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THE FUTURE ROLE OF THE U.S. IN WORLD DAIRY MARKETS

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THE FUTURE ROLE OF THE U.S. IN WORLD DAIRY MARKETS

W.D. Dobson

EXECUTIVE SUMMARY

The U.S. dairy industry was a bit player in dairy exporting and foreign direct investment in dairy-food businesses during much of the 1990s and early 2000s. But U.S. dairy companies became more important exporters beginning in the mid-2000s when international and domestic developments changed the economic environment facing the U.S. dairy industry. Globalization trends—which previously had little effect on the U.S. dairy industry—created important opportunities for expanded dairy exports in the mid-2000s. Global and domestic developments that expanded opportunities for U.S. dairy exports include the fall in the value of the U.S. dollar, a decline in European Union (EU) dairy exports, production shortfalls in other major dairy exporting countries, the North American Free Trade Agreement (NAFTA), and declining real government support for segments of the U.S. dairy industry.

U.S. dairy exports during the next several years will be shaped in important ways by the following developments:

- Reduced USDA support prices for nonfat dry milk (NDM) and production shortfalls in other exporting countries will help to maintain relatively large U.S. exports of that product. U.S. whey exports also will continue to be robust because of the host of uses for whey products, substitution of whey for NDM by foreign processors, and the absence of USDA supports that price U.S. whey products out of international markets.
- While U.S. butter exports increased in 2007, it is questionable whether U.S. bulk butter can remain price competitive in international markets over the longer-run.
- Prospects for U.S. cheese exports are difficult to assess partly because of the heterogeneity of cheese products. However, Mexico is likely to remain a strong market for U.S. cheese, partly because of the preferred access that the U.S. gained to the Mexican market under the NAFTA. The U.S. cheese industry also will have opportunities to gain a larger share of the multibillion dollar U.S. specialty cheese business if, as expected, the industry displaces additional imports of European specialty cheeses.
- U.S. dairy exporters have a window of opportunity for expanding dairy exports during 2008 to 2014/15 while EU milk production quotas remain in effect. If, as is likely, EU milk production quotas end after 2014/2015, European firms will benefit from the removal of quota shackles and become stronger competitors in world dairy markets.

Five U.S. firms—Dean Foods, Kraft Foods, Schreiber Foods, Dairy Farmers of America and Land O'Lakes—are members of the top twenty dairy companies in the world in terms of value of dairy sales. Strategies of the top five U.S. firms, which will influence the size of the U.S. dairy industry's dairy exports and foreign direct investment (FDI) in dairy-food businesses, include the following:

- Dean Foods is focusing increasingly on the domestic market for fluid milk products. This strategy manifested itself in the firm's decision to divest itself of its operations in Spain and Portugal in 2006 and 2007.

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- Kraft Foods has recently focused its expansion efforts in foreign dairy-foods businesses in growth markets where the firm has sufficient scale, including Mexico and Brazil. However, the firm's big foreign acquisition in 2007 was the purchase of Groupe Danone's biscuit (cookie) business for $7.2 billion.
- Dairy Farmers of America (DFA) has entered into joint ventures and alliances with Fonterra of New Zealand and Glanbia of Ireland. These initiatives increase DFA's ability to engage in import substitution and give the cooperative additional experience with global dairy markets. DFA also has become an important exporter of whey products. However, DFA's participation in the Dairy America initiative to outsource NDM exports to Fonterra denies the firm of valuable exporting experience for an important export item.
- Land O'Lakes is focusing increasingly on expanding domestic sales of value-added dairy products. This strategy manifested prominently in the cooperative's sale of its Cheese & Protein International plant (industrial cheese plant) in Tulare, California to a U.S. subsidiary of Canada-based Saputo, Inc. in 2007.
- While DFA and Land O'Lakes have a strong domestic focus to their businesses, both are positioned strategically to expand dairy exports and dairy FDI fairly rapidly if profit prospects dictate the need for such a change.
- Schreiber Foods is a rapidly growing cheese company that is likely to be a noteworthy actor in expanding U.S. dairy exports and dairy FDI in future years. The firm's recent foreign acquisitions include a 51 percent share of Dynamix Dairy Industries, Ltd. in India.

For the next several years, U.S. companies are likely to make limited amounts of FDI in dairy-food businesses. Consequently, investments by foreign firms in the U.S. dairy sector will continue to exceed similar U.S. investments abroad for the foreseeable future. Foreign investors (including Nestle, Unilever, Danone, Fonterra and Glanbia) in U.S. dairy businesses have brought important technologies and expertise to the U.S. dairy industry.

Part of the reason for the low prospective U.S. FDI is the decline in the value of the U.S. dollar. U.S. FDI in the dairy-food businesses in Mexico may be attractive partly because the dollar has held up well against the Mexican peso. But dairy exports—which are helped by the weak U.S. dollar—rather than FDI will be the main vehicle through which the U.S. dairy industry will increase its footprint in world dairy markets in the next few years.

THE FUTURE ROLE OF THE U.S. IN WORLD DAIRY MARKETS

Focus of the Paper

For the first several decades after WW II, the U.S. dairy industry focused heavily on serving the domestic market. The reasons for this emphasis are easy to fathom. The U.S. dairy market is large, familiar, and populated by many high-income consumers, making it an attractive market to serve. In addition, the U.S. government provided a ready market for dairy surpluses under the USDA's dairy price support program during this period.

But in the 1990s, dairy industry officials familiar with strategies of dairy companies in export-oriented countries urged the U.S. dairy industry to give more attention to export markets. Among the first to call for a greater focus on exports was Mr. Bruce Stuart, former CEO of M.E. Franks (a leading exporter of U.S. dairy products in the 1990s) and a former official of the New Zealand Dairy Board (now part of Fonterra). Stuart said this about the U.S. dairy industry in 1992 [30]:

> *The (U.S.) dairy industry should also keep in mind the fact that one of these days we may be without government assistance, but still in need of the secondary international market. The more experience and presence we can gain now in markets across the ocean, the better prepared we will be for the challenge such a situation would bring.*

Stuart's comment may have reflected the New Zealand Dairy Board's (NZDB) experience with early mover advantages in dairy exporting. For example, Mr. Neville Martin, a NZDB official reported in 1995 that, based on the Board's international experience, initial entrants into a market gain, on average, a 15 percent advantage over second entrants. Third-place entrants into a given market tend to break even. Entering a market fourth or later is a strategy for losing money [23]. While early mover advantages probably cannot be defined as precisely as Martin suggests, it is likely that those advantages are substantial.

Mr. Thomas Suber, then Executive Director of the U.S. Dairy Export Council (USDEC), characterized the future of the U.S. dairy industry in 1999 as one where real costs of milk production are declining, domestic demand is growing modestly, and the role of government is declining. As a result, he claimed that ". . . the processors, cooperatives, traders, and farmers who determine USDEC policy face the future with a cold realism that either we compete internationally or we shrink as an industry [31]."

Exhortations of the type delivered by Stuart and Suber and any fear on the part of the U.S. dairy industry of suffering the disadvantages associated with being a late mover into dairy exporting had little effect on U.S. dairy exports for much of the 1990s and early 2000s. However, U.S. dairy exports during the early 1990s did exhibit some strength because of fairly large foreign sales of nonfat dry milk (NDM) and butter, made mostly with the help of U.S. Dairy Export Incentive Program (DEIP) subsidies (Table 1). Indeed, in 1993 the U.S. recorded a small dairy trade surplus (Figure 1). However, after 1993 the U.S. ran a long string of large dairy trade deficits. The U.S. also continued to be an important destination for foreign direct investment (FDI) in dairy-food businesses.

However, in recent years the U.S. has become a bigger player in dairy exporting. NDM, whey and whey products, and cheese have become the biggest U.S. dairy export items [16]. In 2006, for example, these products accounted for 63 percent of the value of U.S. dairy exports. Mexico and Canada were the most important destination markets for U.S. dairy products, representing 38 percent of the value of U.S. dairy exports. Asian markets (China, Japan, Philippines, Indonesia, Korea, Malaysia and Vietnam) were the next most important as destinations for U.S. dairy exports in 2006.

