
Dairying In The Future:

**Some questions you may want
to ask about past experiences
and coming challenges.**

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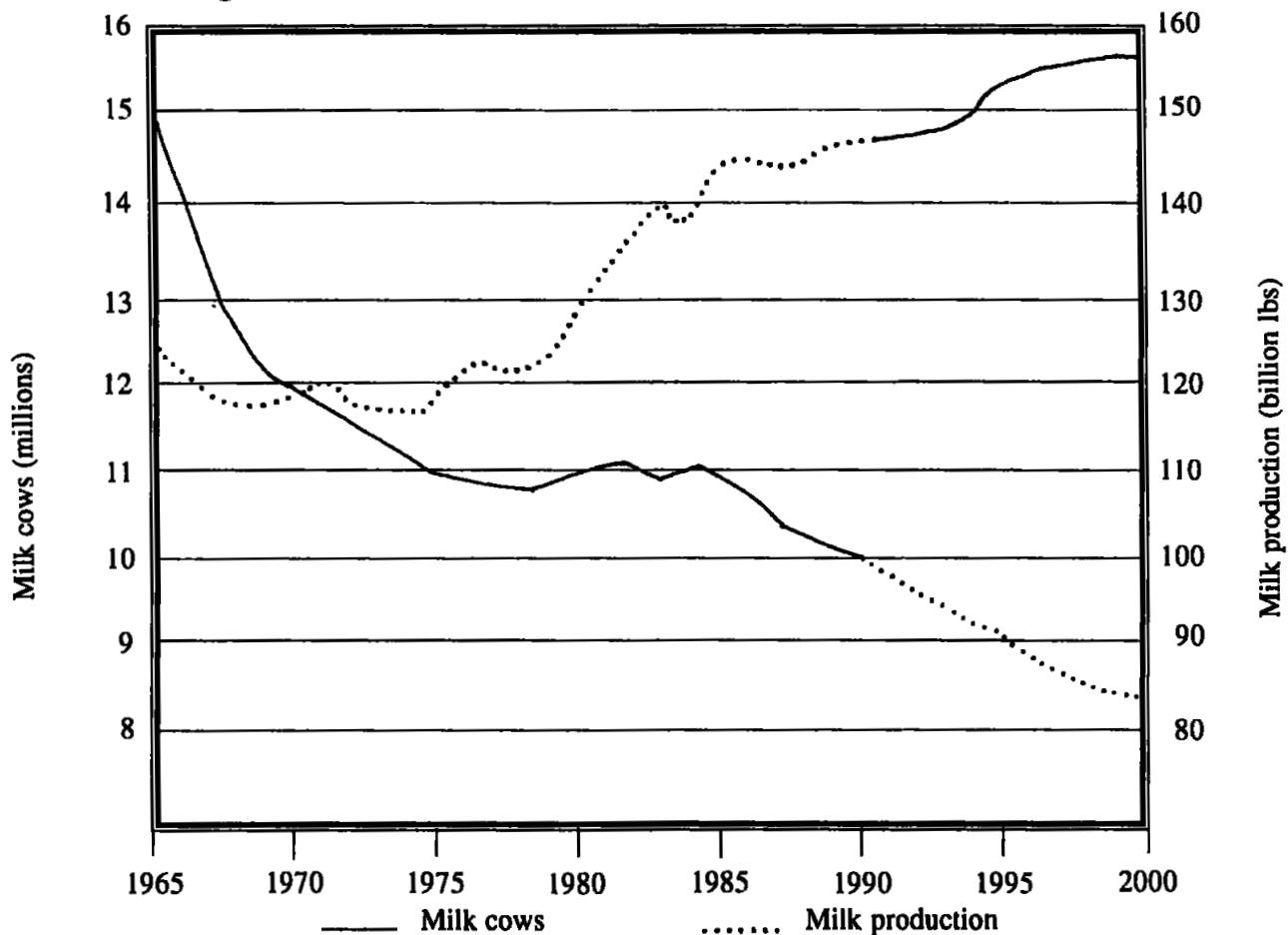
One could design an entire conference around the subject of what dairymen will need to know to dairy in the 21st century and beyond. Most of the answers can be found in reviewing the past. I have chosen to zero in on just a few areas I think will be important for dairymen to consider as our industry progresses into the next century. Let's not dwell too much on where we are today, because dairymen who are not on the cutting edge and using the tools available to them probably will not be around to be competitive in the years to come. Ours is a shrinking industry when it comes to numbers of people involved, yet truly a growth industry when it comes to production per cow, output per man hour and rapid technological

advances.

