

## AN OVERVIEW OF THE MEXICAN DAIRY SECTOR

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Mexico and the United States agreed to negotiate a trade agreement in June 1990. Canada subsequently joined the negotiations, and a provisional North American Free Trade Agreement (NAFTA) was signed in September 1992. The U.S. Congress approved a slightly modified agreement in November 1993 and the NAFTA became effective as of January 1, 1994. The NAFTA will substantially reduce trade barriers between the United States and Mexico, yet it permits each country to maintain current domestic programs, policies and product standards. This is the first of two leaflets examining the short- and intermediate-term potential of expanded dairy trade with Mexico.

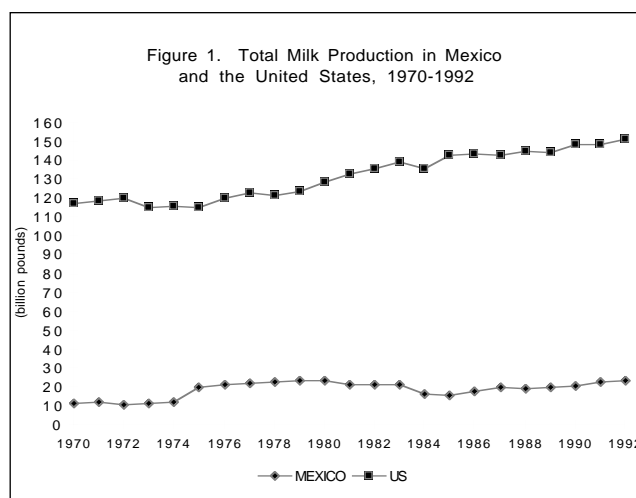
Benefits of greater trade between the U.S. and Mexico are already being realized by the U.S. dairy industry, as evidenced by expanded exports of fluid milk and frozen dairy products. Prospects for further increases in U.S. exports of dairy products will depend crucially on future developments in Mexican production, consumption, and trade with other partners. This leaflet emphasizes recent trends in production and consumption in Mexico and examines historical dairy trade patterns. Leaflet P-14 explores the possible consequences of increased dairy trade under the NAFTA for the U.S. dairy industry and discusses issues of potential concern.

### *Milk Production and Processing in Mexico*

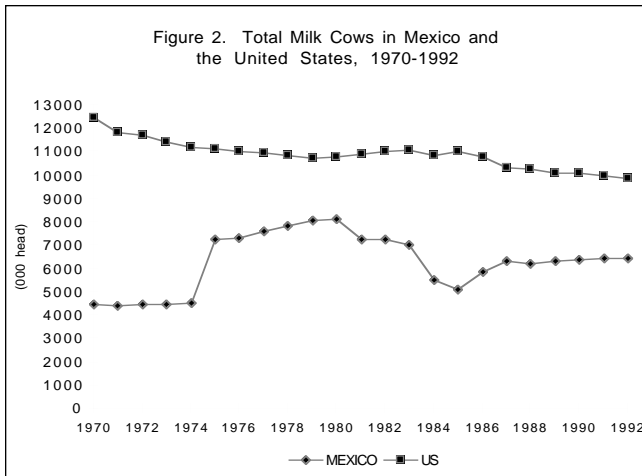
Growth of milk production in Mexico over the past two decades has been uneven. According to USDA, total milk production in Mexico more than doubled from 1970 to 1980, declined to 15.3 billion in 1985, and rebounded to the 1980 production level of 23.6 billion pounds in 1992 (an amount comparable to

production in California or Wisconsin, Figure 1). The production decline in the mid-1980s was largely attributable to government price controls and related policies. Although a number of milk production estimates are available for Mexico from different governmental and producer association sources, production levels are generally the same regardless of the source.

Estimates of the number of cows in Mexico vary much more than production and are felt to be less reliable. The large number of dual-purpose (milk-beef) herds in Mexico's tropics makes definition and estimation of the country's total dairy herd difficult. USDA estimates are considerably higher than those of Mexican governmental agencies. However, officials in Mexico appear to be less concerned with estimating the number of cows than with total milk production. USDA estimates of Mexican and U.S. dairy cattle inventories are shown in Figure 2.



