not designed to increase price (and farm income) above the long-run free market price. Other approaches and programs would be needed to achieve a price level that permanently exceeds the free market level.

Today the program, like a car, is being asked to exceed its safe driving speed (support level). The basic decision is whether to operate the present program within the speed (level of support) for which it was designed or whether to adopt a different or modified program with suitable supply controls.

Program objectives. The stated objectives of the dairy price support program were specified in the Agricultural Act of 1949. They were to:

1. assure an adequate supply of milk
2. assure a level of farm income to maintain productive capacity to meet future needs, and
3. reflect production costs

Although the objectives are good in principle they are vague and provide little guidance in selecting a specific support price.

Economists have always had trouble with the term "adequate supply." This point was driven home to me during a conversation with one of my colleagues. We were talking about how hard it was for farmers to find good

reliable hired labor. I said "A shortage of hired farm labor exists." My colleague quickly reminded me that the shortage was only perceived. What I was saying was that the amount of hired labor desired exceeded that available at the price farmers were willing to pay. At higher wage rates more labor would be available and less labor would be demanded. At some higher wage rate the amount desired would equal the amount available and the labor market would be in equilibrium. In a free market the price adjusts until an equilibrium exists. In a free market there are no shortages.

In this context what does it mean to set the milk support price to assure an adequate supply? Is an adequate supply 10 percent more than consumption needs? The present "surplus" condition is only a manifestation that at the present level of prices dairymen in the aggregate produce more milk than consumers are willing to consume. To assure an adequate supply of milk really gives little guidance in establishing the level of milk price support.

An equally vague objective of the price support program is to select a milk support price that will "assure a level of farm income to maintain productive capacity to meet future milk needs." The implication of many price support discussions is that, unless milk prices are supported, most if not all, dairymen will be forced out of production which in turn will destroy the future capacity to produce milk. Some view milk production as an irreversible process. If the spicket is ever turned off it would be difficult or impossible to turn it on again. The recent expansion would suggest that this is an overstatement. Such a view, however, suggests the entire dairy industry is dependent on milk price supports. I doubt this

is the case. An interesting question is whether the dairy industry could survive a free market environment.

Unlike dairy, the cattle and hog producers operate without a price support program. Recognizing that dairy is unique in many respects it is interesting to observe how cattle and hog producers get along in a relatively free market environment.

Both industries go through cycles of expansion and declining prices then contraction and increasing prices. In cattle the complete cycle is about ten years while in hogs it is about four years. When hog prices fell a few years ago the adjustment was quite painful. I heard reports of hog facilities being sold for 50 cents on the dollar. The very depressed condition did not mean the demise of pork production but, as you know, hog prices are up again following relatively large cut backs in production. The stage is set for increased hog production within the next year or so.

It seems reasonable to me that dairy could survive a free market environment. There would be cycles of low prices that would result in adjustments but would not bankrupt all dairy farmers.

In this context, what does it mean to set milk prices to insure future production capacity? Again the stated purpose of the price support program is extremely vague. It gives little concrete guidance in where to set the support price for milk.

In the long-run milk prices must reflect costs of production. However, calculating a cost of production as a guide in setting the support price is a very imprecise process. Too many arbitrary assumptions are involved in cost calculations to accurately reflect the above long-run free market price. Whether parity prices or cost of production estimates are used as a basis for setting price supports the bottom line still comes back to the long-run free market price needed to balance supply and demand.

In the context of the present program and the pressure to reduce prices when supply exceeds demand is probably the best criterion for price support adjustments. This means that flexibility to adjust prices in a timely manner according to changes in supply and demand conditions works best with the present program.

The 1977 farm bill reduced the flexibility of the Secretary of Agriculture to adjust prices down as surpluses began growing. Now we are at the cross-roads. A decision must be made whether a new program is needed so that the support price can be maintained above the long-run free market level or to make downward adjustments in the support price within the design of the present program.

What Can Be Done?

The present emphasis in Washington on cutting costs coincides with the rapid increase in costs of the dairy support program. This raises the question of what can be done to reduce government costs and still minimize the impact on the dairy industry.

Several alternative solutions have been suggested, including a reduction in imports, an increase in exports, and expansion of domestic consumption through promotion and advertising. These alternatives would be relatively painless for the dairy industry as they would not require reduction in the support price or impose supply controls. But how effective would they be?

Reduce Imports

Some observers believe the solution to the dairy program is to tighten import controls even further.

Import quotas for dairy products into the United States are presently set at 2.23 billion pounds of milk equivalent, or about 1.7 percent of total domestic production. In addition casein, which is not under quota, is being imported (152 million pounds in 1980). Although some of the casein is used for industrial products, some has been used in food products and thus has replaced some commercial sales of nonfat dry milk.

