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WHERE WILL MILK FOR MANUFACTURING BE PRODUCED?

AFPC Policy Issues Paper 96-1

January 1996



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Agricultural and Food Policy Center
Department of Agricultural Economics
Texas A&M University
College Station, Texas 77843-2124

or call (409) 845-5913.

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Ronald D. Knutson
Robert Schwart
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Agricultural and Food Policy Center
Department of Agricultural Economics
Texas Agricultural Experiment Station
Texas Agricultural Extension Service
Texas A&M University

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College Station, Texas 77843-2124
Telephone: (409) 845-5913
Fax: (409) 845-3140
e-mail: rknutson@tamu.edu

Where Will Milk for Manufacturing be Produced?

Ronald D. Knutson, Robert Schwart, David Ernstes and Joe Outlaw

Debate on the 1995 Farm Bill centered around the degree to which the dairy industry should be deregulated. At the time of this workshop, the removal of supports under the price of milk for manufacturing appears to be a foregone conclusion. Butter and nonfat dry milk (NDM) supports are to be eliminated in both the House and Senate bills. Cheese supports, likewise have been agreed to be lowered even though the cheese price is substantially above the support level. The debate, therefore, is over the future of the federal milk marketing order program. Order proposals range from consolidation of orders and speeding up of the decision process to virtual elimination as early as 1996.

The purpose of this paper is to discuss the prospective impacts of such policy changes on the availability of milk for manufacturing. This will be accomplished by examining the trends in the availability of milk for manufacturing and the production of cheese, NDM and butter in 1980 and 1994. Next, farm level results will be analyzed under reregulation options of no price supports (no supports) as proposed in the House and Senate bills and no supports with order elimination as proposed in the House bill. The impacts of these two policy options were derived from price and macroeconomic projections for each option made by FAPRI. These impacts are believed to be quite consistent with similar estimates made by other university dairy analysts.

Presented at the Dairy Economist Workshop in Kansas City, Missouri on October 25, 1995.

The authors are, respectively, the Director of the Agricultural and Food Policy Center, Professor, Research Associate and Assistant Professor at Texas A&M University.

Both the trend and farm level analyses were conducted for six regions. These regions were proposed in one of the Freedom-to-Farm alternatives. They are believed to represent relatively uniform market areas from dairy supply and demand perspectives.

Milk for Manufacturing, 1980 and 1994

The rather simplistic approach of comparing two years of manufactured product production was taken because:

- Data on quantity of milk manufactured for each state is not available. Considerable effort was involved in developing even two years of reliable data from existing sources (AMS, NASS).
- Interim years production, particularly in the mid-1980s, were distorted regionally by the differing levels of participation in the dairy diversion (1983) and termination (1986) programs.
- While, arguably, 1980 production was also distorted by the 80 percent of parity support requirement, it was judged to be the appropriate year for discerning longer-run trends.

