Staff Paper Series

THE U.S. DAIRY INDUSTRY TODAY: TRENDS AND PROBLEMS[1]

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Staff Paper SP92-23 October 1992

FOOD AND RESOURCE ECONOMICS DEPARTMENT

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ABSTRACT

This paper outlines the current U.S. dairy industry situation and comments on the problems it faces. It postulates that the industry, while successful in providing good cheap milk and milk products, has done so through politically determined rather than economic prices. It shows the apparently strong financial situation of the average dairy farm. The paper states that herds will continue to get bigger and become fewer while governmental funding of output increasing technologies exists. It argues that governmental purchases of the surpluses and artificial disposal of these surpluses must also continue while supply increases faster than demand. The paper outlines changes in dairy policies and suggests that the declining power of the dairy lobby and governmental efforts to reduce federal and trade deficits will prevent any sustained increases in milk prices. The conclusion is that current government policies hinder dairy industry unity.

Key words: dairy industry, deficits, policy, financial picture, demand and supply, milk products.

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INTRODUCTION

The main purpose of this paper is to outline the current situation in the U.S. dairy industry. It attempts to show the main causes for this situation and their consequences. This attempt assembles a lot of recent data and therefore provides a brief but hopefully complete synopsis of the industry today.

The two basic problems currently associated with the industry are firstly the increasing reluctance of the federal government to support dairy prices at previous levels and secondly the inter dairy industry squabbles stemming from this reduced public sector support. The results of the dairy supports have not been digested because milk prices for 1992 will probably stay above 1991 prices and be only a little below 1989 and 1990. The real consequences will only be felt when milk production expands sufficiently. There is little likelihood of nearby problematic surpluses as cow numbers continue to fall and cow slaughter remains high. So much depends on the future adoption of output enhancing technologies.

The paper is in four main sections. The first deals with the reasons why there is less public support for the industry. This section emphasises the role of and the current strong support for GATT from both political parties. The second section presents the rationale for a dairy industry and concludes that this industry has succeeded in its basic task of providing a plentiful supply of widely available and relatively cheap dairy products. Hence past govermental dairy policies could be considered successful.

The third section looks at the industry in some detail. It outlines trends in demand and supply and ends with a detailed examination of the finances of the average dairy farm. The conclusion is that this average farm is doing rather well. The corollary is that perhaps dairy farmers do not need public support. The final section builds on the average dairy's current financial situation and suggests that the future will not be as good. This postulation derives from the declining govermental support for the industry which will be reflected in reduced support prices. The paper concludes with some final remarks.

(1) U.S. trade and federal deficits: their influence on GATT and U.S. agricultural policy (8)[*]

(i) the deficits

The U.S. runs a negative trade balance. This means that extra imports are financed by selling assets or by borrowing. Selling assets reduces the domestic investment pool. Borrowing means that some of the future earnings must go for debt service rather than investment. Increased borrowing may also increase the cost of debt capital. The U.S. generally finances the trade deficit with debt.

This deficit is compounded by a continuing federal deficit. There are various estimates on just what is owed. One estimate of the total federal debt is $6 trillion, the current federal deficit $450 billion, and the annual interest on this debt $170 million. By taking $25,000 from every man, woman and child in the U.S. would erase all the debt. (main author's figures and calculations). This is, of course, unlikely to happen. However the U.S. government will continue to spend more than it receives in revenues. This federal deficit is also mainly debt financed, which reduces the potential investment pool with increased debt service costs and drives up the cost of debt capital. The U.S. has

[*]The numbers in brackets refer to the bibliography.

run both trade and federal deficits for a long time. Managing these deficits makes it difficult to achieve sufficient investment in the U.S. for a healthy domestic economy and export competitiveness.

(ii) deficits and GATT

The U.S. government is attempting to reduce both the federal deficit and trade balance without producing political unpopularity and domestic trama. GATT is popular with the trade deficit worriers because they believe that the U.S. will gain more from increased exports than it will lose from increasing imports. The federal deficit group are looking at ways to both expand revenues and cut spending. Japan is a favourite target for both groups and it will get more publicity as the U.S. increasingly focusses on international markets.

