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**BABCOCK INSTITUTE DISCUSSION PAPER
No. 2003-4**

**DEVELOPMENTS IN THE DAIRY INDUSTRIES OF MEXICO,
CENTRAL AMERICA, ARGENTINA, AND BRAZIL—
IMPLICATIONS FOR THE U.S. DAIRY SECTOR**

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The Babcock Institute for International Dairy Research and Development
is a joint program of the
University of Wisconsin-Madison College of Agricultural and Life Sciences
University of Wisconsin-Madison School of Veterinary Medicine
University of Wisconsin Extension Cooperative Extension Division

Funding for this study was provided by CSRS USDA Special Grant 02-34266-12789

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ISBN 1-59215-082-9

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DEVELOPMENTS IN THE DAIRY INDUSTRIES OF MEXICO, CENTRAL AMERICA, ARGENTINA, AND BRAZIL—IMPLICATIONS FOR THE U.S. DAIRY SECTOR

W.D. Dobson*

Executive Summary

Introduction

- Many Latin American countries—including those that are the subject of this paper—have experienced economic problems in recent years that have adversely affected their dairy industries. Adjustments made by the dairy industries of these countries in response to the problems have effects that extend beyond their borders.
- The main purpose of this study is to evaluate how economic problems and developments in the dairy industries of Mexico, Central America, Argentina, and Brazil will affect the U.S. dairy sector.

Mexico

- Under the North American Free Trade Agreement, Mexico's tariffs on fluid milk and cheese imported from the U.S. declined to zero in 2003. U.S. cheese now enters Mexico duty free while cheese imports from third country suppliers face tariffs of about 20%.
- Mexico's over-quota tariffs on nonfat dry milk (NFDM) will not go to zero until 2008. However, it would not be surprising if the government of Mexico receives strong pressures from the domestic industry to prevent the tariff on NFDM from falling to zero as scheduled in 2008.
- The pervasive and persistent poverty in Mexico will maintain the demand for imported NFDM. However, U.S. exports of NFDM will likely be limited to about 60 thousand metric tons annually for the next few years.
- Mexico's dairy markets have matured. As such, competition for export sales in Mexican dairy markets is keen, especially for bulk dairy product sales. Argentine firms in recent years have emerged as strong competitors for Mexico's dairy imports. This has occurred partly because the Argentines have scrambled to replace declining dairy exports to Brazil with expanded sales in Mexico.
- While milk production has increased in Mexico's northern states, there is little evidence that Mexico is becoming more nearly self-sufficient in milk production. Mexico's milk production is anticipated to increase at a moderate rate in the foreseeable future, but not enough to satisfy increasing domestic demand.
- Corruption has discouraged U.S. dairy exports and U.S. foreign direct investment in Mexico's dairy markets. While corruption remains a problem, Mexico's government has reduced corruption. Thus, the Global Corruption Report for 2003 has declared that Mexico is leading the region (Mexico, Central America and the Caribbean) in implementing anti-corruption measures.

Central America

- With the exception of Costa Rica, the Central American countries (Costa Rica, El Salvador, Guatemala, Honduras, and Nicaragua) are experiencing difficult economic times. The economic

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problems have produced out-migration from all Central American countries except Costa Rica, increasing the number of people in the U.S. with Central American roots. This development, in turn, has expanded the U.S. market for dairy foods that are familiar to Central Americans.

- Nicaragua, the largest cattle-producing country in Central America, has the potential to further increase milk and dairy product production and expand dairy exports. Many people in Nicaragua's dairy industry believe that additional quantities of dry, hard, salty (morolique) cheese could be exported profitably to the U.S.
- Morolique cheese commanded premium prices (\$6.00 to \$7.00 per pound at retail) in the U.S. in the early 2000s. Dairy companies in the U.S. and elsewhere have found it difficult to replicate the distinctive flavor and color of morolique cheese. The flavor has proven difficult to replicate, in part, because some morolique cheese is made from unpasteurized milk.
- Nicaraguan firms were developing an alliance to expand exports of morolique cheese to the U.S. in early 2003. Performance of this experimental alliance will reveal much about the capacity of smaller Nicaraguan dairy firms to export dairy products successfully. U.S. dairy firms may find it useful to monitor the performance of this exporting alliance.
- Developments in Central America's dairy industries have implications for serving the large and growing U.S. market for dairy products represented by Latinos living in the U.S.
 - Latin Americans living in the U.S. totaled about 35 million in 2000. Latin Americans are expected to account for about 40% of the U.S. population growth between 2000 and 2010. Mexicans make up about two-thirds of U.S. Hispanics.
 - Hispanic cheese production in the U.S. is growing faster than overall U.S. cheese production. Within the U.S., California's producers of Hispanic cheeses expanded output most rapidly (9.5% per year) during 1995 to 2000. Wisconsin's producers of Hispanic cheeses recorded increases of 7.0% per year during this period.
- Preferences of Latin Americans living in the U.S. depend on a number of things, including their country of origin. Thus, Nicaraguans, Hondurans, and Salvadorians have similar cheese preferences that differ from those of Mexicans. The niche export marketing strategy of Central American dairy firms recognizes this point.
- Corruption in Central American countries will discourage U.S. foreign direct investment in the dairy-food businesses of those countries.

Argentina and Brazil

- The macroeconomic and political problems that hit Argentina and Brazil in the late 1990s and early 2000s have adversely affected many industries, including the dairy industries of the two countries.
- Argentina's financial problems created difficulties for the country's dairy industry, which had developed into the "dairy supplier of Latin America" during the 1990s and was expanding into other markets.
- The devaluation of the Argentine *peso*, which began in January 2002, had differential effects on milk and crop prices. In particular, the price of grains in Argentina increased almost in proportion to the devaluation. No similar effect occurred for milk. As a result of relatively low returns in dairying, many Argentine dairy farmers stopped or reduced feeding of silage and grains and went back to a more pasture-based system of feeding.
- Problems besetting Argentina's dairy industry in recent years included declining milk production, declining domestic dairy product consumption, loss of dairy exports to Brazil, and loss of dairy exports to other countries because of an outbreak of foot and mouth disease.
- While Argentine firms expanded dairy exports to Mexico, for the next few years, at least, Argentina will be a weaker competitor in most international dairy markets and a less attractive market for U.S. dairy inputs than in the 1990s.
- While Brazil's dairy industry did not escape the impacts of macroeconomic problems affecting the country, the effects were less severe than in Argentina:
 - Aggregate milk production and milk production per cow in Brazil increased from 1997 to 2002.

- The country's dairy industry attracted investments and joint ventures geared to using Brazil as a base for expanding dairy exports.
- Policies of the Brazilian Government have focused on making the dairy industry more commercially competitive.
- Brazil is likely to continue to be an attractive market for U.S. dairy genetics. Sales of farm bulk milk tanks in Brazil promise to increase during the next several years as a result of a new "National Program to Increase Milk Quality" in Brazil. U.S. firms will face vigorous competition for the bulk tank sales.
- While Brazil will have strong competition for expanded dairy exports, the country's dairy industry possesses advantages. First, raw product costs are among the lowest in the world. Secondly, strong international dairy traders—e.g., Nestle, and Fonterra—have established bases in the country. Finally the devaluation of the Brazilian *real* provides an impetus for expanding dairy exports. Brazil appears poised to be a strong competitor in international dairy markets.
- It is too early to tell how much impact the proposed Free Trade Area of the Americas pact (FTAA) might have on the U.S. dairy industry and the dairy industries of Argentina and Brazil. Presidents Kirchner of Argentina and da Silva of Brazil have expressed a preference for strengthening the MERCOSUR before entering into the FTAA. FTAA treatment of individual commodities such as dairy will have to await agreement on whether there will be a FTAA in the near future.

DEVELOPMENTS IN THE DAIRY INDUSTRIES OF MEXICO, CENTRAL AMERICA, ARGENTINA, AND BRAZIL—IMPLICATIONS FOR THE U.S. DAIRY SECTOR

W.D. Dobson

Introduction

The dairy industries of Latin America have experienced noteworthy changes in recent years. A few of those changes have received publicity in the popular press and scientific literature. Mexico—a signatory to the North American Free Trade Agreement (NAFTA)—has been identified as an important market for U.S. dairy exports and foreign direct investment. It also has become clear that Mexico’s dairy market is more complex for U.S. firms to serve than many had anticipated. Argentina and Brazil experienced macroeconomic shocks that have adversely affected many sectors of the economies of the two countries, including the dairy industries.

Latin America’s economic problems, of course, are not confined to Argentina and Brazil. Analysts have described recent years as a “lost half decade” for much of Latin America. Only Mexico, Chile, and Costa Rica escaped the worst of the macroeconomic problems. As will be apparent, the lost half decade had substantial negative effects on the dairy industries of Latin America.

Central America (Costa Rica, El Salvador, Guatemala, Honduras, and Nicaragua) and the term “major dairy industry” are rarely mentioned in the same breath. However, this characterization fails to recognize important developments in the dairy industries of the five Central American countries. For example, Nicaraguan farmers—taking advantage of the country’s large land area and large cattle population—have made dairying a more important enterprise in that country, partly in response to a decline in the profitability of coffee and sugar cane production. Moreover, Costa Rica’s successful dairy industry has shed its image as one of the best kept secrets in the world dairy business. In this connection, Dos Pinos Cooperative of Costa Rica has emerged as a world-class processing and marketing cooperative that arguably can be grouped in the same set as Fonterra of New Zealand, Murray Goulburn of Australia, the Kerry Group of Ireland, Land O’Lakes of the U.S., Arla Foods of Denmark and Sweden, and a host of other large European dairy cooperatives.