To the extent that casein is substituted for nonfat dry milk in food products, imports of casein directly affect the cost of operating the dairy price support program. A recent report concluded that cutting casein imports in half by imposing a 50 percent quota would reduce CCC purchases of nonfat dry milk about 10 million pounds or \$9.3 million.^{2/} A 50 percent tariff that increased the price of casein 60 cents a pound would have no impact on the cost of the price support program.

The government is expected to remove 13.7 billion pounds of milk equivalent from commercial channels for the October 1981 to September 1982 period. This greatly exceeds the potential 2.23 billion pounds of imports plus the nonfat dry milk replaced by casein imports. In addition, eliminating import quotas would not automatically result in an additional demand for 2.23 billion pounds of domestic milk. Part of the imports undoubtedly reflects a demand for specific foreign cheeses such as Danish blue and other varieties which United States-made cheese may not fulfill.

Eliminating import quotas and restricting casein imports would help reduce the government cost of operating the present dairy price support program. However, it would do so by only a fraction of current program cost, and would be far short of bringing the sector into balance.

^{2/} USDA "U.S. Casein and Lactalbumin Imports: An Economic and Policy Perspective," Economics and Statistics Service, USDA, ESS Staff Report No. AGESS 810521.

Increased Exports

World supply and demand situations generally put limits on the potential export of United States dairy products. Surpluses in Europe, New Zealand, and Australia make it difficult to expand exports without using export subsidies or disrupting United States trade relationships. Foreign donations continue to provide a place to ship some nonfat dry milk, but proposed budget cuts for Public Law 480 make it unlikely that this export possibility will be realized. Even if the budget for PL 480 were increased, it is not likely that that program could accomplish very much to reverse the imbalance in the dairy industry.

Expand Domestic Consumption

Civilian consumption has increased about 1 percent per year since 1975 but recently has been about double that rate. Milk production, over this same time period has increased about two percent per year and outstripped the normal growth in civilian consumption with government removals amounting to about 10 percent of production. The potential for promotion to sell surplus seems remote. The Omnibus Reconciliation Act excluded any promotion provisions.

More Painful Solutions

Direct payments or supply control are two policy alternatives that could reduce government purchases, but generally neither policy is preferred by the United States dairy industry or the present Administration. Direct payments would allow retail prices to decline, reducing or eliminating the need for government purchases and permitting products to be sold commercially. However, the total government cost for payments with

such a program would increase dramatically. Such increases would only compound the present federal budget problems.

Yet, supply control would be difficult to administer. Many administrative questions such as how to establish a farmer's quota and how to allow for resource adjustments and new entrants into dairy farming would exist.

Another nonprice program would be to provide payment incentives for farmers to cull dairy cows. This type of program could help bring about the needed adjustment, but again would be difficult to administer and could be expensive. Payments would probably be made for many cows that would normally be culled (about 25 percent of all milk cows are culled each year).

The only remaining alternative is to lower the level of the support price. Of course this alternative would be of most concern to dairy farmers for it would reduce their income. Prior to 1977 it has always been possible to bring supply into balance with demand with a minimum support price of 75 percent of parity. This may not be true today with unusually low feed prices and relatively poor alternatives to dairy.

The legislation just signed is a program that effectively reduces the farm milk price. However, consumer prices will remain at the higher support level and, thereby, fail to encourage additional consumption. The possible refund of the second 50 cent reduction is to depend on whether a farmer reduces his milk production. This is a departure from the past as it in effect institutes a program whose support is tied to reductions in milk produced. The deduction would be able to raise enough revenue so direct government costs to purchase surplus dairy products could be significantly reduced. The reduction in government cost would exceed the reduction associated with a 50 cent lower support price.

A reduction in support price provides incentive to both consumers and producers to make the needed adjustment. This spreads the burden of

adjustment, and brings it about on as broad a scale as possible without imposing undue hardship on particular groups. What is often forgotten is that allowing prices to provide the incentive for adjustment works on both sides of the market. Lower prices, for example, encourage increased consumption as well as reduced production. Because of this double effect, prices often do not have to decline as much as the overt surplus would suggest. Higher prices associated with high levels of support would encourage the shift to alternative products and development of dairy product substitutes.

Summary

Many changes are occurring in the location of milk production and the source of milk used to make manufactured dairy products. Technology, production practices and herd sizes vary considerably from one region of the country to another. These changes have given rise to questions about whether or not the traditional dairy area in the Upper Midwest still has a comparative advantage in milk production.

Dairy is at a crossroad with the price support program. In order to pursue the long-run objective of increasing dairy farm income above the equilibrium levels, major modifications of the present price support program will be needed if large government costs are to be avoided. The price support program was designed primarily to stabilize milk prices and not to increase dairy farm income.