For example, ex- prime minister Yasuhiro Nakasone gave a speech in Tokyo on May 11 on U.S.-Japan relations (16). While he generally supported GATT he had problems with its application. He stated " Such international rules are not uniformly applied. Depending on the level of economic development of a given country, certain privileges are granted as exceptions to the rule.....In such cases, as in golf handicaps, each nation must be assigned its own handicap recognised by others."

His point is a good one. He suggests the GATT rules be applied discriminatorily, awarding each case or industry in each country a handicap based on their status quo. This concept is particularly important for farm sectors especially in the world's major trading blocks. So the trade and federal deficits and the agricultural sector of the U.S. are inextricably interrelated. ".....but creeping entitlements have kept the deficits growing. Three fifths of federal spending goes on mandatory entitlements: social security, Medicare, farm subsidies, food stamps"(14b).

(iii) GATT, farmers and agricultural policy changes

U.S. row crop farmers made a lot of money exporting their products in the mid 1970s. In fact the agricultural sector still maintains a healthy trade surplus despite some hard times in the early 1980s. For example, the 1991 positive trade balance was $18 billion and 1992's forecast is for $15 billion (23). However there is increasing pressure to reduce agricultural payments and other supports as the government attempts to reduce the federal deficit. The 1990 farm bill was the latest in this attempt and it hit the dairy industry particularly hard (7).

Farmers are understandably somewhat upset. But so, unfortunately, are consumers. As several newspaper articles have mentioned (18), consumers gererally feel that their taxes should not go to farmers who produce what is already in surplus. They resent subsidies for producers to add to these surpluses and more subsidies to domestic and overseas groups who are given or can purchase these same commodities at lower prices than consumers have to pay. For example "The U.S. announced on June 2 1992 the donation of 21,000 m. tons of butter to the Russian Federation.....the butter will come from CCC stocks..... The estimated value.....was $30 million. CCC will also pay approximately $4.5 million for ocean transportation costs" (21).

U.S. consumers are also not in favour of subsidies for not producing and by and large are indifferent to the source of their food provided this food is cheap, fresh and easily obtainable. Farmers no longer have the domestic sympathy they once had despite providing U.S. consumers with the most widely available and cheapest food in the world. Consequently it is not surprising that reductions in farm sector public expenditures are now increasingly likely.

American farmers would generally have preferred the pre GATT Uruguay situation to continue. There are few strong farm supporters of GATT in the U.S. (18). The recent letter from a mid-west farm group to Prime Minister Miazawa is one timely example. The Canadians apparently

feel the same way judging by their estimated 40,000 strong demonstration on Parliament Hill, Ottawa in mid February. This was stated to be the largest farm demonstration in Canadian history (Ibid). there have also been large gatherings of vociferous French farmers, the last one ostensibly against the French government's lenient subsidies for the Eurodisney complex outside Paris. President Bush unexpectedly met an angry group of Australian farmers during his visit there and learned firsthand about their dissatisfaction with GATT. It is perhaps fair to conclude that developed nation farmers are generally not strong GATT supporters when they see their subsidies withdrawn by governments keen to profit from freer trade.

(2) U.S. dairy industry rationale and performance

(i) rationale

The main purpose of the U.S. dairy industry is to provide cheap and widely available fresh milk and milk products for domestic consumption. If this simple objective cannot be achieved then there is a strong case for relying on imports. The U.S. dairy industry does supply reasonably priced milk and products to American consumers. But there is considerable subsidisation to make this possible. Support prices for milk, butter and cheese are up to three times those on world markets (14). "Even the USDA estimates that the costs of the dairy programme between taxpayers and consumers at $10 - $12 billion a year" (Ibid).

