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**STRATEGIES FOR DEVELOPING DOMESTIC AND
INTERNATIONAL MARKETS FOR
NICARAGUA'S DAIRY PRODUCTS**

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STRATEGIES FOR DEVELOPING DOMESTIC AND INTERNATIONAL MARKETS FOR NICARAGUA'S DAIRY PRODUCTS

W. D. Dobson*

Executive Summary

Introduction

- This Discussion Paper analyzes the capacity of Nicaragua's dairy industry to expand domestic dairy product sales and exports profitably.
- The paper (a) presents information on industry traits that influence domestic and export market expansion capabilities and (b) benchmarks Nicaragua's dairy industry against principles that have been discovered to have relevant, profitable applications in the dairy industries of other countries for expanding domestic sales and exports.

Traits of Nicaragua's Dairy Industry that Influence Domestic and Export Market Expansion Capabilities

- The expansion capabilities of Nicaragua's dairy sector were assessed by analyzing developments relating to milk production practices and trends in Nicaragua, the structure of Nicaragua's dairy industry, export markets for Nicaraguan dairy products, favorable factors affecting the industry, and challenges facing the industry.
- Nicaragua's milk production recorded steady increases averaging 3.2% per year from 1990 to 2001. Abundant milk supplies are attractive to expansion-minded firms, but will depress farm milk prices unless additional markets—particularly export markets—are found for the added production.
- Italy-based Parmalat's entry into Nicaragua's dairy industry in 1998-99 transformed the industry. Parmalat may use Nicaragua's dairy industry as a platform for expanding sales in other Central American countries.
- El Salvador and Honduras are currently the largest export markets for Nicaraguan dairy products. The U.S. is a potentially large market for exports of morolique cheese—a dry, salty, hard cheese.
- Favorable developments affecting the industry include the expansion of milk supplies, improvements in milk quality, the emergence of useful alliances among small dairy processing firms, and expanded access to needed services.
- The important challenges facing Nicaragua's dairy sector include those associated with pronounced seasonality of milk production and relatively high farm milk prices during the dry season.
- Low consumer incomes in Nicaragua—the lowest in Central America—will limit growth of dairy product sales in the country.
- The industry must reduce milk transportation costs and gain access to additional cold storage facilities if there is to be an efficient expansion of domestic and export sales of Nicaraguan dairy products.
- Over the longer-run Nicaraguan processors may need to secure lower cost raw product in order to be competitive in the U.S. market. This will be particularly true if U.S. firms replicate the distinctive flavor of morolique cheese.

* W.D. Dobson, Ph.D., is an Agribusiness Economist with the Babcock Institute for International Dairy Research and Development. Financial support for this study was provided in part by the U.S. Agency for International Development (USAID-Nicaragua) and the Foreign Agricultural Service of the U.S. Department of Agriculture. The Instituto Interamericano de Cooperación para la Agricultura (IICA-Nicaragua) provided valuable help for conducting the study.

- Other Central American countries represent familiar, potentially attractive markets for expanded Nicaraguan cheese exports. However, nontariff barriers to trade must be reduced, quality upgraded, and improvements in infrastructure made before these markets will become fully accessible to Nicaraguan exporters.

Strategies for Expanding Domestic Dairy Product Sales

- **Strategy No. 1:** Parmalat should be given incentives to expand dairy exports. If the firm expanded exports, it could use its competitive abilities in broader markets and benefit from competition in foreign markets. Firms often secure advantages by increasing exports rather than by attempting to dominate sales in the domestic market.
- **Strategy No. 2:** Nicaragua's small cheese makers should be encouraged to avail themselves of opportunities to acquire R&D and new product development capabilities from international organizations and private firms.
- **Strategy No. 3:** Nicaragua's government, USAID-Nicaragua, other international organizations, and Nicaragua's dairy processing firms should develop a "Seal of Quality" for selected dairy products. This would improve the quality image of Nicaraguan dairy products. It also would give Nicaragua's consumers more information on product quality and create prices that would better reflect product quality.

Strategies for Expanding Dairy Exports

- **Strategy No. 4:** The effectiveness of the exporting alliance involving the Masiguito, San Francisco De Asis, and Santo Tomas Cooperatives, and Alianza Nova should be supported and carefully monitored by USAID-Nicaragua and IICA-Nicaragua. The effectiveness of this alliance will reveal much about the potential ability of small Nicaraguan dairy firms to export dairy products to the U.S. and identify exporting practices needing improvement.
- **Strategy No. 5:** Additional cold storage facilities should be acquired by Nicaragua's dairy industry. Eliminating the cold storage bottleneck would facilitate expanded dairy exports and limit seasonal reductions in farm milk prices and cheese prices.
- **Strategy No. 6:** Emphasis should be placed on eliminating obstacles (in addition to the cold storage bottleneck) to expansion of Nicaraguan dairy exports over the long-term. Over the long-run, cooperatives hoping to become major exporters will need to acquire market power and processing scale economies through alliances, federations, and mergers.

STRATEGIES FOR DEVELOPING DOMESTIC AND INTERNATIONAL MARKETS FOR NICARAGUA'S DAIRY PRODUCTS

W. D. Dobson

Introduction

This Discussion Paper evaluates the ability of Nicaragua's dairy industry to expand domestic sales and exports of dairy products and suggests strategies for producing profitable expansion of those sales. The study was conducted at the request of the U.S. Agency for International Development (USAID-Nicaragua) and the Foreign Agricultural Service of the U.S. Department of Agriculture. Part of the financing for the study was provided by the two organizations. The Instituto Interamericano de Cooperación para la Agricultura (IICA-Nicaragua) provided valuable help for conducting the study. Findings appearing in the paper are based, in part, on information obtained by the author during a February 23 through March 14, 2003 visit to Nicaragua and Costa Rica. Persons and organizations contacted by the author in the two countries are listed at the end of the paper.

Nicaragua's dairy industry faces both opportunities and challenges as it seeks to expand dairy product sales. Nicaragua has the largest land area and largest cattle herd in Central America, resources that position the country to expand milk production. Moreover, disappointing farm profits from agricultural enterprises such as coffee and sugar cane have fueled added interest in expansion of dairy farming. Many people associated with Nicaragua's dairy industry believe that the industry can profitably expand. However, many of these same people fear that, absent new markets—especially export markets—for added dairy products, farm milk prices in Nicaragua will decline to unprofitable levels. In this connection, a number of export markets—including the U.S., Mexico, and European Union—are being eyed by Nicaragua's dairy industry as potentially promising outlets for expanded exports.

Many market participants in Nicaragua's dairy industry believe that the challenges facing the industry are mainly marketing problems. As will be apparent, marketing problems are very important. However, the study also shows that the challenges facing Nicaragua's dairy industry extend beyond marketing.

The capacity of Nicaragua's dairy industry to expand domestic sales and dairy exports profitably is evaluated by (a) presenting information on industry traits that influence domestic and export market expansion capabilities, and (b) benchmarking Nicaragua's dairy industry against principles that have been discovered to have relevant, profitable applications in the dairy industries of other countries for expanding domestic and sales and exports. Inferences for sales expansion strategies are drawn mainly from the benchmarking activity.

I. Traits of Nicaragua's Dairy Industry that Influence the Capacity of the Industry to Expand Domestic Sales and Exports Profitably

Information on traits influencing the domestic and export sales expansion capabilities of Nicaragua's dairy industry is discussed under the following headings:

- Milk production practices and trends in Nicaragua,
- The structure of Nicaragua's dairy processing and marketing industry,
- Export markets for Nicaraguan dairy products,
- Favorable factors affecting the industry, and
- Challenges facing the industry.

Steps to improve the ability of Nicaragua's dairy industry to expand sales are discussed in connection with each point. However, the major findings and strategies relating to expansion of Nicaragua's domestic dairy product sales and exports appear in the benchmarking section of the paper.

Milk Production Practices and Trends in Nicaragua

Nicaragua's milk supply is obtained mainly from dual-purpose dairy-beef farms stocked with Brahma and Brahma-dairy cross cattle. Farms holding greatest promise for dairying (rather than beef production) are located in higher altitude areas of around 1,000 meters or higher where pastures remain productive for longer periods during the year. Most of the country's dairy farms lack electricity and modern milk cooling equipment. Production from cows on Nicaraguan farms is typically low—frequently only two to three liters (4.5 to 6.8 pounds) of milk per day from each cow during the dry season and up to double these amounts during the rainy season. Once-a-day milking is common on the farms.