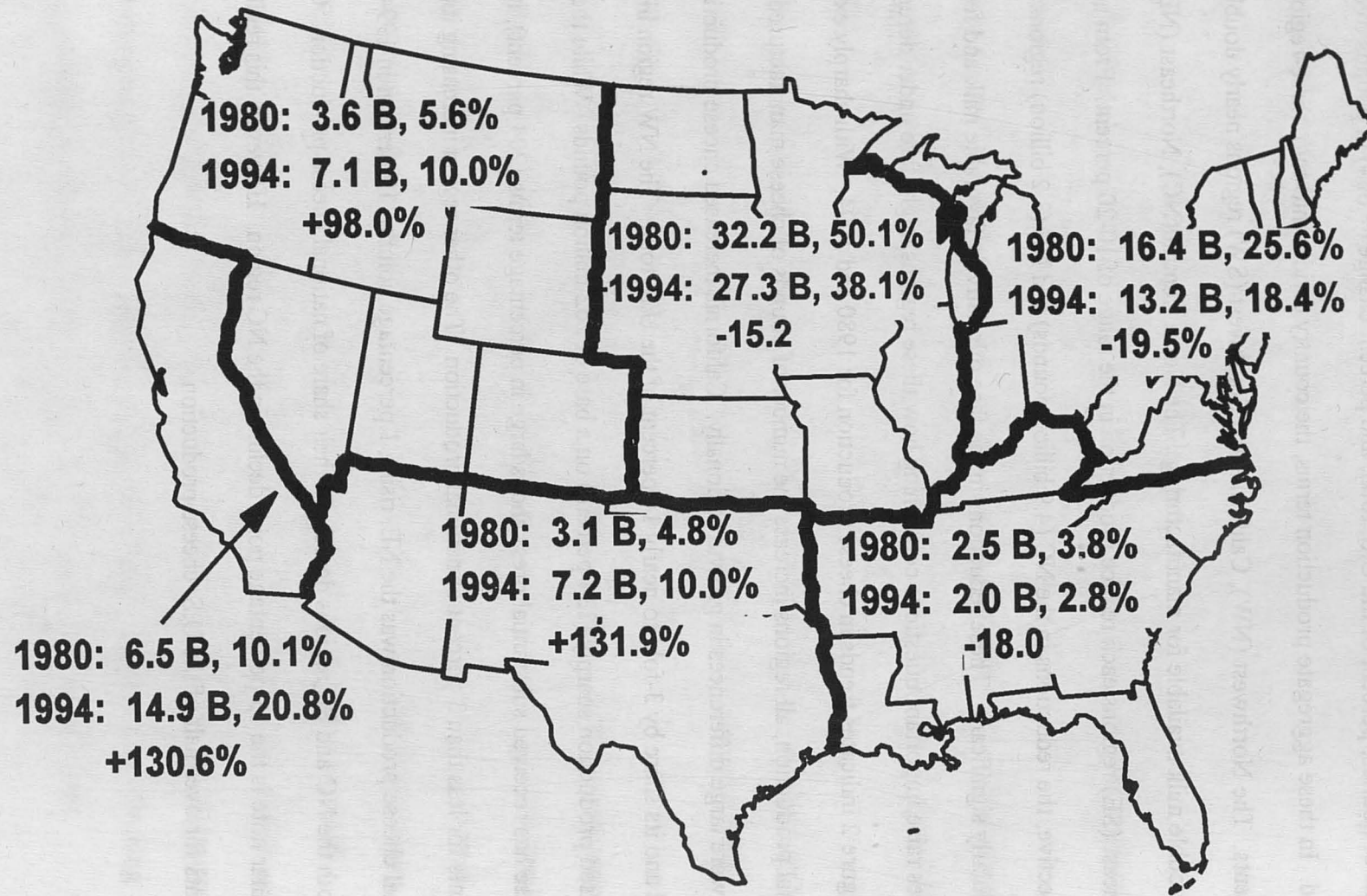
The analysis of trends in milk available for manufacturing was completed for the overall supply of milk utilized for manufacturing from all sources (Grade A, Grade B, federal order, state order and unregulated). Since the main sources of data were from California, AMS (Federal Order) and NASS (products), it is possible that relatively small amounts of milk used to make manufactured products in states such as Montana or Maine were not directly accounted for. However, these were not sufficiently large to negate the balancing and cross-checking process used to obtain aggregate national and regional totals for either 1980 or 1994.

Figure 1 indicates milk production used for manufacturing in 1980 and 1994 regionally, in billions of pounds, percent of the U.S. total, and percent change (+ or -) in pounds over the period. In these aggregate production terms, the country divides into two, three-region segments. The Northwest (NW), California and Southwest (SW) regions nearly double more than double milk available for manufacturing. The North Central (NC), Northeast (NE) and Southeast (SE) regions each reduce production in the range of 10-20 percent. From a volume perspective, the reductions in the NC (4.9 billion pounds) and NE (3.2 billion) regions are particularly significant. These reductions in the face of relatively favorable milk and feed price policies raise important questions concerning how these regions might fare under deregulation.

Figure 2 indicates trends in cheese production for 1980 and 1994. With sharply expanding national production, all regions increase the number of pounds of cheese manufactured. Yet, there were large differences in growth regionally. California increased cheese production over 5-fold and its share by 3-fold to nearly 14 percent of the U.S. total. The NW region likewise increased production sharply (134 percent) on a base of 262 million pounds. While the SW increase has received substantial press and is large in percentage terms (204 percent), it still accounts for less than 3 percent of national production. The other region increasing its share of national cheese production was the NE, rising 1 percentage point to 19 percent in 1994.

Both the NC and SE regions decreased their share of national cheese production. Of particular note is the 13 percentage point decline in the NC region. However, this region still accounts for over half of the U.S. cheese production.

