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International Agricultural Trade and Policy Center

**A DESCRIPTIVE ANALYSIS OF SELECTED SOUTHEAST ASIA
COUNTRIES THAT IMPORT UNITED STATES DAIRY
PRODUCTS**

By

Xumin Zhang, Richard L. Kilmer, & Andrew Muhammad

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INTRODUCTION

World dairy production and trade have experienced increases during the last decade. World trade liberalization, elimination of non-tariff trade barriers, and reduction in dairy export subsidies have increased the United States (US) interest in world dairy markets. The US is in a good position to gain greater access to international dairy markets.

Information by country, which is considered to be a potential importer of U.S. dairy products, and by individual dairy products in the international markets is needed. The information is useful to individuals interested in developing export dairy markets and direct foreign investment in dairy industries in those countries. In the study, 25 dairy import countries were selected from around the world (Table 1). Five countries in Southeast Asia, Indonesia, Malaysia, the Philippines, Thailand, and Vietnam, are covered in this paper.

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Table 1. Major importers of U.S. dairy products.

Canada Mexico	Central America	South America	Caribbean	European Union	East Asia	Southeast Asia	North Africa & Middle East
Canada	Guatemala	Chile	Bahamas	Netherlands	Hong Kong	Indonesia	Egypt
Mexico	Honduras	Colombia	Bermuda	United Kingdom	Japan	Malaysia	Saudi Arabia
	Panama	Venezuela	Dominican Republic		South Korea	Philippines	
			Jamaica			Thailand	
			Trinidad & Tobago			Vietnam	

The following paper covers an descriptive analysis for each individual country about the macroeconomic conditions, milk and dairy production, consumption, imports, the US share of the dairy imports, dairy trade policies, and how these factors have changed overtime. The information in this report can provide a starting point for individuals interested in exploring exports to and direct investment opportunities in Indonesia, Malaysia, the Philippines, Thailand, and Vietnam.

OVERVIEW

World Dairy Production

World production of cow milk increased in the period 1991 to 2001 at an average annual rate of 0.5 percent. In the period 1991 to 1993, world production of milk trended downward from 469,969,290 metric tons in 1991 to 460,185,174 metric tons in 1993 (Table 1). Since then, world production of fresh milk has experienced continuous increases through 2001. In 2001, the world production of cow milk totaled 494,074,772 metric tons, a 1.4 percent increase, compared to 2000 (487,216,313 metric tons) (Table 1). Selected Southeast Asia countries, including Indonesia, Malaysia, the Philippines, Thailand, and Vietnam, produced 1,172,283 metric tons of cow milk in 2001 (Table 2), and it was 0.2 percent of the world cow milk production (Table 1).

Overall, in the period 1991 to 2001, world butter production increased at an average annual rate of 0.6 percent. Significant decreases occurred in the period 1991 to 1994 when world butter production decreased from 7,230,211 metric tons in 1991 to 6,626,853 metric tons in 1994, for an average annual decrease of -2.9 percent. Since then, world butter production trended upward through 2001, increasing at an average annual rate of 2.1 percent. World butter production in 2001 was about 7,639,830 metric tons, which was up 3.8 percent from butter production in 2000 (7,361,928 metric tons) (Table 1). However, there was no butter production in Indonesia, Malaysia, the Philippines, Thailand, and Vietnam in 2001 (Table 2).

Table 1. World milk and selected dairy products production, 1991 through 2001.

Year	Cow Milk, Whole, Fresh	Butter and Ghee	Cheese (All Kinds)	Whole Milk, Dry	Skim Milk, Dry	Dry Whey
Metric Tons						
1991	469,969,290	7,230,211	14,273,176	2,278,421	3,790,059	1,591,469
1992	460,815,550	7,069,007	13,924,948	2,223,634	3,383,613	1,719,527
1993	460,185,174	6,949,108	14,092,319	2,190,812	3,435,523	1,704,052
1994	461,308,188	6,626,853	14,413,909	2,299,879	3,469,588	1,721,392
1995	463,742,780	6,654,099	14,534,298	2,297,568	3,471,565	1,808,545
1996	465,750,719	6,728,324	14,895,164	2,256,240	3,359,823	1,825,342
1997	468,198,514	6,824,872	15,182,338	2,347,216	3,390,716	1,797,683
1998	475,397,193	6,931,101	15,531,190	2,424,612	3,260,097	1,875,487
1999	480,762,511	7,140,653	15,874,743	2,425,512	3,400,623	1,876,269
2000	487,216,313	7,361,928	16,451,548	2,509,210	3,401,153	1,927,189
2001	494,074,772	7,639,830	16,821,541	2,633,776	3,374,176	1,960,928
Average Annual Growth(%)						
1991-2001	0.5	0.6	1.7	1.5	-1.1	2.2

Source: FAO Statistical Databases, 2002

In the period 1991 to 2001, world cheese production increased at an average annual rate of 1.7 percent (Table 1). Particularly in the period 1992 to 2001, world cheese production experienced a continuous increase through 2001, from 13,924,948 metric tons in 1992 to 16,821,541 metric tons in 2001, for an average annual increase rate of 2.1 percent (Table 1). However, there was no cheese production in Indonesia, Malaysia, the Philippines, Thailand, and Vietnam in 2001 (Table 2).

Table 2. Selected Southeast Asia countries milk and dairy products production in 2001.

	Cow Milk, Whole, Fresh	Butter and Ghee	Cheese (All Kinds)	Whole Milk, Dry	Skim Milk, Dry	Dry Whey ^a
Metric Tons						
SOUTHEAST ASIA						
Indonesia	505,000	---	---	---	---	---
Malaysia	32,170	---	---	---	---	---
Philippines	10,800	---	---	---	---	---
Thailand	564,313	---	---	---	---	---
Vietnam	60,000	---	---	---	---	---
TOTAL	1,172,283	---	---	---	---	---

^a Whey production in milk equivalent metric tons was not available.

Source: FAO Statistical Databases, 2002.

World production of dry whole milk increased in the period 1991 to 2001 at an average annual rate of 1.5 percent (Table 1). World dry whole milk production fluctuated in the period 1991 to 1996, ranging from a high of 2,299,879 metric tons in 1994 to a low of 2,190,812 metric tons in 1993 (Table 1). Since then, world dry whole milk production has trended upward through 2001. In the period 1996 to 2001, world dry whole milk production increased at an average annual rate of 3.2 percent. In 2001, world dry whole milk production totaled 2,633,776 metric tons, which was up 5.0 percent from 2000 (Table 1). However, Indonesia, Malaysia, the Philippines, Thailand, and Vietnam did not produce dry whole milk in 2001.

World dry skim milk production (nonfat dry milk or skim milk powder) has exceeded dry whole milk production during the period 1991 through 2001 (Table 1). However, in the period 1991 to 2001, world dry skim milk production trended downward, for an

average annual decrease rate of -1.1 percent (Table 1). World dry skim milk production experienced fluctuations in the period 1991 to 2001, ranging from a high of 3,790,059 metric tons in 1991 to a low of 3,260,097 metric tons in 1998 (Table 1). Overall, between 1991 and 2001, world dry skim milk production decreased 415,883 metric tons. In 2001, world dry skim milk production totaled 3,374,176 metric tons, which was down 0.8 percent from 2000 (Table 1). There was no dry skim milk production in the selected Southeast Asia countries in 2001 (Indonesia, Malaysia, the Philippines, Thailand, and Vietnam).