Production on the relatively few specialized, commercial dairy farms in the country—some of which use more genetics from traditional dairy breeds—is larger. Specifically, production per cow on the specialized, commercial dairy farms may total four to five times as much as recorded on the dual-purpose dairy-beef farms.

While average production per cow on most of Nicaragua's dairy farms remains low, genetic improvements, improvements in veterinary practices, improvements in nutrition, and limited improvements in pastures have increased milk production on many farms. The number of farms producing milk also has increased as farmers switched from 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 1). Production of major dairy products exhibited similar increases during 1990 to 2001. Increases in cheese production recorded the largest yearly increases and also 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.

Table 1. 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 (MAG-FOR).

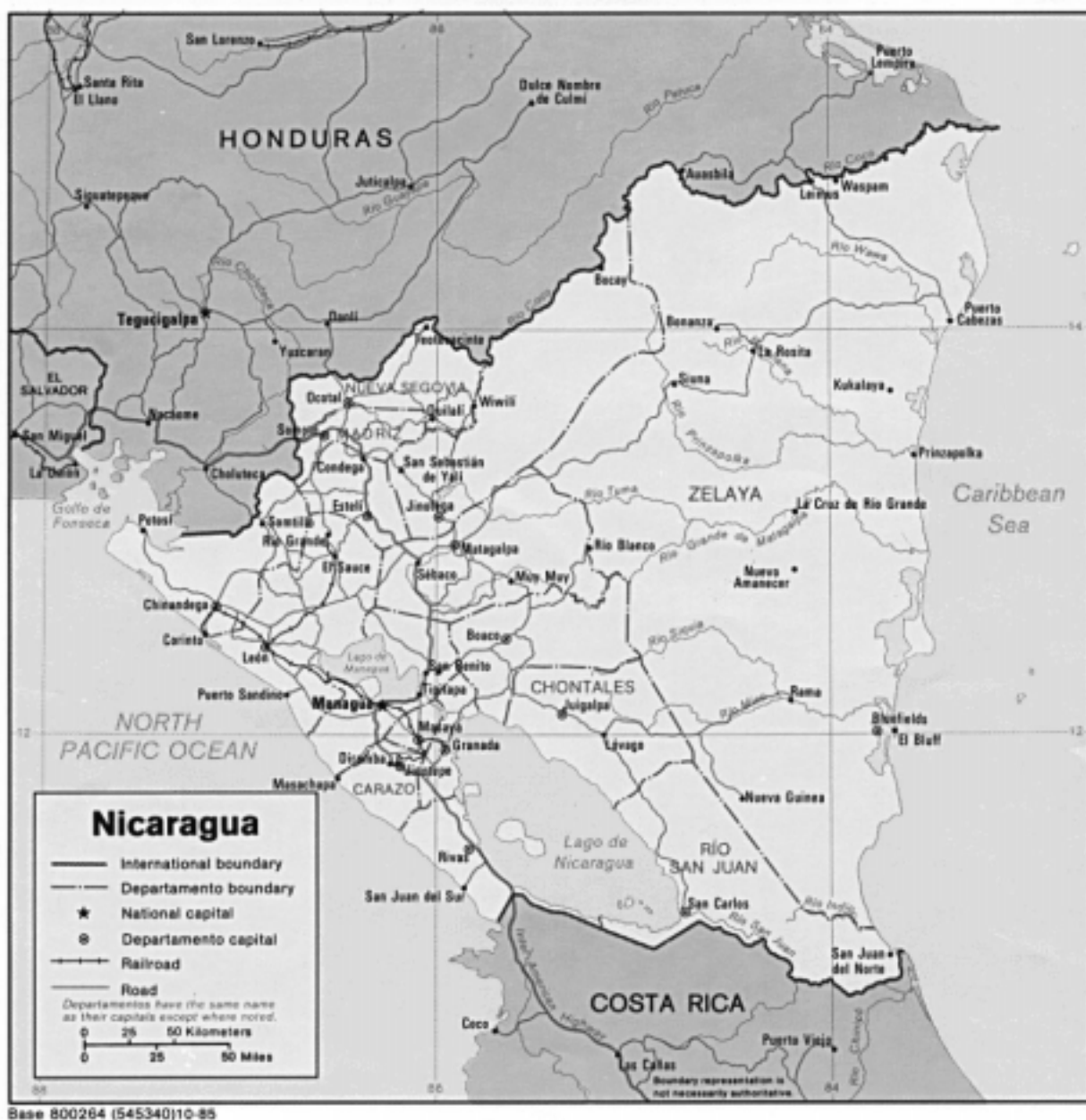
The real (inflation-adjusted) value of milk production in Nicaragua grew at a pace that outstripped the value of most other major livestock categories from 1990 to 2001 [7]. For example, the real value of Nicaraguan milk production grew by 45% during this period while the real value of livestock slaughter increased by only about four percent during this period. The real value of milk production also exceeded that for hog production, which expanded by only about six percent during these years. Only the value of poultry and eggs expanded at a faster real rate than milk production from 1990 to 2001.

The Structure of Nicaragua's Dairy Processing and Marketing Industry

The structure of Nicaragua's dairy processing and marketing industry differs widely by segment. Fluid milk processing in Nicaragua is concentrated—mainly because of the presence of a unit of the Italy-based multinational, Parmalat. Nicaragua's milk supply cooperatives and cheese processors make up a fragmented segment of the industry.

In the remainder of the paper, frequent references are made to certain Nicaraguan dairy processing firms. The names, locations, and products produced and marketed by those firms are described in Table 2 to facilitate a better understanding of the material. The location of the processing firms can also be noted on the map appearing in Figure 1.

Figure 1. Map of Nicaragua



* Source: <http://www.lib.utexas.edu/maps/americas/nicaragua.gif>

The Emergence of Parmalat

It is difficult to overstate the importance of Parmalat in shaping the structure of Nicaragua's dairy industry. Parmalat entered Nicaragua's dairy industry in 1998-99 after purchasing a major domestic fluid milk processor. Parmalat's Nicaraguan acquisition was part of a pattern that included a host of other acquisitions during the 1990s, which produced about an 800% increase in the firm's sales. Mainly as a result of acquisitions, the company established a major presence in Brazil and acquired plants in Argentina, Uruguay, Paraguay, Nicaragua, Mexico, Chile, Spain, Portugal, Germany, France, Hungary, China, Russia, Canada, Australia, and the U.S. during 1990s.

The firm currently has over 90 subsidiaries in Europe and other parts of the world. Parmalat's worldwide dairy sales totaled about U.S.\$5.7 billion in 2000 [3].

Table 2. Name, location, and product line of selected Nicaraguan dairy firms

Firm	Location	Products Produced and Marketed
Parmalat	Managua	Mainly fluid milk products
Eskimo	Managua	Mainly fluid milk products
Nestle	Matagalpa	Milk powder
Santo Tomas Cooperative	Santo Tomas	Hard cheese, fluid milk sales to Parmalat
Masiguito Cooperative	Camoapa	Hard cheese
San Francisco de Asis Cooperative	Camoapa	Hard cheese, soft cheese, and fluid milk sold to Eskimo
Santa Martha	Jinotega	Soft cheeses, butter, and other dairy products
Quesera	La Patriola	Hard cheese
Alianza Nova	La Libertad	Hard cheese and fluid milk

Parmalat has a history of consolidating and rationalizing fragmented fluid milk businesses around the world. It appears to be doing the same in Nicaragua. The firm has upgraded and expanded its facilities since entering Nicaragua. According to Parmalat, the company purchases 25% of the milk sold through commercial markets in Nicaragua. The firm faces limited competition for fluid milk product sales in Nicaragua. Eskimo, a smaller fluid milk and dairy novelty producer with sales in Nicaragua and elsewhere in Central America, represents Parmalat's main domestic competition for fluid sales. Eskimo's fluid milk sales are reportedly about one-eighth as large as those of Parmalat.

Parmalat faces only limited competition for fluid milk sales from other multinationals in Nicaragua. However, other products marketed by multinationals—mainly cheeses, milk powders, and other long shelf life products—are present in the dairy cases of the upmarket supermarkets in Managua. Multinationals selling in those supermarkets include Nestle, Kraft, Fonterra of New Zealand, and Dos Pinos of Costa Rica.