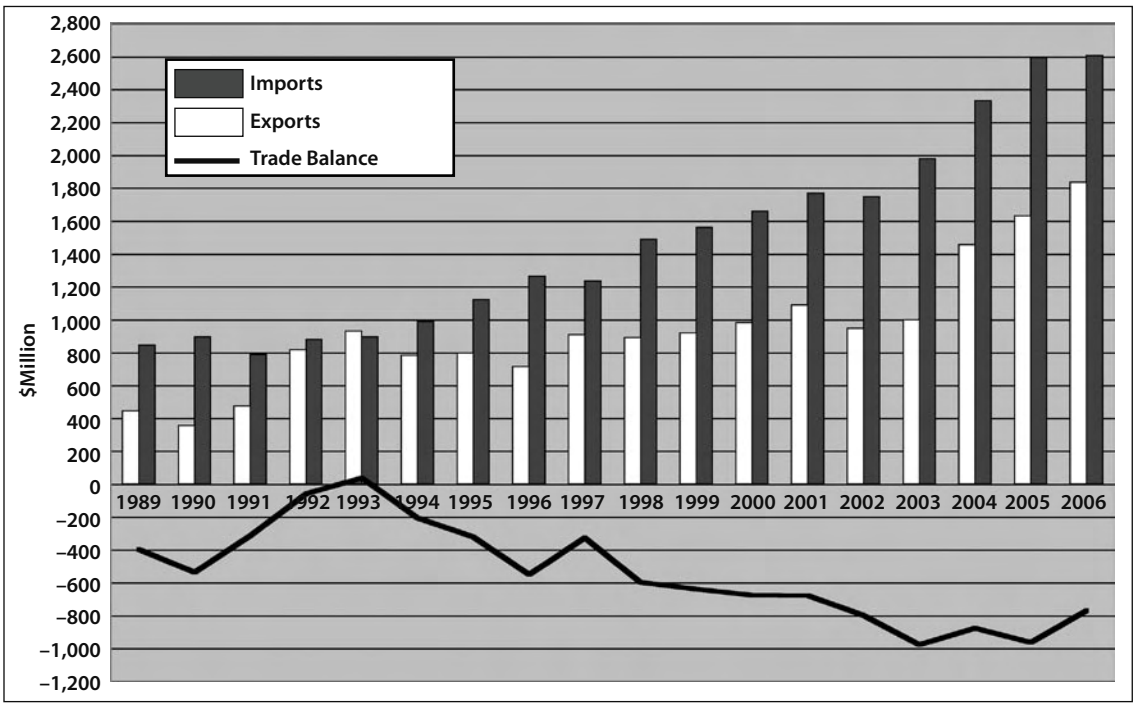
Why did it take so long for the U.S. dairy industry to become a bigger player in export markets? It turns out that Stuart's forecast about the loss of government assistance for the U.S. dairy industry was slow

Table 1. U.S. Export Figures for NDM, Butter and Cheese, 1992–2007.

Year	NDM Exports (1,000 mt)	% of Production	Butter Exports (1,000 mt)	% of Production	Cheese Export (1,000 mt)	% of Production
1992	118	29.8	139	22.5	15	0.5
1993	138	31.9	145	24.3	19	0.6
1994	123	22.0	94	16.0	25	0.8
1995	164	29.3	64	11.2	28	0.9
1996	32	6.6	19	3.6	32	1.0
1997	117	21.2	18	3.4	38	1.1
1998	104	20.2	3	0.6	37	1.1
1999	217	35.2	2	0.4	38	1.1
2000	142	21.6	4	0.7	47	1.2
2001	96	15.0	0	0.0	53	1.4
2002	126	17.4	3	0.5	54	1.4
2003	141	19.6	12	2.1	52	1.3
2004	231	36.0	9	1.6	61	1.5
2005	277	40.0	9	1.5	58	1.4
2006 (P)	287	41.8	11	1.7	71	1.6
2007 (F)	270	41.4	15	2.3	90	2.0

Source: USDA-FAS, Dairy: World Markets and Trade, various issues, 1997–2007 [38].
P = Preliminary, F = Forecast.

FIGURE 1. U.S. Dairy Trade Balance—Value.



to materialize. Thus, the incentives for the U.S. dairy industry to export were muted by continued government support for the industry. But government support is eroding gradually as Suber indicated and the U.S. dairy industry now finds itself in a position where exports add important value to the industry. A host of other recent developments discussed in this paper also pushed the U.S. dairy industry toward a greater export orientation. In addition, other forces are influencing foreign direct investment by U.S. dairy companies and FDI in U.S. dairy-food businesses

This paper (a) summarizes key elements of the competitive environment facing the U.S. dairy industry, emphasizing those affecting U.S. dairy exports, (b) chronicles the decline in government support for the U.S. dairy industry, (c) shows how U.S. firms rank in the world dairy business and discusses how exporting and FDI strategies of leading U.S. dairy firms have evolved in recent years, and (d) discusses trends in FDI by U.S. dairy-food businesses and FDI in the U.S. dairy industry. The points are covered with an eye to assessing how each will influence the future role of U.S. dairy industry in world dairy markets.

The Competitive Environment Facing the U.S. Dairy Industry

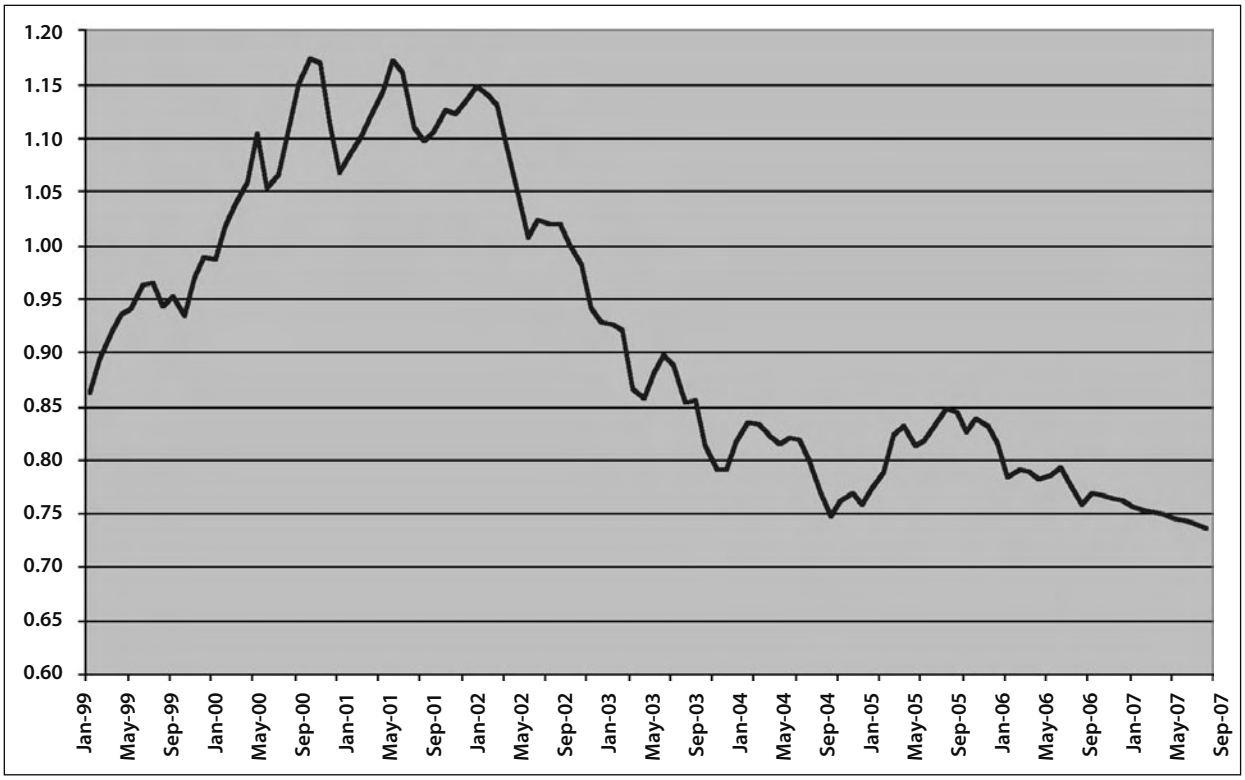
The key elements in the competitive environment outlined below will shape exporting prospects for the U.S. dairy industry and opportunities for FDI by U.S. dairy-food companies during the next few years:

- Deregulation and reductions in support for domestic dairy industries are taking place around the world. Prominent examples include the deregulation and removal of most government support for New Zealand's dairy industry beginning in 1984, the deregulation of Australia's dairy industry in 2000 which made that industry arguably the most deregulated in the world, and the on-going deregulation and removal of government support for the European Union (EU) dairy industry that began in the 1990s and that is likely to include elimination of EU farm milk production quotas after 2014/2015. These steps by other countries were taken, in part, to increase the international competitiveness of their dairy industries. These developments mean more vigorous competition for the U.S. dairy industry in world markets.
- Increased production of ethanol and other biofuels in the U.S. has increased corn and soybean prices in the U.S., raising milk production costs and probably constraining milk production in the U.S. These developments have the potential to reduce U.S. supplies of dairy products available for export. The biofuels boom is having similar effects in certain other dairy exporting countries.
- The North American Free Trade Agreement (NAFTA), which became effective in 1994, increased the competitiveness of U.S. dairy products in Mexico and helped to make that country a leading destination for U.S. dairy exports. The NAFTA eliminated Mexico's tariff on imports of U.S. cheese in 2003, giving U.S. cheese exporters about a 20 percent advantage relative to third country exporters of cheese to Mexico. In January 2008, Mexico's tariff on U.S. milk powder imports will go to zero. Mexico is likely to remain substantially short of self-sufficiency in milk production for the foreseeable future, maintaining opportunities for large U.S. dairy exports to that country.
- While Canada did not reduce barriers to U.S. dairy products under the NAFTA, Canada has become a relatively large market for U.S. dairy exports because of proximity advantages enjoyed by U.S. firms for serving the market, similarity of economic conditions in Canada to those in the U.S. market, high consumer incomes in Canada, connections U.S. dairy firms have developed with food manufacturers in Canada, and other factors. However, Canada has expanded dairy exports to the U.S. at about the same rate that the U.S. has expanded dairy exports to Canada, producing an approximate wash in the dairy trade balance between the two countries.
- Negotiations for the Doha Round WTO Agreement remained stalled in late 2007. Moreover, opposition to multilateral and bilateral trade agreements is growing in the U.S. Congress, signaling lower interest on the

part of the Congress in approving additional trade agreements. Thus, in the immediate future there will be little additional opening of the U.S. market to foreign dairy products and little additional opening of foreign markets to U.S. dairy products via new trade agreements.