The most growth in the production of milk and its products has occurred in the dry whey market. From 1991 to 2001, the average annual growth in world dry whey production has been 2.2 percent, with periods of increases and decreases (Table 1). World dry whey production trended upward through 2001, from 1,591,469 metric tons in 1991 to 1,960,928 metric tons in 2001, for an overall increase of 369,459 metric tons (Table 1). There was no dry whey production in the selected Southeast Asia countries in 2001.

World Imports of Dairy Products

World imports of dairy products in milk equivalent metric tons increased at an average annual growth rate about 2.6 percent in the period 1991 to 2001. In the period 1991 to 1995, world imports of dairy products increased continuously from 52,405,310 metric tons in 1991 to 62,616,493 metric tons in 1995 (Table 3). Although decreases occurred in 1996, 1998, and 2001, world imports of dairy products trended upward through 2001, peaking at 68,138,509 metric tons in 2000 (Table 3). Between 1991 and 2001, world imports of dairy products increased 14,715,220 metric tons, from 52,405,310 metric tons in 1991 to 67,120,530 metric tons in 2001 (Table 3), for an overall increase of 28.1 percent. Dairy imports (in milk equivalent metric tons) into selected Southeast Asia countries (Indonesia, Malaysia, the Philippines, Thailand, and Vietnam) totaled 5,360,340 metric tons (Table 4), which was 8.0 percent of world total dairy imports in 2001 (67,120,530 metric tons, Table 3).

In the period 1991 to 2001, world butter imports decreased at an average annual rate of -0.1 percent. Between 1991 and 2001, world butter imports decreased 52,311 metric tons, reaching a low in 1996 of 1,203,892 metric tons (Table 3). A significant decrease occurred in 1994 when world butter imports decreased from 1,454,129 metric tons in 1993 to 1,288,247 metric tons in 1994, for an annual decrease of -11.4 percent. Since then, world butter imports fluctuated through 2001, ranging from a high of 1,368,933 metric tons in 1995 to a low of 1,203,892 metric tons in 1996 (Table 3). World butter imports in 2001 were 1,280,750 metric tons, which was up 1.5 percent from total

world butter imports in 2000 (1,261,586 metric tons) (Table 3). Butter imports into Indonesia, Malaysia, the Philippines, Thailand, and Vietnam totaled 43,488 metric tons (Table 4), or 3.4 percent of world total butter imports in 2001 (Table 3).

Table 3. World dairy imports, 1991 through 2001.

Year	Milk Equivalent	Butter	Cheese	Dry Whole Milk	Dry Skim Milk	Dry Whey
Metric Tons						
1991	52,405,310	1,333,061	2,127,089	1,115,052	1,664,905	627,884
1992	55,385,703	1,376,590	2,230,616	1,073,993	1,821,565	657,822
1993	55,463,235	1,454,129	2,222,401	1,059,341	1,843,592	645,911
1994	57,759,324	1,288,247	2,461,275	1,161,280	1,773,160	713,385
1995	62,616,493	1,368,933	2,468,786	1,525,707	1,890,674	783,249
1996	59,844,367	1,203,892	2,688,552	1,281,604	1,716,935	838,526
1997	62,626,024	1,321,235	2,843,580	1,357,158	1,727,457	862,943
1998	62,478,356	1,213,138	2,786,286	1,401,542	1,607,154	915,807
1999	66,593,229	1,217,796	2,887,650	1,439,868	1,879,505	998,073
2000	68,138,509	1,261,586	3,093,644	1,418,968	1,805,896	1,067,210
2001	67,120,530	1,280,750	3,354,503	1,351,083	1,577,319	1,165,912
Average Annual Growth (%)						
1991-2001	2.6	-0.1	4.7	2.6	-0.2	6.5

Source: FAO Statistical Databases, 2002.

In the period 1991 to 2001, world cheese imports increased at an average annual rate of 4.7 percent (Table 3). Except for 1993 and 1998, world cheese imports experienced

continuous increases, from 2,127,089 metric tons in 1991 to 3,354,503 metric tons in 2001 (Table 3), for an overall increase of 57.9 percent from 1991. In 2001, world cheese imports were up 8.4 percent from 2000 (Table 3). Total cheese imports into Indonesia, Malaysia, the Philippines, Thailand, and Vietnam totaled 32,632 metric tons in 2001 (Table 4), accounting for 1.0 percent of the world total cheese imports in 2001 (3,354,503 metric tons, Table 3).

Table 4. Selected Southeast Asia countries dairy imports in 2001.

	Milk Equivalent	Butter	Cheese	Dry Whole Milk	Dry Skim Milk	Dry Whey
Metric Tons						
SOUTHEAST ASIA						
Indonesia	1,106,029	8,109	6,420	35,347	73,685	20,277
Malaysia	1,260,766	10,043	5,381	61,370	50,181	16,844
Philippines	1,596,088	8,115	17,288	48,501	95,581	32,310
Thailand	1,126,882	12,221	2,543	36,364	58,823	36,971
Vietnam	270,575	5,000	1,000	---	26,000	3,800
TOTAL	5,360,340	43,488	32,632	181,582	304,270	110,202

Source: FAO Statistical Databases, 2002.

World imports of dry whole milk increased in the period 1991 to 2001 at an average annual rate of 2.6 percent. World dry whole milk imports fluctuated in the period 1991 to 2001, ranging from a high of 1,525,707 metric tons in 1995 to a low of 1,059,341 metric tons in 1993 (Table 3). World dry whole milk imports trended downward in the period 1995 to 2001, for an average annual rate of -1.7 percent. In 2001, world dry whole milk imports totaled 1,351,083 metric tons, down from 1,418,968 metric tons in 2000 (Table

3). Dry whole milk imports into Indonesia, Malaysia, the Philippines, and Thailand totaled 181,582 metric tons in 2001 (Table 4), accounting for 13.4 percent of the world total dry whole milk imports (1,351,083 metric tons, Table 3). However, there were no dry whole milk imports into Vietnam in 2001.

World dry skim milk imports (nonfat dry milk or skim milk powder) have exceeded dry whole milk imports in the last decade (Table 3). However, in the period 1991 to 2001, world dry skim milk imports trended downward, for an average annual decrease rate of -0.2 percent (Table 3). World dry skim milk imports fluctuated, ranging from a high of 1,890,674 metric tons in 1995 to a low of 1,577,319 metric tons in 2001 (Table 3). Overall, between 1991 and 2001, world dry skim milk imports decreased 87,586 metric tons. In 2001, world dry skim milk imports totaled 1,577,319 metric tons, which was down 12.7 percent from 2000 (Table 3). Dry skim milk imports into the selected Southeast Asia countries (Indonesia, Malaysia, the Philippines, Thailand, and Vietnam) totaled 304,270 metric tons (Table 4), accounting for about 19.3 percent of the world total dry skim milk imports in 2001 (1,577,319 metric tons, Table 3).

The most growth in world dairy imports has occurred in the dry whey market. From 1991 to 2001, average annual growth in world dry whey imports was 6.5 percent (Table 3). Except for 1993, world dry whey imports increased continuously from 627,884 metric tons in 1991 to 1,165,912 metric tons in 2001 (Table 3). Dry whey imports into Indonesia, Malaysia, the Philippines, Thailand, and Vietnam totaled 110,202 metric tons (Table 4), accounting for about 9.5 percent of the world total dry whey imports in 2001.