Central American dairy firms—particularly those in Nicaragua and Honduras—have identified the U.S. as a promising market for exports of hard, dry, salty, cheeses—frequently referred to as morolique cheese throughout the paper. People living in the U.S. who trace their roots to Central America are a target market for this cheese. This is a sizable market—it totals about one percent of the U.S. population. The entire group of people with Latin American origins, of course, is much bigger and is growing rapidly. Latin Americans living in the U.S. represent a growing market for many consumer goods, including dairy products.

The main purpose of this study is to analyze how economic developments and developments in the dairy industries of Mexico, Central America, Argentina, and Brazil will affect the U.S. dairy industry. Emphasis focuses on likely impacts of developments in these countries on U.S. dairy exports, U.S. dairy imports, and U.S. foreign direct investment in dairy-food businesses in the countries. Countries singled out for study in the paper were chosen in part because of their proximity to the U.S. and because they are currently, or likely will be, included in free trade agreements with the U.S. These considerations have particular importance for Mexico and Central America. Argentina and Brazil were included in the analysis because of the importance of the dairy industries in these two countries.

I. Mexico

Recent Developments in Mexico's Dairy Industry

Important developments that affected Mexico's dairy industry during most of the post-NAFTA period (1994 through 2001) are described in Babcock Institute Discussion Paper No. 2002-1 entitled, "How Mexico's Dairy Industry Has Evolved Under the NAFTA—Implications for U.S. Dairy Exporters and U.S. Investors in Mexico's Dairy-Food Businesses" [7]. Readers interested in a detailed description of Mexico's dairy industry should consult that paper. Certain statistics included in Babcock Institute Discussion No. 2002-1 appear in updated form in Table 1.

Table 1. Selected statistics describing recent changes in Mexico's economy and dairy industry*

Factor	Value for 2002	% Change from Year Earlier
GDP growth rate	+0.1%	+0.4%
GDP per capita (PPP)	\$9,000**	-1.1
Inflation rate	5.0%	-1.4
Population	103,400,165	+1.5
Percent of population below poverty line	40.0%**	NA
Milk cows (1,000 head)	6,800	0.0
Milk production (1,000 MT)	9,560	0.6
NFDM imports (1,000 MT)	185	0.5
NFDM imports as % of consumption	54	-1.5
Cheese imports (1,000 MT)	65	-1.5
Cheese imports as % of consumption	31	-1.1

* Source: U.S. Central Intelligence Agency [32], World Bank World Development Indicators [38], and FAS-USDA attaché report [30].

** Figures for 2001.

In brief, the figures in Table 1 suggest that Mexico emerged from a mild recession and recorded real GDP growth of 0.4% in 2002. (Mexico had experienced robust growth of 6.9% in 2000 before witnessing a decline of 0.3% in real GDP in 2001.) Perhaps the most noteworthy figure in Table 1 is the percentage of the population living below the poverty line (40%). This figure underscores the pervasiveness of poverty in Mexico, poverty that is particularly evident in rural areas and southern states of the country. Changes in milk production from 2001 to 2002 were small. Cheese imports declined by about 1.5%, reflecting effects of the economic recession and other developments.

A brief summary of other developments affecting Mexico's dairy industry in the past decade, emphasizing those that have occurred after 2001, appears below:

- The NAFTA agreement—which became effective on January 1, 1994—opened the Mexican market to larger U.S. dairy exports.
- Under the NAFTA, Mexico's tariffs on most dairy items imported from the U.S. were to be phased out over a 10-year period. Thus, in 2003, Mexico's tariffs on fluid milk and cheeses imported from the U.S. declined to zero. This development has important competitive implications for U.S. cheese exports to Mexico. U.S. cheese exports now enter Mexico duty free, while cheese imports from third country suppliers face a tariff of about 20% [30, p.2]. However, Mexico's over-quota tariff on NFDM imports from the U.S. will not go to zero until 2008.
- While Mexican demand for many U.S. dairy products rose under the NAFTA, this development did not unfold immediately or smoothly under the trade agreement. Mexico's economy experienced a recession, a sharp devaluation of the *peso*, and a bout of rapid inflation

after 1994. It was not until the late 1990s and 2000 that robust economic growth began to manifest itself in Mexico. While Mexico experienced a recession in 2001 and slow growth in 2002, the country's economy remained stronger than many others in Latin America during the early 2000s.

- The pervasive and persistent poverty in Mexico has maintained the demand for NFDM—substantial quantities of which are imported. Much of the NFDM is reconstituted into fluid milk by the government agency, LICONSA, for sale to low-income people at subsidized prices.
- Mexico's self-sufficiency level varies from product to product. Surprisingly, Mexico's imports of NFDM as a percentage of domestic use have declined since the NAFTA became effective.
- Milk production in Mexico totaled about 9,560 metric tons in 2002. Milk production in Mexico during 1994 through 2002 increased by an average of 2.6% per year. However, during 2001 and 2002, the rate of increase in milk production in Mexico declined from the robust rates recorded during 1998 to 2000 when milk production rose by 4.8% to 6.6% per year.
- While milk production has increased in Mexico's northern states, there is little evidence that Mexico is becoming more nearly self sufficient in milk production. This is partly because milk producers on semi-confinement and dual-purpose dairy farms, which comprise most of the farms in central and southern Mexico, have found it challenging to expand milk production. Poor sanitation and genetics, inefficient cold storage and refrigeration, and out-dated transportation and marketing facilities continue to limit expansion in semi-confined systems and dual-purpose cattle operations [30, p.19].
- FAS-USDA officials in the U.S. Embassy in Mexico City characterize the dairy production-consumption situation as follows [31, p.1]: "(Milk) production is anticipated to increase at a moderate rate in the foreseeable future, but not enough to satisfy increasing domestic demand."
- Mexico has become a mature dairy market that attracts world class competitors. Margins for commodity dairy product exports to Mexico have become "razor thin."
- If the quality of Mexican dairy products continues to improve, it is doubtful whether the price premiums that U.S. fluid milk products, ice cream, and cheeses commanded in up-market Mexican supermarkets during the early 2000s can be maintained.
- Corruption has discouraged U.S. dairy exports and U.S. foreign direct investment in Mexico's markets. While corruption in Mexico remains a problem, Mexico's government has attempted to reduce corruption with positive results. Thus, the Global Corruption Report 2003 has dubbed Mexico as "leading the region (Mexico, Central America and the Caribbean)" in implementation of anti-corruption measures [22, p.95]. Numbers support this claim. Transparency International's Corruption Perceptions Index (CPI) gave Mexico a score of 3.6 for 2002. The CPI score relates to perceptions of corruption as seen by business people, academics, and risk analysts, and ranges between 10 (highly clean) and 0 (highly corrupt). While the 3.6 score places Mexico in the middle third of the 102 countries analyzed, it does represent an improvement from the 3.3 CPI score recorded for Mexico in 2000 [29].

Implications for the U.S. Dairy Industry

As reported in Discussion Paper No. 2002-1, Mexico's dairy market no longer represents "low-hanging fruit" for U.S. dairy exporters. Mexico's dairy market has become mature. As such, competition for export sales to this market is keen, especially for bulk dairy products. Argentine firms in recent years have emerged as strong competitors for Mexico's dairy imports. This has occurred partly because the Argentines have scrambled to replace declining dairy exports to Brazil with expanded sales in Mexico. More on this point later.

U.S. dairy firms have become the dominant suppliers of Mexico's imports of fluid milk, yogurt, whey, and lactose. Further expansion of U.S. exports of these products will be obtained mainly through expansion of the Mexican market through income growth, population growth, and development of new, demand-expanding uses for the products. How much the market for these products will expand depends partly on how fast the Mexican economy grows. Accordingly, the U.S. dairy industry has a stake in continued economic growth in Mexico.

Mexico, as noted earlier, will continue to be a major importer of NFDM for use in making reconstituted milk sold to low-income people. However, U.S. firms will likely make smaller exports of NFDM to Mexico than was the case, at times, prior to the NAFTA agreement. In 1989, for example, U.S. firms exported 98 thousand tons of NFDM to Mexico [6]. This is partly because U.S. exports of NFDM milk made with Dairy Export Incentive Program payments (export subsidies) are limited by the Uruguay Round GATT/WTO Agreement to about 68 thousand metric tons per year. Since Mexico can obtain subsidized exports of milk powder from firms in other countries—especially European Union firms—the U.S. share of Mexico's imports of milk powder will likely be constrained to about 60 thousands tons per year.