- The value of the U.S. dollar has declined sharply in foreign exchange markets (Figure 2). For example, the dollar has fallen from about $0.92 to the Euro in 2000 to over $1.45 to the Euro in October-November, 2007 (over 50 percent). In view of the large current account deficits of about $750 billion per year in prospect for the U.S. until at least 2012, the U.S. dollar is likely to remain weak for the foreseeable future [14]. This development has lowered the price of U.S. dairy products for many foreign customers. Simultaneously, it makes many foreign acquisitions of dairy-food firms more expensive for U.S. firms and increases the incentives for foreigners to acquire U.S. dairy-food businesses.
- The U.S. dairy-food market has evolved into a "mixed bag" for U.S. companies. While consumer incomes on average are high in the U.S. and the market is familiar, it is a highly competitive market. Indeed, a Nestle official characterized the U.S. and Western European dairy-food markets as being "flat and fiercely competitive [33]." A number of U.S. dairy-food firms have characterized the U.S. market as being "fiercely competitive." U.S. consumers also have developed a taste for exotic foreign cheeses, making those items big import items. The latter development creates strong competition for U.S. cheese businesses but also gives U.S. companies opportunities to employ import substitution strategies to displace some foreign cheeses with U.S.-produced specialty cheeses.
- Several U.S. cooperatives have outsourced the exporting of NDM to Fonterra of New Zealand via an organization called Dairy America. This has enabled the U.S. cooperatives to concentrate

FIGURE 2. Nominal Exchange Rate: U.S. Dollar per Euro.



on serving the domestic market and puts the cooperatives' NDM exporting in the hands of Fonterra, their principal competitor for international milk powder sales. This action deprives the U.S. cooperatives of experience in exporting dairy products, experience that could prove valuable in the years ahead. There is also the question of a conflict of interest involving Fonterra. Will Fonterra, which has New Zealand milk powder to export, obtain the highest prices for the NDM it markets for U.S. cooperatives? Why this curious arrangement is not terminated is a mystery.

- U.S. dairy exporters will face important risks and uncertainties in international dairy markets over the longer-run. China and Brazil, for example, represent "wild cards" in international dairy markets. These countries could either remain net importers of dairy products or, at least in the case of Brazil, become dairy exporters. The attractiveness of the international dairy markets for U.S. firms will depend partly on what the dairy industries of these countries ultimately do.

These economic environment factors foreshadow important changes in U.S. and world dairy markets. In particular, globalization trends which, until recently, have affected the U.S. dairy industry in modest ways are becoming more important to the industry. Moreover, globalization-related developments, which can strongly affect U.S. dairy exports, and FDI are occurring despite the lack of progress on multilateral trade agreements.

Declining Real Government Support for the U.S. Dairy Industry

The declining real government support for much of the U.S. dairy industry has increased the incentives of dairy companies to export. U.S. Government support for the U.S. dairy industry takes several forms, including the dairy price support program (product purchase program), the DEIP export subsidy program, border protection (chiefly tariff rate quotas on dairy product imports), federal milk orders, and the milk income loss program (direct payments). In this paper we are mainly concerned with changes in the first three programs since these programs will have the greatest impact on the future role of U.S. dairy industry in world markets.

Dairy Price Support Program. Legislative authority for the dairy price support program rests with the Agricultural Act of 1949 as amended (1949 Act). The USDA administers this program by announcing purchase prices for butter, cheese and NDM. These purchase prices are set so that, theoretically, firms of average processing efficiency can pay producers the support price for manufacturing milk.

U.S. price supports for manufacturing milk have exhibited a general decline in recent decades. Prior to October 1981, the 1949 Act required that the support price for manufacturing milk be set at 75–90 percent of parity [2]. Under this archaic provision of the legislation, the support price for manufacturing milk rose steadily to $13.49 per hundredweight in October 1981, leading to large surpluses of dairy products and record USDA outlays for dairy price supports.

Between October 1981 and October 1990, the support price for milk fell by more than 25 percent to $10.10 per hundredweight [2]. The support price remained at that level through December 1995, before increasing to $10.35 per hundredweight on January 1, 1996.

The 1996 Farm Bill actually scheduled the USDA's dairy price support program for elimination. Under the 1996 legislation, the manufacturing milk support price was set at $10.35 per hundredweight for 1996 and annual reductions of $0.15 per hundredweight in the support price were established for 1997 and 1998. The program was then supposed to end on December 31, 1999. The Congress subsequently extended the dairy price support program to the present day with manufacturing milk support prices set at $9.90 per hundredweight.

There were several reasons for the planned elimination of the dairy price support program in 1996. First, presumably crafters of the 1996 Farm Bill thought that domestic demand for dairy products would be sufficiently strong that the program would not be needed. Secondly, it was recognized that U.S. border protection measures would limit imports of foreign dairy imports and help to keep domestic dairy product prices relatively strong. Third, the 1996 Farm Bill contained pro-

visions for recourse loans for dairy plants that would become effective after the dairy price support program was eliminated. It was reasoned that the recourse loan program would ease processors' apprehensions about elimination of the product purchase program.

In addition, eliminating the U.S. dairy price support program reduced the U.S.'s Aggregate Measure of Support outlays ("Amber Box" or trade-distorting expenditures) under the Uruguay Round WTO Agreement. This was viewed by some policymakers as an important benefit because U.S. dairy price supports made major claims on the allowed Aggregate Measure of Support (AMS) outlays for the U.S. Large AMS claims associated with dairy price supports result because U.S. AMS outlays are measured as the difference between the U.S. support price and a base period world market reference price for manufacturing milk multiplied by total U.S. milk production, producing multibillion dollar claims on the AMS total.

Product purchases under the USDA dairy price support program for 1996 through 2006 are shown in Table 2. Clearly, the major purchases under the program were for NDM. Indeed, in 2002 and 2003 about 40 percent of U.S. NDM production was purchased under the price support program, leading to a structural surplus of NDM at the prevailing support prices for the product.

U.S. government stocks of NDM rose to 468,830 metric tons and 498,643 metric tons in 2002 and 2003, respectively (Appendix Table 1). The USDA also became the major holder of NDM stocks, accounting for about 90 percent of total stocks of the product in 2002 and 2003.

Butter and cheese purchases under the USDA's dairy price support program were small, equivalent to less than one percent of production of these products for 1996–2006.

The large purchases of NDM prompted the USDA to lower the support price for this product in 2001 and 2002, ultimately bringing the NDM support price down to $0.80 per pound (Table 3). Simultaneously, the butter support price was raised to $1.05 per pound under what is referred to as adjustment of the "butter-powder tilt." The "tilt" adjustment permitted the manufacturing milk support price to remain at about $9.90 per hundredweight after the reduction in the NDM support price.

The adjustments in the support prices for the 1995 to 2007 period are shown at the bottom of Table 3. Nominal NDM support prices declined by nearly 23

Table 2. USDA Purchases under the Dairy Price Support Program, 1996–2006.

Year	NDM Purchases (1,000 mt)	% of U.S. Production	Butter Purchases (1,000 mt)	% of U.S. Production	Cheese Purchases (1,000 mt)	% of U.S Production
1996	0	0.0	0	0.0	0	0.00
1997	17,990	3.3	0	0.0	328	0.01
1998	51,495	10.0	0	0.0	0	0.00
1999	107,465	17.4	0	0.0	0	0.00
2000	238,408	36.2	0	0.0	3,530	0.09
2001	161,857	25.2	0	0.0	206	0.01
2002	308,534	42.6	0	0.0	2,566	0.07
2003	288,714	40.0	4,596	0.8	3,905	0.10
2004	125,991	19.7	–19	—	0	0.00
2005	0	0.0	0	0.0	0	0.00
2006	29,026	4.2	0	0.0	0	0.00

Sources: USDA-AMS, Dairy Market Statistics, 1996–2007 [35] and USDA-FAS, Dairy: World Markets and Trade, various issues 2000–2007 [37]. USDA price support purchases represent adjusted Commodity Credit Corporation purchases, contract basis. A negative purchase figure represents the cancellation of a previous contract to purchase.

Table 3. USDA Support Prices for NDM, Butter and Cheddar Cheese, 1995–2007.