The rest of this paper covers the following information for Indonesia, Malaysia, the Philippines, Thailand, and Vietnam: macroeconomic conditions, milk and dairy production, consumption, imports, the US share of the dairy imports, dairy trade policies, and how these factors have changed overtime.

INDONESIA

Overview of Indonesia

Indonesia is the world's largest archipelago, which has 14,000 islands, located in South East Asia, between the Indian Ocean and the Pacific Ocean. The total area of Indonesia is 1,919,440 square kilometers, slightly less than three times the size of Texas. The population was estimated to be 231.3 million, with a 1.54 percent growth rate in 2001 (CIA World Factbook, 2002).

Indonesia faces severe economic development problems, which are from separatist movements, the low level of security in the regions, the lack of a reliable legal framework in business, corruption, weaknesses in the banking system, and strained relations with the IMF (CIA World Factbook, 2002). Indonesia's 25 years of continuous economic expansion was interrupted by the 1997 Asian financial crisis. The economy shrunk about ten percent in 1998. Unemployment was high, in excess of 15 percent, and inflation moved toward hyper levels, over 70 percent per year. By following a tight monetary policy, the Indonesian economy stabilized in 1999, but showed no growth. To revitalize its economy, Indonesia agreed with the IMF on a series of economic reforms in 2002, thus enabling further IMF disbursements (CIA World Factbook, 2002). Indonesia had adopted a comprehensive program of macroeconomic and structural reforms, which included an acceleration of trade and investment liberalization, a major review of anti-competitive practices (such as monopolies and cartels) and a reform of the banking sector (WTO, 1999). In 2001, Indonesia's gross domestic product (GDP) was approximately

\$687 billion (purchasing power parity), with per-capita purchasing power parity of \$3,000. Agriculture accounted for 17 percent of its total GDP (CIA World Factbook, 2002). Indonesia's total exports in 2001 were \$56.5 billion of which the US received 13.8 percent. Indonesia's total imports in 2001 were \$38.1 billion of which the US composed 10.2 percent. The main trading partners are Japan, Singapore, the US, China, and South Korea (CIA World Factbook, 2002).

Dairy Industry in Indonesia

Production of Dairy Products

Indonesia's dairy industry has never been strong. During the last decade, there has been a tendency for a constant increase in individual farm milk production. However, the dairy production sector suffered further setbacks due to the economic crisis, which hit Indonesia in middle 1997 (USDA-FAS, 2002).

Dairy farming in Indonesia is developed for a number of reasons, including being the provision of good quality milk, dung for fertilizer, investment, meat and good income opportunities mainly for small-scale farmers (Burgers 1999). In Indonesia, to improve milk production, promoting large-scale dairy farms is not a viable option because they only produce for a limited population of the middle-class and high-class in the urban market sector. Indonesia's domestic milk supply is primarily from approximately 120 dairy cooperatives, which consist of nearly 100,000 dairy farmers with two or three cows

each (USDA-FAS, 2002). However, among limited number of relatively large-scale dairy farms, Taurus Dairy Farms (TDF) has been recognized as one of the best dairy producers in Indonesia. The reasons for the survival of TDF are consistency of its breeding system, application of feeding and reproductive technology, and support from its own milk processing industry (USDA-FAS, 2002).

The development of dairy farming has been slow compared to the increasing consumer demand for milk. Dairy development in Indonesia still faces many problems. Most of the dairy cows are owned by farmers with an average of two to three cows per farmer. Most farmers are not properly trained in dairy farming technologies, especially in animal nutrition and breeding. Unfavorable weather has caused low productivity. As a result there is poor herd development in cows and low milk yields (USDA-FAS, 2002). Although the Government of Indonesia and the Indonesian Milk Industry Association has initiated programs to support the Union of Indonesian Dairy Cooperatives, the growth rate of the Indonesian dairy production is still unable to keep up with growing demands. The dairy industry continues to rely on milk powder imports (USDA-FAS, 2002). In 2000, Indonesia's total dairy cattle population was about 368,000 head (Indonesia Directorate General of Livestock Services, 2001). Total domestic cow milk production in 2000 was 497,857 metric tons, but it only met about 35 percent of the domestic demand for dairy products (FAO Statistics, 2002). Therefore, unless the dairy cattle numbers is multiplied and the dairy farming condition is improved, dairy product imports are still needed to satisfy the domestic demand (USDA-FAS, 2002).

Milk production in Indonesia has increased during the 1990s. However, the requirement for domestic consumption increased even faster. So Indonesia's milk production could not satisfy the domestic demand. Total milk production was 497,857 metric tons in 2000 (Table 1). The government and the Union of Indonesian Dairy Cooperatives want to increase domestic fresh milk production by 15 percent every year through 2010 (USDA-FAS, 2002). In addition, Indonesia virtually does not produce other dairy products, such as butter, cheese, and nonfat dry milk (Table 1), and must rely on imports to meet domestic consumption requirements.

Table 1. Indonesia milk and selected dairy products production, 1991 through 2000.

Year	Cow Milk, Whole, Fresh	Butter and Ghee	Cheese (All Kinds)	Whole Milk, Dry	Skim Milk, Dry	Whey
Metric Tons						
1991	360,200	----	----	----	----	----
1992	367,200	----	----	----	----	----
1993	387,500	----	----	----	----	----
1994	426,727	----	----	----	----	----
1995	433,400	----	----	----	----	----
1996	441,163	----	----	----	----	----
1997	423,664	----	----	----	----	----
1998	375,382	----	----	----	----	----
1999	435,998	----	----	----	----	----
2000	497,857	----	----	----	----	----

Source: FAO Statistical Databases, 2002.

Demand for Dairy Products

Indonesia is one of the most populous countries in Southeast Asia. Per-capita milk consumption in Indonesia is very low, compared to other South East Asian countries

(USDA, 2002). Milk was considered a luxury item consumed by middle to upper income citizens in Indonesia, and it was slowly becoming a part of the diet of middle to lower income Indonesians. Many people still perceive milk as a baby food. However, different age groups, including young adults and senior citizens, have started to drink milk regularly in recent years (Austrade, 2002).

The 1997 to 1998 Asian crisis limited Indonesian's milk consumption, due to lower income and the increase in food prices. After the crisis, the Indonesian government recognized the nutritional importance of milk and started a campaign to promote milk consumption to improve health. The promotion took the form of a school milk program, subsidized distribution of condensed milk, and other educational activities. As a result, the Indonesian economic crisis did not have a significant long-term impact on the domestic dairy industry (USDA-FAS, 2002). In addition, the development of health and nutrition awareness also caused the growth of dairy consumption.

In the 1990s, as the economic situation and distribution infrastructure for dairy products improved, per-capita milk consumption increased 7.8 percent every year on average (Table 2). However, the 1997 to 1998 Asia economic crisis decreased per-capita milk consumption, from 6.76 kilograms in 1996 to 5.50 kilograms in 1998 (Table 2), for an overall 19 percent decrease. As the economy recovered in 1999, per-capita milk consumption also recovered to 9.76 kilograms (Table 2). In 2000, milk consumption per-capita was 7.98 kilograms per-capita (Table 2). Nevertheless, per-capita milk consumption in Indonesia is very low, compared to other countries in Southeast Asia. In

2000, per-capita milk consumption was 21.27 kilograms in Thailand and 56.93 kilograms in Malaysia (FAO Statistics, 2002). However, with a population of approximately 231.3 million, even a slight increase in consumption will create increases in demand.