Less than 1% of powdered milk and butter and less than 4% of cheese consumed is imported. Milk, cheese and butter retail prices are higher than in practically every other developed country, but take home wages tend to be higher in the U.S. Furthermore food expenditures per dollar of disposable income are much lower. (The U.S. average food expenditure per dollar of disposable income is around 13 cents, compared with Europe's at 26 cents). So dairy prices do not impose undue hardship for the average U.S. consumer. Therefore the U.S. dairy industry is generally successful in meeting the cheap, fresh and easily available requirements of its domestic market.

(ii) performance and governmental influence

Dairying has tended to be among the most government protected enterprises and therefore dairy farmers may have the most to lose from GATT via reductions in governmental supports. The U.S. 1990 farm bill is perhaps a precursor of what is to come in terms of reduced supports. Consequently it might be useful to look at industry performance up to this watershed year.

Firstly it is interesting that the dairy industry has retained a remarkably steady proportion of farm cash receipts over the years (price x quantity sold per annum = cash receipts). For example, in 1950 dairying received 23% of the total livestock receipts in the nation and 13% of the total farm receipts. These proportions have remained almost identical since then. The 1970 figures were 22% and 13% and 1990 were 23% and 12% respectively. So if dairying has been changing then it has changed proportionally along with the farm and livestock receipt changes (15).

U.S. dairy herd numbers are declining rapidly and increasing in size at the same time (6). The smaller farmers are leaving dairying while the large farms are getting larger. Milk cow numbers continue to fall slowly while dairy technology is exploding with output enhancing techniques. Because the results of the latter exceed the former there has been an oversupply of milk for years that has only been alleviated by governmental purchases of specific milk products. Enormous stocks have accumulated which were mainly reduced by overseas and domestic dumping (5).

The U.S. still has too many highly productive milk cows and too much output increasing technology. Both occur in better and better managed and increasingly larger herds which exploit these advances with ever greater productivity. It appears likely that the number of dairy farms will fall from 182,000 in 1991 to perhaps 128,000 by 2000 as a result of this technology (20).

(iii) regionalisation of production

Milk production is also becoming increasingly regionalised (11). For example the corn belt had 17% of the milk production in 1965. This share fell to 12% in 1980 and 11% by 1990. At the same time the Pacific region went from 9% in 1965 to 13% in 1980 and is now around 19%. Different states reflect different patterns. Half the states now produce less milk than 30 years ago (6). Wisconsin is, and has been, the leading dairy state at least since world war II. California is now in second place and if its expansion continues it could well replace Wisconsin. New York, the major state a century ago, is now number three, followed by Pennsylvania, Minnesota and Texas. Over half of the dairy output comes from the top five states. The top two alone provide nearly a third of total U.S. milk output compared with 20% some 30 years earlier. In general the largest milk producing states are gaining market share (Ibid). Thus dairy incomes are much more concentrated today and there are firm signs that this trend will continue.

(3) the U.S. dairy industry

(i) background

"The power of American dairy farmers is not unrelated to their munificent financial contributions to Congress." (14). It is important to grasp this opinion. Milk and milk product pricing in the U.S. is as much political as it is economic. The industry is no different in this conundrum than in any other developed nation. In fact there is good evidence to suggest that U.S. dairy policies favour domestic consumers rather more than in other nations. (1).

The basis for the present system of marketing orders was set when the New Deal divided the U.S. into 44 milk regions. Each region had a local co-operative with sole control over the marketing in that region, via milk marketing orders. Specifically, the 1937 Agricultural Marketing Act "permitted milk producers to adopt marketing orders regulating the marketing of milk eligible for beverage use (Grade A) in a specific marketing area" (2). The main objectives of these marketing orders have been to provide orderly milk marketing, to stabilise prices and get adequate milk supplies to consumers. It seems fair to conclude that they have achieved these objectives. The order structure has adapted to technological, population and production changes. For example, while there were 83 orders in 1962, there are only 40 today (1).