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### Production Systems

Mexico's dairy producers employ more diverse production technologies than the U.S., ranging from confined operations similar to those in the U.S. to dual-purpose dairies similar to those seen in many developing countries. Milk is produced under at least three distinct systems. The confined system accounts for approximately 55 percent of the domestically produced milk and about 18 percent of the national dairy herd. Cows in these herds, typically Holsteins, are fed alfalfa, other forages, and concentrates. They produce 9,100 to 13,600 lbs. (4,000 to 6,000 liters) of milk per year. Herd sizes average over 500 cows. Artificial insemination and careful genetic management are typical in these operations. About 40 percent of confined dairies in northern Mexico have milking machines and cooling tanks.<sup>1</sup> These operations are located primarily along the borders of California, New Mexico, and Texas and in north-central Mexico.

The semi-confined or pastoral system represents approximately 15 percent of Mexico's milk production and approximately 37 percent of the national dairy herd. Cows in these herds are usually Holstein-Zebu or Brown Swiss-Zebu crossbreeds producing 5,400 to 9,100 lbs. (2,400 to 4,000 liters) annually. They are maintained on native or improved pasture, supplemented by corn stalks and sometimes grains fortified with oilseed meals. Herd sizes are small, usually 10 to 15 cows. These operations are primarily located in Mexico's central and northern regions.

Dual-purpose operations in Mexico raise calves to

weaning (and sometimes market weights) on-farm, deriving additional income from sale of milk not allocated to growing calves. This production system provides about 30 percent of the domestic milk supply and accounts for about 45 percent of all dairy cows in Mexico. The cows, typically Zebu and some Zebu crosses, yield only 1,200 to 1,700 lbs. (540 to 750 liters) per year. Grazed forage is the principal feed; supplementation is minimal. Herd sizes average 25 to 30 cows. Dual-purpose operations often are fairly isolated, lack access to good roads or marketing systems, and tend to be located in the tropics along the Gulf of Mexico and along the border with Guatemala. Because pasture is more abundant during the rainy season (September through December), dual-purpose milk production is highly seasonal.

### Dairy Processing and Distribution in Mexico

A relatively small number of companies process dairy products in Mexico, and a few large companies dominate the markets for many products. Currently, the major fluid milk processors are Grupo Alpura, Grupo LALA, Guilsa, Nestlé, and Boreal. A large share of the raw milk produced in Mexico is not chilled on-farm prior to delivery to processors. In addition, 30 to 50 percent of all raw milk is marketed directly by producers or small-scale marketers, reflecting incentives to avoid the price controls formerly imposed on formal marketing channels.

Water is frequently added to fluid milk by both producers and transporters to extend volume, a practice that is illegal in the U.S. Processors also commonly substitute vegetable fats for butterfat (referred to as "filling") in manufactured dairy products and in fluid milk. Filled milk is permitted in Mexico; up to 80 percent of the milkfat can be replaced with cheaper vegetable fat in some products as long as they are labeled accordingly. Filled milk is legal in the U.S., but any such product must be clearly labeled as such. Milk safety regulations in Mexico are as stringent as (sometimes more so than) comparable U.S. codes. However, U.S. regulations are enforced while those in Mexico often are not.

### Factors Influencing Future Production and Processing

Several factors will have a substantial effect on future milk production and processing in Mexico.

<sup>1</sup>Source: USDA Agricultural Attaché Report, December 15, 1992.

Among these factors are producer milk prices, cost and accessibility of production inputs, and improvements in the distribution and processing infrastructure.

**Milk prices.** During the 1980s, milk production in Mexico failed to keep pace with population growth, due in part to government policies. Before 1988, producer, processor and retail milk prices were controlled by the central government. Producers often found themselves in a cost-price squeeze with milk prices fixed and input costs rising. The resulting economic disincentives led to liquidation of the dairy herd and sharply reduced milk production. Milk production began to rebound in 1986, in part due to increased imports of high-producing cows as the U.S. implemented the Dairy Termination Program. Over 25,000 cows were exported to Mexico in 1986, up dramatically from only 1,400 in 1984.

Incentives to expand milk production resulted from a dramatic 1988 change in dairy price policy. In contrast to previous central government control, milk prices now are determined on a state or regional basis. Producer prices are negotiated among producer organizations, governmental agencies, and raw milk purchasers, with consideration given to costs of production. According to the U.S. Agricultural Counselor in Mexico City, October 1992 producer prices ranged from \$9.73 to \$14.18 per cwt (compared with a range in U.S. state average all-milk producer prices of \$11.49 per cwt in California to \$16.40 per cwt in Florida). As in the U.S., Mexican producers complain that prices are too low. Because milk is the only beverage included in calculations of inflation, Mexican governmental agencies have few incentives to raise milk prices.