Table 2. Per-capita consumption of dairy products in Indonesia, 1991 through 2000.

Year	All Milk ^a	Butter	Cheese	Skim Milk ^a	Whole Milk ^a	Whey ^a
			Kilograms			
1991	5.18	0.05	0.02	1.53	3.43	0.37
1992	5.74	0.05	0.02	1.93	3.47	0.30
1993	5.71	0.05	0.02	1.93	3.46	0.37
1994	6.54	0.04	0.02	2.42	3.75	0.51
1995	7.82	0.07	0.04	3.39	3.74	0.93
1996	6.76	0.04	0.03	2.46	3.85	0.86
1997	6.60	0.03	0.02	2.41	3.78	0.74
1998	5.55	0.03	0.02	1.91	3.34	0.51
1999	9.76	0.06	0.04	5.02	3.78	1.62
2000	7.98	0.05	0.03	3.03	4.56	1.07
Average Annual Growth (%) 1991-2000	7.8	7.8	13.0	18.3	3.6	28.4

^a Included food and other uses, such as cattle feed.

Source: FAO Statistical Databases, 2002.

Indonesian people consume very little butter and cheese. In the 1990s, per-capita consumption of butter and cheese were well under 0.1 kilogram (Table 2). In 2000, the Indonesia's total butter and cheese consumed was 11,621 and 6,002 metric tons respectively (FAO Statistics, 2002). Most Indonesian cheese consumption is processed cheese consumed in sweet baked goods or manufactured snack foods. The cheese market

is expected to grow over the next three years by 20 to 25 percent per year (USDEC, 2002).

The growth of per-capita skim milk consumption was relatively strong in the 1990s, by an average annual increase rate of 18.3 percent (Table 2). Skim milk is mainly consumed among high-income people, who have paid more concerns about the fat intake. Between 1991 and 2000, per-capita skim milk consumption increased 1.5 kilograms, for an overall increase of 98 percent. However, as all milk consumption, the Asia economic crisis also led per-capita skim milk consumption decreased in 1998, to only 1.91 kilograms (Table 2). In the 1990s, the growth of per-capita whole milk consumption was much slower than skim milk. The average annual growth rate was about 3.6 percent, and between the year 1991 and 2000, the increase was 1.13 kilograms (Table 2).

Growth in per-capita whey consumption increased at a rate of 28.4 percent per year in the 1990s (Table 2). Indonesia is a predominantly Muslim country. As a result, Indonesia produces and consumes virtually no swine. Therefore, Indonesia uses less than 1,000 tons of dairy ingredients annually, such as whey, in the estimated 5.8 million metric ton animal feed industry. The outlook for dairy ingredient use in the feed industry is correspondingly low (USDEC, 2002).

All dairy plants in Indonesia are currently located on the island of Java, making distribution of products outside of this island difficult, due to a poor infrastructure such as refrigeration, transportation and roads. Milk consumption is concentrated in the more

affluent urban areas. Little or no milk (both skim milk and whole milk) is consumed in many parts of Indonesia (USDA-FAS, 2002).

Imports of Dairy Products

Indonesia is a net importer of dairy products. Population growth and increased domestic consumption of dairy products have left a wider window of opportunity for imported dairy products (USDA-FAS, 2002). In 2000, Indonesia ranked 18th among all countries in total dairy products imported (in milk equivalent pounds) (Table 3). For individual dairy products, Indonesia ranked 24th, 7th, and 17th in imports of butter, dry skim milk, and whey respectively in 2000 (Tables 4, 5, and 6).

In 2000, Indonesia's share of world imports of dairy imports (in milk equivalent pounds) was about 1.6 percent (FAO Statistics, 2002). Indonesia's share of total world imports of butter was 0.9 percent. Due to the low consumption of cheese, imports of cheese were only 6,002 metric tons in 2000 (FAO Statistics, 2002), only 0.2 percent of total world imports of cheese (3,093,644 metric tons) (FAO Statistics, 2002). For dry skim milk, Indonesia's share of total world imports was 4.6 percent in 2000 (FAO Statistics, 2002). For whey, Indonesia's share of total world imports was about 1.5 percent (FAO Statistics, 2002).

Table 3. Selected countries' total dairy imports (in milk equivalent) and ranking, 1996 through 2000.

	1996		1997		1998		1999		2000	
	Mt	Rank	Mt	Rank	Mt	Rank	Mt	Rank	Mt	Rank
Belgium	3,709,566	4	3,661,389	4	3,936,039	5	4,054,076	5	4,434,830	5
China	1,285,203	13	1,584,260	10	1,531,064	14	1,909,979	10	2,243,373	8
France	3,158,352	5	3,582,977	5	3,966,796	4	4,313,597	4	4,685,094	4
Germany	4,673,712	3	4,796,523	3	4,669,373	3	4,554,466	3	5,024,699	3
Indonesia	577,289	23	520,330	24	423,064	27	1,184,247	16	1,092,208	18
Italy	5,210,317	2	5,430,128	2	5,543,997	2	5,509,023	2	5,467,815	2
Mexico	1,912,993	8	2,121,080	8	2,021,171	7	2,217,376	7	2,310,820	7
Netherlands	6,385,562	1	6,061,069	1	5,633,207	1	7,113,321	1	6,297,773	1
Spain	1,450,968	11	1,583,212	11	1,652,153	11	1,661,739	12	1,918,970	10
UK	2,393,522	6	2,476,914	7	2,537,039	6	2,667,275	6	2,710,840	6
USA	1,380,531	12	1,466,204	12	1,873,207	8	1,953,107	9	1,953,940	9
Total	32,138,015	----	33,284,086	----	33,787,110	----	37,138,206	----	38,140,362	----
World	59,844,367	----	62,626,024	----	62,478,356	----	66,593,229	----	68,138,509	----

Source: Food and Agricultural Organization of the United Nations Statistical Databases, 2002.

Table 4. Selected countries' total butter imports and ranking, 1996 through 2000.

	1996		1997		1998		1999		2000	
	Mt	Rank	Mt	Rank	Mt	Rank	Mt	Rank	Mt	Rank
Belgium	100,015	5	103,759	5	101,137	4	100,491	4	112,073	4
Egypt	50,225	7	37,759	8	35,253	9	43,115	8	44,141	7
France	109,919	4	137,381	3	133,670	2	129,819	1	148,302	1
Germany	132,955	1	156,822	2	134,930	1	123,476	2	131,121	2
Indonesia	9,064	23	6,943	31	6,665	32	13,588	17	11,621	24
Italy	48,315	8	52,087	7	60,124	7	46,864	7	41,167	8
Mexico	18,529	14	24,793	9	27,325	10	34,047	9	34,078	9
Morocco	28,050	9	16,457	15	22,104	12	19,818	12	27,357	10
Netherlands	68,782	6	94,022	6	69,879	6	96,933	5	86,887	5
Russian	125,810	2	169,698	1	83,053	5	53,200	6	53,857	6
UK	111,619	3	101,210	4	109,287	3	122,076	3	122,922	3
Total	803,283	---	900,931	---	783,427	---	765,597	---	813,526	---
World	1,203,892	---	1,321,235	---	1,213,138	---	1,217,796	---	1,261,586	---

Source: Food and Agricultural Organization of the United Nations Statistical Databases, 2002.