Moreover, the relatively high tariff (59% in 2002) applied by Mexico to over-quota imports of NFDM from the U.S. tends to make over-quota imports of the product uncompetitive [30, p.24]. The situation will change beginning in 2008 when all U.S. NFDM will enter Mexico duty free. However, do not be surprised if the Mexican government is pressured to prevent the tariff on U.S. NFDM from going to zero according to this schedule. NFDM is a versatile product in Mexico, which is used for making a host of products, including fluid milk, ice cream, and cheese. If additional quantities of inexpensive NFDM became available from the U.S., processors of NFDM from domestic milk supplies in Mexico would experience strong competitive pressures. Affected processors and producer organizations are likely to resist this development by requesting an extension of the time before which the tariff on U.S. NFDM would be eliminated. Thus, a situation paralleling the chicken tariffs may emerge. Tariffs on U.S. imports of chicken meat were scheduled to be eliminated in 2003. After hearing protests from Mexico's chicken producers and processors, the U.S. government agreed that scheduled reductions in Mexico's chicken meat tariffs to zero could be delayed for five years [17].

II. Central America

Background on Economic Conditions in Central America

A small amount of background information on Central America helps to place recent developments in the region's dairy industries in perspective. This information shows that, with the exception of Costa Rica, the Central American countries have recently experienced difficult economic times. The difficult times have produced out-migration recently from all Central American countries except Costa Rica. As noted later, this out-migration has contributed to an increase in the number of people in the U.S. with Central American roots, which, in turn, has expanded the U.S. market for dairy foods that are familiar to Central Americans.

The five Central American countries are generally small (Table 2). Collectively, the five countries have a population only one-third as large as that of Mexico. The countries exhibit a high incidence of poverty. Among the Central American countries, only Costa Rica has a relatively low percentage of its population below the poverty line. Specifically, the percentage of Costa Rican people below the poverty line is only modestly higher than the comparable U.S. figure (13%). The widespread poverty and the high unemployment rates help to explain the negative net migration figures for El Salvador, Guatemala, Honduras, and Nicaragua.

The Central American countries exhibited modest real GDP growth in 2001 (Table 3). GDP figures expressed in purchasing power parity (figures that take into account differences in the cost of living) reveal that Costa Rica has a level of GDP/person (PPP) more than double that of three of the other Central American countries. Nicaragua's GDP/person (PPP) figure—the lowest of the region—reflects effects of the country's civil war in the late 1970s, internal strife during much of the 1980s, and devastation caused by Hurricane Mitch in 1998. Surprisingly, the inflation rates in Central America were typically modest in 2001. External debts of the five countries are similar. However, Nicaragua does have the second highest foreign debt burden as a percentage of GDP of any country in the world [9].

Table 2. Population, poverty, unemployment, and net migration figures for Central American countries, 2002*

Country	Population	% of Population Below Poverty Line	Unemployment Rate	Net Migration Rate
Costa Rica	3,834,934	21%	5.2%	0.52
El Salvador	6,353,681	48	10.0	-3.88
Guatemala	13,314,079	60	7.5	-1.79
Honduras	6,560,608	53	28.0	-2.07
Nicaragua	5,023,818	50	23.0	-1.30

* Source: U.S. Central Intelligence Agency [32]. Figures are for 2002 except for percent of population below poverty line and unemployment rate, which are estimates for various recent years. The Net Migration Rate figures show migration per 1,000 population.

Table 3. Gross domestic product (GDP), inflation, and external debt figures for Central American countries, 2001*

Country	Real GDP Growth Rate	GDP/Person (PPP) U.S. Dollars	Inflation Rate (Consumer Prices)	External Debt (\$ Bill.)
Costa Rica	0.3%	\$8,080	12.1%	\$4.6
El Salvador	1.4	4,500	3.8	4.9
Guatemala	2.3	3,850	7.6	4.5
Honduras	2.1	2,450	9.7	5.6
Nicaragua	2.5	2,366	7.4	6.1

* Source: Figures for real GDP, inflation, and external debt are from the U.S. Central Intelligence Agency [32]. GDP/person (PPP) figures are from the Economist [8].

Implications of the Economic Conditions for the Demand for Dairy Products

The figures in Tables 2 and 3 have implications for the demand for dairy products in these countries. With the notable exception of NFDMM, dairy products tend to be normal (not inferior) goods. Thus, when consumer incomes are low, the consumption of normal goods tends to be low. Similarly, when consumer incomes rise, the consumption of normal goods increases. The low consumer incomes in Central America (except for Costa Rica) tend to produce relatively low consumption of unsubsidized dairy products. Indeed, many dairy products are expensive to consumers relative to staples such as beans and rice. If economic development efforts in Central America are successful, consumption of dairy products will rise in the future.

The net out-migration of people from the Central American countries, except Costa Rica, has put many legal and illegal immigrants from these countries in the U.S. Among other things, this development means that there are markets in the U.S. for dairy products of the type that these people consumed in their home country. In particular, it indicates that there is a sizeable U.S. market for morolique cheese commonly produced in Nicaragua and Honduras.

Dairy Production Characteristics

Most dairy farming operations in Central America are pasture-based. In Central America, the specialized dairy areas tend to be in the higher altitudes of 1,000 meters or higher where pastures stay green for longer periods of the year. Farmers in lower altitude areas—some of which are semi-desert areas—tend to specialize in beef production.

Nicaragua has the largest land area of the Central American countries, exceeding by 11% and 7%, respectively, the land areas of Guatemala and Honduras (Table 4). The cattle number figures in Table 4 must be interpreted with caution because such statistics frequently are not accurate for Central America. Accordingly, the cattle numbers figures in the table give only approximate

magnitudes. However, the figures do indicate that Nicaragua is the largest cattle producing country in Central America and suggest that the country has the potential to further increase milk production.

The total cattle number figures in Table 4 include both beef animals and dual-purpose dairy-beef animals, including Zebu-dairy cross-bred cattle. The number of specialized dairy cattle (Holsteins, Jerseys, Brown Swiss, etc.) in most Central American countries tends to be relatively small. However, even in Nicaragua, where milk production is obtained mostly from cross-bred animals, there are a small number of specialized dairy operations where the cattle include genetics from traditional dairy breeds.

Table 4. Land area and cattle numbers in Central American countries*

Country	Land Area (Square km)	Relationship to Size of U.S. States	Cattle Numbers 2002 (1,000 Head)	
			Total Cattle	Dairy Cattle
Costa Rica	50,660	Slightly smaller than West VA	1,740 (F)	172 (F)
El Salvador	20,720	Slightly smaller than MA	1,270 (F)	291 (F)
Guatemala	108,430	Slightly smaller than TN	2,068 (P)	74 (P)
Honduras	111,890	Slightly larger than TN	1,931 (F)	NA
Nicaragua	120,254	Slightly smaller than NY	3,068 (F)	NA

* Source: Land area figures are from U.S. Central Intelligence Agency [32]. Figures on cattle numbers are from FAS-USDA attaché reports [2,10,12,18,19]. (F) = forecast. (P) = preliminary.

Supply Pressures

Nicaragua's dairy industry, in particular, is feeling the pressure of increased milk supplies on farm milk prices. Average production per cow on most of Nicaragua's dual-purpose, dairy-beef farms remains low—two or three liters per day during the December through May dry season—and up to double that amount during the June through September rainy season. Production on the relatively few specialized, commercial dairy farms in the country—some of which use genetics from traditional dairy breeds—is larger. Specifically, production per cow on the specialized, commercial dairy farms may total as much as four to five times as much as recorded on the dual-purpose, dairy-beef farms. However, genetic improvements, improvements in veterinary practices, improvements in nutrition, and limited improvements in pastures have increased milk production on many Nicaraguan farms. The number of Nicaraguan farmers producing milk also increased as farmers switched from alternative enterprises such as coffee and sugarcane production into dairying.

As a result of these developments, Nicaragua's milk production grew to 62.8 million gallons (244,934 metric tons) in 2001 after recording steady increases averaging 3.2% per year during 1990 to 2001 (Table 5). Production of major dairy products exhibited similar increases during 1990 to 2001. Increases in cheese production recorded the largest yearly increases and also

Table 5. Percentage changes in Nicaragua's milk production and dairy product production, 1990 to 2001*

Product	Average Annual Increase, 1990 to 2001 (%)	Total Increase, 1990 to 2001 (%)
Milk	3.2%	41%
Cheese	10.4	188
Butter	7.6	84
Cream	5.8	68

* Source: Compiled by IICA-Nicaragua from information obtained from Nicaragua's Ministry of Agriculture and Forestry

showed the most consistency. Increases in production of butter and cream also showed upward trends but exhibited much greater year-to-year variability in production than cheese production. Butter production exhibited the variability of a product that is a residual claimant on available supplies of milk.

While Nicaragua recorded increases in milk and dairy product production during 1990 to 2001 that created supply pressures, the country remains a relatively small dairy producer. For example, the country's commercial milk production during 2001 was equivalent to only 2.0% to 3.0% of Wisconsin's milk production for that year. Adding Nicaragua's milk production for the informal market to the 244,934 metric ton figure noted above for 2001 would push the country's total milk production to the equivalent about 6.0% of the Wisconsin figure.

Supply pressures being felt in Nicaragua's dairy industry are accentuated by the pronounced seasonal variations in production. These variations create large price swings that are objectionable to farmers and produce inefficiencies in plant operations. To a major extent, these seasonal swings are simply the product of a pasture-based dairy system that produces sharp seasonal changes in milk production.