Figure 1. Milk Production for Manufacturing: 1980 and 1994



**Figure 2. Cheese Plant Production Under Current Policy:
1980 and 1994**

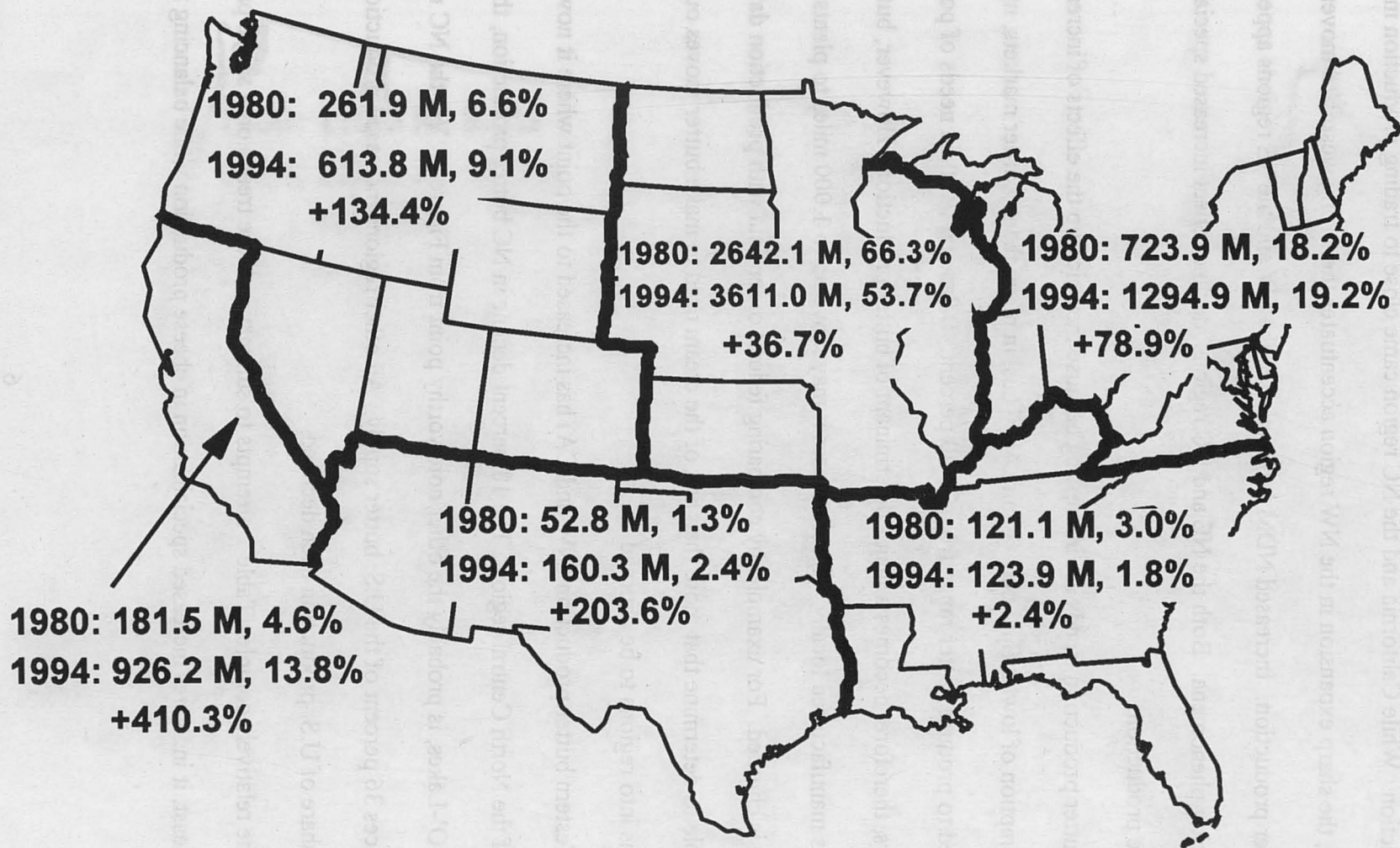


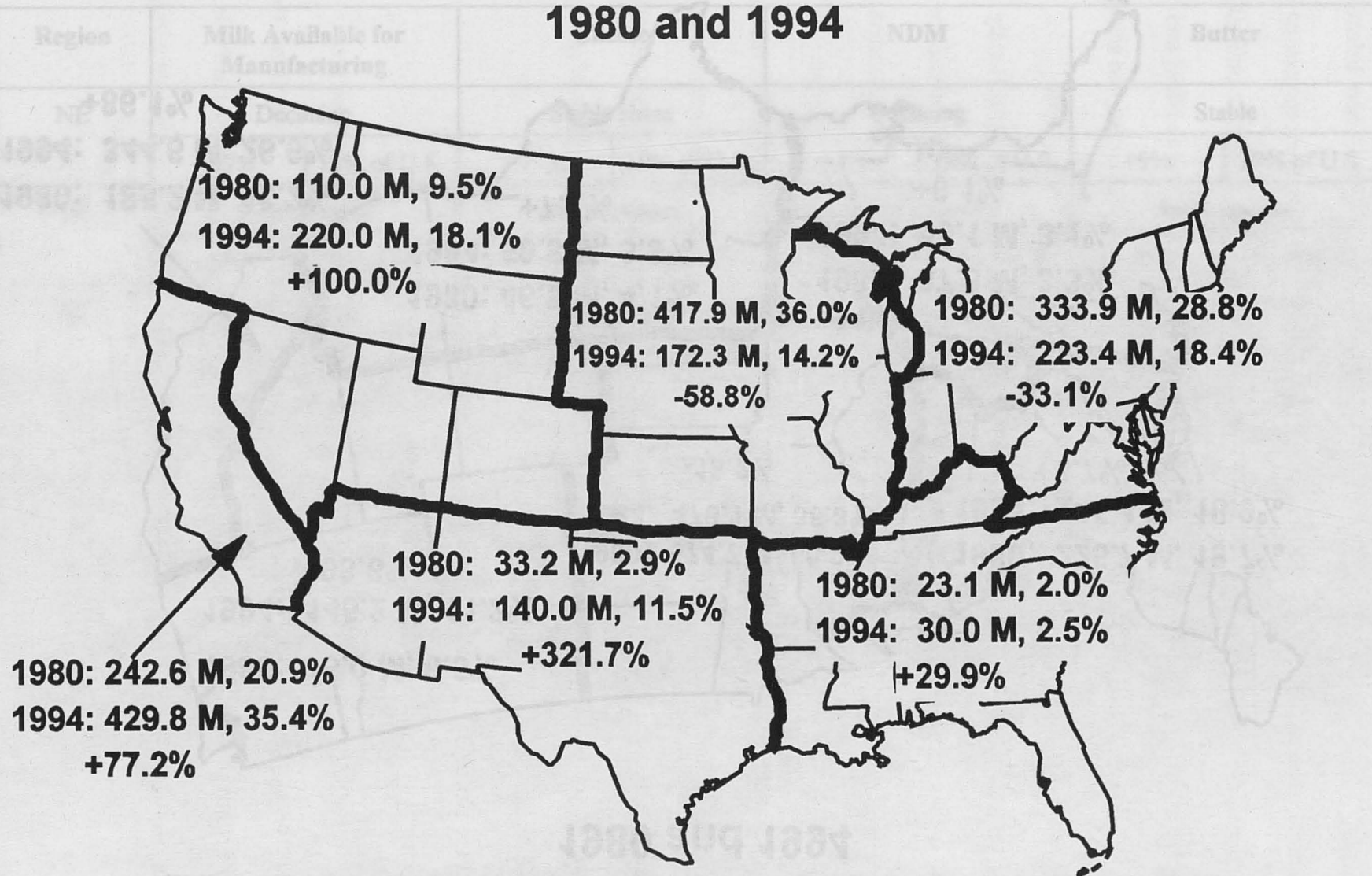
Figure 3 reveals the large regional shift that has taken place in the distribution of NDM production. While California and the NC region came close to trading production in poundage terms, the sharp expansion in the NW region accentuates the strong westward movement of powder production. Increased NDM production in the SW and the SE regions appears to be a balancing phenomena. Both the NE and NC regions' decline reflect increased specialization in cheese production.

Butter production trends are interesting because they pick up the effects of increased consumption of lowfat fluid milk (Figure 4). Thus, in many federal order markets, milk/cream utilized to produce butter range from 20-40 percent. Balancing the fluid needs of population centers, therefore, becomes a major determinant of butter production. However, butter is not always manufactured locally. In some cases it may move up to 1,000 miles to plants where butter is churned. For example, by comparing federal order data with production data it is possible to determine that more than half of the cream used to make butter moves out of these regions into regions to be churned.

Western butter production (NW and CA) has increased to the point where it now surpasses that of the North Central region. The 18 percent decline in NC butter production, the home of Land-O'-Lakes, is probably the other noteworthy point from Figure 4. Yet the NC region still produces 36 percent of the U.S. butter supply. All other regions increased production, although their share of U.S. production each declined.