The furor continues on the future of these orders, concentrating mainly on class pricing differentials for Grade A milk and pricing reconstituted milk (9). There are typically three classes of milk making up Grade A milk in a typical milk marketing order. Class 1 milk includes whole, lowfat and skim milk. Class 2 is used as fluid cream or in soft dairy products. Class 3 is used in making cheese, butter and nonfat dry milk. Pricing falls from 1 to 3 with class 3 called the formula price. Classes 1 and 2 are priced at a fixed differential from this formula price (2). The main squabbles concern the Class 1 and 2 differentials (3,4). The battle is both political and economic. This battle, coupled with the fixed price support in the 1990 Farm Bill have produced some considerable differences within the dairy industry (7).

The class 2 differential is around 10 cents. The class 1 differential is meant to reflect transportation costs of carrying milk from surplus to deficit areas, the supply and demand conditions for milk, marketing costs for fluid milk and the relative cost of producing Grade A and Grade B milk.

Grade B milk is milk considered unfit for drinking. Today practically all U.S. milk is grade A. The class 1 differential was raised in the 1985 Farm Bill but not equally across regions. Any differential change between regions provides new price signals which affect local milk supply by encouraging or discouraging local production. Hence the politics and the within industry arguments.

(ii) domestic demand for dairy products

This section looks at demand via per capita consumption. These consumption figures are presented in table (1).

Table (1): U.S. per capita consumption of the main dairy products (lbs.) (selected years).(11)

Year	Fluid Milk & Cream	Butter	American Cheese	Other Cheese	Cottage Cheese	Ice Cream	Ice Milk	Evaporated and Condensed Milk
1977	258	4.3	9.2	6.8	4.7	17.5	7.1	8.2
1980	246	4.5	9.6	7.9	4.5	17.5	7.1	7.1
1984	238	4.9	11.9	9.6	4.1	18.2	7.0	7.4
1988	235	4.5	11.5	12.2	3.9	17.3	8.0	7.7
1990	233	4.4	11.1	13.5	3.4	15.7	7.7	7.9

Between 1977 and 1990 the U.S. population grew from 220 to 250 million, an increase of nearly 14%. During that time their per capita consumption of all dairy products (including some items not shown in the above table) went from 324 lbs (weight of the actual products consumed) to 309 lbs, a decline of nearly 5%. So it appears that any sustainable increase in domestic demand for dairy products must come from population increases.

The main individual components have all fallen, apart from the non American cheese category (mainly Italian types). Americans are now eating twice as much cheese as they did some thirteen years earlier. But the most striking and worrying figure for the dairy industry is the nearly 10% decline in fluid milk consumption. U.S. consumers consume most of their dairy products as fresh milk. This decline is particularly troublesome as some 22% of fluid milk is now taken with breakfast cereals which have increased their consumption 37% in the past 20 years (22). Thus even this increase has not prevented a significant decline in fluid milk consumption and it is doubtful whether breakfast cereal consumption can increase much more.

(ii) the supply of dairy products

How have dairies responded to the trends presented in table (1)? Some of the salient figures are shown in table (2).

Table (2): Milk Production, Cow Numbers and Milk Prices (selected years)(10,11)

Year	Milk Cows on farms, average ('000) during year	Milk Production		Avg. farmer price/ $ cwt.		
		per cow (lbs)	total (billion lbs)	milk wholesale	fluid milk	manufactured milk
1965	14,953	8,305	124,180	4.23	4.63	3.34
1970	12,000	9,751	117,007	5.71	6.05	4.70
1975	11,139	10,360	115,398	8.75	9.02	7.63
1980	10,799	11,891	128,406	13.05	13.23	12.01
1985	10,981	13,024	143,012	12.76	12.90	11.72
1990	10,127	14,642	148,284	13.73	13.89	12.34
1991	10,011	14,835	148,522	12.24	12.31	11.00

The table shows that cow numbers have fallen 33% since 1965 while yields have risen 78%. The overall effect is a 20% increase in the total amount of milk produced. The nominal price of fluid milk rose 220% during the 1970s and then fell 7% in the 1980s. It declined 11% between 1990 and 1991. The fluid/manufacturing milk price ratio was 1.4 in 1965 and has fallen continually until the 1980s when it levelled off at 1.1. So fluid milk has essentially lost the premium it once had over manufacturing milk.