While the amount of seasonal variation in milk supplies received varies among plants, it is pronounced at almost all plants. Nicaraguan milk processors report that milk production in Nicaragua during the rainy season increases by two-thirds or more compared to milk production during the dry season. Because of the seasonal variation in production (in combination with increasing overall milk production), many processors find it difficult to obtain profitable uses for the additional milk they receive during the rainy season. Accordingly, they reduce prices paid to farmers sharply in the rainy season to discourage farmers from selling milk to them or to avoid losses on milk they do purchase. Rainy season prices paid to farmers by Nicaraguan cheese and milk powder processors in 2003 averaged about one-third lower than dry season prices, declining from about U.S.\$0.22 per liter during the dry season to about U.S.\$0.15 per liter during the rainy season. Anecdotal information suggests that rainy season prices paid by a few processors sometimes decline by as much as 70% from dry season prices.

For obvious reasons, the sharp reduction in prices concerns Nicaraguan dairy farmers who would like to receive a more even price throughout the year. Milk processors find that in the dry season they are using their plants at far less than capacity, creating processing inefficiencies. The manager of the Nestle milk powder plant at Matagalpa, Nicaragua reported that during part of the 2003 dry season he ran only one of the two milk powder processing lines in his plant and ran that line only every other day [27]. Operating at low processing capacity utilization levels at times during the year makes it difficult for plants to compete effectively against plants that have a more even milk supply throughout the year.

The large seasonal variation in milk production causes corresponding changes in cheese prices. For example, prices in export markets for morolique cheese produced in Nicaragua recently have fallen from about U.S.\$1.40 per pound during the dry season to about U.S.\$0.90 per pound during the rainy season, a 35% decline. These differences arise in part because Nicaraguan dairy processors lack the cold storage facilities needed to store substantial quantities of cheese produced in the rainy season for sale in the dry season. The reduced export demand for cheese in other Central American countries also causes buyers in these countries to complain of quality problems in order to avoid purchasing the product from Nicaraguan processors.

Supply pressures facing the dairy industries of other Central American countries appear to be less severe than in Nicaragua. In some of the countries, milk production has increased less than in Nicaragua. In addition, the other Central American countries have exhibited a capacity to limit imports of dairy products, expand dairy exports, and take other measures to ease pressures facing the domestic industry. For example, Costa Rica's advanced dairy industry has developed a portfolio of products—including storable milk powders—that find outlets in the domestic market, elsewhere in Central America, or other foreign markets during most months of the year.

Limits to Expansion of Domestic Demand for Dairy Products

Possibilities for expanding domestic demand for dairy products in Central America are limited by low incomes and pervasive poverty. This consideration does not mean that the demand for dairy products in Central America is uniformly low. The up-market supermarkets in major cities of Central America carry a full range of dairy products similar to those found in supermarkets in the U.S. and Europe. Suppliers of these supermarkets include Parmalat, Dos Pinos, Kraft, Sargento, Nestle, Fonterra, and a host of smaller foreign firms. In Nicaragua, a few small, domestic processors such as Santa Martha of Jinotega, Nicaragua also have acquired shelf space in the upscale supermarkets.

However, the percentage of the population that can afford to shop at these supermarkets is low. Low-income customers often buy from smaller food stores, outdoor markets and suppliers of the informal markets. Informal markets tend to be large in Central America. In Nicaragua, at least 60% of dairy products—and probably more—are made in “kitchen type” facilities or small, unsanitary plants. Typically, the quality of such products is poor. The quality image of Nicaragua’s dairy industry suffers because of the low quality of product coming out of the informal market.

Export Markets

Processors recognize that domestic demand for dairy products will grow slowly and will not keep pace with increases in supplies. Accordingly, they look to export markets as outlets for additional milk and dairy product supplies.

The supply pressures vary from country to country in Central America. In Costa Rica, Dos Pinos Cooperative has about a 90% market share in the commercial segment of the domestic market and cannot expand sales much by increasing market share. Accordingly, Dos Pinos is looking to exports and new product development to expand sales. In an effort to increase dairy exports to the U.S. and Canadian markets, the firm has employed a sales manager whose duties include expanding sales in the two markets. Dairy processors in Honduras and El Salvador export morolique cheese to the U.S. and other markets.

Nicaragua’s dairy industry is under the greatest pressure to expand dairy exports. Nicaragua’s current dairy exporting practices are complex and varied. The country’s dairy exports include small quantities of morolique cheese carried into the U.S. by travelers (which in total are sizable), limited exports of hard, dry cheese to the U.S. made mostly through Miami, Florida to firms that lack licenses needed to import cheeses at low tariff rates, legal and “illegal” exports of hard cheese to El Salvador and Honduras, and (according to anecdotal accounts) large shipments of hard cheese to El Salvador and Honduras that are later transshipped by firms in the latter markets to the U.S. In early 2003, Parmalat exported small quantities of creams produced in Nicaragua to the U.S. Nestle exports milk powder into other Central American countries. There are other noteworthy examples of exports and foreign direct investments by Nicaraguan dairy firms in Central American markets.

El Salvador and Honduras were the largest markets for Nicaraguan dairy products during 1995 to 2001 (Table 6). The pattern exhibited by dairy exports to these markets can be characterized as strong but irregular. Exports to the U.S. market were relatively small but increasing during 1995 to 2001. Interpret the figures in Table 6 with caution, since illegal exports and exports carried to the U.S. in small lots by travelers (and probably some other exports) are not fully represented in these figures. However, the figures in Table 6 provide indications of the approximate magnitudes of Nicaraguan dairy exports to different countries.

Managua-based Parmalat, which purchased about 25% of the commercial milk supplies in Nicaragua in 2003, may use Nicaragua as a platform for substantially larger exports of fluid milk items into other Central American countries. Parmalat’s management also is considering production of additional mozzarella cheese to replace imports of that pizza cheese ingredient from New Zealand. Eskimo, a Managua-based fluid milk processor with production capacity about one-eighth as large as that of Parmalat, exports dairy novelties (ice cream bars, etc.) to other Central American countries.

Table 6. Nicaraguan exports of dairy products to selected destination markets, average for 1995-2001 (thousands of U.S. dollars) and trends*

Destination Country	Value of Exports, Average 1995-2001, US \$ (000)	% of Total	Trend or Pattern
United States	\$ 267.4	2.2%	Increasing
Guatemala	336.6	2.8	Irregular
El Salvador	8,777.6	73.5	Strong but irregular
Honduras	2,557.4	21.4	Strong but irregular
Costa Rica	2.0	0.0	Weak and irregular
Others	1.9	0.0	Weak and irregular
Total	\$11,942.9	99.9%	

* Source: Figures compiled by IICA-Nicaragua from information provided by Nicaragua's Ministry of Development, Industry and Commerce.

Opportunities for Dairy Exports to the U.S. Market

As noted earlier, morolique cheese is a principle export of Nicaragua's dairy industry. It is widely believed in the Nicaraguan dairy industry that substantial additional quantities of morolique cheese could be exported profitably to the U.S. market. It is also argued that substantial amounts of profit (value-added) are being collected by firms in El Salvador and Honduras that transship Nicaragua-produced morolique cheese to the U.S. market. This added value, it is claimed, could be obtained by the Nicaraguan dairy industry if the shipments of the cheese went directly from Nicaragua to the U.S. market.

The optimism about prospects for expanded exports of this dry, salty, hard cheese to the U.S. appears to be based on reliable information, but the competition for these sales will likely intensify. As pointed out in the comprehensive Policy Enhancement and Productivity report prepared by D.V. Casares, there is a large potential market for such cheese in the U.S. represented by former Central American residents and their children who now live in the U.S. [1]. (The Casares report was carried out to assess the U.S. market for dry, hard Honduran cheese but has strong relevance for Nicaraguan and Salvadoran cheeses). According to Casares, former residents of Nicaragua, Honduras and El Salvador now in the U.S. comprise 2.5 to 3.0 million inhabitants or about one percent of the total U.S. population. These people, especially those who have recently arrived in the U.S., represent important potential customers for the cheese. In addition, there are well-developed distribution systems for the cheese through bodegas (small supermarkets that specialize in Latin American products) and other retailing establishments in the U.S. The product is a favorite among retailers carrying the product because it has a long—three to six month—shelf life.

Casares established that a large market existed in the U.S. for the dry, hard, salty cheese but issued the following warning to Honduran cheese exporters [1, p.2]:

Due to the scarce resources of Honduran cheese processors and the risk involved in entering a mature, competitive market such as the U.S., Honduran processors should analyze and weigh all market options before taking action on this analysis.

This warning, which is also relevant for Nicaraguan dairy exporters, was issued by Casares for a number of reasons, including the belief that U.S. processors possess raw product cost advantages for cheese production. The raw product cost competitiveness of Nicaraguan processors depends on the season. In the 2003 dry season, the cost of milk used for manufacturing purposes was only about 15% lower than the U.S. 2002 Class III price (proxy for raw product cost for milk used for producing hard cheese in the U.S.). However, as indicated in the following schedule, in the rainy season, the advantage was substantially greater—more than 40%.