Table 5. Selected countries' total dry skim milk imports and ranking, 1996 through 2000.

	1996		1997		1998		1999		2000	
	Mt	Rank	Mt	Rank	Mt	Rank	Mt	Rank	Mt	Rank
Algeria	58,468	9	78,893	5	87,040	4	71,272	8	91,339	5
Belgium	51,781	12	43,521	11	43,155	13	45,150	15	71,900	9
China	37,975	15	40,945	13	44,813	12	51,150	13	56,862	10
France	33,446	18	28,453	20	42,636	14	63,791	9	84,735	6
Indonesia	45,916	14	41,034	12	33,133	18	98,348	5	82,574	7
Italy	126,614	3	127,504	3	126,494	2	121,779	3	109,008	4
Malaysia	78,151	5	75,000	6	59,596	6	71,879	7	74,721	8
Mexico	126,700	2	132,849	2	102,600	3	125,137	2	129,078	2
Netherlands	216,085	1	224,214	1	162,459	1	230,438	1	205,379	1
Philippines	83,704	4	98,050	4	77,637	5	86,729	6	111,455	3
Total	858,840	---	890,463	---	779,563	---	965,673	---	1,017,051	---
World	1,716,935	---	1,727,457	---	1,607,154	---	1,879,505	---	1,805,896	---

Source: Food and Agricultural Organization of the United Nations Statistical Databases, 2002.

Table 6. Selected countries' total whey imports and ranking, 1996 through 2000.

	1996		1997		1998		1999		2000	
	Mt	Rank	Mt	Rank	Mt	Rank	Mt	Rank	Mt	Rank
Belgium	52,959	4	55,759	3	58,099	3	54,842	4	56,299	5
Canada	43,224	6	36,554	10	37,996	9	48,375	6	62,441	3
China	72,882	2	89,359	2	78,819	2	97,717	2	140,057	2
France	29,238	10	40,931	7	50,588	5	49,463	5	59,048	4
Germany	66,975	3	45,070	5	48,759	6	46,114	7	40,077	9
Indonesia	12,799	17	11,154	17	7,727	20	25,196	13	16,794	17
Italy	40,845	7	37,598	8	42,637	8	37,584	10	42,029	8
Japan	32,343	9	37,481	9	37,351	10	41,157	9	39,522	10
Mexico	48,636	5	49,174	4	56,642	4	55,947	3	55,031	6
Netherlands	251,310	1	217,543	1	248,474	1	292,637	1	252,099	1
Spain	37,147	8	43,362	6	44,869	7	44,225	8	49,109	7
Total	688,358	----	663,985	----	711,961	----	793,257	----	812,506	----
World	886,132	----	902,409	----	973,881	----	1,054,173	----	1,124,090	----

Source: Food and Agricultural Organization of the United Nations Statistical Databases, 2002.

The lack of domestically produced milk and dairy products means that the fall short has to be imported from other countries. In Indonesia, most dairy imports are in the form of skim milk powder and whole milk power. Imported milk powder products are perceived as high quality, specialized formulas, which also carry premium prices. Most imported products are then reconstituted to produce a number of different dairy products. The majority of milk consumed is in the form of sweetened condensed milk, powdered milk, and liquid milk. Consumption of ultra high temperature (UHT) milk and pasteurized milk is growing because of its longer shelf life (USDA-FAS, 2002).

In the 1990s, the average growth rate of all dairy product imports (in milk equivalent pounds) was 23.8 percent. A significant increase occurred in 1999 when imports increased from 423,064 metric tons in 1998 to 1,184,247 metric tons in 1999 (Table 7), for an annual increase of about 180 percent. This was mainly due to the recovery of dairy consumption to pre-crisis level (USDA-FAS, 1999).

Indonesia does not produce certain dairy products, such as butter, cheese, and whey. Those dairy products are imported in relatively small quantities. To satisfy the consumer's needs for those products, Indonesia imported 11,621 metric tons of butter in 2000 (Table 7). However, there was a 14 percent decrease from the 1995 level. In 1995, Indonesia imported 13,316 metric tons of butter. Butter imports into Indonesia increased at an average annual rate of 21.1 percent (Table 7). Cheese imports into Indonesia increased at an annual growth rate of 16.4 percent (Table 7). In 2000, Indonesia imported 6,002 metric tons of cheese. It was a 25 percent decrease from the 1995 level. Indonesia

imported about 7,911 metric tons of cheese in 1995 (Table 7). In addition, the cheese market is expected to grow over the next couple years by 20 to 25 percent per year from the current level (USDEC, 2002).

Table 7. Indonesia dairy imports, 1991 through 2000.

Year	Milk Equivalent	Butter	Cheese	Dry Whole Milk	Dry Skim Milk	Whey
Metric Tons						
1991	440,187	9,640	3,310	2,660	38,180	5,060
1992	443,304	9,018	5,008	2,718	38,658	4,218
1993	434,389	9,986	4,340	1,962	36,637	5,295
1994	500,849	8,726	3,927	2,101	44,060	7,344
1995	727,247	13,316	7,911	1,971	60,692	13,532
1996	577,289	9,064	6,120	2,885	45,916	12,799
1997	520,330	6,943	4,692	3,407	41,034	11,154
1998	423,064	6,665	4,458	3,871	33,133	7,727
1999	1,184,247	13,588	8,550	9,986	98,348	25,196
2000	1,092,208	11,621	6,002	25,572	82,574	16,794
Average Annual Growth (%) 1991-2000	23.8	21.1	16.4	40.8	23.7	33.7

Source: FAO Statistical Databases, 2002.

The strongest growth occurred in the dry whole milk and whey market, where the growth rate on average was 40.8 percent and 33.7 percent, respectively, every year in the 1990s (Table 7). The whey imports to Indonesia fluctuated in the 1990s. Although whey imports decreased from 11,154 metric tons in 1997 to 7,727 metric tons in 1998, due to the economic crisis, it recovered rapidly in 1999, reaching a peak at 25,196 metric tons (Table 7).

Indonesia does not produce nonfat dry milk and relies on imports to meet domestic consumption. Most dairy imports are in the form of skim milk powder and whole milk powder (USDA-FAS, 2002). Indonesia imported 25,572 metric tons of whole dry milk in 2000 (Table 7), and ranked 16th of all countries in imports of whole dry milk (FAO Statistics, 2002). A significant increase occurred in 2000 when whole dry milk imports increased from 9,986 metric tons in 1999 to 25,572 metric tons in 2000 (Table 7).

Indonesia imported 82,574 metric tons of nonfat dry milk in 2000 (Table 7), and ranked 7th of all countries in imports of nonfat dry milk (Table 5). The growth rate for nonfat dry milk on average in the 1990s was 23.7 percent (Table 7).

Exports of Dairy Products from the U.S.