The overall size of the dairy sector is dependent upon sales, and sales are determined by the changing demands and desires of consumers and their willingness to spend hard dollars on what they perceive to be the healthfulness of the foods they eat.

Change will continue to be the common denominator in the dairy industry. In the mid-1940s, 5 million farms reported milk cows. By 1959 well under 2 million farms reported milk cows. Reductions in farms with dairy cows dropped even more percentage wise during the 1960s, when dairy operations terminated on more than 1.2 million farms, a 10-year decrease of 68%. This trend has persisted in the 1970s and 1980s. The 1987 census reported

Average Number of Milk Cows on Farms and Total Milk Production, 1965-2000



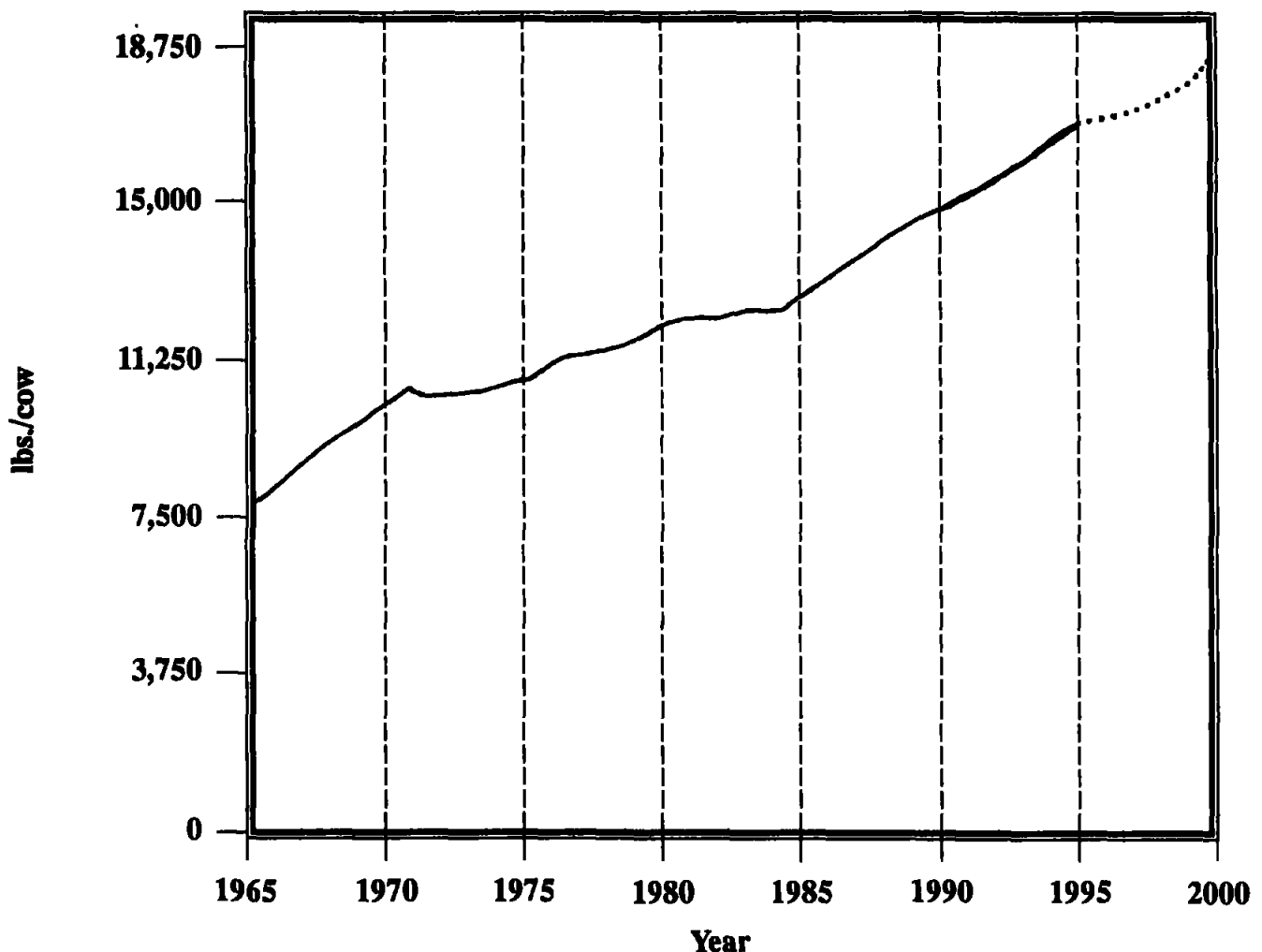
202,000 farms with milk cows. In 1987, two-thirds or 138,000 dairy farms, accounted for over 90% of all milk cows in the U.S. This reduction in dairy farms has been accompanied by rapid declines in the size of the nation's dairy herd. During the 1940s and early '50s, milk cow numbers were nearing the 25 million number. Major decreases brought cow numbers near 11 million in the mid 1970s. By 1993, the number of milk cows dropped below 9.8 million – the smallest national herd in over 100 years.