Location of Plants and Season	Farm Price (U.S. \$/liter)	% of U.S. Class III Price
U.S. Class III (2002 Season Average) [16]	\$0.26	100%
Selected Nicaraguan dairy manufacturing firms		
--2003 Dry season	0.22	85
--2003 Rainy season	0.15	58

Given the disadvantages facing Nicaraguan firms (distant location, smaller plants, etc.), the dry season raw product costs probably are not competitive for serving the U.S. cheese market. However, the rainy season manufacturing milk prices in Nicaragua—which were approximately the same as the New Zealand average farm prices for 2002—would be more competitive. The raw product cost disadvantages facing Nicaraguan processors during the dry season, at least, are exacerbated by the larger cheese yields that U.S. processors obtain from a given quantity of milk. Casares also suggested that imported hard, dry cheeses might evolve into commodities and, at some point, command lower prices.

While morolique-type cheese has characteristics that might cause it to evolve into a commodity cheese, it does not appear that retail customers in the U.S. regarded it as a commodity in the early 2000s. Prices charged for the cheese at retail in the U.S. in this period ranged from U.S.\$6.00 to U.S.\$7.00 per pound [1]. These prices were approximately twice as high as prices for some U.S.-produced commodity cheeses. The imported product commands a high price in part because the dry, hard, salty cheese has a unique flavor—a flavor originating in part from unpasteurized milk. Moreover, it is a flavor that, to date, has been difficult for competing cheese makers from the U.S. and other countries to replicate. The uniqueness of the flavor probably accounts for the ability of retailers in the U.S. to sell it for approximately U.S.\$6.00 to U.S.\$7.00 per pound to people who trace their roots to parts of Central America.

Thus, challenges facing the Nicaraguan dairy industry relating to relatively high raw-product cost probably will not sharply impede exports of morolique-type cheese to the U.S. in the near-term. This is because the product has the characteristics of a differentiated product. And producers of differentiated products typically do not need to be low-cost producers [20, 21]. However, over the longer run, as prices for the product come under increased pressure from competition from U.S. firms and other exporters from Central America, the Nicaraguan industry will need to become more competitive in terms of the cost of the raw product used to produce the cheese if it is to remain competitive. Increased competitiveness on raw-product costs will quickly become important if cheese makers in the U.S. and elsewhere develop the ability to duplicate the unique flavors of the dry, hard, salty Nicaraguan cheese.

Implications for the U.S. Dairy Industry

The implications for the U.S. dairy industry of recent developments in Central America's dairy sectors extend from the specific to the general. The specific implications show that Central American farmers, processors, and exporting firms have advanced plans in place to sell more morolique cheese to people living in the U.S. who trace their origins to Central America. The more general implications of the developments relate to opportunities for serving the large and growing market for dairy products purchased by the Latinos living in the U.S.

An exporting alliance that was being developed by Nicaraguan dairy processors in early 2003 illustrates the type of effort being put together by Central American firms to expand morolique cheese exports to the U.S. The alliance is comprised of the Masiguito, San Francisco De Asis, and Santo Tomas Cooperatives and the propriety firm, Alianza Nova—all relatively small firms located within about 120 miles of Managua, Nicaragua.

While alliance members still have a substantial amount of work to do, things appear to be going well for the alliance. First, in early 2003, the alliance received commitments from each alliance member to supply 10,000 pounds of cheese for export. The cheese processors' commitment to put

their own cheese at risk in the exporting initiative is noteworthy since the firms are likely to be serious about creating a favorable outcome for the initiative when their products are at risk. Secondly, a buyer for the first shipment of cheese to the U.S. apparently has been identified. Third, U.S. Food and Drug Administration (FDA) approval for plants that would be involved in exporting the dry, hard, salty cheese to the U.S. is being sought. Finally, cold storage facilities are being sought to store morolique cheese—some of which is made from unpasteurized milk—for the 60 days required for exports of the product to the U.S.

Gaining FDA approval for the exporting plants is likely to represent a significant challenge—one that may be underestimated by the Nicaraguan firms. It will also be important for the firms to obtain the capital needed to acquire additional cold storage facilities. Shortages of cold storage facilities currently represent a critical bottleneck for Nicaragua's dairy industry.

The exporting alliance represents a valuable experiment for the Nicaraguan dairy firms. Participants in the alliance and supporting organizations will learn a great deal about the capacity of Nicaragua's smaller dairy firms to export cheese to the U.S. from experience with this initiative. The exporting initiative undoubtedly will be monitored carefully. Experience under the initiative will reveal much about opportunities and challenges for expanding Nicaraguan dairy exports. U.S. firms also will be able to assess the competitiveness of Nicaraguan dairy exporters from this experiment.

The fact that Nicaraguan dairy firms will take significant risks and address the challenges associated with entering the mature, competitive U.S. market says something about the attractiveness of the U.S. market for morolique cheese. U.S. firms have advantages for serving that market that relate to proximity, raw product costs (at least for part of the year), economies of scale in processing, management experience, and familiarity with U.S. market channels. Despite the advantages possessed by U.S. firms, the Nicaraguan firms believe they have a reasonable chance of making profits in the U.S. market. The Nicaraguan firms are apparently relying on the unique flavor and color of the product to overcome these disadvantages. If U.S. firms wish to capture more of this market, it will be necessary for the firms to do a better job of replicating those flavors and related characteristics.

The more general implications of developments in the Central American dairy industries relate to serving the large and growing U.S. market for dairy products represented by the entire Latino population living in the U.S. What in brief is known about the size and characteristics of the U.S. market for consumer goods purchased by people who trace their origins to Latin America? What in brief is known about the market for Latin American cheeses in the U.S.?

- Latin Americans living in the U.S. totaled about 35 million in 2000. Latin Americans are expected to account for about 40% of the U.S. population growth between 2000 and 2010 [1, p.5].
- Mexicans make up about two-thirds of U.S. Hispanics [1, p.21].
- Hispanics living in the U.S. are relatively youthful. According to the U.S. Census, 25.7% of the U.S. population was under age 18 in 2000 while 35% of the Hispanics were less than 18 in this same year [5, p.C7].
- Of the total U.S. Latinos, Central American-born descendents are among the fastest growing population segments, both in terms of immigration to the U.S. and in birth rates. Each year about 23,000 Hondurans, Salvadorians, and Nicaraguans collectively enter the U.S. illegally, and Hispanic women average approximately three children versus about 1.8 children for non-Hispanic women [1, p.6].
- According to 1999 census estimates, the five U.S. metropolitan areas with the largest Central American populations are: Los Angeles (420,000), Miami/Fort Lauderdale (136,000), New York/New Jersey/Long Island (129,000), Washington, D.C./Maryland/Virginia (81,000), and Houston (73,000) [1, p.7].
- Hispanic cheese production in the U.S. is growing faster than overall cheese U.S. cheese production. U.S. domestic production of Hispanic cheeses grew at a compounded annual growth rate of 8.7% during 1995 to 2000, exceeding the 5.9% overall growth rate of the U.S.

cheese market [1, p.16]. Within the U.S., California's producers of Hispanic cheeses expanded output most rapidly (9.5% per year) during 1995 to 2000. Wisconsin producers of Hispanic cheeses recorded increases of 7.0% per year during this period [1, p.16].

- The top five U.S. domestic processors of Hispanic cheeses had sales totaling approximately \$75 million in 1999 [1, p.20]. Most of these processors sold Mexican, Central American, and Caribbean cheeses.
- Nicaraguans, Hondurans, and Salvadorians have similar cheese preferences [1, p.1]. Mexican people generally have different cheese preferences than those of people from these three Central American countries.
- Importers of Central American morolique cheese are likely to target first and second generation Nicaraguans, Hondurans, and Salvadorians, whose food preferences reflect those of their native country [1, p.19]. Central Americans of the third and later generations have become more fully acclimated to U.S. foods and would express less preference for foods imported from the home country.
- When selecting supplier-exporters, U.S. importers of cheese from Latin America attach importance to dealing with exporters who (a) follow FDA regulations regarding sanitation and labels, and (b) provide consistent quality of product as related to taste and appearance [1, p.45].

Central American firms have chosen to serve a niche of the large U.S. market for Latin American cheeses. U.S. firms selling other types of consumer goods have discovered that it is a mistake to assume that Latinos living in the U.S. are a largely homogeneous group. It has been found that preferences of the Latin Americans living in the U.S. depend on a number of things, including their country of origin. The marketing strategy of the Central American dairy firms suggests that this principle applies to dairy products as well. At the risk of noting the obvious, this point should be kept in mind by U.S. dairy firms seeking to serve Latinos living in the U.S.

U.S. dairy firms could engage in activities in addition to import substitution efforts aimed at developing cheeses that duplicate the unique flavors of morolique cheese. In particular, U.S. firms might also find it advantageous to integrate backward into Central American countries to obtain regular supplies of cheeses produced to specification. Such investment initiatives likely would be welcomed by capital-short Central American dairy groups. There are precedents for such integration by U.S. firms. For example, U.S. integrators obtained supplies of sweet onions from Nicaraguan producers in the early 1990s.

It is unclear whether there are additional, good dairy exporting opportunities for U.S. firms in Central America. As noted earlier, U.S. companies presently supply differentiated dairy products to upscale supermarkets in Central America. These markets will expand modestly as incomes in Central America increase. Foreign direct investment opportunities are similarly difficult to assess. However, Corruption Perceptions Index figures compiled by Transparency International reveal something about the investment climate existing in each of the Central American Countries (Table 7). Transparency International ranked 102 countries to compile the 2002 CPI figures.