Year	NDM (U.S.$/lb)	Butter (U.S.$/lb)	Cheddar Cheese (U.S.$/lb)	Mfging Milk (U.S.$/cwt)
1995	$1.034	$0.65	$1.120	$10.10
1996	1.065	0.65	1.145	10.35
1997	1.047	0.65	1.130	10.20
1998	1.028	0.65	1.115	10.05
1999	1.010	0.65	1.100	9.90
2000	1.010	0.6590	1.111	9.90
2001	0.9344	0.7882	1.131	9.90
2002	0.8833	0.8873	1.131	9.90
2003	0.800	1.05	1.131	9.90
2004	0.800	1.05	1.131	9.90
2005	0.800	1.05	1.131	9.90
2006	0.800	1.05	1.131	9.90
2007	0.800	1.05	1.131	9.90
		% Change, 1995–2007		
Nominal terms	–22.6	+61.5	+1.0	–2.0
Real Terms	–40.6	+24.0	–22.5	–24.8

Sources: Support prices from USDA-ERS [37]. Producer Price Index Figures used to express price changes in real terms from U.S. Department of Labor, Bureau of Labor Statistics [10,11]. Butter prices for 2000 and NDM and butter support prices for 2001 and 2002 represent weighted averages of the monthly support prices for these products. Support prices for NDM are for 50-pound bags. Support prices for cheddar cheese are those for 40-pound blocks. Real price changes from 1995 to 2007 were computed using as a deflator the Producer Price Index for Intermediate Materials, Foods and Feeds, 1982 = 100.

percent over the period, while butter support prices increased by 61 percent over the period. Nominal cheddar cheese and manufacturing milk prices showed little change over the period.

However, in real (inflation adjusted) terms large reductions in NDM, cheddar cheese, and manufacturing milk support prices are evident over the 1995–2007 period. Real butter support prices also show a more modest gain (24 percent) than the nominal support prices over the period.

Market prices that exceed support levels and productivity increases have permitted many U.S. milk producers and dairy processors to remain in business despite the declining real government support prices for certain dairy products.

The lower U.S. NDM support price, booming global demand for the product, and shortfalls in NDM production in Australia, the EU, and some other countries changed price relationships for the product in the mid-2000s (Table 4). U.S. prices for NDM dropped below those for Oceania and Europe beginning in 2004 after being more than 60 percent higher than F.O.B. prices in these regions in 1998 and 1999. The U.S. went from being priced out of the international NDM market (unless export subsidies were employed) to being the low-priced market in 2004–2007. The price comparisons in Table 4, of course, are imperfect indicators of international competitiveness but show that market price relationships among U.S., Oceania and European markets have changed substantially to favor expanded U.S. exports of NDM.

Table 4. U.S., Oceania and Europe NDM Prices, 1995–2007.

Year	US NDM Price (U.S.$/mt)	Oceania NDM Price (U.S.$/mt)	Europe NDM Price (U.S.$/mt)	U.S. Price as % of Price for Oceania	U.S. Price as % of Price for Europe
1995	2,326	2,138	2,144	108.8	108.5
1996	2,581	1,915	1,986	134.8	130.0
1997	2,362	1,905	1,975	124.0	119.6
1998	2,326	1,420	1,444	163.8	161.1
1999	2,233	1,316	1,331	169.7	167.8
2000	2,217	1,873	1,887	118.4	117.5
2001	2,174	2,056	2,012	105.7	108.1
2002	2,028	1,367	1,352	148.4	150.0
2003	1,855	1,742	1,742	106.5	106.5
2004	1,878	2,018	2,068	93.1	90.8
2005	2,097	2,225	2,262	94.2	92.7
2006	1,993	2,212	2,522	90.1	79.0
2007*	3,459	3,671	4,016	94.2	86.1

Sources: Prices obtained from USDA-AMS, Dairy Market Statistics [35]. U.S. prices are for low and medium heat NDM for the West region. Oceania and Europe prices are F.O.B. port.
*Figures for 2007 are for first half of the year.

While other forces shaped NDM export sales, the impact of the lower USDA support price for NDM on the competitiveness of U.S. NDM should not be underestimated. From 1995 through 2003, the U.S. support price for NDM was actually higher than the F.O.B. market prices for NDM in Oceania and Europe [35]. Hence, the support price provided disincentives for exports of NDM and limited U.S. non-subsidized exports of the product until 2004.

While international markets for U.S. NDM are likely to be robust for the near future, the situation for U.S. butter is more uncertain. U.S. prices for butter have been higher than butter prices for Oceania and Europe for much of the time since 1996 (Appendix Table 2). During 2005 and 2006, for example, U.S. butter prices averaged 57 percent and 58 percent higher, respectively, than in Oceania and Europe. Moreover, in the 2000s (with the exception of the first nine months of 2007), the U.S. support price for butter has been higher than F.O.B. prices for butter in Oceania and Europe (Appendix Table 2). Thus, the higher support prices for butter associated in part with the NDM-butter "tilt" in the early 2000s priced U.S. butter out of international markets until 2007.

U.S. butter prices became more internationally competitive in 2007 when Oceania butter prices approximately doubled and those in Europe tripled from January to September, 2007. As a result, U.S. butter exports for January-September 2007 rose to about 21 thousand metric tons, up substantially from the full-year average of about seven thousand metric tons (1.2 percent of production) for 2000 through 2006.

It is uncertain whether U.S. butter prices can remain competitive in international markets if Oceania and Europe prices return to more normal levels. Also, butter sold in international markets differs from that marketed in the U.S.—much of the bulk butter sold internationally is unsalted butter with a butterfat content of 82 percent while U.S. butter is salted and contains 80 percent butterfat. Therefore, U.S. companies would need to change manufacturing procedures to produce to specification for the international butter market. Accordingly, some U.S. firms are likely to gear up to produce for the international butter market only

if price differentials favor producing butter for export for an extended period.

The Dairy Export Incentive Program. The DEIP was first authorized under the 1985 Farm Bill and was extended to the present under subsequent legislation. The DEIP is an export subsidy program similar to the export enhancement program used for other U.S. agricultural commodities. The program provides cash export subsidies based on the difference between the U.S. and world market prices to approved exporters from bids submitted by exporters to the USDA for specific dairy products and markets.

DEIP export subsidies are governed by WTO rules. The U.S. is currently permitted to export approximately the following quantities of dairy products each year with subsidy under limits established under the Uruguay Round WTO Agreement:

- Butter: 21,100 metric tons.
- Milk Powder: 68,200 metric tons
- Cheese: 3,000 metric tons

U.S. and other negotiators agreed to eliminate all agricultural export subsidies by 2013 at the Hong Kong, China Ministerial Meetings for the Doha Round of WTO negotiations in December 2005. However, the Doha Round negotiations are stalled and the concessions regarding export subsidies will not be binding until an agreement on all other components of the Doha Round is completed. When, if ever, full agreement will be reached under the Doha Round is unclear.

DEIP bid acceptances during 1996–2006 appear in Table 5. While DEIP export subsidies for NDM and cheese were used up to the WTO limits for 2000–01 through 2003–04, the subsidies have not been used in later periods. WTO flexibility provisions during the Uruguay Round WTO implementation period permitted the U.S. to exceed the current export subsidy limits prior to 2000–01.

High world prices for NDM eliminated the need for DEIP export subsidies for this product after 2003–04. Whether DEIP export subsidies will be used in the future for U.S. NDM is unclear. The maximum allowable DEIP exports subsidies for butter/butteroil and cheese were equivalent to only about 3.5 percent and 0.07 percent, respectively, of the annual U.S. production of butter and cheese during the 2000s. Hence, the DEIP has not been a big factor affecting exports of these products.

TABLE 5. Dairy Export Incentive Bid Acceptances, 1996–2006.

	(mt of bid acceptances)			
Year	NDM	Whole Milk Powder	Butter/ Butteroil	Cheese
Calendar Years				
1996	45,130	2,486	0	2,455
1997	138,319	7,213	24,617	4,291
Fiscal Period				
1997–98	92,216	7,487	15,648	3,510
1998–99	84,212	5,003	395	3,122
1999–00	101,383	17,908	5,298	3,865
2000–01	68,201	0	0	3,030
2001–02	68,201	0	0	3,030
2002–03	68,201	0	0	3,030
2003–04	68,201	0	0	3,030
2004–05	0	0	0	0
2005–06	0	0	0	0
2006 Jul–Dec.	0	0	0	0

Source: USDA-AMS, Dairy Market Statistics, 1996–2006 [35]. The Fiscal Periods shown run from July 1 through June 30 of the years shown.

Despite the limits on use of the DEIP subsidies for butter and cheese, the program has given valuable exporting experience to a number of U.S. dairy companies including Land O'Lakes, Schreiber Cheese, and Associated Milk Producers, Inc. Among other things, the DEIP has alerted the firms to the need to produce dairy products to specification for foreign markets.

Border Protection Measures. The Uruguay Round WTO Agreement, which became effective in 1995, had noteworthy effects on U.S. dairy imports. The key requirement in the agreement pertaining to U.S. dairy imports specified that all non-tariff barriers (quotas, import licenses, etc.) must be converted to tariffs and reduced by an average of 36 percent over six years, with a minimum reduction of at least 15 percent from 1986–88 base levels.