Australia and New Zealand have the advantage of transportation costs and a long history in Indonesia's dairy market, and continue to dominate the Indonesian market for milk and dairy products. In 2001, over 50 percent of the milk and dairy products were imported from Australia and New Zealand. Their market share was even more significant in 2002, about 60 percent (USDA-FAS, 2002). As a result, Indonesia did not import many dairy products from the US, and the market share of US products was small, except for whey (Table 8). In 2000, Indonesia's total cheese imports were 6,002 metric tons. The US share was only 0.5 percent, or 31.1 metric tons (Table 8). However, the US was one of the major whey suppliers to Indonesia. The market share of US whey was over ten percent in the 1990s, except in 1998, when the US exported 764.5 metric tons whey into

the country, with the market share of 9.9 percent (Table 8). Additionally, the US was not a big supplier of dry whole milk to Indonesia. In 2000, the US exported 193.9 metric tons of dry whole milk to the countries, for a market share of 0.8 percent (Table 8).

Although the US is still facing competition from Indonesian's neighboring countries, including Oceania countries, some US nonfat dry milk entered the market under USDA Section 416(b) shipments, a program for the Indonesian school milk program (USDA-FAS, 2002). In 2001, Indonesia imported 3,860.4 metric tons of nonfat dry milk from the US, and one-half of the imports were attributed to this program (USDA-FAS, 2003).

Due to drought conditions in Australia in 2002, its nonfat dry milk production dropped. As a result, the Australian nonfat dry milk prices increased above Indonesia's dairy processors' purchasing power. Indonesian dairy processors looked for other sources to meet their import demands. Given the drought conditions cannot go away quickly, the US has opportunities to increase its share in 2003 and the near future (USDA-FAS, 2002).

Due to the stiff competitions from Oceania countries, although the US was the major supplier of whey imports to Indonesia, the US hasn't dominated Indonesia's whey market, where the market share of US whey imports has never been more than 20 percent since 1992 (Table 8). In 2000, the US share of whey imports into Indonesia was 15.6 percent, in the amount of 2,622.5 metric tons (Table 8).

Table 8. Selected dairy products exported from the US to Indonesia, 1991 through 2000.

Year	Butter ^a	% of All Butter Imports ^b	Cheese ^a	% of All Cheese Imports ^b	Whole Dry Milk ^a	% of All WDM Imports ^b	Non-Fat Dry Milk ^a	% of All NFDM Imports ^b	Whey ^a	% of Whey Imports ^b
	Mt	%	Mt	%	Mt	%	Mt	%	Mt	%
1991	0.0	0.0	36.8	1.1	0.0	0.0	399.8	1.0	1,172.1	23.2
1992	1,217.7	13.5	21.0	0.4	9.0	0.3	0.0	0.0	699.9	16.6
1993	0.0	0.0	7.6	0.2	0.0	0.0	0.0	0.0	587.8	11.1
1994	0.0	0.0	2.2	0.1	14.4	0.7	0.0	0.0	916.9	12.5
1995	341.0	2.6	11.2	0.1	600.2	30.5	418.8	0.7	1,833.8	13.6
1996	0.0	0.0	16.9	0.3	92.0	3.2	34.0	0.1	1,844.5	14.4
1997	0.9	0.0	126.2	2.7	612.9	18.0	6,131.0	14.9	2,132.3	19.1
1998	0.0	0.0	40.0	0.9	67.3	1.7	425.0	1.3	764.5	9.9
1999	0.0	0.0	32.1	0.4	114.8	1.1	5,116.3	5.2	2,681.4	10.6
2000	0.0	0.0	31.1	0.5	193.9	0.8	3,115.7	3.8	2,622.5	15.6

^a Source: United States Department of Agriculture Foreign Agricultural Service, 2003.

^b Data from Table 7.

Trade Policy and Tariff

Indonesia became a member of the WTO in 1995. Indonesia undertook a successful, though incomplete, transformation of its economy from one based on natural resources to one relying on manufactured products and services. The transformation was fostered by the liberalization of trade and investment. However, despite this liberalization, together with prudent macroeconomic policies, Indonesia has been the country most seriously affected by the 1997 to 1998 Asian crisis (WTO, 1999).

In the face of economic urgency, the Indonesia government committed itself to bold economic and trade reforms. The Government has begun to remove many of the distorting trade barriers that survived the decade-long liberalization process, and which have, over time, generated growing input costs for the economy.

One positive result was the Indonesian government's decision to include agricultural goods in tariff reductions. In 1998, all Indonesian tariffs on food items were cut to a maximum of five percent, while local regulations on dairy products have been completely abolished (WTO, 1999). In recent years, import duties for dairy products are set at five percent. In addition, imported dairy products are subject to a ten percent value added tax (VAT). However, import licenses are still required to import bulk dairy products such as powdered milk, buttermilk and bulk cheese (Austrade, 2002). For some yogurt and processed cheese, Indonesia charges an additional ten percent luxury tax on the top of the five percent import duty and ten percent VAT (Austrade, 2002).

While trade and structural reforms may benefit the economy in the long run, the depreciation of the Indonesian currency puts considerable pressure on the conduct of economic policy in the short term. Increasing the prices of imported food generates local barriers to imported dairy products. By mid-2002, the depreciation of Indonesia's real exchange rate was about 50 percent (IMF, 2003). Other barriers include limited cold storage facilities and limited distribution channels (Austrade, 2002).

MALAYSIA

Overview of Malaysia

Malaysia is located in the Southeast Asia peninsula and northern one-third of the island of Borneo, bordering Indonesia and the South China Sea, south of Vietnam. The total area of Malaysia is 329,750 square kilometers, slightly larger than New Mexico. The population of Malaysia in 2001 was about 22.66 million, with a 1.91 percent growth rate (CIA World Factbook, 2002).

Malaysia is a middle income country. Malaysia transformed itself from a producer of raw materials into an emerging multi-sector economy. The economic growth is driven by exports, particularly electronics. Therefore, Malaysia was hard hit by the global economic downturn and the slump in the information technology (IT) sector in 2001. Gross domestic product (GDP) in 2001 grew only 0.3 percent due to the contraction in exports. Malaysia also experienced the Asian crisis of 1997. As a result, Malaysia built a healthy foreign exchange reserve and relatively small external debt to make it unlikely to happen again, but the economy remains vulnerable to a more protracted downturn in the US and Japan, top export destinations and key sources of foreign investment. In 2001, Malaysia's real GDP was \$200 billion (purchasing power parity), with per-capita purchasing power parity of \$9,000, and agriculture accounted for 12 percent of the total GDP (CIA World Factbook, 2002).

Malaysia's total exports in 2001 were \$94.4 billion of which the US received 20 percent. Malaysia's total imports in 2001 were \$76.9 billion of which the US composed 17 percent. The main trading partners are the US, Japan, Singapore, and China (CIA World Factbook, 2002).

Dairy Industry in Malaysia

Production of Dairy Products

Malaysia is the third wealthiest country in Southeast Asia after Singapore and Brunei. In Malaysia, agriculture contributes about 12 percent of the real GDP, with the livestock sector accounting for 3.5 percent of the total GDP (CIA World Factbook, 2002). Malaysia is self-sufficient in poultry meat, eggs, and pork, but only five percent of milk requirements are met within the country (Malaysia Ministry of Agriculture, 2002).

Dairy husbandry and milk production are not indigenous to Malaysia. At the beginning of the 20th century, there was a small dairy industry started, largely by the immigrations from India. Indian dairy cattle herds were brought in by the immigrants. Milk production has been concentrated in rubber and oil palm plantations, and the perimeters of urban areas (USDA-FAS, 1999).