The decrease in milk cow numbers is a result of farm productivity increasing at a faster rate than dairy product sales. A look at productivity trends

shows a steady increase in milk per cow. U.S. dairy-men have realized a 300% increase in average milk production since 1940, from 4,600 lbs. per cow to about 15,500 lbs. per cow in 1993. Since 1960 the rate of gain has been about 275 lbs. per year. I look for this trend to accelerate substantially.

Census data shows the average herd size going from 5 cows in the 1940s to just over 50 cows in 1987. Data for 1993 indicates that there were 9.7 million cows on 175,000 farms. Production per cow average 15,554 lbs. and commercial disappearance of products was 150 billion lbs. of milk. Assuming milk production only keeps up with population

Annual Milk Output Per Cow, 1965-2000



growth of about 1% per year and production per cow grows at its historic rate of about 2% per year, then cow numbers must decline over 10% by the year 2000. If farm size moved up from 55 cows to an average of 75 cows per dairy, the number of dairies in the U.S. would decline about 35%. One can surmise from the above if new technology increased production to 3% from the historic 2%, then cow numbers would decrease by almost 19%

by the year 2000, all

else being equal. If we assume technology advances results in more larger farms and greater productivity gains to the point that the average herd size rises to 100 cows instead of 75, then farm numbers will decline 51% over the next 10 years.

By the year 2000, there will be 8.5 million cows in the U.S. on about 90,000 dairies, with production of about 18,500 lbs. of milk per cow totalling 157 billion lbs. of milk. The greatest production increase will be in the West. New York and Pennsylvania will show moderate growth and by the late

Top 5 States - Production / Cow		
California	19,425	
Washington	19,377	
New Mexico	19,272	18,930
Arizona	18,402	
Colorado	18,175	
U.S. Average	15,554	
Bottom 5 States - Production / Cow		
Arkansas	12,206	
West Virginia	12,043	
Kentucky	11,844	11,585
Louisiana	11,835	
Tennessee	11,492	

Impact of Milk Production on costs and returns*

Milk Level	Per cwt milk			Total Cost	Return to labor, mgmt. and risk
	Feed Cost	Labor Cost	Operating Cost		
18,000	\$5.76	\$0.82	\$11.60	\$2,342	\$179
19,000	5.64	0.78	11.21	2,384	257
20,000	5.52	0.74	10.86	2,426	335
21,000	5.41	0.70	10.53	2,465	415
22,000	5.33	0.67	10.26	2,511	490

* Values are based on \$12 per 100 pounds milk. Concentrate use is assumed to provide for extra production using 1 pound concentrate (\$0.81/pound) for each 2.5 pounds milk with roughage held constant.