Prior to the Uruguay Round WTO Agreement, U.S. dairy markets were protected by Section 22 quotas provided by the Agricultural Adjustment Act of 1933, as amended, which prevented dairy imports from interfering with the USDA's price support program. The Section 22 quotas were converted to tariff-rate quotas under the Uruguay Round WTO agreement. The over-quota tariffs applicable to U.S. dairy imports in 2000 (after the WTO implementation period) were as follows:

Product	*Over-Quota Tariff in 2000 and later Periods*
NDM	39.2 cents/lb.
Butter	69.9 cents/lb.
Cheese	55.6 cents/lb.

Under the Uruguay Round WTO Agreement, countries were also required to ensure that current access opportunities for imports were maintained and to open up minimum access opportunities in cases where there was little or no trade. When current access for a product was less than 3 percent, countries were required to open up a minimum amount of access. This access was to be increased to 5 percent by 2000.

The Uruguay Round WTO Agreement had a substantial impact on U.S. cheese imports. In absolute terms, yearly U.S. cheese imports averaged 43 percent higher during 2000 to 2007 than during 1992 to 1994 [38]. However, the change between the two periods in annual U.S. cheese imports was much smaller as a percentage of consumption. U.S. cheese imports averaged 4.89 percent of U.S. consumption from 2000 to 2007. This compared to average imports of 4.56 percent of domestic consumption between 1992 and 1994. Additional within-quota U.S. cheese imports are likely to be permitted if the Doha Round WTO agreement is ever completed.

What does information in this section suggest about the U.S. role in world dairy markets? Approximate export market shares of U.S. dairy exporters for NDM, butter, and cheese in 2007 appear in Table 6. The large NDM export figure for the U.S. is no surprise. For reasons noted earlier, export markets for U.S. NDM are likely to remain strong for at least the next few years. The same is true for whey products.

TABLE 6. Dairy Export Market Shares for Selected Major Exporting Countries, 2007.

Country	**NDM (%)**	**Butter (%)**	**Cheese (%)**
U.S.	25.4	1.9	7.0
EU-25	9.4	32.7	42.7
Argentina	1.9	—	4.5
India	5.6	1.3	—
Australia	16.5	8.8	15.6
New Zealand	29.2	50.3	23.3
Others	12.0	5.0	6.8
Totals for Selected Countries:			
%	100.0	100.0	99.9
(1,000 mt)	1,062	795	1,287

Source: USDA-FAS, Dairy: World Markets and Trade, July 2007 [38]. Figures for 2007 are USDA forecasts. Total percentage for selected countries for cheese does not add to 100.0% because of rounding error.

In part, U.S. whey export prospects are robust because there is no USDA price support program for whey that prices this product out of international markets. Secondly, the large U.S. cheese industry, which claimed about 36 percent of U.S. milk in 2005, generates many whey products as companion outputs of the cheese business. Thirdly, foreign processors have been savvy about opportunities to substitute whey for expensive NDM in the production of a host of products. Finally, on a related point, the versatility of whey for use in products ranging from animal feeds to energy bars helps to make whey a growth item in international markets. These factors should help to keep whey exports, which were approximately double 2006 levels for the first nine months of 2007, at high levels in the future. Future U.S. cheese exports are difficult to assess because of the heterogeneity of cheese products. But, U.S. cheese exports, which accounted for 13 percent of U.S. dairy product exports by value in 2006, will probably remain relatively strong in the next few years. Mexico, which was the destination for about one-third of the value of U.S. cheese exports in 2006, holds promise as a growth market for U.S. cheese partly because of the preferential access Mex-

ico gives U.S. cheese under the NAFTA Agreement [16].

Increased U.S. production of specialty cheeses should permit these cheeses to displace increased amounts of exotic European cheeses and claim more of the multi-billion dollar U.S. specialty cheese market. Specialty cheese production in Wisconsin has exhibited a strong upward trajectory in recent years and in 2005 accounted for about 15 percent of Wisconsin's total cheese production [39]. Thus, Wisconsin's cheese industry is likely to figure prominently in import substitution activity to displace more of the European specialty cheeses in the U.S.

It might be argued that U.S. buyers of European specialty cheeses are not price sensitive and will not reduce the amount of exotic European cheeses purchased in the next few years. This argument ignores the amount that prices for European specialty cheeses will increase in the U.S. if, as is likely, the exchange rate remains at approximately U.S.$1.45 to U.S.$1.50 to the Euro. It also ignores the effects of increases in the variety and quality of U.S. specialty cheeses on U.S. consumption of domestically-produced specialty cheeses.

The U.S. dairy industry, of course, will be competing with counterpart industries in a number of other countries to supply the global demand for dairy products in future years. Countries which have major dairy industries and that compete strongly with the U.S. for export markets include those listed in Table 7.

The U.S. has exhibited fairly steady annual increases in milk production during the 2000s, which augurs well for the country's dairy exporting potential. The miniscule year-to-year increases in EU-25 milk production reflect the effects of quotas. EU milk production quotas will likely limit EU-25 milk production and exporting capacity until after 2014/2015 when the quotas are expected to end. Moreover, prior to 2014/2015 available EU supplies of milk are likely to be used to produce additional value-added products such as cheese rather than to increase NDM production.

U.S. dairy exporters will find it useful to monitor EU-25 milk production and dairy exporting capabilities after quotas end since exports from several EU countries could increase substantially after the quota shackles are removed. However, the U.S. will have a window of opportunity from 2008 to 2014/2015 to expand dairy exports, especially of NDM and whey

TABLE 7. Changes in Fluid Milk Production, Selected Countries, 2000 to 2007.

Country	2007 Milk Production (1,000 mt)	% Change, 2000–07	% Average Year-to-Year Change, 2000–07	Comments
U.S.	85,445	12.53	1.72	Mostly steady annual increases
EU-25	131,500	1.63	0.23	Small quota-constrained annual increases
New Zealand	15,600	27.50	3.58	Lower rates of annual increase in later years of 2000 to 2007 period
Australia	9,785	–12.41	–1.77	Production reduced by drought in recent years of 2000 to 2007 period
Argentina	10,800	10.20	1.75	Production has recovered from recession-related shortfalls in the early 2000s
Brazil	25,365	14.60	1.97	Highest rates of increase recorded in mid-to-late part of 2000 to 2007 period
China	38,100	360.48	24.51	Very high rates of increase slowed modestly in 2005 to 2007
Russia	32,000	0.31	0.08	No discernible production trend

Source: USDA-FAS, Dairy: World Markets and Trade, selected issues, 2005–2007 [38].
Figures for 2006 and 2007 used to construct the table are preliminary and forecasts, respectively.

products—prior to the end of EU milk quotas and the likely resurgence of EU exporting capabilities.

New Zealand will continue to be a major dairy exporting country, but possibilities for added domestic milk production in that country are limited. Australia must recover from the severe drought before dairy exports from that country will realize their full potential. Argentina has the potential to expand dairy exports because the country has recovered from recession-related shortfalls in milk production in the early 2000s. However, it is not clear that Argentina's government will maintain macroeconomic policies that will permit the country's dairy industry to realize its full exporting potential.

Brazil and China, as noted earlier, represent "wild cards" in international dairy markets. Both countries have recorded relatively large percentage increases in milk production in recent years. Both have large domestic populations (190 million for Brazil and 1.3 billion for China), which could absorb most of the available dairy product supplies. Brazil, partly because of its lower population relative to milk production, presumably is more likely to evolve into a dairy exporting country than China. However, both countries should be watched for important developments relating to their dairy importing and exporting prospects. While pockets of expanding dairy activity are occurring in Russia, there is no discernible overall trend in milk production in that country that would signal an ability for Russia to expand dairy exports.

In a statement that has summary implications for this section, Mr. Linwood Tipton, former CEO of the International Dairy Foods Association, commented as follows in 2006 about how much world dairy demand will increase in the next five years and the U.S. role in satisfying that demand [32]:

> *. . . the demand for globally-traded dairy products will increase about 20 percent over the next five years, and the U.S. dairy industry is well positioned to fill the gap and become a major competitive force in the world.*

This section did not address the question of how much global dairy demand will increase in the next five years. However, if global demand does increase by about 20 percent in this period the U.S. dairy industry appears well situated to supply a significant part of that demand increase, especially for NDM and whey products.

How U.S. Firms Rank in the World's Top-20 Dairy Companies

The measures affecting the international competitiveness of the U.S. dairy industry discussed previously relate mostly to dairy commodities. How competitive the U.S. dairy industry will be in international markets for value-added dairy products depends partly on the competitive strategies of major U.S. dairy companies.

Which U.S. dairy-food companies could be formidable international competitors? Five U.S.-based dairy firms rank in the world's Top-20 in terms of dairy

TABLE 8. The World's Top 20 Dairy Companies Measured by Dairy Sales, 2006.