Table 7. Corruption Perceptions Index (CPI) figures for Central American countries, 2002*

Country	CPI	Low-High Range
Costa Rica	4.5	3.6 to 5.9
El Salvador	3.4	2.0 to 4.2
Guatemala	2.5	1.7 to 3.5
Honduras	2.7	2.0 to 3.4
Nicaragua	2.5	1.7 to 3.4

* Source: Transparency International [29]. Key: 10 = highly clean. 0 = highly corrupt.

Costa Rica ranked in the middle third of the countries. The remaining Central American countries ranked in the bottom third of the countries. It is necessary to interpret the figures with caution since typically the CPI figures are based on relatively few observations from academics,

country analysts and business people. However, figures for all except Costa Rica suggest that the environment for foreign direct investment might be considerably less hospitable than in the U.S. domestic market where the CPI figure for 2002 was 7.7.

Negotiations on the proposed U.S. Central American Free Trade Agreement (CAFTA) that are scheduled to be completed in early 2004 may provide a modest increase in dairy trade between the U.S. and Central America. Given the political sensitivity of dairy trade, the U.S. is unlikely to eliminate all tariffs on Central American dairy products quickly. The recent U.S.-Chile trade agreement, under which U.S. tariffs on dairy imports will be phased out over a 12-year period, is perhaps illustrative of what might be expected under the CAFTA. Sanitary and phytosanitary requirements on dairy products entering export markets also might be regularized under the CAFTA.

III. Argentina and Brazil

Background on Macroeconomic and Political Problems of Argentina and Brazil

The macroeconomic and political problems affecting Argentina and Brazil have adversely affected many industries in the two countries. Before examining how the dairy sectors of Argentina and Brazil have been influenced by these developments, it is useful to review recent GDP, inflation, and exchange rate figures for the two economies.

Argentina's real GDP growth rate was relatively strong during much of 1991 through 1998—reaching double digit growth during 1991 and 1992 (Table 8). The country's economic problems began to manifest themselves in 1999 when real growth of the economy declined by 3.4%. Multiple exchange rate systems, export taxes, and other measures were put in place in efforts to remedy Argentina's problems, but with little or no positive effect. In December 2001, Argentina defaulted on its foreign debt [37]. Argentina's economy remained in recession from 1999 through 2002, and in 2002 the country's economy shrunk by nearly 10%, triggering massive political turmoil.

Brazil's real GDP growth rate exhibited more stability than the Argentine growth rate. From 1991 to 2000, real growth in Brazil was modest, averaging from near zero to 5.9% (Table 8). But in 2001 and 2002 real growth in Brazil plateaued at 1.5%.

What lies behind the variability reflected in the real GDP figures for the two countries? Both countries suffered from severe inflation during the late 1980s and early 1990s. To combat inflation, the governments of Argentina and Brazil enacted economic reforms that tied the currencies of the two countries to the U.S. dollar. In Argentina, the *peso* was pegged one-to-one to the U.S. dollar. Brazil's *real* was also linked to the U.S. dollar. Schnepf and Torgerson, ERS-USDA analysts, describe the impact of these currency linkages as follows [23, p.11]:

These currency linkages held through much of the 1990s. Unfortunately for Argentina and Brazil, timing of the pegging coincided with a 5-year rally in the U.S. dollar in the late 1990s. As a result, *peso*-and *real*-priced commodities were uncompetitive in international markets. By late 1998, problems had magnified for the *real*, creating fears among international investors of a spillover effect following the Russian financial crisis of August 1998. In January 1999, Brazil's government removed the *real's* link to the U.S. dollar and allowed it to float freely.

The impact of removing the *real*-U.S. dollar link is shown in Table 8. The *real* declined from 1.23 *reals* per U.S. dollar to 1.88 *reals* per U.S. dollar—a 52% depreciation from 1998 to 1999. The Argentine *peso*-U.S. dollar link was maintained until 2002. Severing this link caused the *peso* to decline from essentially the one-to-one link in 2001 to 3.60 *pesos* per U.S. dollar in 2002 (Table 8).

Table 8. Real GDP growth rate, inflation rate, and real exchange rate figures, Argentina and Brazil, 1990-2002*

Country and Year	Real GDP Growth Rate (%)	Inflation Rate, CPI (% Change) (2000=100)**	Real Trade Weighted Exchange Rate (2000=100)**	
Argentina			(P/US\$)	% Change
1990	- 2.4%	2314.0%	1.76	- 39.0%
1991	12.7	171.7	1.12	- 36.4
1992	11.9	24.9	0.96	- 14.8
1993	5.9	10.6	0.90	- 6.2
1994	5.8	4.2	0.88	- 1.5
1995	- 2.8	3.4	0.88	- 0.5
1996	5.5	0.2	0.90	2.8
1997	8.1	0.5	0.92	1.8
1998	3.8	0.9	0.93	0.6
1999	- 3.4	- 1.2	0.96	3.4
2000	- 0.5	- 0.9	1.00	4.4
2001	- 4.5	- 1.1	1.04	3.9
2002	- 9.8	33.8	3.60	246.5
Brazil			(R/US\$)	% Change
1990	- 4.3	2947.7	1.16	- 15.1
1991	1.3	432.8	1.38	18.5
1992	- 0.5	951.6	1.38	0.3
1993	4.9	1928.0	1.35	- 2.3
1994	5.9	2076.0	1.34	- 1.0
1995	4.2	66.0	1.17	- 12.9
1996	2.7	15.8	1.13	- 2.7
1997	3.3	6.9	1.16	2.6
1998	0.2	3.2	1.23	6.0
1999	0.8	4.9	1.88	52.4
2000	4.5	7.0	1.83	- 2.6
2001	1.5	6.8	2.27	23.9
2002	1.5	8.1	2.57	13.4

* Source: World Bank World Development Indicators compiled by ERS-USDA [38].

**Real GDP and inflation rate figures represent percentage changes from year-earlier levels. The real trade weighted exchange rate figures (column 4) represent Argentine *pesos* per US dollar (P/US\$) and Brazilian *reals* per US dollars(R/US\$), respectively. The real exchange rate figures in Column 5 represent percentage changes from a year earlier.

The impacts of linking the Argentine *peso* and the Brazilian *real* to the U.S. dollar during the 1990s and the subsequent severing of the linkages are shown in the inflation figures. The hyperinflation present in the early 1990s in Argentina and in the early to mid-1990s in Brazil was brought under control by economic reforms and currency linkages. Similarly, severing the linkages was accompanied by the return of inflation—especially in Argentina. However, the 34% inflation recorded for Argentina for 2002 may not signal a return to rampant inflation. Indeed, Argentina recorded a small (0.4%) decline in inflation for May 2003, marking the first month-to-month decline in inflation since the Argentine *peso's* one-to-one peg to the U.S. dollar was abandoned in January 2002 [36].

New leaders have been elected in the two countries. Mr. Nestor Kirchner took office as President of Argentina on May 25, 2003, promising to maintain the value of the *peso* at approximately three *pesos* per U.S. dollar but giving few indications of other actions that would be taken to stabilize Argentina's economy. However, it is unlikely that the partial devaluation measures and multiple exchange rates used by the Argentine government during the worst of the country's financial problems in the early 2000s will be reinstituted. Luiz Inacio Lula da Silva was elected President of Brazil in October 2002. Mr. da Silva's actions since taking office on January 1, 2003 indicate that he has backed away from the ambitious social agenda that he advocated to gain election.

Preliminary reports show that Argentina's economy grew by about 4% over year-earlier levels during the first quarter of 2003. Argentine government officials forecast growth of about 4% for all of 2003, a growth rate that contrasted sharply with the approximate 10% decline in real growth in 2002. Brazil's economy contracted by about 0.1% during the first quarter of 2003, but grew by 2% from the comparable quarter a year earlier [26]. Different economic forecasts show Brazil's economy growing by 1.9% to about 2.7% for all of 2003 [26, 35]. The growth in Brazil's economy is being fueled in substantial part by expanding agricultural exports.

While encouraging comments have emerged regarding the policies of both presidents and preliminary growth estimates are promising, it is too early to tell how the Argentine and Brazilian economies will perform during the next year or two.

Schnepf and Torgerson described the problems facing Argentina's economy as follows in a 2001 article [23, p.11]:

The economy is still burdened by excessive regulation and labor market problems. Employers have little flexibility in firing employees, lowering wages, or hiring part-time labor. As a result, high payroll costs make many Argentine goods too expensive to compete in international markets. Although many sectors of the Argentine economy changed from public to private control under the reforms, in many cases it simply resulted in substituting a privately-owned monopoly for a government monopoly with little improvement in competition or efficiency. The Government of Argentina (GOA) employs nearly one-third of the Argentine labor force. Despite some initial cuts, government payrolls remain large in 2001, and government expenditures have exceeded revenues since 1995. Rather than cutting expenditures the GOA has raised taxes in an attempt to close the gap, which has raised business costs.

Most problems described by Schnepf and Torgerson remain unresolved, suggesting that the devaluation of the *peso* and other measures taken to date will solve only part of the competitiveness problem facing the Argentine economy.

While facing fewer problems than Argentina, Brazil's economy is not without difficulties. Many burdensome costs and policy distortions affect Brazil. These include inefficient transportation and marketing systems that raise marketing costs, high interest rates that discourage investment, and state-level taxes on the movement of goods and services [23]. While the da Silva administration has tackled some problems facing Brazil's economy, many of these problems remain.