**Cost and accessibility of production inputs.** Costs of production relative to producer milk prices will continue to have a significant effect on Mexico's milk production. Based on a limited number of estimates for confined operations in northern Mexico, average U.S. and Mexican production costs per hundredweight are not substantially different. Production costs for semi-confined and dual-purpose systems may be lower than average U.S. costs, but assembly and marketing costs are higher. Little information is available on the profitability of Mexican dairy operations, but the increase in milk production in the late 1980s is due in part to improved producer incentives.

Cost and accessibility of production inputs will obviously influence future production patterns. Restrictions on land use, labor costs, and NAFTA's effects on availability of new production inputs are crucially

important. Recently adopted changes in land-use policies will significantly affect the future structure of Mexican agriculture. The new policies will allow large land areas, once owned by the government but farmed communally, to be owned outright by members of the community. As a result, the agricultural sector will likely move away from traditional, subsistence farming towards larger-scale, commercial farming.

The low cost and availability of labor in Mexico is often cited as a factor that could help support growth in labor-intensive industries like agriculture. Although the labor cost per hour is low and labor is plentiful, the unit labor cost of producing milk in Mexico may be higher because of the lower output per cow and the lack of mechanization. With increased productivity and mechanization, however, the potential exists for higher labor productivity and lower labor costs per unit of milk produced.

NAFTA would improve the access of Mexican farmers to agricultural inputs such as new and used farm equipment, spare parts, improved seeds and breeding stock, feeds and additives for animal nutrition, and technical consulting. Many confined system producers are improving breeding stock, in part by imports of bulls, semen, and heifers from the United States. Table 1 documents U.S. exports of dairy breeding cattle to Mexico as well as the value of all breeding semen. No import permits are required and there are no ad valorem tariffs on bull semen or purebred breeding dairy cattle. A proportion of current growth in milk production can be attributed to the movement away from traditional, land-extensive types of dairy production systems to higher yielding, confined feeding systems. Given

| Year | Breeding bulls (number) | Breeding females (number) | Breeding semen value (mil \$) |
|------|-------------------------|---------------------------|-------------------------------|
| 1980 | 327                     | 6,147                     | 0.8                           |
| 1981 | 413                     | 11,291                    | 1.4                           |
| 1982 | 214                     | 5,307                     | 1.2                           |
| 1983 | 47                      | 1,382                     | 0.8                           |
| 1984 | 1,349                   | 8,055                     | 1.3                           |
| 1985 | 4,727                   | 25,461                    | 1.9                           |
| 1986 | 957                     | 22,764                    | 1.6                           |
| 1987 | 743                     | 9,028                     | 1.5                           |
| 1988 | 2,329                   | 14,987                    | 2.0                           |
| 1989 | 3,331                   | 23,154                    | 2.6                           |
| 1990 | 2,515                   | 27,317                    | 3.4                           |
| 1991 | 14,555                  | 22,524                    | 3.7                           |
| 1992 | 5,165                   | 23,898                    | 4.2                           |

changes in input costs, this trend toward confined feeding systems appears likely to continue.

Improvements in distribution and processing infrastructure. Improvements in the transportation system to allow more efficient processing and distribution could alter producer milk prices and the location of milk production in Mexico. Because improvements in infrastructure would require substantial investments, such changes will likely take place slowly for Mexico as a whole. However, NAFTA may create promising investment opportunities upon its implementation.