The relatively complex Table 1 attempts to summarize these trends on a single page. For the Northeast, it indicates increased specialization in cheese production while balancing fluid needs

**Figure 3. NDM Plant Production Under Current Policy:
1980 and 1994**



**Figure 4. Butter Plant Production Under Current Policy:
1980 and 1994**

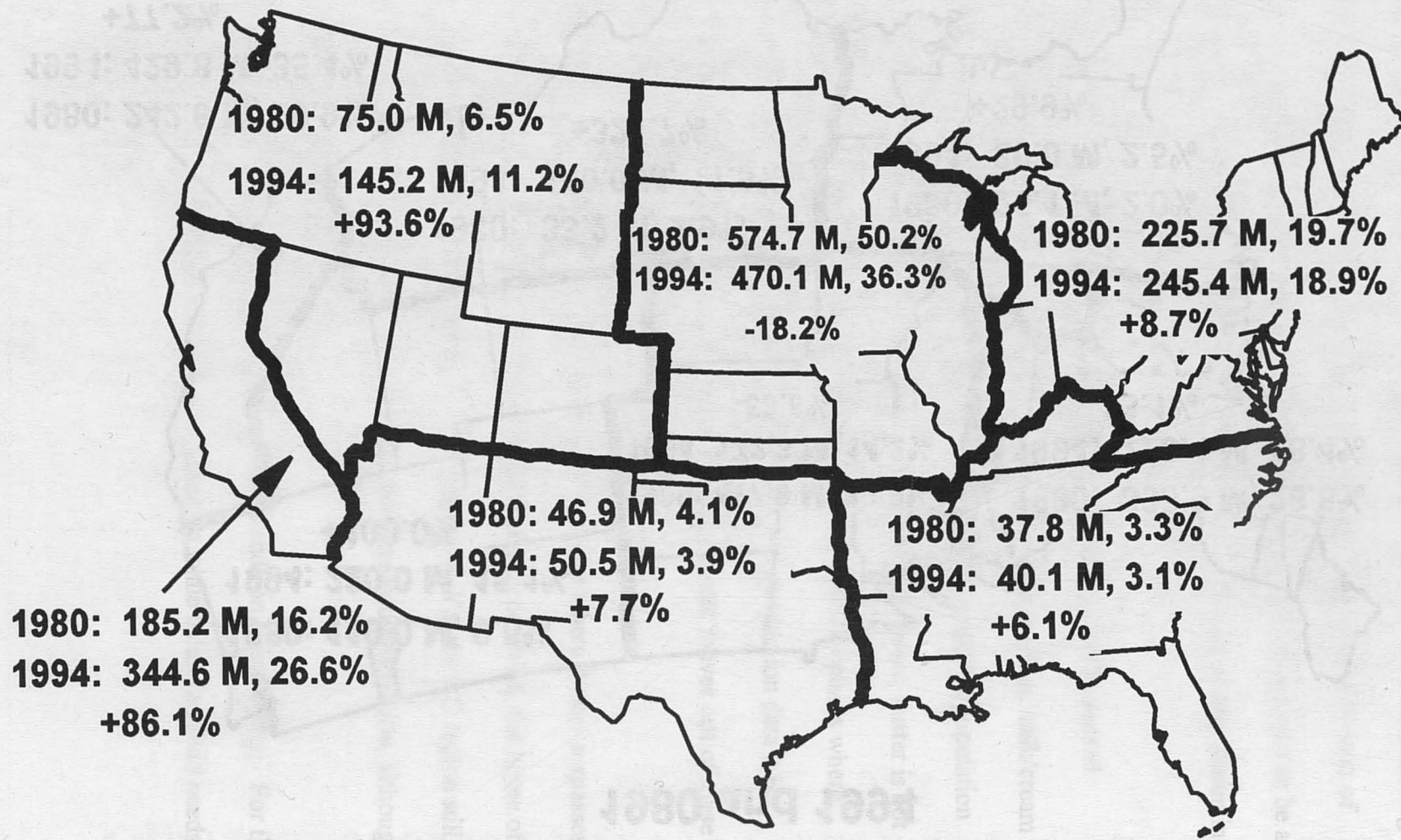


Table 1. Regional Conclusions Under Current Policies From Trend Analysis

Region	Milk Available for Manufacturing		Cheese		NDM		Butter	
NE	Declining		Stable share		Declining		Stable	
	-20%	18% of U.S.	+79%	19% of U.S.	-33%	18% of U.S.	+9%	19% of U.S.
SE	Small amount		Small amount		Small amount		Small amount	
	-18%	3% of U.S.	+2%	2% of U.S.	+30%	3% of U.S.	+6%	3% of U.S.
NC	Declining		Decreasing share		Declining		Decreasing share	
	-15%	38% of U.S.	+37%	54% of U.S.	-59%	14% of U.S.	-18%	36% of U.S.
SW	Increasing		Increasing		Increasing		Small amount	
	+132%	10% of U.S.	+204%	2% of U.S.	+322%	12% of U.S.	+8%	4% of U.S.
NW	Increasing		Increasing		Increasing		Increasing	
	+98%	10% of U.S.	+134%	9% of U.S.	+100%	18% of U.S.	+94%	11% of U.S.
CA	Increasing		Increasing		Increasing		Increasing	
	+131%	21% of U.S.	+410%	14% of U.S.	+77%	35% of U.S.	+86%	27% of U.S.