Company	Headquarters Location	Dairy Sales ($ Bil.)
1. Nestle	Switzerland	$18.6
2. Lactalis	France	10.4
3. Groupe Danone	France	10.0
4. Dean Foods	U.S.	9.3
5. Arla Foods	Denmark	8.7
6. Fonterra	New Zealand	8.5
7. Dairy Farmers of Am.	U.S.	7.9
8. Kraft Foods	U.S.	6.4
9. Unilever	Netherlands & UK	5.5
10. Friesland Foods	Netherlands	5.5
11. Campina	Netherlands	4.6
12. Parmalat	Italy	4.3
13. Bongrain	France	4.2
14. Meiji Dairies	Japan	4.1
15. Saputo	Canada	3.9
16. Morinaga	Japan	3.8
17. Schreiber Foods	U.S.	3.1
18. Land O'Lakes	U.S.	2.8
19. Muller	Germany	2.6
20. Dairy Crest	UK	2.5

Rabobank International as reported in Export Profile, September 2007 [26].

sales. The five firms are: Dean Foods, Kraft Foods, Dairy Farmers of America, Schreiber Foods and Land O'Lakes (Table 8). Dairy Farmers of American and Land O'Lakes are farmer cooperatives. Dean Foods and Kraft are publicly-held corporations. Schreiber Foods is an employee-owned firm.

U.S. companies recorded some of the slowest growth rates during the five-year period ending in 2006. For example, Dean Foods and Kraft reported sales increases of 16 percent and 7 percent, respectively, over the five-year period [34]. This compares to increases of 37 percent, 117 percent, and 61 percent for Nestle, Lactalis, and Group Danone, respectively, for the same five-year period. USDEC attributes the faster growth of the foreign firms partly to their rapid expansion of sales outside their domestic markets [34].

Exporting and FDI Strategies of U.S. "Big-5" Dairy Firms

The following section analyzes strategies of the U.S. "Big-5" dairy firms to obtain insights about the likely future role of the U.S. dairy industry in world dairy markets for value-added products in particular.

Dean Foods. Dean Foods is a domestically-oriented fluid milk company. The company, which represents the December 2001 merger of the original Dean Foods and Suiza, is the largest fluid milk processor in the U.S., operating 98 plants at the end of 2006 [8]. The original Dean Foods (after which the current company is named) and Suiza were responsible for much of the increased concentration in the U.S. fluid milk business that occurred from the 1970s through the early 2000s.

Dean Foods is a company in transition, which recently has focused on improving efficiencies. It also repurchased some $400 million of company stock in 2006 and made a one-time cash dividend payment of $15 per share to all Dean stockholders ($2.0 billion in total) in 2007 [8]. These actions represent the behavior expected of an acquisition-oriented firm that finds only a limited number of attractive acquisition targets.

At the same time, the company has expanded into niche soymilk and organic milk markets in the U.S. and decreased foreign operations. Regarding the last point, Dean Foods sold its fluid milk operations in Spain and Portugal in 2006 and 2007, concluding that ". . . there are other organizations that may be better positioned to take advantage of the Iberian market [8, p. 24]." However, the company retained the Rachel's organic milk business in the UK [8, p. 13]. Dean reports that Rachel's was the leading brand of organic milk in the UK in 2006. The company plans to introduce Rachel's line of yogurts to U.S. consumers.

There is little in Dean's recent history to suggest that it will sharply expand its foreign operations. Fluid milk products, Dean's specialty, do not lend themselves well to exports. Furthermore, Dean's experience in Spain and Portugal, at least, suggests that the company's investments in foreign operations have not been as profitable as U.S. business. Indeed, in explaining the Iberian sales, Dean noted that in recent years ". . . our primary focus has been on our domestic operations [8, p. 24]." The emphasis on the U.S. domestic market appears likely to be a facet of Dean's strategy for the next few years.

However, international forces have adversely affected Deans' profitability. Mr. Greg Engles, Dean's CEO, made the following comment to explain why the firm lowered its 2007 profit forecast for a second time in October 2007 [15, p.A2]:

> *The third quarter (of 2007) has been particularly challenging as dairy commodity costs have been rising sharply, hitting all-time highs. This is by far the most difficult operating environment in the history of the company.*

Dean Foods expected its input costs to remain high in the remainder of 2007 and for additional periods. Dean attributed the high prospective input costs partly to strong export demand for NDM. Dean's branded fluid milk products also face formidable competition from private label fluid milk.

Kraft Foods. Kraft is perhaps the most export- and FDI-oriented dairy-food business in the group. In June 2006, Kraft officials unveiled a new exporting/FDI strategy for 2007, which USDEC described as follows [34, p.4]:

> *(It is) . . . designed to increase . . . (the company's) business on a global scale, targeting the fastest growing developing countries around the world. Mexico, Brazil and Russia were cited as attractive*

markets . . . The Middle East is another key market for Kraft cheese. The company is building a $40-million processing/R&D facility in Bahrain, which will serve as its Middle Eastern hub of operations. Construction is expected to be complete by October 2007.

Ms. Irene Rosenfeld, Kraft's CEO, emphasized that the company's international sales would focus on ". . . a select number of developing markets where we have sufficient scale, including Brazil and Mexico [17, p.19]."

It is unclear how much Kraft will emphasize foreign sales and FDI in dairy in future years. Kraft's revenues from cheese and dairy declined by 1.6 percent in 2006 in contrast to revenues for other broad product categories, which showed increases. Moreover, Kraft's big foreign acquisition in 2007 was Groupe Danone's global biscuit business for $7.2 billion. Rosenfeld described the wisdom of the Danone acquisition, as follows [18]:

This proposed acquisition makes great sense for Kraft. It will increase our presence in snacks—our fastest growing global segment—and transform our international business. This growing high margin business will give Kraft another core growth category in Europe, a cornerstone for faster growth in emerging markets, and the best portfolio of iconic biscuit brands in the world.

Whether the points listed for Kraft, on balance, will push the company into faster growth in foreign sales of dairy products is unclear. Kraft, which has emphasized sales in the North American market, will face strong competition if the firm chooses to expand dairy-food sales in international markets. In particular, it will be difficult for Kraft to compete effectively against Nestle and Unilever, which have generations of experience in foreign dairy-food businesses. Hence, Kraft's expansion into foreign dairy-food markets is likely to be modest in the future.

Schreiber Foods. Founded in 1945 with a single production facility located in Green Bay, Wisconsin, Schreiber has expanded into a company with production-distribution facilities in nine U.S. states and four foreign countries (Brazil, Germany, India and Mexico). Schreiber has four facilities in Wisconsin, four in Missouri, two in Utah, and one in Arizona, Georgia, Nebraska, Pennsylvania, Tennessee and Texas.

The company describes itself as the world's largest private label supplier of dairy products (especially cheese) to grocery chains and wholesalers. A Wikipedia report shows that Schreiber's cheese slices are used on cheeseburgers by 17 of the top 20 hamburger chains [41, p.1]. In addition to cheese, Schreiber sells milk powders, casein, whey powders, and condensed milk. The company makes international sales in Africa, Asia, Australia, Europe, North America and South America.

Schreiber's strategies include emphasis on efficient plant operations. Plants acquired that fail to deliver expected profits have been shuttered without much delay. For example, Schreiber closed a Waukesha, Wisconsin cheese plant in April 2002, approximately two years after the plant was acquired from Beatrice Foods. Schreiber said excess cheese processing capacity in the Midwestern U.S. forced the company to close the Waukesha plant [29].

Schreiber's strategies also focus on rapid domestic and international growth. The firm describes its growth as follows [27]:

Over the past 10 years, Schreiber has grown at a rate of close to one new manufacturing facility per year. By developing new products, building new plants and acquiring businesses, we've increased our customer base and market share and became an international leader . . .

Mr. L.P. Furguson, CEO of Schreiber Foods, described the strategic importance of the firm's domestic expansion in the southeastern U.S. via the 2002 acquisition of a Gainesville, Georgia plant owned by Winn-Dixie as follows [28]:

(The acquisition) . . . is an important strategic platform for the company's future . . . It enhances our ability to serve customers throughout the southeastern United States and Caribbean. This acquisition anchors our ability to serve existing customers and expand our business in the region in the years ahead.

Schreiber's acquisition of a 51 percent stake in Dynamix Dairy Industries, Ltd., a Pune, India-based

food contract manufacturing firm, for 1.7 billion rupees (about U.S.$38 million) was an ambitious foreign acquisition in 2004. Dynamix is a modern milk processing and product manufacturing plant in Baramati, Pune, India which has a capacity to process 1.2 million liters of milk per day, making it one of the largest cow milk-based dairy companies in India. Rabo India Finance described the Schreiber-Dynamix transaction as ". . . one of the largest deals in the food and agribusiness space in India [9]." Schreiber views this investment as ". . . the first material step towards increasing its presence in India and thereby in Asia [9]."

Schreiber probably will be a noteworthy force in expanding U.S. dairy exports and dairy foreign investment in future years. The company's record appears to be one of successful growth in both domestic and foreign markets. The venture into India undoubtedly carries risk, but it represents a potentially valuable platform for expanded sales into India's growing markets and elsewhere in Asia. Schreiber has a history of "pulling the plug" on unprofitable investments in the U.S. Presumably the company will exercise similar strategies regarding its investments in India and elsewhere in foreign markets if those investments turn sour.