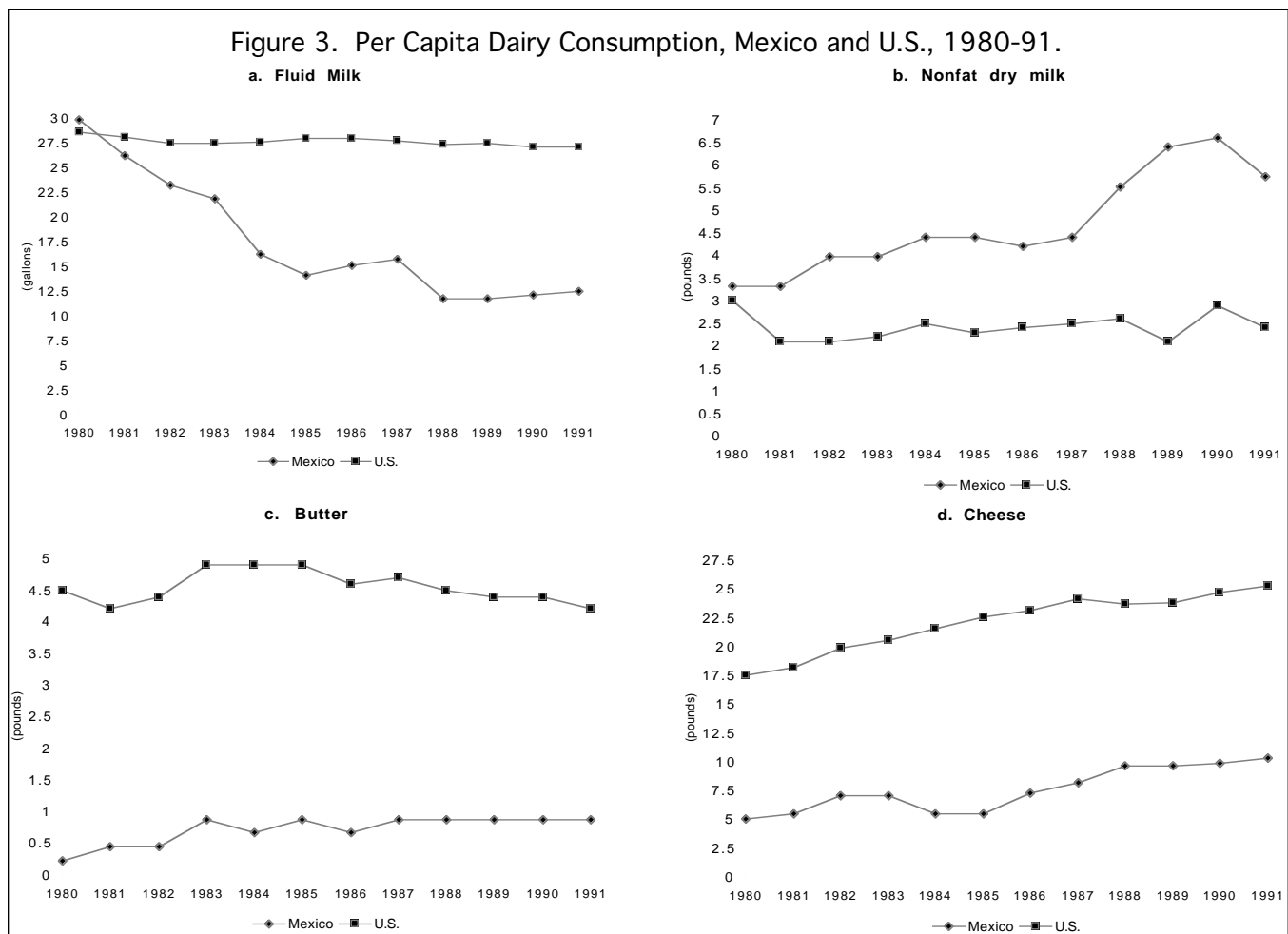
### Current Mexican Dairy Consumption Patterns

Aggregate per capita dairy product consumption in Mexico was about 46 percent of the U.S. level in 1991, according to USDA estimates. Mexico's per capita consumption, however, has been growing at just over 2 percent annually since 1988, compared with a 0.2 percent decline in the United States. In 1991, per capita fluid milk consumption in Mexico was 47 percent of the

U.S. level, lower than consumption in the early 1980s (Figure 3).

This difference in fluid milk consumption is offset somewhat by Mexican per capita consumption of NDM almost three times the U.S. level. Often this nonfat dry milk is reconstituted with vegetable fat for low-income social programs. Mexico's per capita NDM fluid equivalent consumption was 6.87 gallons in 1991. If the two figures are combined, Mexico's fluid milk and fluid equivalent consumption was 19.34 gallons, or 73 percent of U.S. fluid milk consumption. This represents a high-end estimate of beverage consumption because some of the NDM is used to make other products. Retail milk prices in Mexico appear to be somewhat lower than U.S. prices. During October 1992, Mexican consumers paid from \$1.50 to \$2.10 per gallon of pasteurized milk, whereas U.S. retail prices in October 1992 averaged \$2.82 per gallon.