results in stable butter production. The SE is a small factor in manufacturing where balancing is a function fluid demands to serve a growing population. While the NC region represented approximately 30 percent of the 1994 U.S. milk production and 38 percent of milk utilized for manufacturing, it is in a state of decline. This decline is particularly apparent in NDM and butter. In cheese, while production in the NC region has increased by 37 percent, the share has declined by 12 percentage points to 54 percent -- still a majority of U.S. production.

The SW has received publicity for its relatively high Class I differentials and its rapidly increasing production. While the percentage increases are impressive for milk available for manufacturing, for cheese production and for NDM production, the shares are still relatively small. The question is whether this region can hold its production under deregulation.

Not surprisingly, the NW and California have experienced large increases in both absolute and relative terms. The magnitude of the increases are very significant. These increases are particularly astonishing with the realization that producer prices in these regions are lower than in the North Central region. Of substantial interest is for how long this magnitude of growth can be sustained.

Farm Level Impacts

AFPC maintains a system of about 80 representative farms in major production areas throughout the United States, 22 of which are dairy farms. The locations of these farms are indicated in Figure 5. The number and size of farms in each location are indicated in Table 2. Each farm is abbreviated in subsequent tables by state and size as indicated in the right column of Table 2.

Figure 5. Representative Farms Producing Milk

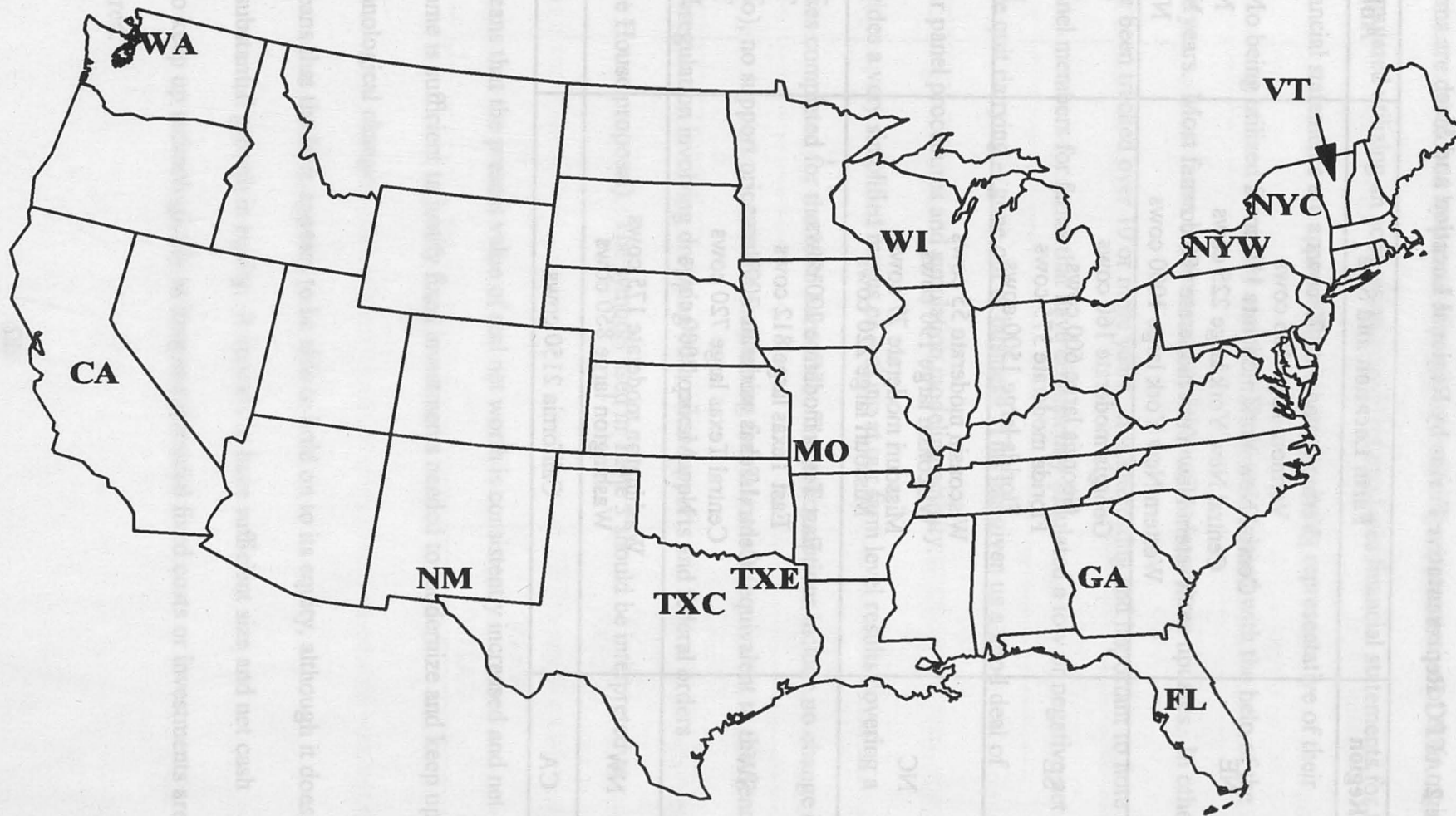


Table 2. AFPC Representative Farms by Regional Location and Size

Region	Farm Location and Size	Abbreviation
NE	Vermont moderate 70 cows Vermont large 186 cows Central New York moderate 110 cows Central New York large 225 cows Western New York moderate 600 cows Western New York large 1000 cows	VT70 VT186 NYC110 NYC225 NYW600 NYW1000
SE	Georgia moderate 160 cows Georgia large 600 cows Florida moderate 375 cows Florida large 1500 cows	GA160 GA600 FL375 FL1500
NC	Wisconsin moderate 55 cows Wisconsin large 190 cows Missouri moderate 77 cows Missouri large 220 cows	WI55 WI190 MO77 MO220
SW	East Texas moderate 200 cows East Texas large 812 cows Central Texas moderate 300 cows Central Texas large 720 cows New Mexico 2000 cows	TXE200 TXE812 TXC300 TXC720 NM2000