Parmalat indicates that it may use Nicaragua as a platform for expanding sales of dairy products throughout Central America. This plan could materialize if the firm can obtain suitable amounts of high quality milk in Nicaragua, and if nontariff barriers and other impediments to exports into other Central American countries are reduced. Parmalat, like other Nicaraguan dairy firms, occasionally finds that the borders of other Central American countries close for varying lengths of time in retaliation for commercial disputes, especially when dairy product supplies are abundant. The causes for the border closings vary, but firms in other Central American countries often complain that their products are discriminated against in Nicaraguan markets and persuade their governments to keep out Nicaraguan products as a retaliatory measure. It is unclear whether there is justification for such actions. It is clear, however, that the retaliatory actions produce troublesome trade barriers.

Parmalat has the capacity to be a formidable competitor in much of Central America. However, even if nontariff barriers to the firm's dairy exports are reduced, Parmalat will encounter stiff competition in Costa Rica from Dos Pinos Cooperative. Dos Pinos' product line includes many items produced by Parmalat. In particular, Dos Pinos has a lengthy history of producing ultra high temperature (UHT) processed milk, which is a major item in Parmalat's product line in many countries.

Milk supply cooperatives and cheese producers are concerned about Parmalat's market power. Partly this is because Parmalat obtains part of its milk supply from farmers other than those represented by the cooperatives. Thus, Parmalat pursues a variation of what business strategist Michael Porter of Harvard's Business School calls a tapered integration strategy [10]. Among other things, a tapered integration strategy calls for maintaining multiple sources of supply for raw

materials as a bargaining measure. For Parmalat in Nicaragua, pursuit of the tapered integration strategy limits the bargaining power of milk supply cooperatives. The milk supply cooperatives recognize that if they ask for an unacceptably high price for milk or fail to deliver to specification, Parmalat can increase milk purchases from other sources. The implication is that Nicaragua's milk supply cooperatives may need to join together in a federation or merge if they wish to bargain more effectively with Parmalat.

Nestle's Operations

Switzerland-based Nestle operates a milk powder processing plant in Matagalpa, Nicaragua. In many countries, Nestle's dairy operations represent world-class businesses whose operations are the envy of the industry. Nestle's Matagalpa plant is not a typical Nestle operation. Nestle's Matagalpa plant was built in 1969 and has received a number of upgrades to keep it at least marginally competitive. However, it does not produce the instant milk powder that many modern milk powder plants produce. While Nestle does sell from the Matagalpa plant into Costa Rica and elsewhere in Central America, its competitiveness in the region is limited because of the age of its plant and the fact that its product line does not include instant milk powder.

Cheese Processors and Milk Supply Cooperatives

Several of the remaining firms listed in Table 2 are cheese processors and milk supply cooperatives. These firms comprise the fragmented segment of the industry. The merger movement, which has produced a massive consolidation of milk cooperatives in many other countries, has not yet had a similar impact in Nicaragua's dairy industry.

The Informal Sector

A large informal market for dairy products exists in Nicaragua. While the statistics on this point are limited, it appears that more than 60% of the milk processed in Nicaragua is processed in small, often unsanitary milk plants or in "kitchen-type" cheese-making establishments. The low-quality products emerging from these facilities damage the image of dairy products produced in Nicaragua. The problem is exacerbated by the fact that some cheeses produced under unsanitary conditions in Nicaragua find their way into foreign markets.

Export Markets for Nicaraguan Dairy Products

Nicaragua's dairy exports take complex and varied forms. The country's dairy exports include small quantities of hard cheese carried into the U.S. by individual travelers (in total these exports are sizable), limited exports of hard cheese to the U.S. (made mostly through Miami, Florida to firms that lack the 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 by Nicaraguan dairy firms into Central American markets.

El Salvador and Honduras were the largest markets for Nicaraguan dairy products from 1995 to 2001 (Table 3). 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 from 1995 to 2001. Interpret the figures in Table 3 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 3 provide suitable indications of the orders of magnitude of Nicaraguan dairy exports to different countries.

Potential for Additional Dairy Exports to the U.S. Market

Morolique cheese—a dry, salty, hard cheese—is a major 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. 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.

Table 3. Average value of Nicaragua's dairy exports, 1995-2001*

Destination Country	Value of Exports, Average 1995- 2001, U.S.\$ (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 but Irregular
Others	1.9	0.0	Weak but 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.

The optimism about prospects for expanded exports of this dry, salty, hard cheese to the U.S. appears to be plausible, but the competition for these sales will likely intensify. As pointed out in the comprehensive Policy Enhancement and Productivity Project 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 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 those retailers carrying the product because it has a long, four-to-six-month shelf life.

Casares established that a large market existed in the U.S. for the dry, hard 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 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. These disadvantages, Casares points out, are exacerbated by the larger cheese yields that U.S. processors obtain from a given quantity of milk. He 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. regard it as a commodity. Prices charged for the cheese at retail in the U.S. in the early 2000s 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 which, among other things, carries a reminder

of home, probably accounts for the ability of retailers in the U.S. to sell it for relatively high prices to people who trace their roots to parts of Central America.

Challenges facing the Nicaraguan dairy industry relating to relatively high raw product cost, which will be discussed in more detail later, 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. However, over the longer-run as prices for the product come under increased competitive pressure from U.S. firms and other exporters from Central America, it will be important for the Nicaraguan industry to become more competitive in terms of the cost of the raw product used to produce the cheese. 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.

Opportunities for Expanded Dairy Exports to Other Central American Countries

There are advantages associated with efforts to expand Nicaraguan dairy exports to other Central American countries. These markets are more familiar to Nicaraguan exporters than the U.S. market and some other foreign markets being considered by Nicaragua's dairy industry—e.g., Mexico and the European Union. Moreover, there are, in principle, no tariffs on products shipped from one Central American country to another if the products exported are of domestic origin.

Parmalat is an attractive vehicle for expanding dairy exports into other Central American countries. This firm has the technical expertise and financial resources needed to substantially expand exports into other Central American countries. In addition, El Salvador—with its relatively large population and small dairy industry—should continue to be an important market for Nicaraguan cheese exports.

But the following constraints need to be addressed if Nicaraguan firms are to take full advantage of dairy exporting opportunities represented by other Central American countries:

- Nontariff barriers for dairy exports to the other Central American countries need to be minimized.
- “Kitchen-type” cheeses and other dairy products manufactured under unsanitary conditions should be eliminated from export markets.
- Meaningful food quality and food safety requirements—e.g., requirements that imported products be made from pasteurized milk—of importing countries' governments need to be observed by processors.
- Roads in dairy production areas and cold storage facilities need to be expanded to make Nicaraguan processors more competitive in other Central American markets.

Favorable Factors Affecting Nicaragua's Dairy Industry

The favorable factors affecting Nicaragua's dairy industry stem in part from the increases in milk supplies, improvements in milk quality, improvements in management of dairy processing businesses, the emergence of valuable demonstration effects, and additional access that dairy plants have gained to technical, financial and marketing assistance.

Expanding Milk Supplies

While growth in milk supplies with no addition to profitable markets would depress farm milk prices, the expansion of milk production in Nicaragua arguably is, on balance, a favorable development. Abundant supplies of raw product are attractive to expansion-minded processors. This consideration has relevance for Parmalat. As noted earlier, if Parmalat can obtain additional supplies of milk at competitive prices, this will increase the chances that Parmalat will use Nicaragua as a platform for expanding dairy product sales in Central America.

However, the challenges associated with using a larger milk supply to advantage should not be underestimated. The large potential increases in revenues from increased milk supplies that could be produced on Nicaragua's large land area—the largest in Central America—and increasing cattle numbers (totaling about three million head in 2001 [5]) will remain just that—potential sources of

increased revenue—unless improvements in consumer incomes, production, marketing and processing infrastructure, and management skills occur.

Improvements in Milk Quality

In certain supply areas, at least, the quality of milk and dairy products produced in Nicaragua is increasing. Parmalat has contributed to this development by insisting on quality milk supplies and by paying premium farm milk prices for quality milk delivered in volume. In addition, several milk supply cooperatives—e.g., Masiguito, San Francisco De Asis, and Santo Tomas—have recognized the importance of obtaining higher quality milk for producing quality cheeses for export. This development enhances the chances that these cooperatives will develop and sustain exports of quality cheese to the U.S. and other foreign markets.