Cheese and butter consumption in Mexico have been lower than U.S. levels for many years (Figure 3).



In 1991, Mexico's per capita cheese consumption was 40 percent of the U.S. level, while butter was at 20 percent of U.S. levels. Traditionally, butter has not been an integral part of the Mexican diet. Beans have been preferred to cheese in supplying protein needs, although farm-processed cheese is consumed in tropical regions. With higher incomes, cheese consumption could be expected to increase.

Although Mexican cheese and butter consumption were well below U.S. levels from the 1980 to 1991, fluid milk consumption was much closer to U.S. levels in the early 1980s (Figure 3). The decline in per capita fluid milk consumption from 1980 to 1991 coincides with a period of economic difficulty in Mexico. The decline in per capita incomes during the 1980s had a profound effect upon the consumption of dairy products in Mexico. Between 1981 and 1988, nominal per capita incomes in Mexico fell 35 percent from \$2,880 to \$1,760 before recovering to \$2,490 in 1990. During that period, aggregate consumption of dairy products fell by nearly one-half. Recovery occurred during the early 1990s and clearly the potential exists for increased consumption of dairy products primarily due to population growth and recovery of per capita incomes.

#### *Future Mexican Consumption*

The demand for dairy products in Mexico could exceed domestic supplies due to population growth, whether or not per capita consumption increases. Mexico's population of 90 million is almost one-third the size of the U.S. market, and is projected to increase by over 40 percent to 129 million by the year 2010. The majority of the population is below 20 years of age and lives in an urban area. Significant growth in dairy product consumption is possible due to the dietary needs of the young and market concentration in the cities. The increases in per capita income in 1989 and 1990 are expected to continue into the 1990s, improving the prospects for an increase in demand for dairy products, especially for specialty products such as ice cream and yogurt. NAFTA could have significant impact on the availability of milk in Mexico and, therefore, upon the price of dairy products.

#### *Mexican Dairy Trade Patterns*

During the 1980s, Mexico emerged as a major importer of dairy products; in fact, Mexico became the world's largest market for milk powder. Production shortfalls coupled with consumption increases were