NW	Washington moderate 175 cows Washington large 850 cows	WA175 WA850
CA	California 2150 cows	CA2150

These 22 farms are developed by panels of producers as being representative of their region. The farms are simulated utilizing an accounting model that produces financial statements for the farm. These financial statements are approved by the panel as being representative of their operations prior to being utilized for policy analysis. Farms are updated with the help of the panel every three years. Most farms have now existed through at least three updates. In other words, they have been tracked over 10 or more years. It is interesting and important to note that several of the panel members for farms that have consistently simulated a low or negative net cash income have quit dairying -- gone out of business. This has given us a good deal of confidence in our panel procedures and simulation modeling activity.

Table 3 provides a very simplified means of looking at our farm level results covering a number of analyses completed for the 1995 Farm Bill. The policy options include no change in policy (status quo), no support prices while maintaining federal orders (equivalent to the Senate proposal), and deregulation involving dropping both price supports and federal orders (equivalent to the House proposal). The symbols used in Table 3 should be interpreted as follows:

- A "+" means that the present value of real net worth is consistently increased and net cash income is sufficient to justify fixed investments needed to modernize and keep up with technological change.
- A "0" means that the farm appears to be able to hold on to its equity, although it does not indicate substantial growth in equity. It appears to have sufficient size and net cash income to keep up technologically as long as substantial fixed costs or investments are not required.

Table 3. Farms Increasing the Present Value of Real Net Worth by Dairy Policy Option

	Regional/Farm	No Change	No Support	Deregulation	
NE	VT70				
	VT186				
	NYC110				

	NYC225	0	0		
	NYW600	+	+	+	
	NYW1000	+	+	+	
SE	GA160				
	GA600	+	0		

		FL375		0	
	FL1500	+	0		
NC	WI55	0	0	0	
	WI190	+	+	+	

		MO77	0	0	0
	MO220	0	0	0	
SW	TXE200				
	TXE812	0	0		

		TXC200			
		TXC720	+	+	+
	NM2000	+	0		
NW	WA175	+	+	0	
	WA850	+	0	0	
CA	CA2150	++	++	++	

- A “ ” (blank) means that the farm is losing equity and does not have enough net cash

income to keep up technologically. Farms in these areas are experiencing either a need to restructure to reduce unit costs or go out of business.