Edward A. Fiez and Dean F. Falk

TOTAL COSTS OF MILK PRODUCTION, \$/CWT

	1987	1988	1995	AAGR 1988-1995	2000	AAGR 1988-2000
Upper Midwest	\$11.84	\$13.89	\$12.81	-1.2%	\$13.63	-0.2%
Corn Belt	12.54	13.88	12.87	-1.1	13.33	-0.3
Southeast	12.70	14.48	12.98	-1.8	13.12	-0.8
Northeast	11.99	12.92	12.58	-0.4	12.74	-0.1
Southern Plains	12.40	13.51	11.54	-2.2	11.58	-1.3
Appalachia	11.75	12.70	11.48	-1.4	11.35	-0.9
Pacific	10.42	11.17	9.78	-1.9	9.78	-1.1
United States	11.79	13.18	12.15	-1.1	12.40	-0.5

1990s production in the Upper Midwest may rebound.

One of the areas I want to look at and talk about is one we don't pay enough attention to in the dairy business: the socio-economic area. Recently, the Roper Group conducted a survey in rural areas. The questionnaire asked, "What do you need for your family to make a comfortable living, to set aside money for a college education for your children, retirement" and so on. The answers were gathered geographically with those surveyed in the Northeast responding

\$40,000, the South \$30,000, the Midwest \$30,000 and the West \$40,600.

Now if you relate these answers to dairy families and assume the average dairy producer in the U.S. produces about 1 million lbs. of milk a year; in order to have the lifestyle the survey indicates he'll feel comfortable with, one needs to net \$3 per cwt. That's not happening; nor is it likely to happen. I wanted to start with this premise and show why it will take an extremely competitive, efficient producer to meet the income goals referred to in the Roper survey.

Recently, Ed Fiez and Dean Falk, with the University of Idaho Extension Service, studied milk production costs and returns; their conclusions are significant. They found at the 18,000-lbs. milk level one can expect \$179 in return to labor, management and risk. But as milk production level increases to 20,000 lbs., or roughly 10% more, the return for labor and management didn't go up 10%... It went up 100%. As we look at the 22,000-lbs. levels, we see a tremendous increase in return for labor, management and risk. Almost three times the original return. Remembering the survey results: If the dairyman is currently shipping 1 million lbs. of milk a year and trying to net \$35,000, the only practical way for him to do it is to increase production to 22,000-lbs. or more and/or increase herd size.

Now if we look at the U.S. averages for production in Figure 4, we're only two-thirds of the way there, so we've got a lot of producers who are not on the competitive edge. Their future as dairymen and providers of income at the comfort level is in jeopardy.

In a study done a few years back, the Stanford Research Institute projected total costs of production in different geographic areas out to the year 2000. In 1987 costs varied from a high \$12.70 in the Southeast to a low of \$10.42 in the Pacific region, or a \$2.28 per cwt. spread between top and bottom. In 1988, even though the total costs rose in all areas, the variance from the average ranged from a high of +\$1.32 to a low

Figure 6. North Valley avg. - Sept. 1994	Herds Ranked By Production Levels		
	low 1/3	middle 1/3	top 1/3
cwts. milk sold/cow/mo.	13.60	16.57	19.20
net receipts/cow	\$159.29	\$189.86	\$219.97
net income/cow	-\$5.29	\$8.21	\$16.39
net income/cwt.	-39¢	+50¢	+85¢

Figure 7. Income/Cow/Mo. North Valley avg. - Sept. 1994	Herd Size			
	<250 (26)	251-600 (56)	601-1000 (22)	1000+ (13)
cwts. milk sold per cow per mo	15.01	16.35	16.74	17.25
net receipts/cow	\$168.21	\$182.66	\$187.99	\$195.44
net income/cow	-\$4.17	\$9.56	\$8.50	\$13.28
net income/cwt	-28¢	+58¢	+51¢	+77¢