Useful Alliances are Being Developed

Mechanisms to develop alliances among cooperatives and proprietary firms are being put in place. One such alliance involves cooperatives Masiguito, San Francisco De Asis, and Santo Tomas, and the proprietary firm, Alianza Nova. The immediate purpose of this alliance is to pool knowledge, finances, and cheese supplies, with an eye to expanding cheese exports to the U.S. Such alliances would have the additional important benefit of permitting the cooperatives to bargain more effectively with Parmalat and perhaps support, and benefit from, Parmalat's efforts to expand dairy product sales from Nicaragua into other parts of Central America.

Valuable Demonstration Effects have Emerged

Actions of a few smaller firms have a valuable demonstration effect for the industry. One firm that provides a notable demonstration effect is the Santa Martha (LACTOSAM) firm located in Jinotega, Nicaragua. This firm has developed a valuable brand for its cheeses, butter and other dairy products. Santa Martha has acquired dairy sales in upmarket supermarkets in Managua and in food stores in regional centers in Nicaragua, effectively competing with larger firms for these sales. The business also has an enviable record in new product development. Actions of this firm are worthy of emulation by other small dairy businesses in Nicaragua.

Expanded Access to Needed Services

Finally, Nicaragua's dairy industry has gained access to technical, financial, and market-development help from a number of organizations, including USAID-Nicaragua, IICA-Nicaragua, Land O'Lakes, Inc., and a host of organizations representing foreign governments. The government of Japan has made an important contribution. The Japanese government has contributed financing for an expanded school milk program in Nicaragua that promises to improve nutrition among school children and expand fluid milk sales. The organizations mentioned will be useful for facilitating export market expansion activities of Nicaragua's dairy industry and for upgrading the management skills of smaller dairy processing firms in Nicaragua.

Challenges Facing Nicaragua's Dairy Industry

Nicaragua's dairy industry faces problems associated with pronounced seasonality of production, relatively high domestic farm milk prices by international standards (especially during the dry season), low consumer incomes, undercapitalization, poor sanitation on some farms, smaller processing plants, shortages of cold storage facilities, high-cost transportation systems, and underdeveloped management skills.

Pronounced Seasonality of Milk Production

Nicaragua's dairy industry faces problems associated with pronounced seasonal variations in production that create large price swings that are objectionable to farmers and produce inefficiencies in plant operations. To a major extent, these seasonal swings are the product of a pasture-based dairy system. New Zealand's dairy industry, which is also pasture-based, faces similar problems, but New Zealand's dairy industry uses its low raw-product costs to offset negative competitive effects of marked seasonal milk production swings on plant efficiencies.

While the amount of seasonal variation in milk supplies received varies among plants, it is pronounced at almost all plants. Milk processors interviewed reported that milk production in Nicaragua during the rainy season (June through September) increased by two-thirds or more compared to milk production during the dry season (December through May). 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—in a few cases by as much as 70%—to discourage farmers from selling milk to them or to avoid losses on milk they do purchase.

For obvious reasons, the sharp reduction in prices concerns dairy farmers who would like to receive a more even price throughout the year. Milk processors also find that they are using their plants at far less than capacity in the dry season, creating processing inefficiencies. The manager of the Nestle milk powder plant at Matagalpa, Nicaragua reported that during part of the current dry season he ran only one of the two milk powder processing lines in his plant and ran that line only every other day. 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 year around milk supply.

Relatively High Farm Milk Prices

Nicaraguan farm milk prices are relatively high by international standards (particularly during the dry season), making it challenging for the Nicaraguan dairy industry to compete in international markets. While it is difficult to make unambiguous inter-country comparisons of farm milk prices, the prices recorded in Table 4 provide a basis for comparing prices paid to farmers for milk used for fluid purposes in Nicaragua to those paid by processors located elsewhere in Central America and in Panama. The prices in Table 4 represent prices paid to farmers for Grade A milk used for fluid purposes and are not fully representative of prices paid for milk used to produce hard cheeses. Thus, the prices noted for Nicaragua are most representative of prices paid to farmers by processors such as Parmalat or Eskimo for milk used for fluid purposes.

Table 4. Prices paid to producers for fluid milk, various years, 1994-2001*

Country	Period	Average Price (U.S.\$/liter)
Nicaragua	1994-2001	\$0.30
Costa Rica	1994-2001	0.28
El Salvador	1994-2001	0.42
Guatemala	1994-1999	0.44
Honduras	1994-1997	0.27
Panama	1999-2001	0.24

* Source: Compiled by IICA-Nicaragua from information obtained from MAG-FOR. Prices for Guatemala, Honduras, and Panama were not available for the entire 1994-2001 period.

Prices paid for fluid milk in Nicaragua were in the “middle of the pack” in Central America. Thus, Nicaragua's farm milk prices were strongly competitive with those of El Salvador and Guatemala but less competitive with the others. It is noteworthy that Nicaragua's farm milk prices for fluid uses were modestly higher than in Costa Rica's advanced dairy industry. This has implications for how well Parmalat could compete with Dos Pinos Cooperative in Costa Rica's fluid milk market.

The Nicaraguan farm milk prices presented in Table 5 generally represent dry season prices for Grade A milk suitable for producing cheese for export markets that demand consistently high-quality products. It is recognized, of course, that not all export markets require cheese made from Grade A milk. For example, in the 2003 dry season, Masiguito Cooperative sold hard, dry cheese made from milk of mixed grades into El Salvador. The same practices characterize Quesera's sales of cheese into El Salvador. However, for hard cheese exported to the U.S. market, it is reasonable to assume that Grade A milk would be required to produce the product.

Table 5. Farm milk prices in Nicaragua and selected other countries, U.S.\$/liter*

Country	Farm Milk Price (U.S.\$/liter)	Product Characteristic and Date of Price
New Zealand	\$0.16-0.148	All milk, 2002 season average price
U.S. Class III Price	0.262	2002 average price
Nicaraguan Firms:		
• Parmalat, Managua	0.31-0.32	A Grade, dry season, 2003
• Santo Tomas Cooperative, Santo Tomas	0.22	A Grade sales to Parmalat, 2003 dry season
• Masiguito Cooperative, Camoapa	0.223	Mixed grades, dry season, 2003
• San Francisco de Asis Cooperative, Camoapa	0.219	A Grade, dry season, 2003
• Quesera, La Patriola	0.235	Mixed grades, dry season, 2003
• Nestle, Matagalpa	0.20	Mixed grades, dry season, 2003

* Sources: Farm prices paid by Nicaraguan firms are those reported by plant operators during 2003 interviews. The U.S.\$0.16 estimate of farm prices received by New Zealand producers was obtained from the manager of the Nestle plant in Matagalpa, Nicaragua. The U.S.\$0.149 price estimate for New Zealand producers was obtained from LTO Nederland [8]. U.S. farm milk prices represent average Class III prices for 2002 supplied by LTO-Nederland [8].

Perhaps the most telling comparison of the prices in Table 5 relates to the U.S. federal milk order Class III price, which represented the average raw product cost for milk used to produce hard cheese in the U.S. in 2002. The U.S. price was U.S.\$0.038 (17%) higher per liter than the average dry season prices paid by Santo Tomas, Masiguito, San Francisco De Asis and Quesera. Farm milk prices (raw product costs) represent a large portion (75% to 80%) of the cost of producing dry, hard cheese—an item that Nicaraguan dairy firms would like to export in increased quantity to the U.S. As noted earlier, this raw product cost situation may not be critically important in the short-run since the dry, salty, hard cheese is not yet a commodity in the U.S. But, the relatively small Nicaragua raw product cost advantage will be of concern over the longer-run if U.S. processors learn to duplicate the unique flavors of Nicaraguan dry, salty, hard cheese.

The figures in Table 5 also have implications for the likely success of Nicaragua's import substitution efforts. For example, pizza makers in Nicaragua currently import relatively large amounts of mozzarella cheese from New Zealand. Parmalat and a few other Nicaraguan dairy processors speculate that it would be possible to produce greater amounts of mozzarella cheese in Nicaragua to serve the domestic market for pizza cheese. This import substitution effort will require domestic firms to produce cheese to specification for the pizza makers. While production to specification appears possible, the problem of competing with New Zealand's low raw product cost—which recently averaged about two-thirds as high as the dry season farm milk price paid by Santo Tomas, Masiguito, San Francisco De Asis, and Quesera—will be significant.