(iii) dairy farm finances

This section shows how the trends in the previous two tables have affected the finances of the average dairy farm. Table (3) shows some of the income effects (11).

The income statement for the average U.S. dairy farm looks healthy. Gross cash income increased 28% over the 1987-1990 period. However, variable cash expenses grew 35%. Consequently dairy farmers' net cash income grew 15% and net farm income only by 12%. Feed makes up a little over 40% of these expenses and feed cost increased 45% between 1987 and 1990. Labour, the second largest variable cash expense, or 12% of these expenses, increased 14% during the period. Thus the average dairy farmer is probably more concerned with rising feed costs than with increasing yields.

Averages unavoidably mask individual farm situations. Therefore the following table presents two basic performance figures over the same period for dairies classified according to gross annual sales (11,10). For example, the net cash farm income figures in the first row of the table refer to the average dairy farm that has over $500,000 in annual sales.

Table (3): Farm business income statement for the average U.S. dairy farm ($ per farm)(10,11)

	1987	1988	1989	1990
Gross cash income	137,022	148,355	162,009	175,183
• of which milk sales	126,192	137,559	149,898	164,875
Cash expenses				
• variable	85,138	96,396	106,993	115,678
• fixed	18,153	18,488	18,820	20,734
• total	103,290	114,883	125,794	136,412
Net cash farm income	33,732	33,472	36,216	38,771
Adjustments				
• minus depreciation	13,349	12,789	15,127	13,864
• labour: non cash benefits	944	788	873	1,094
• plus				
• inventory change	6,912	1,286	14,628	5,307
• non money income	3,081	2,364	3,661	3,716
Net farm income	29,432	24,446	38,504	32,835

Table (4): Net cash farm income and net farm income for average U.S. dairy farms classified by economic class between 1987 and 1990 ($ per farm),(10,11).

Class	1987	1988	1989	1990
$500,000 +				
N.C.F.I	228,096	188,923	200,542	198,64
N.F.I.	175,994	138,934	186,456	150,451
250,000 - 499,999				
N.C.F.I.	83,383	69,488	75,339	77,976
N.F.I.	76,030	56,818	73,877	67,264
100,000 - 249,999				
N.C.F.I.	39,499	38,371	40,780	37,736
N.F.I.	33,123	24,421	42,714	32,613
40,000 - 99,000				
N.C.F.I.	18,571	17,871	18,646	19,740
N.F.I.	17,940	13,516	23,459	17,405
Less than 40,000				
N.C.F.I.	3,121	1,670	(256)	3,172
N.F.I.	3,622	3,596	3,850	4,739

The most obvious point in this table is the variation in returns in both categories in all the economic classes. It is almost axiomatic that dairying provides regular income throughout the year. Yet net farm income had a range of 34% for the two larger groups during the 4 year period, and nearly 75% for the next two. These fluctuations do not make it easy to plan future investment. The second point is that net cash farm income was lower in 1990 than in 1987 for the 3 largest groups and net farm income was also lower in 1990 in the top 4 groups. Again, this situation makes future planning difficult.

There are some regional differences in average dairy farm figures (those summarised in table 3) in the 10 dairy regions in the U.S. Net farm income for the average dairy farm within a region varied considerably between 1987 and 1990. But perhaps the most interesting fact is the comparative variation between regions. Net farm income during this period varied 30% in the Northeast, and 60%, or twice as much in Appalachia, and the Lake states. In contrast, net farm income fluctuated 200% in the Corn Belt, Southern Plains and Pacific regions, 270% in the Mountain, and Delta regions and around 310% in the Northern Plains and the Southeast. It is not surprising that the dairy industry is having difficulty speaking with unanimity.

Fluctuating incomes affect balance sheets. Therefore it is important to examine what has happened to dairy farmers' wealth over this same four year period. The average dairy farm balance sheet is shown in table (5).