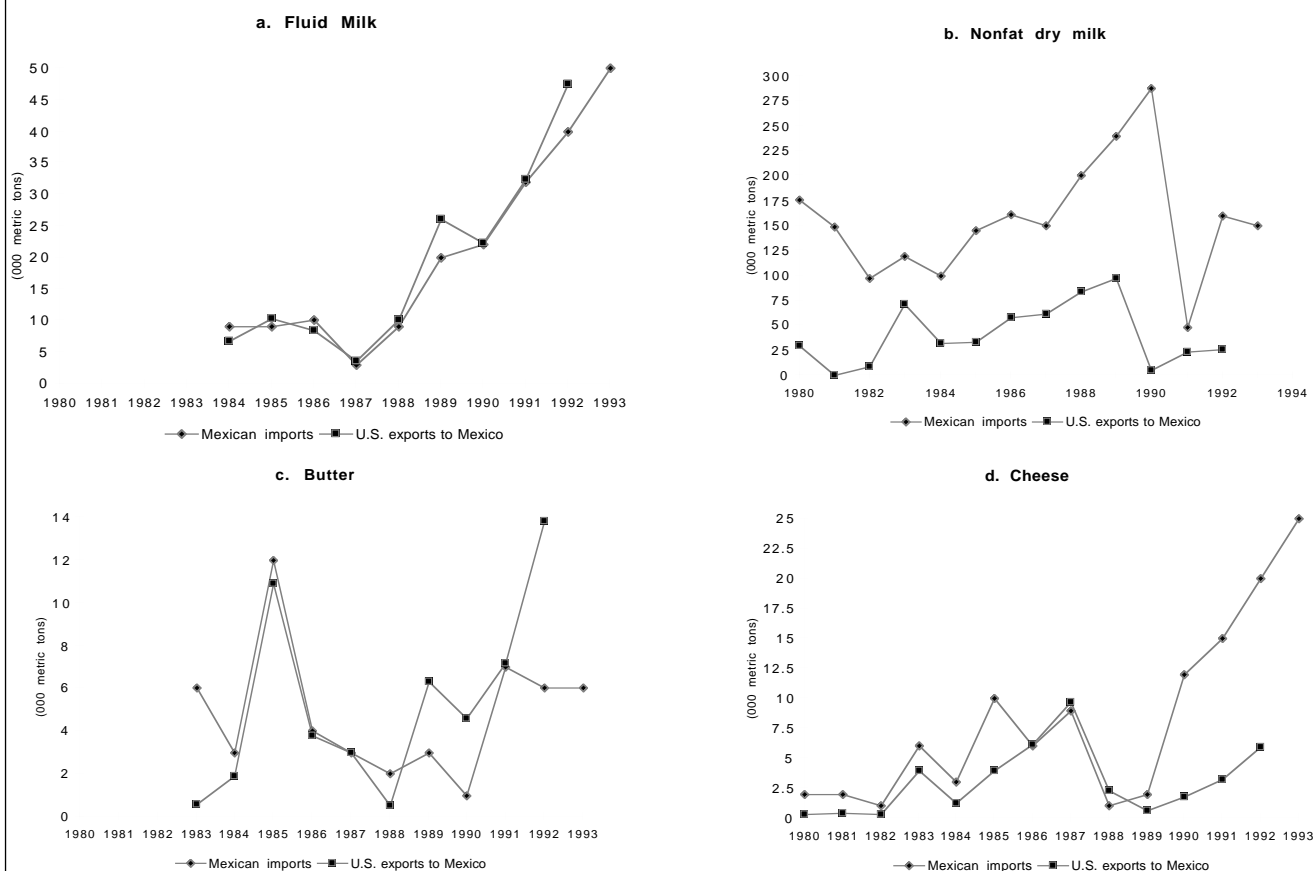
largely responsible. U.S. exports of dairy products to Mexico have, to varying degrees, kept pace with changes in total Mexican imports (Figure 4). In 1991 and 1992, for example, Mexico was the single largest importer of dairy products from the U.S. (Figure 5). Data concerning U.S. exports of dairy products to Mexico differ depending on the source, and total dairy product imports reported by Mexican agencies are sometimes less than USDA's reported exports to Mexico alone. Thus, the data in this leaflet should be treated as representative of general trends in dairy product trade between the U.S. and Mexico, but the absolute levels of products traded are less certain.

U.S. fluid milk exports to Mexico rose from 14.7 million pounds in 1984 to 104.8 million pounds in 1992. Because of its proximity to the United States and relative ease of shipping, most Mexican fluid milk imports are from the United States. Nonfat dry milk (NDM) exports to Mexico fluctuated widely during the last decade but remain near levels in the early 1980s. The U.S. share of Mexican NDM imports is affected by price competitiveness, the general availability of NDM, and the level of assistance from export subsidy programs. The share has ranged from practically zero in 1981 to almost 60 percent in 1983, but typically U.S. exports accounted for 30 to 50 percent of Mexican nonfat dry milk imports. This nonfat dry milk is used mainly in reconstituting milk as a fluid milk substitute and in cheese production.

Mexican butter imports fluctuated during the 1980s, but have increased in the early 1990s. The United States currently is the principal shipper of butter to Mexico. Anhydrous milkfat, a more concentrated form than butter, is an important form of U.S. butter exports to Mexico. Butterfat is used mainly as an input in cheese production, along with nonfat dry milk. Mexican cheese imports showed strong growth during the last decade, increasing from 2,000 metric tons in 1980 to 20,000 metric tons in 1992. The United States provided 20 to 40 percent of Mexican cheese imports. Most of the imported cheese is hard cheese from European countries, which is preferred by upper income consumers due to its presumed higher quality.

Although the United States has a locational advantage in exporting dairy products to Mexico, stiff competition from several other countries, mostly European, exists in the Mexican market for some dairy products. Mexican dairy import shares by source country for 1991

Figure 4. Total Mexican Imports and U.S. Exports to Mexico of Selected Dairy Products, 1980-1993.



Butter includes anhydrous milkfat.

Figures for 1993 are forecasts.