The Union of Agricultural Producers of Nicaragua (UPANIC) and Land O'Lakes, Inc. question whether Nicaragua's farm milk prices are high by international standards. They note that milk prices in Nicaragua, particularly during the flush (rainy) season, are competitive in the Central American market, making Nicaraguan dairy products more affordable in export markets than competing products from neighboring countries. A different competitive picture does emerge when prices for Nicaragua's rainy season are compared to the New Zealand prices and the U.S. Class III prices. The average rainy season prices for Santo Tomas Cooperative, Quesera, and Nestle (U.S.\$0.148/liter) in Table 6 are roughly the same as the lower of the New Zealand prices and only 56% as high as the U.S. Class III price. These comparisons suggest that Nicaragua's rainy season farm milk prices are competitive with those of low-cost producers in other countries as claimed by UPANIC and Land O'Lakes.

Table 6. Farm milk prices in Nicaragua for the rainy season and average farm milk prices for selected other countries, U.S.\$/liter*

Country	Farm Milk Price (U.S.\$/liter)	Product Characteristic and Date of Price
New Zealand	\$0.16-0.149	All milk, 2002 season average price
U.S. Class III Price	0.262	2002 average price
Nicaraguan Firms:		
• Santo Tomas Cooperative, Santo Tomas	0.10-0.168	Mixed grades, rainy season, 2003
• Quesera, La Patriola	0.135	Mixed grades, rainy season, 2003
• Nestle, Matagalpa	0.19	Mixed grades, average for recent rainy seasons

* Sources: Farm prices paid by Nicaraguan firms were those reported by plant operators during 2003 interviews. The U.S.\$0.16 estimate of farm prices received by New Zealand producers was obtained from the manager of the Nestle plant in Matagalpa, Nicaragua. The U.S.\$0.149 price estimate for New Zealand producers was obtained from LTO Nederland [8]. U.S. farm milk prices represent average Class III prices for 2002 supplied by LTO-Nederland [8].

However, the small number of rainy season prices appearing in Table 6 should be interpreted with caution. Unlike the dry season prices quoted earlier, which were prices currently being paid, the rainy season prices in a few cases reflected prices that plant officials anticipated paying in the 2003 rainy season. Thus, they may differ from actual pay prices. In addition, the prices in the table reflect prices for mixed grades of milk, while the prices in Table 5 represent mostly Grade A milk prices. Finally, the price quoted for Nestle, Matagalpa apparently was an illustrative price reflecting recent rainy season pay prices.

An additional point should be noted regarding the implications of the figures for the international competitiveness of Nicaragua's milk prices. Low prices during the rainy season do not reflect unambiguous increases in competitiveness. For example, Honduras and El Salvador represent important export markets for Nicaraguan cheeses. However, demand for imported cheese in those nearby countries declines during Nicaragua's rainy season since those countries have abundant supplies of their own. Indeed, the abundance of local supplies in Honduras and El Salvador sometimes manifests itself in complaints about quality that are used to keep Nicaraguan product out of the markets. If Nicaraguan processors had cold storage facilities capable of storing more cheese produced during the rainy season for sale later in the dry season in these markets, Nicaragua's low raw product cost during the rainy season would have a greater positive, competitive impact.

Firms appear to have incentives to acquire additional cold storage facilities. Prices for hard, dry, salty cheese exported from Nicaragua to Honduras and El Salvador recently have declined by about U.S.\$0.50 per pound (from U.S.\$1.40 to U.S.\$0.90) from the dry season to the rainy season. Thus, more cheese produced by Nicaraguan processors in the rainy season could be stored and sold for higher prices during the dry season if the processors possessed additional cold storage facilities. Of course, dry season prices paid by buyers in El Salvador and Honduras would be modestly lower if more stored cheese came onto the market in those countries during the dry season. But the size of the current seasonal swings in cheese prices suggests that there would be gains from storage for enterprising organizations that acquire additional cold storage facilities. Thus, international organizations might consider supplying credit at favorable terms to a consortium of small dairy cooperatives for acquiring additional cold storage space.

The broad implication of the price comparisons is that in the long-run, at least, Nicaragua's milk producers may need to adopt additional farm-level efficiencies that expand supplies (especially during the dry season) and bring farm milk prices to more competitive levels if they are to be successful in international cheese markets. This finding suggests that more than marketing improvements will be needed to expand Nicaragua's dairy industry successfully.

Low Consumer Incomes

Consumer incomes in Nicaragua are the lowest in Central America, making dairy products expensive for many of the country's consumers. According to figures compiled by the United Nations World Development Board, the International Monetary Fund, and the Economist's Economic Intelligence Unit, the Gross Domestic Product per person in Nicaragua (purchasing power parity) was U.S.\$2,366 in 2001, the lowest in Central America [4].

The purchasing power parity (PPP) measure takes into account differences in the cost of living among countries. However, the average income figures for Nicaragua fail to reflect the full extent of poverty since a disproportionately large number of people are concentrated in the low income categories. According to the U.S. Central Intelligence Agency's Fact Book for 2002, incomes of about half of Nicaragua's population place them below the poverty level [11].

Country	GDP/Person, 2001 PPP, U.S. Dollars
Nicaragua	\$2,366
Costa Rica	8,080
El Salvador	4,500
Honduras	2,450
Guatemala	3,850

A Parmalat official pointed out the practical significance of the low income figures for Nicaragua. He noted that many consumers in Parmalat's sales areas in Nicaragua have incomes equivalent to only about U.S.\$500 per year. According to his estimates, a liter of fresh fluid milk per day would require about three percent of such a family's income. Thus, he argued, the relatively high cost of fresh fluid milk compared to staples such as rice and beans will limit fresh milk consumption relative to these staples.

The low consumer incomes may account for the relatively low per capita consumption of dairy products in Nicaragua. IICA-Nicaragua figures indicate that per capita consumption of dairy products in Nicaragua was equivalent to only about 32 liters per capita in 2001 [6]. This figure is among the lowest in Central America.

Most dairy products are considered to be what economists call normal goods. Thus, consumption of these goods rise when consumer incomes increase. If economic development proceeds effectively in Nicaragua in the next few years and consumer incomes rise, expect consumption of most dairy products to increase. Milk powder used to produce reconstituted milk will likely be an exception, since consumers tend to substitute fresh milk for this product when their incomes rise.

Dairy Processors and Dairy Farmers are Undercapitalized

Many dairy processors and dairy farmers in Nicaragua are undercapitalized. This makes it difficult for such processors and farmers to borrow money to acquire the equipment and technologies needed to modernize their operations. Moreover, commercial credit is not accessible to certain farmers and some processors. A few processors complained that commercial banks charged interest rates as high as 30% for loans. According to their comments, even loans guaranteed by international agencies or others sometimes carried interest rates as high as 15% to 20%. When interest rates are at these levels, retained earnings—which are frequently scarce in Nicaragua's dairy industry—tend to be the main source of expansion capital.

Several factors account for the high interest rates charged by commercial banks. There are problems with titles to properties that could be mortgaged to secure loans. Thus, properties in some cases have conflicting claims as to ownership. Banks are understandably reluctant to accept such properties as collateral for loans. In other cases, farmers and processors have a limited credit history, making it difficult for banks to assess their creditworthiness. In addition, agricultural

enterprises are regarded as risky, seasonal businesses in many countries. When this perception exists, bank loan funds are frequently allocated to other types of businesses.

However, problems with credit availability for dairy processors should not be overstated. Certainly, multinational firms operating in Nicaragua—such as Parmalat and Nestle—would have little difficulty obtaining credit at internationally competitive interest rates. Moreover, one small dairy processing firm in Nicaragua reportedly obtained commercial credit from a bank at lower rates (10% to 12% interest on a U.S. dollar loan) in early 2003. Small firms that find it feasible to obtain commercial loans at lower interest rates often have a history of repaying bank loans and supply suitable collateral for loans.