Table (5): Dairy balance sheet for an average U.S. dairy farm for the period 1987-1990 ($ per farm)(11)

	1987	1988	1989	1990
ASSETS				
• current assets (CA)	90,871	58,208	78,246	83,799
• of which				
• cash and equivalent	56,425	23,841	21,436	22,761
• crop inventory	16,448	15,115	22,665	20,937
• livestock inventory[1]	13,508	13,260	29,411	34,915
• long term assets				
• of which				
• land and buildings	255,967	282,471	324,746	326,282
• breeding animals	71,929	73,992	71,923	69,473
• equipment	69,200	68,372	75,749	82,610
• Total long term assets	399,326	427,780	474,956	481,022
Total Assets	490,197	485,987	553,202	564,821
LIABILITIES				
• current (CL)	32,741	25,827	26,394	26,116
• long term	84,823	78,556	80,605	88,429
• non real estate	NA	24,650	29,706	22,013
• real estate	NA	53,906	50,899	66,416
• Total Liabilities (TL)	117,564	104.383	106,999	114,544
EQUITY	372,633	381,604	446,203	450,277
Total liabs and equity	490,197	485,987	553,202	564,821

[1]excluding breeding animals

During this period, assets grew 15%, while debt fell 3% and equity increased nearly 21%. This good performance is enhanced by the apparently improved liquidity on this average farm. The current ratio (CA/CL) has risen from 2.78 to 3.21, showing potential for immediate new equity investing. There is nearly $60,000 working capital (CA-CL) to play with. The debt structure ratio (CL/TL) fell from 27% in 1987 to 23% in 1990, thus reducing the burden of nearby debt service.

All this seems healthy. But there are some troubling signs. Firstly, current assets fell over this period. The 1990 cash cushion was less than half the 1987 figure. Secondly, current assets were 17% of long term assets in 1990 compared with 23% in 1987. Dairy farmers were apparently using these assets to invest in real estate. Real estate values during this relatively low period of inflation, increased 28% and were 58% of total assets in 1990 compared with 52% in 1987. But real estate is an illiquid asset that is not as directly productive as milk cows and may therefore well adversely affect future liquidity. And it is increasingly important to maintain sufficient liquidity as times get tough. This is particularly hard for the smaller dairy farms which inevitably have greater proportions of real estate assets and are therefore often less liquid than the larger units.

(3) recent U.S. dairy policy (7)

(i) general events

The U.S. dairy industry has gradually shifted in the last half century from its traditional price and income support policy which attempted to support the family farm. It later aimed at providing reasonable incomes for dairy farmers. Over the last decade the policy has changed to roughly match supply and demand. These policy changes broadly stemmed from declines in the enormous political clout that the dairy fraternity once possessed. But times have changed and the dairy lobby has gradually lost influence over the past decade.

The current budget crisis and differences within the dairy industry have further reduced its political clout. Perhaps nothing shows the industry's current comparative lack of power better than the dairy section of the 1990 farm bill. The main points are well summarised by Pollack and Lynch (7) who emphasised the following:

- the minimum support price was set at $10.10 per cwt.
- this price will be increased at least 25 cents each January 1 that the dairy product surplus is estimated to be less than 3.5 billion lbs. for the following year (total milk solids equivalent).
- the support price will decrease by 25 to 50 cents each January 1 that the surplus is estimated to be more than 5 billion lbs. but in no case will the support price be less than $10.10.
- the support price will be unchanged if the surplus is between 3.5 and 5 billion lbs.
- if the surplus is estimated to be above 7 billion lbs. in any year from 1992 to 1995, USDA is authorised to collect assessments to reimburse the CCC for the cost of purchasing above 7 billion lbs. An additional assessment of 5 cents per cwt. in calendar year 1991 and 11.25 cents in 1992-95 will be imposed. These assessments will come from the producers who have increased their production during that period and will be given to those who have not.