Due to data discrepancies, U.S. exports are reported to exceed Mexican imports in some years

Sources: Mexican imports from Gudmunds and Webb "PS&D View '91" electronic database USDA/ERS, November 1991; U.S. fluid milk exports from *U.S. Dairy, Livestock, and Poultry Trade*, USDA/FAS, Circular Series FDLP, various issues; U.S. exports of NDM, butter, and cheese from USDA, *Foreign Agricultural Trade of the U.S.*, calendar year supplement, various issues.

are listed in Table 2. The United States is the largest exporter of fluid milk, yogurt, and dairy cattle. However, the U.S. faces stiff competition primarily from European countries in exports of NDM, butter and cheese, generally having less than 50 percent of the market.

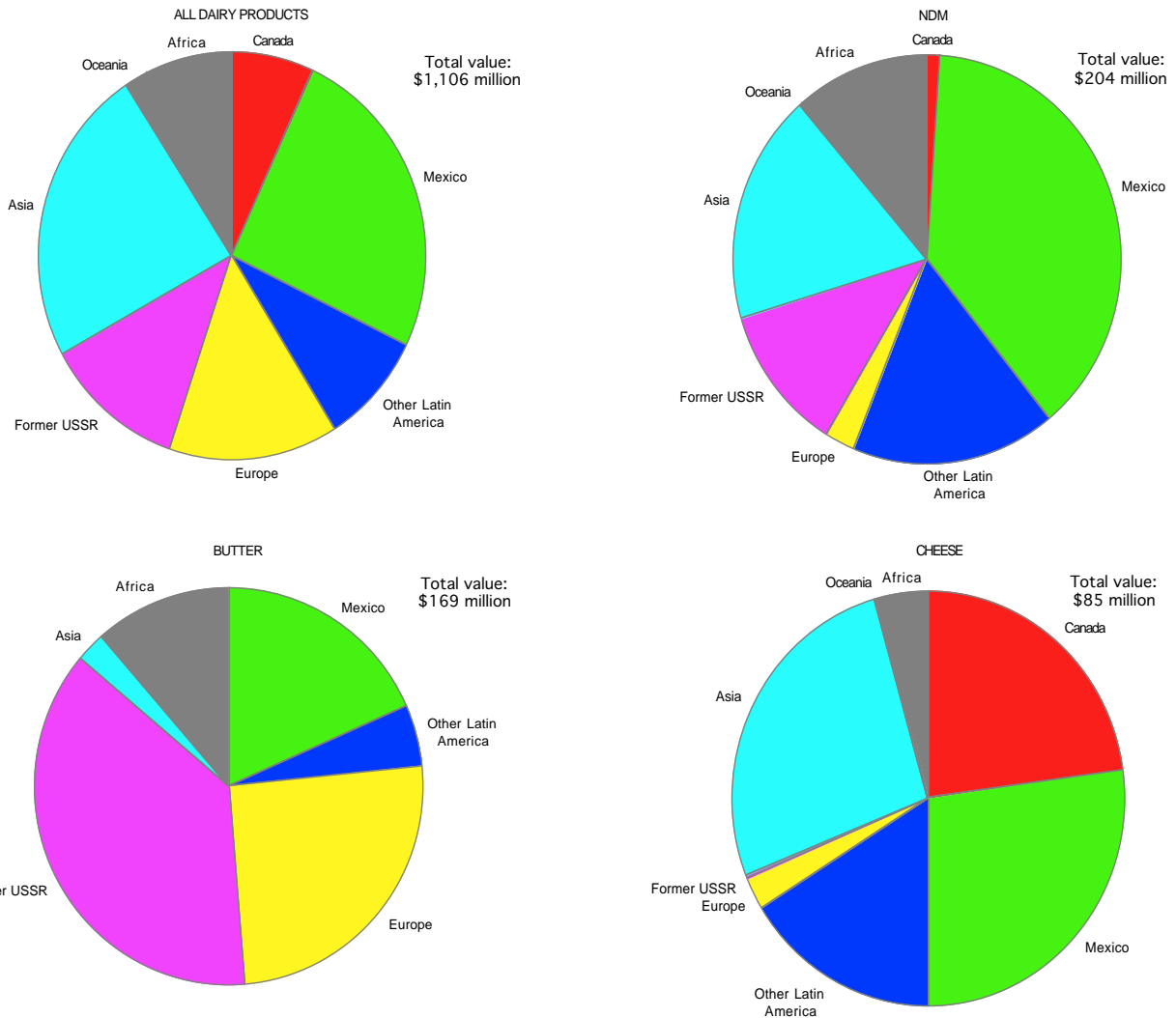
**Mexican and U.S. Dairy Trade Policies**

Prior to 1986, the Mexican dairy trade policy mirrored trade policies for agriculture in general; high tariffs, non-tariff barriers, and an extensive governmental involvement in import purchases largely determined Mexico's trade in dairy products. Since Mexico's entrance into the GATT in 1988 and the beginnings of

a more open economy, these trade barriers have been lowered.