International agencies have recognized the difficulty smaller dairy processors face in securing loans at acceptable interest rates. In a few cases, loans for plant and equipment made by the agencies to small processors have taken on the characteristics of grants—i.e., repayment requirements were so lenient that the firms felt little compulsion to repay the loans. Such loan terms may be advantageous to recipients in the short-run, but the loans do little to instill in recipient firms commercial discipline. Indeed, the availability of such loans can short-circuit development of competitive management skills in firms receiving such loans. It is questionable whether loans that exhibit grant-like characteristics have a place in an industry that is attempting to become internationally competitive.

Problems with undercapitalization will also be important to the smaller dairy firms that plan to expand dairy exports to the U.S. and other markets. Inevitable early failures associated with dairy exporting make it important that the firms have the capital needed to weather the early difficulties. Indeed, if smaller Nicaraguan dairy firms are to succeed in exporting, many will need access to additional financial reserves or lines of credit to deal with payment delays or defaults on payments by foreign buyers.

Milk and Dairy Product Quality Still Suffer

While milk quality has improved, it still suffers in some production areas. A host of reasons explain the continued presence of low-quality milk. These include the lack of electricity and cooling equipment on most farms, lack of knowledge on the part of farmers regarding proper sanitation practices, and limited price incentives for production of high quality milk.

Nicaraguan dairy products have an image problem because some cheeses, in particular, manufactured under unsanitary conditions enter domestic and foreign markets. This problem will be a difficult to solve because many low-income people make their living from cheese making activities and are likely to continue to do so. One way to separate quality dairy products made under sanitary conditions in commercial plants from low-quality products would be to establish a “Seal of Quality” for consistently high-quality products. Efforts to establish the quality seal would be a joint undertaking involving both private firms and government dairy inspectors. Products carrying a Seal of Quality would have to be consistently produced under sanitary conditions for an extended period of time. Eventually, the seal would be an important differentiating device that would identify consistently high-quality products. Land O’Lakes, Inc., which has helped dairy groups in Macedonia to investigate the feasibility of establishing a similar seal, could make an important contribution to developing a quality seal.

Processors Possess Limited Knowledge of Certain Management Practices

Managers of the processing plants visited exhibited exemplary management skills in a number of areas. They produced marketable dairy products under difficult conditions from variable and sometimes low-quality milk supplies. Moreover, they did this while supervising workers who frequently had limited experience and little formal education. Hence, no blanket indictment of their management skills is intended. However, managers of some processing plants had little experience with developing business plans, strategy development, international marketing, and risk management. It will be particularly important for exporters to develop risk management skills. For example, to see the importance of risk management skills one needs only ask, “What would happen to a small cooperative and its farmer suppliers if a buyer from El Salvador failed to pay for a large

shipment of cheese?" It will be advantageous for small firms bent on expanding dairy exports and domestic sales of dairy products to acquire a host of advanced management skills. Land O'Lakes, Inc.—which has provided management advice on these subjects in Honduras and Nicaragua—has the capacity to provide more of the needed training.

Cold Storage Facilities are in Short Supply

As indicated earlier, Nicaragua has limited cold storage facilities. This accentuates the seasonal swing in cheese prices and limits the ability of the industry to age cheeses for export. This constraint will be particularly important if large additional export markets are obtained for hard cheeses requiring aging for 60 days or more. Capital will need to be devoted to easing this bottleneck if the industry is to make substantially larger exports of certain cheeses.

Transportation Costs are High

Milk and dairy product transportation costs are high in parts of Nicaragua. Partly this is because of a shortage of paved roads in the country. The U.S. Central Intelligence Agency estimates that only 11% of the country's roads are paved [11]. Moreover, paved roads in important dairy regions of the country have fallen into a severe state of disrepair. One main road leading to Juigalpa provides an example. The analyst considers this road to be one of worst main roads he has witnessed anywhere in the world. During the rainy season difficult problems with mud emerge on unpaved roads and on those roads that have fallen into severe disrepair. Such roads increase milk and dairy product transportation costs by increasing the time required for transporting these products; the roads increase wear and tear on vehicles sharply.

There are also problems with access to seaports. Nicaragua has no major seaport on the Atlantic coast side of the country. As a practical matter, this necessitates that large, bulky shipments of Nicaraguan dairy products destined for the Eastern U.S. or the Caribbean be shipped through ports in Honduras or Costa Rica, increasing costs for such shipments.

II. Benchmarking Nicaragua's Dairy Industry Against Principles that Shape an Industry's Ability to Expand Domestic Sales and Exports

Performance characteristics exhibited by an industry's firms strongly influence the ability of those firms to expand domestic sales and exports. Moreover, strengths exhibited by an industry's firms for serving the domestic market profitably often can be used to advantage for serving export markets. Certain principles noted below have been used to advantage for expanding domestic sales and exports by some of the world's leading international dairy firms, including Fonterra of New Zealand, the Kerry Group of Ireland, Dos Pinos of Costa Rica, and U.S.-based multinational firms. The reader will recognize that the principles are based, in part, on the writings of Michael Porter, a leading business strategist with Harvard's Business School [9,10].

- In the long-run, producers of commodities must be low-cost producers in order to remain profitable. Producers of differentiated products need not be low-cost producers to be profitable. Producers who are neither low-cost producers nor producers of differentiated products often end up being "stuck in the middle" and find it difficult to remain profitable.
- The benefits of being a low-cost producer and a producer of differentiated products are additive. Firms that are low-cost producers and also practice product differentiation tend to be formidable international competitors. The two characteristics are found in Fonterra of New Zealand.
- Demanding customers in the domestic market help make a firm more competitive in international markets.
- Related and supporting industries in the home country (sometimes referred to as clusters) are important sources of strength for firms hoping to expand exports.
- Government help for domestic firms and exporters is most effective if it produces improved product quality, fosters strong domestic competition, and improves educational opportunities for the workforce. Governments can also make important contributions via improvements in infrastructure—e.g., improved roads and ports. Government subsidies and manipulation of exchange rates often do little to enhance the long-run competitiveness of exporting firms.

- Research and development (R&D) efforts are needed to underpin a firm's capacity to serve domestic and export markets over the longer-run. Successful international dairy firms—e.g., Fonterra, Dos Pinos, and the Kerry Group—have strong in-house R&D capabilities that contribute to new product development.
- Risk management strategies are frequently used by successful exporters. For example, the New Zealand Dairy Board (now part of Fonterra) used a multiple-step process to manage risk when entering a new dairy export market [2]. The first step frequently involved working with an agent to make sales in a new foreign market. If the market appeared promising, the firm would then enter into a joint venture with the agent (or other firm) to expand sales in the new market. Still later, as the firm expanded sales further and confirmed the profitability of the market, the Board would buy out the joint venture partner, creating a subsidiary through which additional export sales were channeled. This risk-reducing process, of course, can be shortened if an exporter enters into a joint venture with a buyer in the importing country as a first step for expanding exports.
- Exports that begin as differentiated products may degrade into commodities. This sometimes happens when close substitutes emerge for the product in the receiving market.
- When a firm or an industry benchmarks against a competitor (compares one's capabilities to those of competitors), it is advisable to benchmark against the best in the world.
- Firms recognize that exporting is not for everyone. Exporting is but one expansion strategy. However, Michael Porter argues that it is often more profitable for a firm to expand exports than to dominate the domestic market.

Implications of the Principles for Developing Strategies to Expand Domestic Sales of Nicaraguan Dairy Products

The picture that emerges when Nicaragua's dairy industry is evaluated according to the principles is "mixed" as far capacity to expand domestic sales of dairy products is concerned. Parmalat has abundant capacity to expand domestic sales. Nestle's status as a domestic competitor is unclear. Firms in the fragmented cheese-producing industries are likely to face challenges as they seek to expand domestic sales.

Parmalat's Capacity to Expand Domestic Sales

Parmalat's operations clearly satisfy many requirements that are important for expanding domestic dairy product sales. It produces mostly branded, differentiated products and probably is a low-cost producer of certain fluid items, making the firm a formidable domestic competitor. It also has the in-house R&D capacity needed for new product development.