Figure 8. South Valley avg. - Sept. 1994	Herds Ranked By Production Levels		
	low 1/3	middle 1/3	top 1/3
cwts. milk sold/cow/mo.	13.85	16.36	18.17
net receipts/cow	\$156.12	\$183.31	\$203.11
net income/cow	-\$2.55	\$5.05	\$13.53
net income/cwt.	-20¢	+30¢	+74¢

Figure 9. Income/Cow/Mo. South Valley avg. - Sept. 1994	Herd Size			
	100-700 (34)	701-1200 (24)	1200+ (23)	3X + 1383 (9)
cwts. milk sold per cow per mo	15.01	16.35	16.74	17.25
net receipts/cow	\$168.21	\$182.66	\$187.99	\$195.44
net income/cow	-\$4.17	\$9.56	\$8.50	\$13.28
net income/cwt	-28¢	+58¢	+51¢	+77¢

WORLD DEMOGRAPHICS

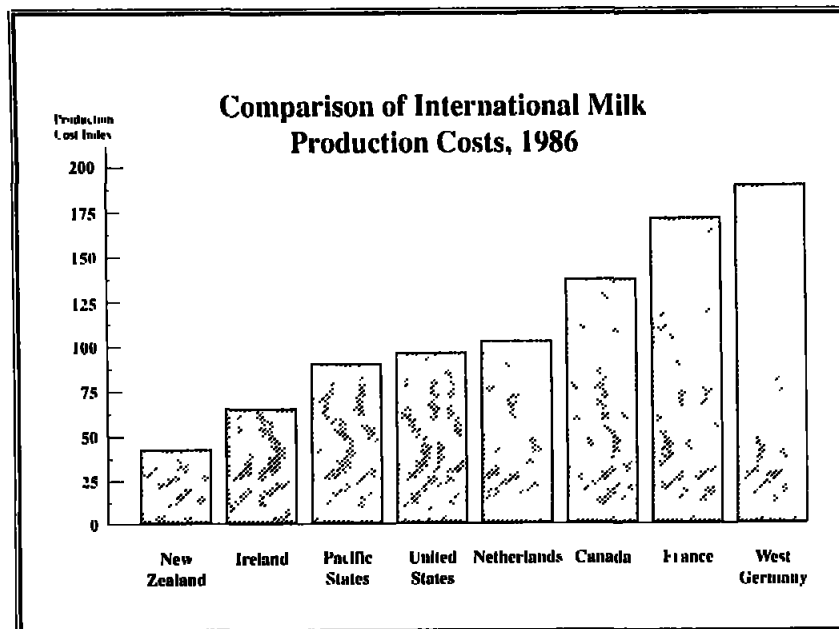
	Million/ People	% Population	% Milk Production
North America	277	5.1	20
South America	450	8.4	5.5
Europe	499	9.3	37
Asia	2,900	56.1	9.3
Japan	125	1,379	
China	1,184		
Korea	70		
Africa	795	14.9	.6
USSR*	291	5.4	23
Oceania	26	.4	3.4

of -\$1.99. When we project out to the year 2000, we see a greater total variance of \$3.85 than we saw during earlier years. In all cases the Pacific states had a tremendous advantage in costs of production. The Pacific region and the Southwest have many cost advantages in common. There is no doubt these areas will continue to grow and lead the rest of the nation by a wide margin in growth. The Northeast shows promise as a dairy area of growth and one that will be able to compete. However, the historic area for milk (or residual milk supply for the United States) is beginning to shrink. The SRI study done in 1986 predicted this would occur and the events since then have shown this to be the case. A significant "retooling" will be necessary before this region rebounds.