Dairy Farmers of America. Established on January 1, 1998 through the consolidation of four regional dairy marketing cooperatives, Dairy Farmers of America (DFA) now supplies about one-third of the milk marketed in the U.S. In 2006, DFA marketed 61.7 billion pounds of milk for dairy farmers across the U.S. [3].

DFA is a complex organization, featuring numerous joint ventures and other collaborative arrangements with domestic and foreign organizations. The cooperative boasts eight joint ventures with fresh milk and ice cream processing companies located from coast-to-coast in the U.S. Through different marketing arrangements DFA sells whey and cheese products to Canada, Mexico, Europe, Central America, South America, Asia, the Pacific Rim and the Middle East [4].

Joint ventures are used by the cooperative to enhance its exporting and import substitution capabilities. One important DFA affiliation with a foreign company is carried out through Dairy America. DFA describes Dairy America as ". . . a federated marketing company and an association of seven producer-owned dairy cooperatives that work together to supply quality dairy products regionally, nationally and internationally [4]." Dairy America is the previously mentioned mechanism through which the member cooperatives outsource the exporting function for NDM to Fonterra of New Zealand. For reasons noted earlier, it is questionable whether outsourcing the NDM export sales function to Fonterra will result in optimal corporate learning and optimal returns for DFA members over the longer-run.

DairiConcepts is a joint venture entered into by DFA that has contributed to import substitution. It represents a joint venture between the former New Zealand Milk Products Key Ingredients Group (later merged into Fonterra) and the food ingredients division of DFA. This joint venture company manufactures and markets cheese and dairy ingredients for complex applications in the food processing industry.

In 2002, DFA and Fonterra began producing milk protein concentrate (MPC) for the U.S. market in Portales, New Mexico through DairiConcepts. DFA reports that the DairiConcepts joint venture initiative represents the first time that Grade A MPC was produced in the U.S. This was noteworthy since U.S. MPC imports in the early 2000s were large and a source of concern for the U.S. dairy industry. Hence, the importance of this U.S. MPC production effort as a foundation for import substitution.

A more recent collaboration involved Ireland-based Glanbia to create Southwest Cheese Company in Clovis, New Mexico. This is a joint venture among Glanbia, DFA, Select Milk Producers, and other dairy cooperative members of the Greater Southwest Agency. The joint venture is owned 50 percent by Glanbia with the balance owned primarily by DFA and Select Milk Producers.

Mr. Gary Hanman, former CEO of DFA described the joint venture as follows [13]:

> *This is an exciting project for all of the dairy farmers who market their milk through the Greater Southwest Agency. Through this partnership, we are creating an important new market for milk in a region of the U.S. where milk production has seen rapid growth. DFA is pleased to have joined forces with Glanbia—a dairy processor with a reputation for developing and operating large scale, efficient facilities.*

Glanbia described the performance of Southwest Cheese in the U.S as follows [12, p.6]:

> *Southwest Cheese . . . was commissioned in 2006. This plant, which produces cheese and whey proteins, is based in New Mexico and continues to ramp up to full capacity, forecast for the second quarter of 2007. Southwest Cheese is already producing to world class standards and is forecast to perform as planned in 2007.*

Extrapolating from the Southwest Cheese experience, a Glanbia official interviewed by Babcock Institute personnel in 2007 speculated that Southwest Cheese and other large western cheese plants in the U.S. will effectively eliminate medium-size commodity cheese plants as viable competitors in the U.S. While this comment may exaggerate the future structural change in U.S. cheese processing, it is noteworthy. It suggests that the U.S. cheese processing business in a few years will consist of a few large commodity cheese plants located near western milk production areas and many smaller specialty cheese plants located in Wisconsin and elsewhere in the U.S.

The Southwest Cheese plant in Clovis, New Mexico can serve as platform through which expanded cheese exports will be made in Mexico and in South America.

DFA will maintain important linkages to international dairy markets in future years. The firm also will continue to be a significant exporter of differentiated whey products. Whether it will be a major direct exporter or will rely heavily on joint venture arrangements to export the cooperative's other dairy products in the future is uncertain.

Land O'Lakes. This cooperative was formed in the Upper Midwestern U.S. more than 80 years ago when the Minnesota Cooperative Creameries Association became Land O'Lakes. Land O'Lakes in 2006 described its operations, including its domestic and foreign sales, as follows [20]:

> *Land O'Lakes is a national, farmer-owned food and agricultural cooperative with annual sales of more than $7 billion. Land O'Lakes does business in all 50 states and more than 50 countries. It is a leading marketer of a full line of dairy-based consumer, food service, and food ingredients products across the United States; serves international customers with a variety of food and animal feed ingredients; and provides farmers and local cooperatives with an extensive line of agricultural supplies (feed, seed, crop nutrients, and crop protection products) and services.*

While Land O'Lakes does business in more than 50 countries, the cooperative does not appear to emphasize international dairy sales. Rather, the cooperative's current emphasis in dairy is on increasing domestic sales of value-added dairy products. The firm is well along in this effort in butter and deli cheese—it has a number one position in the U.S. in branded butter and deli cheese sales [19, p.1]. The cooperative's CEO and Board Chair said that they will cultivate progress in dairy foods by:

- Continuing to build brand strength and grow valued-added business, and
- Create a right-sized, strategically located and profitable industrial infrastructure.

The cooperative's focus on increasing value-added dairy product sales also was revealed in the firm's decision to sell its Cheese & Protein International operations (industrial cheese business) located in Tulare, California to a U.S. subsidiary of Canada-based Saputo, Inc. for U.S. $216 million in 2007 [21,25]. However, Land O'Lakes member-producers will provide raw milk for the Saputo plant under a milk supply agreement. In a statement accompanying the sale, C. Policinski, CEO of Land O'Lakes said the following about the strategic implications of the sale [21]:

> *This sale represents a very important strategic step for our Dairy Foods business, allowing more focus on our branded, value-added marketing while providing a secure long-term milk supply arrangement for our members' milk production. This transaction is consistent with our commitment to generate value for members through branded, value-added marketing while maintaining an appropriate investment in our manufacturing infrastructure.*

The sale of the firm's Tulare industrial cheese plant does not mean that Land O'Lakes is exiting from the cheese manufacturing business. In 2007, the coopera-

tive continued to operate cheese manufacturing facilities in Tulare, California (different plant from the one sold to Saputo); Orland, California; Melrose, Minnesota; Denmark, Wisconsin; and Kiel, Wisconsin, and a cheese processing facility in Spencer, Wisconsin.

The cooperative's strategic emphasis on increasing sales of value-added dairy products is not surprising given the professional backgrounds of the firm's top officers, as noted below [22]:

- C. Policinsky, President and CEO: Prior to joining Land O'Lakes, Policinski held senior leadership positions at Pillsbury and Kraft-General Foods.
- S. Dunphy, Executive VP and Chief Operating Officer, Dairy Foods, Value-Added: Before joining Land O'Lakes, Dunphy held management positions with Kellogg, Pillsbury, and Proctor and Gamble.
- A. Pierson, Executive VP and Chief Operating Officer, Dairy Foods Industrial: Before joining Land O'Lakes, Pierson held senior management positions at Pillsbury.
- B. Wolfish, VP of Corporate Strategy and Business Development. Prior to joining Land O'Lakes, Wolfish held executive positions with General Mills in the U.S. and General Mills, Canada.

The experience of these officers with large corporations such as Kellogg, Pillsbury, Proctor & Gamble, Kraft, and General Mills—all of which emphasize production and sale of differentiated products—undoubtedly serves the cooperative well as it seeks to increase sales of value-added dairy products. Experience of the officers with the multinational companies would also help the cooperative if it chooses to expand foreign sales of dairy products or increase investments in dairy-food businesses located outside the U.S. However, there is little to suggest that such initiatives will be emphasized.

While Land O'Lakes dairy product sales have a domestic focus, the firm did report that part of its strong earnings from dairy sales in 2006 resulted from "Dairy proteins with a whey price double that of 2005 and increased European demand [19, p.4]."

Implications. What is one to make of the strategies of the U.S. "Big-5" dairy firms regarding the U.S. role in world dairy markets? The U.S. "Big-5" dairy firms have established a fairly strong domestic orientation for their sales, emphasizing value-added dairy products. The emphasis of the "Big-5" on increasing sales of value-added dairy products has numerous advantages. Firms selling value-added products do not need to compete exclusively on the basis of price. In addition, producers of value-added dairy products need not be large, low-cost producers in order to remain profitable over the longer-run.

However, DFA and Land O'Lakes have established a foundation of international expertise that would allow them to increase dairy exports and FDI if the profit picture changes to strongly favor increased international sales. DFA's involvement with Fonterra and Glanbia, for example, undoubtedly gives the cooperative a useful perspective on international dairy markets. However, DFA's involvement through DairyAmerica to outsource sales of NDM to Fonterra prevents the cooperative from gaining direct exporting experience with a product that has emerged as an important dairy export item.