If one accepts the principles listed above as important determinants of domestic competitiveness, then the area where Parmalat is most deficient relates to shortages of domestic competition. Michael Porter argues persuasively that absent strong domestic competition, a firm has limited incentives to innovate [9]. Parmalat's main domestic competitor for fluid milk sales is Eskimo. While Eskimo is a well-managed producer of differentiated products, the firm undoubtedly has higher production costs than Parmalat. It is also questionable whether Eskimo has a capacity to develop new products that approaches the capabilities of Parmalat. While Parmalat may now enjoy its near monopoly position in Nicaragua's domestic fluid milk market, the firm over the longer-run may suffer from the shortage of domestic competition.

Arguments may be raised about whether Parmalat has the demanding domestic customers needed to encourage the firm to innovate. Given that the firm caters mostly to upmarket customers in Managua and regional centers, most of Parmalat's customers are probably sufficiently demanding that they transmit to the firm their strong interest in having access to consistently high quality products.

Parmalat undoubtedly has the R&D and marketing capacity to develop viable import substitution programs. In particular, Parmalat could develop mozzarella cheese to replace imports of this pizza cheese ingredient from New Zealand. Whether this is the most profitable avenue for

Parmalat's new product development efforts is a decision that will be made by Parmalat's management.

Nestle's Capacity to Expand Domestic Sales

Nestle's future in Nicaragua is unclear. While the firm is part of Switzerland-based Nestle and has the advantages that this connection to a powerful multinational confers, the Matagalpa-based Nestle milk powder plant has not been upgraded enough to make it fully competitive. Nestle's management appears to be waiting to see how economic developments unfold in Nicaragua and elsewhere in Central America before deciding whether to make the investments needed for the firm to become fully competitive in Nicaragua's domestic market and export markets.

Capacity of Other Firms to Expand Domestic Sales

Firms in Nicaragua's fragmented cheese-processing industry have less capacity to expand domestic sales. While there is no shortage of domestic competition, the competition in this fragmented segment of the industry does not appear to foster the innovation that competition produces in some markets. In part this is because the industry lacks the supporting industries (clusters) relating to packaging, cold storage, finance, and R&D that are needed for successful innovation. Also, since the cheese processors sell to a broad group of domestic customers, they may not encounter the same homogeneity of demand from consumers for high product quality that faces Parmalat.

This does not mean that the "Seal of Quality" for Nicaraguan products mentioned earlier in the paper is unimportant. Presumably, all domestic customers for Nicaraguan dairy products would prefer the broader choice of products and the additional information on product quality that a Seal of Quality would produce.

Nicaragua's producers of the dry, salty, hard morolique cheese face contrasting domestic and foreign markets. In Nicaragua, morolique cheese appears to be regarded substantially as a commodity. However, in the U.S. market it is regarded as a differentiated product that has commanded retail prices of U.S.\$6.00 to U.S.\$7.00 per pound in recent years [1]. The high prices stem partly from the value consumers attach to the unique flavors of morolique cheese. The situation creates both a dilemma and an opportunity for Nicaragua's cheese processors. There is a widely accepted principle that producers of commodities need to be low-cost producers to remain profitable. There is little chance that Nicaraguan producers of morolique cheese will rapidly become low-cost producers. For this to happen, new larger plants, a host of infrastructure improvements, and lower raw product costs would be needed in Nicaragua—things that will not materialize soon. However, exporters of the product to the U.S. would be under less pressure to be low-cost producers. This is an additional incentive for developing U.S. export markets for the product.

Much that is productive is taking place in Nicaragua to expand opportunities for smaller cheese processors in the domestic market. For example, IICA-Nicaragua has arranged for a Mexican cheese making expert to come to Nicaragua to teach small cheese processors how to make a variety of different cheeses. This type of initiative partially substitutes for the lack of in-house R&D facilities and new product development capabilities in the smaller firms.

Activities that would take place under a proposed draft contract between IICA-Nicaragua and Land O'Lakes, Inc. that was being considered when the author was in Nicaragua would produce similar improvements in the ability of small firms to expand domestic sales. While the activities under the proposed contract focus mainly on expanding exports, initiatives undertaken under the contract would also help small Nicaraguan dairy firms to expand domestic sales. Activities in the latter category include technical assistance to prepare operation and control manuals for five plants, introduction of five new products onto the market, and training of personnel from five plants at the Pan-American Agricultural School at El Zamorano in Honduras.

III. Strategies for Expanding Domestic Dairy Product Sales

The following inferences for strategy can be drawn from material describing how effective Nicaragua's dairy firms are likely to be in efforts to expand domestic dairy product sales.

Strategy No. 1

Parmalat should be given incentives to expand dairy exports. The incentives could be transmitted via complaints about the firm's near monopoly position in Nicaragua's fluid milk business. These complaints could be delivered to the government or, informally, through trade organizations. If Parmalat expanded exports, it could use its competitive abilities to advantage in broader markets and benefit from competition in foreign markets. Firms often secure advantages by increasing exports rather than by attempting to dominate sales in the domestic market.

Strategy No. 2

Nicaragua's small cheese makers should be encouraged to avail themselves of opportunities to acquire R&D and new product development capabilities from international organizations and private firms such as Land O'Lakes.

Strategy No. 3

Nicaragua's government, USAID-Nicaragua, other international organizations, and Nicaragua's dairy processing firms should cooperate to develop a "Seal of Quality" for selected Nicaraguan dairy products. This would improve the quality image of Nicaraguan dairy products. It would also give Nicaragua's consumers more information on product quality and create prices that would better reflect product quality.

Implications of the Principles for Developing Strategies to Expand Exports of Nicaraguan Dairy Products

The different abilities exhibited by Nicaraguan dairy firms to expand dairy exports parallel in many ways their abilities to expand domestic sales. Smaller firms clearly face the more difficult challenges. However, because of export expansion efforts supported by IICA-Nicaragua, USAID-Nicaragua, and Land O'Lakes, Inc., and the strong incentives the smaller cheese-producing firms have to expand exports, the firms have a reasonable chance of overcoming the challenges associated with expanding exports.

Parmalat's Capacity to Expand Dairy Exports

As noted earlier, Parmalat has abilities and incentives to expand dairy exports. Parmalat could tap into markets with higher consumer incomes if the firm branched out more fully into other Central American countries. The firm also has access to a milk supply in Nicaragua that would support expansion. However, Parmalat will encounter stiff competition from Dos Pinos Cooperative if it seeks to further expand sales in the relatively high-income Costa Rican market. Dos Pinos has developed processing scale economies—one of its new plants has the capacity to process one million liters of milk per day—in both fluid milk and manufactured dairy products, and has carried out the new product development work needed to capture approximately 90% of the commercial dairy market in Costa Rica. While Parmalat's due diligence may reveal opportunities in Costa Rica, it appears that the firm's best opportunities outside of Nicaragua lie in El Salvador, Honduras, and Guatemala, and in import substitution efforts in Nicaragua.

Parmalat may have opportunities to develop markets for UHT processed milk products in Central America and other neighboring countries. UHT milk, which has a long shelf life and does not require refrigeration until the UHT milk carton is opened, is a major product sold by other Parmalat units in many countries of the world. Parmalat-Nicaragua presumably has the R&D capacity to develop the ability to manufacture the product efficiently. Moreover, Parmalat-Nicaragua undoubtedly would have access to the latest technology for producing UHT milk from the parent company if it chose to manufacture the product in Nicaragua for export. However,

Parmalat would encounter competition for UHT milk sales in parts of Central America from Dos Pinos Cooperative.

Eskimo's abilities as a Pan-Central American exporter of dairy products are noteworthy. It has the license to manufacture and sell the well-known Yoplait brand of yogurt throughout Central America. In addition, the firm could expand exports of dairy novelties—e.g., ice cream bars—in Central America and the Caribbean. However, the firm apparently would encounter brand and licensing disputes with the Eskimo Pie company if it sought to expand sales of dairy novelties in the U.S.

Capacity of Other Firms to Expand Exports

The alliance among the Masiguito, San Francisco De Asis, and Santo Tomas Cooperatives and the proprietary firm, Alianza Nova, to develop cheese exporting capabilities was described earlier. Organizers of this well-conceived alliance have received important help from IICA-Nicaragua, USAID-Nicaragua, Land O'Lakes, Inc. and other organizations. In March 2003, the dairy exporting alliance was being targeted for additional assistance under a draft IICA-Nicaragua and Land O'Lakes contract.

The assistance received from the international organizations and Land O'Lakes will partially compensate for the inability of small individual firms to satisfy the requirements for successful exporting. In particular, the assistance partially substitutes for the cluster of supporting organizations often associated with success in exporting.