If we remember chart 4 showing the top five states in the country (all in the West) averaged 19,000 lbs. of milk and the bottom five states (mainly in the Southern region) with average production of 11,500 lbs., we can get a pretty good sense of who is going to be competitive and who is not. Individuals operating at these lower levels are not going to be able to stay competitive with

those on the other end of the spectrum. This becomes even more important as we become players in the world dairy markets. If we are looking at 8,000 pound differences between averages in production levels in herds that range let's say from 200-400 cows, we are looking at competitive disadvantages you cannot compensate for by cheaper costs of land, labor and other inputs.

I would like to spend some time reviewing data I analyzed from the California Department of Food and Agriculture Milk Stabilization Branch. In California about 20% of all the herds are on state-audited cost of pro-



duction studies. The herds are selected at random and about 15% of the herds are turned over annually. The cost data is collected by field auditors who actually spend time at the dairy collecting the data which is later analyzed, summarized and used in the formula for setting the state's Class 1 price. While the state personnel use these numbers in pricing, many of us use the data for many other purposes including production trends, competitiveness of our members, and so on.

Without question the single most important factor in determining profitability per herd is the level of production. The two major production areas of the state are the North Valley and the South Valley. A review of herds ranked by production level clearly shows a very strong dollar advantage in those herds with higher production. The advantage is in the form of net receipts per cow, net income per cow, and net income per hundredweight. One can argue for

FARM MILK PRICES, 1990-1992 Ranked for 1992			
Country	1990	1991	1992
New Zealand	8.04	4.64	6.07
Australia	9.83	9.26	9.25
United States	13.74	12.24	13.11
Ireland	14.43	13.45	15.33
France	15.44	14.55	15.93
Canada	18.45	19.00	17.50
Netherlands	16.35	16.36	17.60
Germany	17.20	16.38	17.61
Italy	22.68	21.71	22.06
Japan	27.91	30.14	32.06
Switzerland	33.73	32.80	33.39

U.S. DAIRY EXPORTS TO MEXICO

Product	Quantity (Tons)			
	1990	1991	1992	1993 (1)
Butter	7,066	12,011	12,029	714
Nonfat Dry Milk	3,590	19,190	24,480	31,172
Dry Whole Milk	1,278	4,258	3,636	16,308
Condensed Milk	1,392	1,041	1,878	529
Ice Cream	1,561	3,500	4,670	2,961
Casein	366	1,457	1,405	553
Cheese	1,827	3,230	5,923	3,681
Fluid Milk (2)	21,523,916	31,299,164	46,122,721	23,803,730

(1) January - June 1993

(2) Reported in liters

lower costs and other efficiencies, but level of production in general is the most important factor in profitability.

While herd size appears to give some indication of profitability it appears that once the area of diminishing returns is reached net income when measured by cow or by hundredweight is quickly erased. My guess is management loses the ability to keep the operation "fine tuned" and slippage occurs in the

area of feed efficiency and other costs.

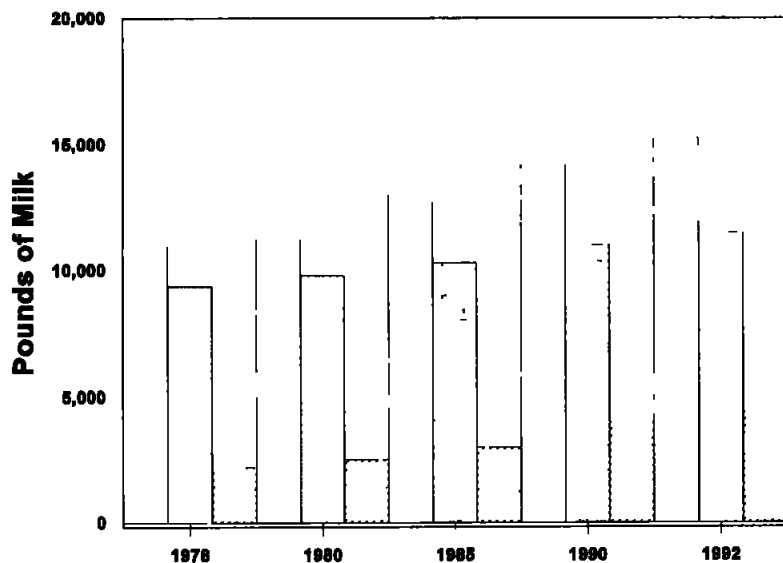
Having looked at regional costs domestically, I would like to turn our focus on world markets; after all, that's what both the NAFTA and GATT agreements were all about. Like it or not we are stepping beyond competing with each other for the U.S. market and looking at international markets. That's what DEEP, DEIP, NAFTA and GATT are all about.