Problems of the two countries are also linked to MERCOSUR—a regional customs union consisting of Argentina, Brazil, Paraguay, and Uruguay. This customs union increases regional ties among the countries by establishing largely duty-free trade within the union. As pointed out by Schnepf and Torgerson, the interdependence of trade among members has made each country vulnerable to problems besetting the other members [23, p.12]. In particular, depreciation of Brazil's currency in 1999 made Argentina's commodity exports less competitive. In addition, the high common external tariff of the customs union has sheltered inefficient industries from foreign competition.

Impact of Argentina's Financial Problems on the Country's Dairy Industry

Argentina's financial problems created difficulties for the country's dairy industry, which during the 1990s had developed into the "dairy supplier of Latin America" and was expanding into other markets [15, p.2]. FAS-USDA officials in the U.S. Embassy in Buenos Aires described the adverse impacts of the macroeconomic problems as follows [15]:

- With the beginning of Argentine recession and later in early 1999 when the Brazilian *real* was devalued, the dairy sector began to suffer from weaker retail prices. Weakness in retail prices and Argentina's overvalued currency—which discouraged exports—put negative pressure on farmgate milk prices.
- Returns to farmers and processors dropped. Milk production declined in response to the lower farm milk prices. By 2001, milk production was had fallen by 8% from 1999 levels, reversing eight years of increases in milk production.
- The devaluation of the Argentine *peso* in early 2002 improved Argentina's competitiveness in international markets for some products, but contributed to additional reductions in milk production. In particular, the *peso* devaluation that began in January 2002 had differential effects on milk and crop prices. The price of grains and soybeans increased almost in the same proportion as the devaluation, and the competition for land favored crop production over milk production. The estimated change in net returns from dairying versus grains and soybeans was as follows:

Product	Net Return in U.S. Dollars Per Hectare		Increase from 2001 to 2002
	October 2001	October 2002	
Dairy	\$ 6.00	\$ 32.00	\$ 26.00
Corn	18.00	218.00	200.00
Soybeans	106.00	224.00	118.00

- As a result of the relatively low returns for dairying, many dairy farmers stopped or reduced feeding silage and grains and went back to a more pasture-based system of feeding.
- Farmgate milk prices in Argentina were forecast to increase to U.S.\$0.11 to U.S.\$0.13 per liter in 2003. While this represents an increase from the prices in October 2002, which averaged between U.S.\$0.09 and U.S.\$0.10, the higher prices projected for 2003 still leave Argentine farm milk prices among the lowest in the world. It is doubtful whether the prices projected for 2003 will stimulate strong increases in milk production in Argentina.
- The dismantling of part of the dairy sector will limit the export potential of Argentina for several years. Argentina's total milk production for 2003 is projected to be below average domestic consumption for 1996 to 2001.
- Dairy imports are projected to be negligible for 2003 as the *peso* devaluation and the deep recession make imported products expensive for a population, which has lost purchasing power.

Officials of Arla Foods of Denmark and Sweden described the impact of Argentina's economic problems on the cooperative's exports as follows [3, p.10]:

In December (2001), normally the peak season for sales of Arla Foods' specialty cheese, sales figures were 30% down on the year....In the week of January 10, (2002) the Argentine peso fell by a further 30%, making imported products more expensive to buy. The falling currency rate will also affect Argentine customers' debts to Arla Foods....As a consequence of the crisis, Arla Foods has introduced a temporary sales and supply stop to some customers. Shipping of export products from Denmark has also been suspended.

Arla's problems and actions are perhaps representative of those of other exporters of dairy products—and other products—to Argentina during the worst of the financial crisis.

Impact of Brazil's Economic Problems on the Country's Dairy Industry

Brazil's economic problems had a smaller impact on the country's dairy industry. While farm milk prices in Brazil declined as a result of the economic problems, the industry continued to

witness enhanced productivity. FAS-USDA officials in the U.S. Embassy in Brasilia described impacts of the economic problems on the dairy sector and adjustments made in the dairy industry in response to the problems as follows [25]:

- Fluid milk consumption in Brazil declined during 2002 reflecting reductions in consumer purchasing power. This development contributed to a decline in farm milk prices in all regions of the country.
- Farm milk prices in 2001 were about 30% lower than in 2000. Brazilian farm milk prices in the largest milk-producing states (Minas Gerais and Goias) ranged from U.S.\$0.09/liter to U.S.\$0.12/liter in 2001. Farm milk prices in the two states rose modestly to U.S.\$0.12/liter to U.S.\$0.13/liter in the last half of 2002.
- Fluid milk production was projected to increase by about three percent in 2003, reflecting increases in productivity, improved weather conditions in major producing areas, and higher farm milk prices.
- Brazilian powdered milk production was expected increase by six to seven percent in 2003 to near 500,000 metric tons. (Over three-fourths of Brazil's milk powder production is whole milk powder.)
- Brazil's milk powder production was expected to expand because of:
 - a) A decline in imports of powdered milk due to higher costs of imports, reflecting higher tariffs and the further devaluation of the *real* in 2001,
 - b) An expanded allocation of government funds for use of milk powder in social programs at the federal and state levels,
 - c) A prohibition against use of imported powdered milk in social programs, and
 - d) Strict sanitary standards for imported milk.
- Imports of powdered milk were expected to decline by about 10% in 2003, following increases of over 50% in 2002. The higher imports of powdered milk in 2002 reflected higher purchases from MERCOSUR countries to fill contracts for export.
- Imports of fluid milk—mostly UHT milk—sold by Argentine and Uruguayan companies with commercial interests in Brazil declined in 2002, substantially because of the fall in the value of the Brazilian *real* in foreign exchange markets.
- Cheese imports were expected to rebound in 2003, possibly by as much as 25%, reflecting higher demand for specialty cheeses and mozzarella cheese for the fast food industry.
- Brazilian cheese exports were expected to double in 2003 because of the devaluation of the *real*. Destinations for the cheese exports include Argentina, Japan, Taiwan, Paraguay, and the U.S.

Contrasting Trends in the Dairy Industries of Argentina and Brazil

Contrasting impacts of economic conditions on the dairy industries of Argentina and Brazil are suggested by figures in Table 9. The strong uptrend in Argentine milk production is evident in the figures for 1997 through 1999. Milk production in Argentina began to move lower after that date partly because of the decline in milk production per cow that accompanied the return of some producers to pasture-based systems. It is unusual that the decline in milk production per cow in Argentina in the early 2000s was not larger than indicated in the figures. It would not be surprising if the milk production per cow figures were revised downward for these years in subsequent reports since pasture-based systems tend to generate substantially lower milk production per cow figures than suggested by the data for Argentina. For example, milk production per cow in Australia's dairy industry—which has a silage-grain-pasture feeding regime similar to the one previously employed by Argentina—records milk production per cow about a quarter larger than in New Zealand's dairy industry, which uses a pasture-based system almost exclusively.

Brazil's figures, by contrast, show that the economic problems in the country had limited impacts on milk production. Milk production in Brazil during the late 1990s and early 2000s showed steady increases. Unlike the situation in Argentina, milk production per cow in Brazil continued to climb during 1997 through 2002, albeit at a lower rate in the latter years of the period. Note, however, that average milk production per cow in Brazil is only about one-third of the comparable figure for Argentina. In part, this is because of the larger percentage of Zebu and Zebu-

dairy cross animals in Brazil's dairy herd. The Zebu cattle perform better in Brazil's more tropical climate, but do not deliver the milk yield of dairy breeds employed in Argentina.

Table 9. Cows milk production and milk production per cow in Argentina and Brazil, 1997-2002*

Country and Year	Milk Production (1,000 mt)	% Change from Year Earlier	Milk Production Per Cow (kg)	% Change from Year Earlier
Argentina				
1997	9,060	+ 1.8%	3,775	-2.4%
1998	9,450	+ 4.3	3,780	+0.1
1999	10,300	+ 9.0	4,120	+9.0
2000	9,800	- 4.8	4,000	-2.9
2001	9,500	- 3.1	3,918	-2.0
2002 (P)	8,200	-13.7	3,833	-2.2
Brazil				
1997	20,600	+ 5.8%	1,207	+6.0%
1998	21,630	+ 5.0	1,267	+5.0
1999	21,700	+ 0.3	1,340	+5.8
2000	22,134	+ 2.0	1,380	+3.0
2001 (P)	22,580	+ 2.0	1,407	+2.0
2002 (F)	23,260	+ 3.0	1,456	+3.5

* Source: USDA, Dairy: World Markets and Trade [33]. (P) = Preliminary, (F) = Forecast.

Economic conditions also had contrasting effects in the production, exports, and imports of whole milk powder (WMP)—an important export item for Argentina and an important import for Brazil (Table 10). Declining milk production, a still strong *peso*, and other factors caused Argentina's production and exports of WMP to decline sharply after 1999. Brazil, on the other hand, shows a continued uptrend in domestic production of WMP during 1997 through 2002. Reasons for this development were discussed earlier. In part, this reflects incentives for domestic production of the item, expanded milk production, and disincentives for imports of the product from Argentina—at least in 2000 and 2001.