The result of these proposals has been, along with all the other changes mentioned earlier, to encourage more disunity in the dairy industry than for 50 years. Few of the potential effects of the bill have been felt so far because milk prices have stayed well above the support price. For the first two quarters of 1992 the U.S. average milk price was around $12.87 (21). But milk prices are expected to decline in the near future (24), and so the potential for disunity remains. It occurs among the different regions in the country and between the different nodes in the dairy chain. There is, however, some unanimity on one part of the bill. Few in the dairy industry accept the idea of transferring wealth from the low cost to the high cost producer which is essentially what the fifth summarised point in the farm bill demands. Low cost producers generally wish to increase their production, while the high cost producers generally do not. The crux, reflected even in casual reading of trade publications, is a lot of uncertainty in the industry. How did the industry get to this state?

(ii) events in the last decade

The dairy industry has gone through a decade of rather conflicting policy and is understandably in an uncertain period. It has experienced lowered price supports, a dairy buyout scheme and the introduction of producer assessments. All these policy moves were adopted to restrict production. Yet, paradoxically, most governmental supported funding has gone into scientific research aimed at increasing output. The individual dairy would have probably benefited more from research into areas such as marketing, product differentiation or lower cost feeding than from increasing yields per cow.

The results of a decade of funding output enhancing technologies have produced a 20% increase in cow yields and a 15% increase in overall supply while demand only grew some 3%. Thus Commodity Credit Corporation purchases to remove the consequent surpluses have been substantial. For example, one annual purchase was the equivalent of the total output of California, the second largest milk producing state (4). Their annual purchases typically matched one quarter of the nation's butter and 40% of the nonfat dried milk. During the first three months of 1992 alone the CCC purchased 218 million pounds of butter. These huge purchases of fat suggest that the industry has a severe surplus fat, rather than a surplus milk problem (13).

Markets must be created for surplus milk products. These markets tend to sell products at discounted prices to qualified consumers only. Once created, expectations rise among the demanders and the suppliers that these subsidisied markets will continue. Reducing these markets creates political noise, especially when coupled with accusations of discrimination. The surplus problem is compounded as reducing surpluses may make economic sense but it may well lead to social and political problems for those bold enough to advocate change. And it does not help in predicting future dairy industry stability.

Through the late 1980s there were two significant events for the dairy industry (7). One was the general U.S. drought. The second was a change in the EC dairy price policy. Consequently U.S. milk prices rose to a 10 year high, rising to $13.85 by January 1990 (10). High prices encourage more production, more cows and more interest in dairying. Just as perceived scarcity produces high prices so too much product causes price collapses. The milk price fell between February 1990 and February 1991 more than it had in a generation. In some areas, including much of the South, prices fell by 25%. This practically unique price volatility again did not help in maintaining a stable and peaceful dairy industry. Additionally, the political efforts to reduce the federal deficit prevented any chance of lobbying for higher milk prices.

The result of all these problems has been increased disunity within the industry and frustration on how to cope. These disagreements are most visible between both members and non members of the dairy cooperatives. There is also considerable criticism of the whole federal milk

marketing order system (9). It is not yet clear who will seize the reins but it is inevitable that there will be more changes in the future.

(iii) what is next for the industry?

In the present state of flux it is a bit hard to forecast what will come next. There are, however, two problems that the industry is only just beginning to experience. One problem concerns the gradually changing diet of the American people. There is a strong concerted effort to reduce the amount of fat in their diets. This looks to be already ingrained in the young and it is hard to see anything that will reverse this trend. It is not simply a yuppie trend. It is seen in all economic classes and all races. In effect the trend means less consumption of whole milk, butter and full fat cheeses as well as red meats. The recent change in the previously hallowed USDA food triangle emphasising the portions and balance of daily food types is indicative of the trend. The triangle now advertises greater reliance on grain products and less on meat and dairy products.

An example of these charging trends is per capita beef consumption, which peaked in 1980 after climbing continually since around 1950. It has fallen gradually since it peaked and now is at about early 1960s levels. Poultry per capita consumption overtook beef in the mid 1980s and is now 33% of total per capita consumption of meat, poultry and fish. And, while total per capita fat and oil consumption is still climbing, animal fat consumption has declined steadily since world war II and is now around one fifth of vegetable oil consumption (22). Interestingly, it has been suggested that the dairy industry suffers from a butterfat surplus rather than a milk surplus (13). Hence the National Dairy Board's number one priority for 1993 is to increase the commercial utilisation of milkfat.