While Land O'Lakes is focusing on building on its strong branded U.S. business in butter and deli cheese to increase sales of value-added dairy products, it does have international sales in numerous countries. In addition, useful cross-fertilization of ideas undoubtedly occurs between personnel from the cooperative's International Development unit and the dairy group. For example, experience that the cooperative's International Development arm has gained from contractual work for the U.S. Agency for International Development undoubtedly helps the firm to make informed FDI decisions. Such experience would be useful if the cooperative focused more heavily on international dairy business.

Kraft Foods and Dean Foods do not appear to be increasing the foundation for any substantial expansion of their foreign dairy businesses. Indeed, they seem to be moving to a greater emphasis on domestic sales or foreign sales of non-dairy items in the case of Kraft Foods. Kraft's purchase of a $7.2 billion foreign biscuit (cookie) business in 2007 speaks volumes about Kraft's international strategies.

As suggested earlier, Schreiber Foods is a company to watch. The firm appears to be doing many things correctly in domestic and foreign markets. It is also nimble enough to exit loss-producing businesses rapidly.

The bottom line is that cooperative members of the "Big-5" are positioned to expand dairy exports and to make investments in foreign dairy-food businesses if they see strong profit potential in such businesses. Schreiber also has the potential to further expand its foreign dairy product sales.

However, smaller dairy companies may be a main engine for expansion of U.S. dairy exports. Davisco of Le Sueur, Minnesota represents a noteworthy example of such a firm. Davisco produces some 185 million pounds of cheese annually and is one of the largest suppliers of cheese to Kraft Foods [7]. Whey products are an important companion product of Davisco's cheese business. The company produces 10 million pounds of whey protein isolate annually. Davisco indicates that it is the industry leader in technology and production of whey protein isolates, accounting for 65 percent of whey protein isolates sold worldwide. These isolates are found in many grocery products today, including sports drinks, reduced-fat candies, low-fat salad dressings, infant formulas, yogurts, shelf-stable baking mixes, and low-fat cheese sauces. Given the diverse uses of whey protein isolates, these products are likely to represent a source of growing export demand.

FDI Trends Affecting U.S. Dairy-Food Firms

For the next several years at least, U.S. firms are likely to be small players in FDI in dairy-food businesses. Partly this is because of the decline in the value of the U.S. dollar in foreign exchange markets.

The large decline in the value of the U.S. dollar relative to the Euro, in particular, has created formidable disincentives for U.S. dairy-food firms to invest in Euro-zone countries. Canada's dairy businesses also have become expensive for U.S. firms since the Canadian dollar reached approximate parity with the U.S. dollar in the third quarter of 2007. The U.S. dollar has held up well relative to the Mexico peso, making firms in that country potentially more attractive as FDI targets for U.S. dairy-food companies.

The limited role of the U.S. in FDI in dairy-food businesses is not a new phenomenon. An ERS-USDA report issued in 2005 described the situation as follows [36]:

> *The dairy sector, one of the largest food sectors in the United States, has been less successful (than firms involved in branded non-dairy beverages, grain and oil seed milling, etc.) in gaining a foothold overseas, and accounts for 2 percent of U.S. FDI in food manufacturing.* ***In fact, investments by foreign firms in the U.S. dairy sector have exceeded similar U.S. direct investment abroad*** *(emphasis supplied).*

What accounts for the attractiveness of the U.S. as a destination for FDI in dairy-food businesses? The ERS-USDA reports that three main characteristics make the U.S. attractive to FDI, alliances and partnerships, namely: (a) the sheer size of the high-income market, (b) the absence of supply controls on raw milk production, and (c) foreign direct investment policies of the U.S. government are less restrictive than those of other high-income countries [1].

How big is the footprint of FDI in the U.S. dairy-food industry? The ERS-USDA describes the size and nature of FDI in the U.S. dairy-food business as follows [1, pp.12, 15]:

> *. . . investments (in the U.S. dairy industry have been) steadily growing over the past two decades. In 2000, large foreign-owned proprietary firms had U.S. sales of $6.4 billion, accounting for about 3 percent of U.S. dairy sales. By 2003, the stock of foreign direct investment in the U.S. dairy industry amounted to $2 billion. Foreign companies now own $4.6 billion of assets in the U.S. dairy industry. Foreign firms have a significant presence in various "less tradable" product markets, such as ice cream (Unilever), and yogurt (Danone and Sodiaal) . . . Nestle also formed a joint venture, Ice Cream Partners, a General Mills subsidiary, which includes such popular brands as Haagen-Dazs and Drum Stick. Nestle and Unilever, an Anglo-Dutch company, together account for 30 percent of the U.S. supermarket sales of ice cream.*

Wisconsin recently has been a recipient of dairy FDI. Mr. Rod Nilsestuen, Wisconsin's Secretary of Agricul-

ture, Trade and Consumer Protection, described recent foreign investments in Wisconsin's dairy processing industry as follows [24]:

> *Cheese producers from other countries are also interested in locating (in Wisconsin). (As evidence he cited) the Kaukauna cheese plant purchased in 2006 by Arla, a Danish company that's one of the world's largest dairy companies and the Woolwich Dairy goat-cheese factory being developed in Lancaster (Wisconsin) by Canada's largest goat-cheese producer.*
>
> *Foreign dairy-food firms investing in the U.S. have brought important technologies and expertise to the U.S. dairy industry.*

The bottom line is that FDI by U.S. dairy companies in foreign dairy-food businesses is likely to remain small for the foreseeable future. Indeed, since U.S. companies made little FDI in dairy-food businesses outside the U.S. when the U.S. dollar was relatively strong, there is little prospect that those purchases will increase substantially now that the dollar is much weaker. Thus, dairy exports—which are helped by the weak U.S. dollar—rather than FDI are likely to be the mechanism through which the U.S. dairy industry increases its role in world dairy markets in the next several years.

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APPENDIX

APPENDIX TABLE 1. U.S. Average Monthly NDM Stock Data, 1996–2006.

Year	Average Monthly Total Stocks (mt)	Average Monthly Government Stocks (mt)	Government Stocks as % of Total
1996	35,108	1,852	5.3
1997	57,180	2,843	5.0
1998	73,691	32,901	44.6
1999	106,576	53,245	50.0
2000	236,025	165,185	70.0
2001	392,058	334,350	85.3
2002	526,290	468,830	89.1
2003	548,845	498,643	90.8
2004	335,775	282,818	84.2
2005	114,220	69,586	60.9
2006	58,888	16,933	28.8

Source: USDA-AMS, Dairy Market Statistics, 1996–2006 [35].

APPENDIX TABLE 2. U.S., Oceania and Europe Butter Prices, 1995–2007.

Year	US Butter Price (U.S.$/mt)	Oceania Butter Price (U.S.$/mt)	Europe Butter Price (U.S.$/mt)	U.S. Price as % of Price for Oceania	U.S. Price as % of Price for Europe
1995	$1,795	$1,991	$2,194	90.2	81.8
1996	2,376	1,696	1,850	140.1	128.4
1997	2,556	1,515	1,842	168.7	138.8
1998	3,899	1,749	1,916	222.9	203.5
1999	2,733	1,345	1,511	203.2	180.9
2000	2,594	1,225	1,371	211.8	189.2
2001	3,666	1,331	1,403	275.4	261.3
2002	2,438	1,044	1,156	233.5	210.9
2003	2,524	1,343	1,411	187.9	178.9
2004	4,005	1,791	1,893	223.6	211.6
2005	3,414	2,131	1,969	160.2	173.4
2006	2,726	1,773	1,912	153.8	142.6
2007*	3,047	2,610	3,580	116.7	85.1

Continues

APPENDIX TABLE 2. Continued

Year	U.S. Butter Support Price (U.S.$/mt)	Oceania Butter Price (U.S.$/mt)	Europe Butter Price (U.S.$/mt)	U.S. Support Price as % of Price for Oceania	U.S. Support Price as % of Price for Europe
1995	$1,433	$1,991	$2,194	72.0	65.3
1996	1,433	1,696	1,850	84.5	77.5
1997	1,433	1,515	1,842	94.6	77.8
1998	1,433	1,749	1,916	81.9	75.0
1999	1,433	1,345	1,511	106.5	94.8
2000	1,453	1,225	1,371	118.6	106.0
2001	1,774	1,331	1,403	133.3	126.4
2002	1,956	1,044	1,156	187.4	169.2
2003	2,315	1,343	1,411	172.4	164.1
2004	2,315	1,791	1,891	129.3	122.3
2005	2,315	2,131	1,969	108.6	117.6
2006	2,315	1,773	1,912	130.6	121.1
2007*	2,315	2,610	3,580	88.7	64.7

Source: Prices obtained from USDA-AMS, Dairy Market Statistics [35]. U.S. market prices for butter are for Chicago Mercantile Exchange Grade AA butter. Oceania and Europe prices are F.O.B. port.
*Market price figures for butter 2007 are for first nine months of the year. The butter support price is for the full year of 2007.