Before looking at world demographics, I want to take a moment and compare U.S. dairy trends with some interesting trends in the European community. The EC-10 has had a very rigid supply management program beginning in 1985. Since 1978 when the EC-10 dairy herd numbered 25 million, it is now below 19 million – a six million cow reduction while, during the same time, the U.S. herd decreased by roughly 1 million head. The EC-10's rate of reduction was about 2.5 times the U.S. rate.

An even more interesting trend to look at is per cow production. The difference between the U.S. and the EC-10 was about 2,200 lbs. per cow, or 78% of the U.S. level. In 1992, the difference increased to 4,400 lbs. per cow. In other words, EC-10 yield had dropped to 72% of U.S. yield.

How much of loss of productivity was due to the quota system? If this trend continues won't the European Community become even more uncompetitive? Without increased subsidies or a renewed interest in regaining it's lost rate of productivity, the EC-10 may be over run with

U.S. - E.C. MILK/COW DIFFERENCE



**Projected Import Demand
Growth for Dairy Products, 1990 to 1996**

Country	1990	1996	%90-96
	(million lbs , M E)		(%)
Indonesia	485	734	+51
Malaysia	1,327	2,064	+56
Philippines	1,614	1,896	+17
Thailand	1,230	2,035	+65
S.E. Asia	5,099	7,418	+45
Japan	1,828	2,372	+30

Source: International Dairy Federation. S.E. Asia inc. Singapore

imports from less expensive products produced more efficiently elsewhere.

In one of the publications that John Naisbitt has written, *"Mega-trends 2000"*, he predicts a number of things are going to occur over the next few years. For the rest of the 1990s and into the year 2000, he predicts a booming global economy and that North America, Europe and Japan will actually form a great triangle of Free Trade. (This was written before GATT, NAFTA or DEIP.) If this is going to occur, dairying will need to become part of the big picture. He says we will soon learn to forget about the term "trade deficit" between the U.S. and Japan. His example is, can anyone tell us what the trade deficit is between Rochester and Syracuse, Seattle and San Francisco or Denver and Dallas?