In 1971, the Malaysian government introduced its New Economic Policy, which strongly supported the development of the domestic dairy industry. The government established and operated a number of large dairy enterprises, and assisted the development of private farms. The Malaysia government established a system of centralized milk collection centers. As a result, in the later 1990s, 60 percent of milk produced was collected and sold through official milk collection centers, with the remainder being sold direct from farms or through local vendors. About 65 percent of milk from the milk collection centers was used for domestic dairy manufacturers. The government support was implemented by direct investment in farms, promotion of consumption through schools, and restrictions on entry of imported milk and milk products (Falvey, 1999).

However, despite various attempts by the Malaysian government, as well as the private sector, to expand the dairy industry, it has remained small and under developed (USDA-FAS, 1999). Most of the dairy farms in the country are owned by smallholder farmers and the major constraint to increase milk production is the difficulty in providing feed of sufficient quantity and with adequate nutrient composition throughout the year. Moreover, factors limiting its development include low lactation and reproduction performance, the hostile tropical weather condition, high cost for quality feed and lack of trained personnel for farm management. Investment in the dairy industry is still considered to be a risky business and the prospect for future growth is not bright at all. Milk production is not expected to show significant growth in the near future (USDA-FAS, 2002). In 2000, Malaysia had 37,284 milk cattle producing about 37,000 metric tons of milk (FAO Statistics, 2002). The milk production per cow in Malaysia was only about one metric ton per year.

Milk production in Malaysia was increasing slightly during the 1990s, from 29,300 metric tons in 1991 to 37,000 metric tons in 2000 (Table 1), with an average annual growth rate about three percent (FAO Statistics, 2002). However, the requirement for domestic consumption of milk and dairy products increased fast, so Malaysia's milk production could only satisfy about five percent of the domestic demand (Malaysia Ministry of Agriculture, 2002). Moreover, Malaysia doesn't produce other dairy products, such as butter, cheese, dry skim milk, and whey. Every year, about 95 percent of milk and dairy products have to be imported from abroad to meet the domestic consumption (Malaysia Ministry of Agriculture, 2002).

Table 1. Malaysia milk and selected dairy products production, 1991 through 2000.

Year	Cow Milk, Whole, Fresh	Butter and Ghee	Cheese (All Kinds)	Whole Milk, Dry	Skim Milk, Dry	Whey
			Metric Tons			
1991	29,300	----	----	----	----	----
1992	31,500	----	----	----	----	----
1993	33,500	----	----	----	----	----
1994	35,800	----	----	----	----	----
1995	37,100	----	----	----	----	----
1996	36,500	----	----	----	----	----
1997	38,000	----	----	----	----	----
1998	39,500	----	----	----	----	----
1999	41,000	----	----	----	----	----
2000	37,000	----	----	----	----	----

Source: FAO Statistical Databases, 2002.

In the later 1990s, direct government support diminished. There has been a move toward more market-oriented production and processing, and the milk production decreased in 2000, from 41,000 metric tons in 1999 to 37,000 metric tons in 2000 (Table 1), for an annual decrease of ten percent. Malaysia's domestic liquid milk production makes up one half of milk consumption, and the rest is from ultra high temperature (UHT) milk recombined from imported skim milk powder and butter oil milk. Processors rely heavily on imported products (Falvey, 1999).

Demand for Dairy Products

Malaysia is one of the fastest growing economies in the world. Malaysians are increasingly familiar with Western foods and are traditionally open to trying new foods and recipes. Consumption of Western foods at home is growing, and dairy products start to show on dinner tables or in household refrigerators. For example, breakfast in

Malaysian households increasingly includes bread and butter and breakfast cereals (USDA-FAS, 2002).

Increased consumption of dairy products in Malaysia is fueled by growth in the number of city dwellers with more money to spend, and by the market dominance of big business (FAO, 1997). The strong growth of the hypermarket and supermarket sectors in Malaysia has led to a greater availability of shelf space for dairy products. In addition, a growing middle-income society has resulted in greater demand for dairy products. In Malaysia, the market for dairy products for consumers is relatively small and is very brand-loyal (Austrade, 2002).

Malaysia's domestic milk and dairy production accounts for a very small percentage of total domestic dairy product consumption. As a result, Malaysia remains heavily dependent on dairy imports. Malaysia imports powdered milk and other dairy products mainly from Australia and New Zealand (USDA-FAS, 1999). To expand its dairy industry, the Malaysia government has attempted various campaigns, such as public awareness programs. However, due to the diverse cultures in Malaysia, different religious affiliations have different inspection requirements for beef and dairy producers. For dairy producers, it is difficult to meet all of those requirements for different groups. As a result, the dairy industry is still under developed, due to the difficulties to sell the products. Malaysia aims to achieve at least 10 per cent self-sufficiency in milk products in 2010. Future plans are to focus on improving milk quality and improving the cold chain distribution (Malaysia Ministry of Agriculture, 2002).

Although milk consumption in Malaysia is low by world standards, it is ranked in the top three in the Southeast Asian countries, after Brunei and Singapore (USDEC, 2002). In

2000, per-capita consumption of all milk was 56.93 kilograms per year (Table 2). It was only one fifth of that experienced in the US (FAO Statistics, 2002). Totally, Malaysia's consumption for all milk in 2000 was reported to be 1,264,783 metric tons. Of this, only about four percent of the total demand was produced domestically in that year. The remainder was mainly imported from Oceania countries, such as Australia and New Zealand (FAO Statistics, 2002).

Table 2. Per-capita consumption of dairy products in Malaysia, 1991 through 2000.

Year	All Milk ^a	Butter	Cheese	Skim Milk ^a	Whole Milk ^a	Whey ^a
	Kilograms					
1991	53.58	0.53	0.09	33.50	16.64	1.87
1992	58.62	0.48	0.10	36.63	17.99	2.31
1993	59.57	0.48	0.11	37.42	18.03	3.94
1994	59.93	0.52	0.13	37.57	17.02	6.80
1995	69.04	0.50	0.14	44.53	18.91	6.91
1996	61.94	0.41	0.16	38.93	18.00	7.04
1997	64.76	0.53	0.13	36.32	23.14	7.75
1998	46.41	0.32	0.14	28.70	14.22	7.70
1999	54.64	0.42	0.19	32.80	17.61	8.54
2000	56.93	0.50	0.17	32.68	20.19	10.29
Average Annual Growth (%)						
1991-2000	1.6	1.9	8.4	0.5	4.2	23.5

^a Included food and other uses, such as cattle feed.

Source: FAO Statistical Databases, 2002.

The growth rate for all milk consumption increased by 1.6 percent per year in the 1990s (Table 2), as the Malaysia government paid more attention to milk consumption. Even with this annual growth, per-capita milk consumption increased only 3.35 kilograms between 1991 and 2000, reaching a peak in 1997 when 64.76 kilograms was consumed (Table 2). Per-capita consumption of butter in 2000 was 0.50 kilogram, for an

average growth rate of 1.9 percent; however, per-capita butter consumption declined by 0.03 kilogram between 1991 and 2000 (Table 2).