A quasi-governmental organization, CONASUPO (Compañía Nacional de Subsistencias Populares), continues to be the sole importer of NDM. CONASUPO also controls another major import, dehydrated butyric fat. In early 1992, CONASUPO began negotiating direct purchases with individual bids instead of using public tenders as it had previously. CONASUPO's purchases of NDM may be held as stocks and are subsequently sold to Mexican dairy product manufacturers. The only dairy products currently requiring an import license are milk powder, evaporated milk, and some types of cheese. Duties on milk products also

Figure 5. U.S. Exports of Dairy Products,\* by Destination, 1991-1992.



\*Dollar value.

Source: USDA, Foreign Agricultural Trade of the U.S., calendar year 1992 supplement.

Table 2. Mexican Dairy Import Shares by Source Country, 1991.

|             | Fluid milk                         | Nonfat dry milk | Butter | Dehydrated butyric fat | Cheese | Yogurt | Dairy Cattle |
|-------------|------------------------------------|-----------------|--------|------------------------|--------|--------|--------------|
|             | ----- (% of Mexican imports) ----- |                 |        |                        |        |        | --(head) --  |
| US          | 99.2                               | 49.9            | 32.9   | 34.8                   | 23.2   | 98.1   | 75.3         |
| Canada      | 0                                  | 8.7             | 0      | 0                      | 0      | 0      | 24.7         |
| EC          | 0                                  | 39.0            | 12.8   | 35.6                   | 26.8   | 0      | 0            |
| New Zealand | 0                                  | 0               | 24.2   | 21.9                   | 4.8    | 0      | 0            |
| Other       | 0.8                                | 2.4             | 30.1   | 7.7                    | 45.1   | 1.9    | 0            |
| TOTAL       | 100.0                              | 100.0           | 100.0  | 100.0                  | 100.0  | 100.0  | 100.0        |

Source: Dairy Annual Report, American Embassy, Mexico City, USDA/FAS, October 1992.

have been reduced. Current levels range from zero on milk powder to 10 percent on fluid milk, evaporated milk, and condensed milk, to 20 percent on yogurt, buttermilk, butter, cheese, and ice cream.

U.S. trade policies also affect Mexican dairy imports. U.S. dairy exports under Public Law 480, commonly known as PL-480, all fall within the Title II category, which indicates that the exports are donations intended for emergency food relief for nutritionally underdeveloped nations. The Section 416 program, similar to PL-480 Title II, provides donations of surplus commodities owned by the CCC.

Under the Dairy Export Incentive Program (DEIP) the U.S. provides a direct cash subsidy to U.S. dairy exporters which enables them to meet prevailing world prices for targeted countries. These target countries are primarily those which the U.S. feels would import from countries that unfairly subsidize their exports. In 1992, Mexico was eligible for 40,000 metric tons of NDM under the DEIP, all of which was exported under the program with a total cash bonus value of \$31.7 million. Relative to NDM prices in the U.S., this subsidy represented a 66 percent effective reduction in price. For 1993, Mexican imports of up to 25,000 metric tons of

milk powder are eligible for bonuses, and in April 1993 20,000 metric tons were approved for export to Mexico under DEIP. The CCC also sells dairy products directly from its reserves. In addition, the U.S. facilitates exports to Mexico under GSM-102, by guaranteeing loans.

#### ***Concluding Remarks***

Mexico stands as a viable market for U.S. dairy products over at least the next five years. Rapid growth in population and income holds the potential for increased exports to a market where the U.S. has the closest and most direct proximity. Although approval of NAFTA will aid the realization of this optimistic prospect, it may not be critical. Trade increases are already occurring in fluid and frozen products, as well as in dairy cattle. In addition, there are prospects for increased exports of equipment. With a Mexican preference for domestic sources of supply, particularly in populous southern areas, opportunities for U.S. investment in local production or processing system may be another way that the U.S. dairy industry works with Mexico.