Implications of Argentine Developments for the U.S. Dairy Industry

It is frankly too early to fully assess how Argentine developments will affect the U.S. dairy industry. But for the next few years, Argentine dairy firms are likely to be weaker competitors in international dairy markets and Argentina will be a less attractive market for U.S. dairy inputs than in much of the 1990s.

However, certain developments noted below will help Argentine firms to maintain at least modestly high levels of dairy exports:

- Argentina's last widespread outbreak of foot and mouth disease was in January 2002. The absence of an outbreak opened foreign markets for dairy product that had been temporarily closed.
- Mexico's government approved the largest two Argentine processors to be suppliers of dry milk for Mexico's social welfare programs.
- Argentina's dairy products are widely regarded as being of good quality in international markets.
- The devaluation of the *peso* has made Argentine dairy products more competitive in international markets.
- Argentine farm milk prices will be among the lowest in the world, producing internationally-competitive raw product costs.

Table 10. Whole milk powder production, exports, and imports, Argentina and Brazil, 1997-2002*

Country and Year	WMP Production (1,000 mt)	% Change from Year Earlier	WMP Exports or Imports (1,000 mt)	% Change from Year Earlier
Argentina			(Exports)	
1997	166	+ 2.5%	62	+12.7%
1998	210	+ 26.5	97	+56.4
1999	244	+ 16.2	149	+53.6
2000	202	- 17.2	104	-30.2
2001	195	- 3.5	90	-13.5
2002	185	- 5.1	95	+5.6
Brazil			(Imports)	
1997	231	+ 5.0%	105	-7.1%
1998	240	+ 3.9	133	+26.7
1999	244	+ 1.7	147	+10.5
2000	256	+ 4.9	108	-26.5
2001 (P)	310	+ 21.1	43	-60.2
2002 (F)	330	+ 6.4	85	+97.7

* Source: USDA, Dairy: World Markets and Trade [33]. (P) = Preliminary, (F) = Forecast.

The growing importance of the Mexican market for Argentine dairy firms warrants emphasis. Argentine firms that have scrambled to replace declining dairy exports to the Brazilian market have found Mexico to be an attractive market. Agra Europe described the developments as follows [4, p.15]:

Dairy exports from Argentina to Mexico, the world's largest consumer of milk powder, have grown without interruption in recent years. In 1999, Mexico accounted for only 3% of Argentina's total dairy shipments, rising to 6% in 2000 and more than tripling to 19% in 2001, making it Argentina's 2nd largest dairy export market.

Brazil accounted for 70% of Argentine dairy exports in 2000, but this figure declined to about 41% during the first eight months of 2001. Hence, the growth in Mexico's imports of Argentine products was doubtless welcomed by Argentina's dairy industry.

The current problems in Argentina's dairy sector have reduced the demand for foreign dairy inputs such as genetics and dairy equipment. Anecdotal accounts indicate that exports of U.S. dairy genetics were nearly shutdown during the worst of the economic times in Argentina. How soon this market will recover is unknown.

There is speculation that Argentina's dairy industry will restructure to further increase output by smaller, regional processors that have greater flexibility in operations. These firms have captured market share from large processors in recent years. It is unclear how much equipment these firms will purchase from U.S. and other foreign suppliers. If, as is likely, they are low-cost operators, their purchases of imported equipment may be limited.

Implications of Brazilian Developments for the U.S. Dairy Industry

Developments in Brazil have produced a more nearly self-sufficient dairy industry that is gearing up to expand dairy exports. These trends reflect both actions of private firms and government policy. In addition, Brazil's membership in the MERCOSUR discourages imports of dairy products by member countries from non-MERCOSUR countries. In total, these developments favor expanded U.S. sales of dairy inputs to Brazil far more than dairy products.

The numerous acquisitions of Brazilian dairy companies by foreign dairy firms since the mid-1990s suggest that the Brazil is regarded as a promising market. Acquiring foreign firms include Parmalat (Italy), Danone (France), Royal Numico (Netherlands), Mastellone (Argentina), Milkaut (Argentina), and Fleischman Royal (U.S.) [25, p.3]. The acquiring companies have increased the demands on producers for higher milk quality and upgraded milk processing and distribution systems in Brazil. Many of these processors emphasize sales of UHT milk, which has become widely accepted by Brazilian consumers.

Nestle and Fonterra of New Zealand have entered into a joint venture called Dairy Partners Americas (DPA) based in Brazil that is structured to expand Brazilian dairy exports. The FAS-USDA Agricultural Counselor in Brazil describes the plans and functions of DPA as follows [25, p.12]:

...It will enter into operation on January 1, 2003. The company will have its headquarters in Brazil, and will operate in Latin American countries. During 2003, DPA plans to operate only in Argentina, Brazil, and Venezuela, expanding later to Chile, Ecuador, Colombia, and the Caribbean Islands. In 2004, DPA plans to initiate sales to the NAFTA countries. DPA officials estimate sales of dairy products, mostly powdered milk, in the first year of operation at US\$420 million. Nestle's seven milk plants in Brazil will serve as the production base for DPA.

DPA's expansion plans apparently have been delayed, but the joint venture could become a powerful processor and distributor of dairy products in Latin America. This is so because the joint venture partners represent two of the world's most effective dairy exporting firms.

SERLAC, an additional Brazilian dairy exporting organization was formed in 2002. This firm, fashioned after the New Zealand Dairy Board, will market mostly milk powder under the Brazilian Dairy Board brand. SERLAC includes as members five major dairies and cooperatives. Algeria, Morocco, Libya, Middle Eastern countries, and other Latin American countries initially will be the target markets for SERLAC's sales.

In addition to measures noted earlier, Brazil's government plans to adopt a number of measures to facilitate expanded dairy exports including mechanisms to (a) streamline procedures for approval of Brazilian dairy firms for exporting, (b) negotiate "inspection equivalency" agreements for milk and milk products with foreign governments, (c) identify foreign import barriers to Brazilian dairy products, and (d) create market promotion programs to increase dairy exports.

While Brazil will clearly have abundant competition for expanded dairy exports, the country's dairy industry does possess advantages. First, raw product costs are among the lowest in the world. Secondly, strong international dairy traders—e.g., Nestle and Fonterra to name a few—have bases in the country. Finally, the devaluation of the *real* will provide an impetus for expanding dairy exports. It is a country worth watching in international dairy markets.

Brazil has been a good market for U.S. dairy inputs, especially dairy genetics. In 2001, Brazilian firms spent U.S.\$11 million for imports of semen, embryos, and live animals [25, p.2]. U.S. firms had nearly a 70% share of Brazil's imports of dairy genetics.

The Brazilian market for bulk milk cooling equipment is likely to increase in the next three to five years. Under a new National Program to Increase Milk Quality, the Brazilian government will require that all types of milk be cooled at the farm. The new requirements will be phased in at different times in different parts of the country. Farm bulk milk tank sales are forecast to increase by U.S.\$20 million in 2003 as a result of the change [25, p.6]. FAS-USDA officials predict that this development will increase sales of multinationals such as DeLaval, Westfalia, and Bosio, companies that dominate the Brazilian market for farm bulk milk cooling tanks [25, p.6].

Summing Up Prospects for Dairy Exports to Argentina and Brazil

The best prospects for growth in exports appear to be in the dairy inputs area—especially dairy genetics—in Brazil. U.S. foreign direct investment opportunities in dairy processing in Brazil

appear less promising. Brazil has attracted foreign direct investment in processing by multinationals—e.g., Nestle, Parmalat, Danone, Fonterra and others. Entry into Brazil's dairy product markets has been made challenging by the presence of these firms.

The environment for exports and foreign direct investment in Argentina and Brazil is affected by the amount of corruption in the countries. The Transparency International Corruption Perceptions Indexes for 2002 for the two countries appear in Table 11.

Table 11. Corruption Perceptions Index (CPI) figures for Argentina and Brazil, 2002*

Country	CPI	Low-High Range
Argentina	2.8	1.7 to 3.8
Brazil	4.0	3.4 to 4.8

* Source: Transparency International [29]. Key: 10 = highly clean. 0 = highly corrupt.

Argentina's 2.8 Corruption Perceptions Index lies at the top of the bottom third of the 102 countries for which the statistic was collected. Brazil's 4.0 CPI was in the middle group. Both CPI's are substantially lower than the comparable figure for the U.S. which was 7.7 for 2002. This comparison gives one indication of the attractiveness of the U.S. market relative to the Argentine and Brazilian markets.

It is too early to tell how much impact the proposed Free Trade Area of the America's (FTAA) pact might have on the U.S. dairy industry and the dairy industries of Argentina and Brazil. This ambitious trade agreement that would include 34 countries and 800 million people is optimistically scheduled to be in place in 2005. The FTAA would eventually create an open, tariff-free trading environment for the hemisphere.

Part of the uncertainty regarding the FTAA relates to a coolness toward the agreement on the part of the new leaders of Argentina and Brazil. Presidents Kirchner and da Silva have expressed a preference for strengthening the MERCOSUR prior to entering into the FTAA [11]. Among other things, the strengthened MERCOSUR might include a MERCOSUR parliament and a joint monetary institute that would work toward developing a common currency. How much of this is posturing to strengthen the hands of Argentina and Brazil in negotiating with the U.S. on FTAA provisions is unclear. However, it is evident that treatment of individual commodities such as dairy will await broad agreement on whether there will be a FTAA in the relatively near future.

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