The second problem involves the increasing environmental awareness in the U.S. Ground water contamination, slurry disposal, runoff, flies and even noise from dairy operations make it increasingly difficult to start large confined dairies. Even existing ones are facing growing environmental and nuisance legislation. For example, Florida taxpayers have spent over $8 million dollars buying out large dairy operations that have contributed to increases in the phosphate levels of Lake Okeechobee (12). Yet the remaining dairies have been accused of adding sufficient phosphate to the lake in the last two years to exceed state limits by 40%.

It is estimated that cows produce 20 times the waste volume of humans. Several of the proposed new dairies in North Florida, which is where the deplaced southern Florida dairies are relocating, will be well over 1,500 cows. One is proposed for 10,000 cows. If the dairies are built, much of their waste will be liquified and sprayed untreated on to the ground. A Gainesville Florida attorney, James McPherson, says "..the dairy has many more attributes of an industrial facility than a farm. It discharges a great deal of pollutants into the air and water, it operates on a 24 hour basis with large trucks coming and going at all times, DER regulates it under industrial waste rules..... it looks like an intensive industrial facility rather than a bucolic farm" Ibid.

(4) Final remarks

There are considerable economies of scale in dairy production. Large dairies tend to produce milk more cheaply than small ones do. These economies stem from buying major inputs in bulk, spreading fixed costs and managerial expertise, and better labour productivity due do more generous labour packages. Therefore herds will continue to get bigger, at least during the 1990s. The majority of dairies are still small scale. The average dairy herd in the U.S. has 55 milking cows. (The above 1,500 cow unit is the equivalent of 27 average herds.) Regional concentration may continue at an even quicker rate than now as smaller scattered dairies give up. There may also be advantages for those herds which rely on forages both from cheaper feeding and less environmental pressure on their more land extensive methods of production.

In summary, the dairy industry probably faces more problems than ever before. Domestic demand is unlikely to increase more than 3% a decade if consumers are presented with the same products they have today. It is more likely that demand will fall a bit, particularly with the growing awareness of the effects of fat consumption in a predominantly sedentary lifestyle. Support prices are more likely to fall than rise. The industry's political power may also continue to decline. Herd expansion and confined herd start-ups must cope with legal as well as economic barriers. The beef people are probably capable of preventing another dairy buy out scheme. There is a lot bickering within the industry which may result in a permanently changed marketing chain for milk.

Through most of the 1990s the supply of milk products will continue to be greater than demand unless the Dairy Export Incentive Programme expands. But as this export programme is an additional subsidy there may be political reluctance for a major expansion. This means that the domestic programme, via the CCC must continue to buy milk products to maintain farmers' prices. This in turn means that the CCC must keep the domestic markets it has created to get rid of surpluses, just to avoid paying for large inventories. And this in turn means that those receiving subsidised products will increasingly expect to receive this wealth transfer, which finally means that the political storm from eventually removing these tax funded gifts will become unacceptable for the politicians representing the recipients.

In essence it can be seen that the dairy policies in America have a lot to do with politics and little to do with economics. Even the support price mechanism for milk is convoluted and lacking common sense. The basic govermental dairy support price, which dictates dairy farmers' incomes, is derived from class 3 milk which is mostly used for manufacturing milk products. Cheese is the major manufactured product and so cheese becomes the main factor in determining the Minnesota-Wisconsin (M-W) milk price, from which milk prices are determined nationwide. Estimates postulate that 75% of the M-W price is due to the cheese price and 92% of the variability of this price is explained by changes in the cheese price (17). So dairy farmers' incomes essentially derive from cheese prices rather than the main use for their output, namely milk for drinking.

The dairy industry itself cannot be expected to solve situations it did not create and was originally encouraged to respond to. The government in a commendable effort to influence supplies of cheap and high quality milk and milk products has created a monster that it lacks the courage to challenge. Until it finds that courage the dairy industry will remain in disarray. And in all probability it will remain there for a long time to come.

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