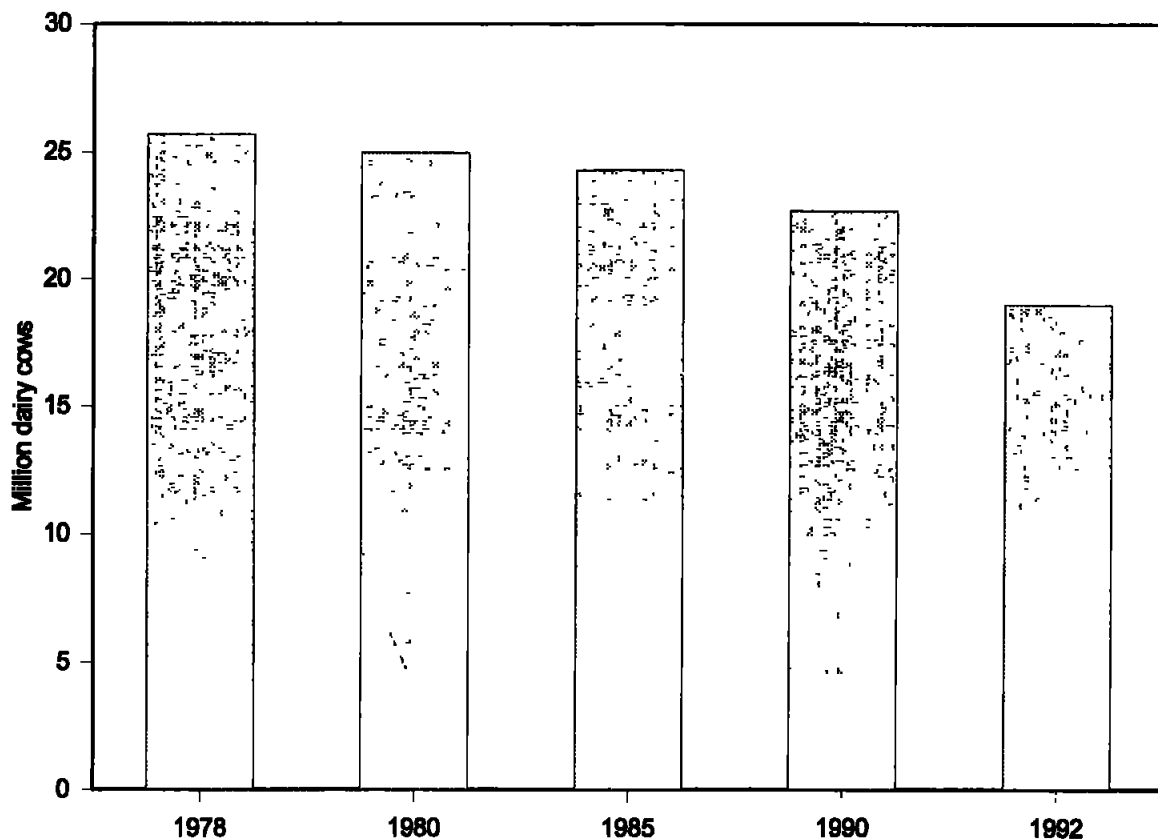
He calls for an emergence of free market socialism. Basically, protectionism as such is dying, and

it is dying very quickly. As the globe becomes smaller and smaller you learn and need to be competitive. Naisbitt talks about the rise of the Pacific Rim. Its population is more than twice that of the U.S. and Europe combined. He says Los Angeles, Sydney and Tokyo will replace New York, London and Paris as the cities of World Trade and World Importance in the years to come. He talks about the late 1990s becoming the 'Age of Biology' in the world economy. (Maybe biotechnology is more accurate.)

In looking at the numbers we can see the tremendous potential in Asia for dairy products. While that part of the world has 56% of the population, it only produces 9.3% of the world's milk.

Let's see how we stack up using cost of production numbers. Even though the data in Figure 11 is somewhat dated, I believe the relationship between

Dairy cow herd in the EC since 1978



costs is still pretty much in line. As you can see, the U.S. and especially the Pacific states can compete very well internationally. Even though New Zealand has by far the cheapest costs in the world, its total production is about equal to California's and it is questionable just how much more "cheap" production growth is available there.

If we examine our competitiveness based on farm milk prices we get an even better perspective about what our relative position is with competing nations for dairy sales. If GATT truly does moderate the level of farm subsidies, we should be nicely positioned to sell dairy products in a number of markets.

We can see some of the markets that could be real boons for our dairy producers in the near term. In fact, Mexico has been a real bright spot for U.S. dairy products since 1990. Even though the DEIP program helped make us competitive in this market, the per capita income growth in Mexico is creating a whole new generation of buyers with money to spend. Currently, per capita consumption is about one-third that of the U.S. With over 90 million con-

sumers, Mexico should remain an excellent growing market for years to come.

The National Dairy Board recently published some data showing projected demand in Southeast Asia for the 1990-1996 period. Their numbers indicated a 45% growth in dairy imports.

As these growth trends continue to develop in international markets, it becomes increasingly evident that only those producers who are committed to increasing production levels and efficiency levels will be in a position to compete for the marketplace. The marketplace as we have known it is being redefined with a new global perspective. Those producers who expect to be players in the next century will have to be innovators. Their abilities to manage will have to be keen. They must be able to adopt new technologies and adapt to changing markets. They will have to be in the upper end of the management scale. High production per cow; low costs per pound of milk produced. They will have to make things happen.

notes