While much remains to be done, things appear to be going well for the alliance. First, the alliance has 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. 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 approval for plants that would be involved in exporting morolique cheese to the U.S. is being sought. Finally, cold storage facilities are being sought to store morolique cheese for the 60 days required for exports of the product to the U.S.

The exporting alliance is a thoughtful experiment. Participants in the alliance and supporting organizations can 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 should be monitored carefully. Experience under the initiative will reveal much about opportunities and challenges for expanding Nicaraguan dairy exports.

Changes Needed to Enhance the Ability of Nicaragua's Dairy Industry to Expand Exports Over the Longer-Run

Many substantive changes will be needed if Nicaragua's dairy industry is to consistently export large quantities of dairy products. One of the first—and perhaps one of the least expensive—changes that could contribute to expanded dairy exports is an increase in cold storage space. For reasons indicated earlier, the lack of cold storage space is presently a critical bottleneck.

Additional changes needed to improve the country's long-term competitiveness in the dairy business are potentially more difficult to achieve. As noted earlier, Nicaragua's farm milk prices during the dry season are relatively high by international standards. Moving farm milk prices during the dry season to internationally competitive levels will require increases in farm level efficiency and expanded milk production. Nicaraguan farmers understandably would be uneasy about the possible, price-depressing effects of expanded milk production. However, increased efficiency at the farm level might allow Nicaraguan farmers to achieve the same or higher net profit despite increased milk production. Negative impacts of expanded milk production on farm milk prices also would be partially offset by market expansion efforts now underway.

Individuals in Nicaragua's dairy industry have discussed the merits of "Israeli Model" dairy operations that have found experimental use in El Salvador. Funded in part by the Israeli government, the El Salvador feedlot-type operations have produced milk output per cow at high levels similar to those recorded in the U.S. and other countries where such operations are more common. There has been reluctance to try such operations in Nicaragua because it was feared that additional milk without additional markets would sharply depress farm milk prices. In addition, some individuals are skeptical about the merits of the feedlot-type operations because they require mechanization, intensive management, and feeding practices that differ from those found on many Nicaraguan dairy farms.

While marketing initiatives take priority, there is merit in experimenting with such operations in Nicaragua. First, milk quality from such operations is likely to be high. Firms such as Parmalat or Eskimo likely would be receptive to receiving the milk from this type of operation. Secondly, the limited amount of milk originating from one or a few such operations would have little negative effect on farm milk prices. Thirdly, the cost of such an experiment may be manageable since the Israeli government apparently would finance portions of the cost of the technical expertise needed to start the feedlot type operations. Finally, it may be useful to diversify experiments to include at least one emphasizing expansion of production.

Road improvements in rural Nicaragua—which would have strong positive impacts on the dairy industry and on economic development throughout the country—should continue to be emphasized. This is an area deserving of support by Nicaragua's government, USAID-Nicaragua, and other international organizations.

Finally, the principle calling for benchmarking against the best competitors in the world needs to be kept in mind. The most innovative and efficient pasture-based dairy industries in the world include those of New Zealand, Australia, and Costa Rica. There is no presumption that Nicaragua's dairy industry can quickly become like those of these three countries; however, the dairy industries of these countries exhibit characteristics worthy of emulation in the long-run. Among other things, the dairy industries of these countries have strong R&D capabilities, plants that exhibit economies of scale, operations that meet demanding product quality requirements, and sell a host of differentiated dairy products in domestic and foreign markets.

Only Parmalat in Nicaragua presently exhibits most of these characteristics. Thus, Parmalat is the vehicle that, in the near-term, could be employed to substantially expand Nicaraguan dairy exports. Nicaragua's smaller cooperatives could supply the milk needed by Parmalat to expand dairy exports throughout Central America and other neighboring countries. In the process, the cooperatives could reap the benefits that accompany being such a supplier. In the near-term, the cooperatives could use alliances and federations to gain the power needed to bargain effectively with Parmalat. Over the longer-run the smaller cooperatives are likely to find it advantageous to merge. Merged cooperatives would be still more capable of negotiating effectively with large firms such as Parmalat. And by becoming more like the big cooperatives found in New Zealand, Australia, and Costa Rica, they will find it more feasible to acquire the capital needed to build processing plants that exhibit economies of scale and employ superior management.

IV. Strategies for Expanding Dairy Exports

The following inferences for strategy can be drawn from the material describing how effective Nicaragua's dairy firms are likely to be in efforts to expand dairy exports:

Strategy No. 4

The exporting alliance involving the Masiguito, San Francisco De Asis and Santo Tomas Cooperatives and Alianza Nova should be supported by USAID-Nicaragua and IICA-Nicaragua. Progress of the alliance should be carefully monitored. The effectiveness of this alliance will reveal much about the potential ability of small Nicaraguan dairy firms to export dairy products to the U.S. and identify exporting practices that need improvement.

Strategy No. 5

Additional cold storage facilities should be acquired by Nicaragua's dairy industry. Eliminating the cold storage bottleneck would facilitate expanded dairy exports and limit seasonal reductions in farm milk prices and cheese prices.

Strategy No. 6

Emphasis should be placed on eliminating obstacles (in addition to the cold storage bottleneck) to expansion of Nicaraguan dairy exports over the long-term. Over the long-run, cooperatives hoping to become major exporters will need to acquire market power and processing scale economies through alliances, federations, and mergers.

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Appendix. Persons and Organizations Contacted by W.D. Dobson During February 23 to March 14, 2003 Trip to Nicaragua and Costa Rica

Nicaragua:

- Tomas Membreno, Agribusiness Advisor, USAID-Nicaragua.
- Marino Chanlatte, Project Director IICA/EPAD, Nicaragua.
- James Johnson, Agribusiness Specialist, IICA Nicaragua.
- Augusto Oporta, IICA Agribusiness Specialist and Dairy Farmer, IICA Nicaragua.
- Jose Orbina, Product Technology Manager, Parmalat, Managua, Nicaragua.
- Lic. Ali Miranda Baez, General Manager, Santo Tomas Cooperative R.I., Santo Tomas, Chontales, Nicaragua.
- Patricio Jerez, Alianza Nova S.A., La Libertad, Chontales, Nicaragua.
- Lic. Julio Fernandez Marin, Former General Manager, Masiguito Cooperative, R.L., Camoapa, Nicaragua.
- Ing. Juan Denis Rivera Olivas, General Manager, San Francisco De Asis Cooperative, R.I., Camoapa, Nicaragua.
- Armando Fernandez, President, San Francisco De Asis Cooperative, R.I., Camoapa, Nicaragua.
- Colonia Supermarket, Managua, Nicaragua (Evaluated dairy product line offered by supermarket.)
- Ulises Gonzalez D., Santa Martha-LACTOSAM, Jinotega, Nicaragua.
- Anael Mendoza, Quesera, La Patriola, Nicaragua.
- Gretchen L. Dhooge, Micro Enterprise Specialist, Land O'Lakes, Nicaragua.
- Jose Rene Orue Cruz, Attorney, IICA, Managua, Nicaragua.
- Ing. Roberto Rondon Sacasa, (Former Agriculture Minister), Currently General Manager, CIA. Agropecuaria Hato Grande, S.A., Juigalpa, Chontales, Nicaragua.
- Romiro Tijerino H., Manager, (Nestle) PROLACSA, Matagalpa, Nicaragua.
- Ariel Cajina, President, Dairy Federation of Central America, Managua, Nicaragua.
- Augustin Sequeira, President, Alianza Amerrisque, Chontales, Nicaragua.

Costa Rica:

- Auto Mercado Supermarket, San Jose, Costa Rica (Evaluated dairy product line offered by supermarket).
- Victor Gonzalez, Agricultural Specialist, FAS-USDA, San Jose, Costa Rica.
- Megasuper Food Store, Santa Ana, Costa Rica (Evaluated dairy product line offered by supermarket).
- Ing. Maria Ileana Mora B., Sales Manager, U.S.A.-Canada, Dos Pinos Cooperative, San Jose, Costa Rica.
- Adriana Badilla A., Commercial Strategy Counselor, Dos Pinos Cooperative, San Jose, Costa Rica.
- Eric Montero, Executive Director, Costa Rica's Chamber of Milk Producers, San Jose, Costa Rica.