These farm level results indicate that even with no change in policy, moderate size farms in all regions are having substantial problems surviving. Both moderate and large Vermont farms lose equity under current policies. With no supports while retaining federal orders (Senate proposal), most farms in the SE and SW would either experience substantial stress or would only be able to hold onto their equity (not grow). Even in the NC region only the larger Wisconsin farm is able to sustain growth without supports. This indicates greater pressure for structural change in these regions than currently exists.

The deregulation option suggests substantial accelerated pressure for structural change in all regions except California. Production throughout the United States would shift decisively toward larger scale farms and/or exit the dairy industry. Regions continuing to experience real growth in equity but only on larger farms include Western New York, Central Texas, Wisconsin and California. It is important to note that large scale farms in both Florida and New Mexico lose equity in the absence of supports and federal orders. We view these deregulation results as representing best case scenarios. Our models are not able to capture the within year effects of price variability nor the potential for longer-term cut-throat competition associated with either handler pooling or extensive structural adjustment.

Combination of Trend and Farm Analysis

Table 4 attempts to combine and summarize the results of the trend and farm-level analyses under the deregulation scenario. It indicates that increased quantities of milk available for manufacturing are likely to develop only in California. California and NW are likely to produce all types of manufactured products. Structural change in this region will emphasize continued growth to larger size farms.

The Northeast will utilize declining milk supplies to specialize in serving fluid markets and cheese production. Most of the decline will be in New England and on smaller/moderate size farms in the rest of the region. Large farms such as those located in Western New York will tend to evolve and dominate the industry of the region.

The Southeast will restructure to serve the fluid market. Manufacturing will be related to performing the balancing function. Much of this manufacturing will be transported to other regions as is occurring with butter. It is possible that growing fluid markets will be served by new concentrated production areas removed from population centers and environmentally sensitive areas in Florida.

The North Central region will continue to experience declining production as it restructures to larger scale dairying. From a feed availability perspective, this region clearly has the ability to continue to be a major milk producing region. But a progressive "can do" posture of larger farms is required for the region to be competitive. Like the Northeast, this region will specialize in producing cheese. However, facilities and marketing firms will continue to be committed to producing butter, some of which will be supplied from other regions.

Table 4. Regional Conclusion from Trend and Farm Analysis Under Deregulation

Region	Milk Available for Manufacturing	Emphasis in Manufacturing Production	Magnitude of Structural Change
NE	Declining	Cheese	Very Large
SE	Very Little	Butter/NDM Balancing	Very Large
NC	Declining	Cheese/Butter	Very Large
SW	Stable to Declining	Cheese	Large
NW	Stable	Cheese, Butter, NDM	Small
CA	Increasing	Cheese, Butter, NDM	Small

The Southwest has received much attention for its growth in milk and cheese production. Substantial new manufacturing investments in this region appear to signal continued growth in demand. However, all signs are not positive. New Mexico farms are experiencing higher feed costs resulting from exports of its high quality hay to dairies in Mexico. In Mexico and New Mexico, expanded hay production is limited by water availability. Growth in West Texas utilizing corn silage as roughage is possible but competes with large feedlots. Future milk production trends in what has been one of the most robust milk producing areas remains in question. Declines in production could be experienced with deregulation. Substantial structural change will continue in East Texas as it seeks a competitive strategy for producing milk in a traditionally dense milk producing area.

Conclusions

Three overall conclusions are warranted from this analysis under a deregulation policy scenario:

- There will be a rapid consolidation of the U.S. dairy industry to larger farms located in the most efficient production areas. Many of these areas are known -- California, Idaho, Western New York. Others are yet to be identified.
- Manufactured product production will become concentrated in the most dynamic production areas. The West is an obvious example. Attitudes in other traditional regions will need to change from negative to positive, from protective to aggressive, from finger pointing to self-evaluation in order to become dynamic.

- Fluid milk needs will be satisfied primarily out of local supplies. The “Sam’s model” involving long distance procurement of bottled products will not become the norm, although it will continue to be disruptive.

Is there an alternative plausible scenario to that sketched out here that could be right? Surely there is. There may be several. One such scenario involves the potential that our models substantially overestimate the amount of price reduction associated with deregulation. Under this scenario, higher market prices resulting, for example, from increased export demand might reduce the magnitude of adjustment in traditional production areas. For this scenario to be plausible, substantial policy adjustment would have to occur in other countries, such as Canada and the European Union. While some of these adjustments are called for under GATT, they may not come fast enough. While not dismissing this scenario, we believe it to be less likely than the one presented in this paper.

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