In Malaysia, about one half of cheese consumption consists of natural cheese, and another third is processed cheese. Cheese marketing channels are diverse, with one-third sold at retail, one-quarter through the bakery sector and one quarter through Western-style quick service pizza restaurants (USDEC, 2002). In 2000, total cheese consumed in Malaysia was 3,683 metric tons (FAO Statistics, 2002), for an annual growth rate of 8.4 percent (Table 2). The amount of cheese consumed in Malaysia is projected to rise to around 9,000 metric tons by 2008 (USDEC, 2002).

The growth of per-capita skim milk consumption was 0.5 percent annually in the 1990s; however, per-capita skim milk consumption declined 0.82 kilogram between 1991 and 2000. The growth of per-capita whole milk consumption was 4.2 percent annually in the 1990s, with an increase of 3.55 kilograms between 1991 and 2000 (Table 2).

The strongest growth occurred in whey consumption, which grew at 23.5 percent annually in the 1990s (Table 2). Per-capita whey consumption grew 8.42 kilograms between 1991 and 2000. One reason is that the milk products are locally produced by reconstituting and blending of imported milk powder (skim and whole), whey and other ingredients (USDA-FAS, 2002). Another reason is because of the usage in the feed industry. In 2002, about 3,000 metric tons of dairy ingredients are utilized in animal feed, an amount projected to grow to 3,600 metric tons by 2010 (USDEC, 2002).

Imports of Dairy Products

Malaysia is a net importer of dairy products, and it is also one of the major importers of whey and skim milk powder. In 2000, Malaysia ranked 15th among all countries in total dairy products imported (in milk equivalent pounds) (Table 3). For individual dairy products, Malaysia ranked 26th, 8th, and 16th in imports of butter, dry skim milk, and whey respectively in 2000 (Tables 4, 6, and 7). Additionally, Malaysia ranked sixth in imports of dry whole milk in 2000.

In 2000, Malaysia's share of world imports of dairy imports in milk equivalent pounds was about 1.9 percent (FAO Statistics, 2002). For butter, dry skim milk, and whey, Malaysia's share of world imports were about 0.9, 4.1, and 1.6 percent, respectively (FAO Statistics, 2002). For dry whole milk, Malaysia's share of world imports was about 4.1 percent (Table 5). Due to the relatively low consumption of cheese, imports of this product was 4,995 metric tons in 2000, only about 0.16 percent of total world imports cheese (3,093,644 Mt), and out of the top 30 cheese importing countries (FAO Statistics, 2002).

Table 3. Selected countries' total dairy imports (in milk equivalent) and ranking, 1996 through 2000.

	1996		1997		1998		1999		2000	
	Mt	Rank	Mt	Rank	Mt	Rank	Mt	Rank	Mt	Rank
Belgium	3,709,566	4	3,661,389	4	3,936,039	5	4,054,076	5	4,434,830	5
China	1,285,203	13	1,584,260	10	1,531,064	14	1,909,979	10	2,243,373	8
France	3,158,352	5	3,582,977	5	3,966,796	4	4,313,597	4	4,685,094	4
Germany	4,673,712	3	4,796,523	3	4,669,373	3	4,554,466	3	5,024,699	3
Italy	5,210,317	2	5,430,128	2	5,543,997	2	5,509,023	2	5,467,815	2
Malaysia	1,232,386	15	1,339,006	17	987,670	17	1,180,192	17	1,292,582	15
Mexico	1,912,993	8	2,121,080	8	2,021,171	7	2,217,376	7	2,310,820	7
Netherlands	6,385,562	1	6,061,069	1	5,633,207	1	7,113,321	1	6,297,773	1
Spain	1,450,968	11	1,583,212	11	1,652,153	11	1,661,739	12	1,918,970	10
Thailand	1,130,498	17	1,392,123	15	1,008,043	16	1,077,533	19	1,140,017	16
UK	2,393,522	6	2,476,914	7	2,537,039	6	2,667,275	6	2,710,840	6
USA	1,380,531	12	1,466,204	12	1,873,207	8	1,953,107	9	1,953,940	9
Total	32,793,109	----	34,102,762	----	34,351,716	----	37,134,151	----	38,340,736	----
World	59,844,367	----	62,626,024	----	62,478,356	----	66,593,229	----	68,138,509	----

Source: Food and Agricultural Organization of the United Nations Statistical Databases, 2002.

Table 4. Selected countries' total butter imports and ranking, 1996 through 2000.

	1996		1997		1998		1999		2000	
	Mt	Rank	Mt	Rank	Mt	Rank	Mt	Rank	Mt	Rank
Belgium	100,015	5	103,759	5	101,137	4	100,491	4	112,073	4
Egypt	50,225	7	37,759	8	35,253	9	43,115	8	44,141	7
France	109,919	4	137,381	3	133,670	2	129,819	1	148,302	1
Germany	132,955	1	156,822	2	134,930	1	123,476	2	131,121	2
Italy	48,315	8	52,087	7	60,124	7	46,864	7	41,167	8
Malaysia	8,986	24	11,508	22	7,284	30	9,765	27	10,918	26
Mexico	18,529	14	24,793	9	27,325	10	34,047	9	34,078	9
Morocco	28,050	9	16,457	15	22,104	12	19,818	12	27,357	10
Netherlands	68,782	6	94,022	6	69,879	6	96,933	5	86,887	5
Russian	125,810	2	169,698	1	83,053	5	53,200	6	53,857	6
UK	111,619	3	101,210	4	109,287	3	122,076	3	122,922	3
Total	884,082	---	905,496	---	784,046	---	761,774	---	812,823	---
World	1,203,892	---	1,321,235	---	1,213,138	---	1,217,796	---	1,261,586	---

Source: Food and Agricultural Organization of the United Nations Statistical Databases, 2002.

Table 5. Selected countries' total dry whole milk imports and ranking, 1996 through 2000.

	1996		1997		1998		1999		2000	
	Mt	Rank	Mt	Rank	Mt	Rank	Mt	Rank	Mt	Rank
Algeria	67,865	3	88,882	2	103,724	2	105,507	2	96,340	2
Belgium	66,029	5	53,781	9	54,362	7	46,786	10	57,289	7
Brazil	115,586	1	101,169	1	133,742	1	145,983	1	108,609	1
China	58,981	7	68,234	5	62,598	5	83,985	4	83,011	4
Malaysia	53,152	9	66,000	6	44,857	12	54,203	6	57,696	6
Netherlands	94,413	2	77,736	3	71,376	4	101,713	3	89,672	3
Philippines	36,476	11	39,656	12	40,511	13	36,958	12	56,072	8
Sri Lanka	35,027	12	37,364	13	48,788	10	48,308	9	49,070	9
Thailand	50,430	10	69,180	4	50,237	8	49,791	8	48,249	10
Venezuela	66,321	4	51,842	10	84,115	3	52,042	7	64,759	5
Total	644,280	---	653,844	---	694,310	---	725,276	---	710,767	---
World	1,281,604	---	1,357,158	---	1,401,542	---	1,439,868	---	1,418,968	---

Source: Food and Agricultural Organization of the United Nations Statistical Databases, 2002.

Table 6. Selected countries' total dry skim milk imports and ranking, 1996 through 2000.

	1996		1997		1998		1999		2000	
	Mt	Rank	Mt	Rank	Mt	Rank	Mt	Rank	Mt	Rank
Algeria	58,468	9	78,893	5	87,040	4	71,272	8	91,339	5
Belgium	51,781	12	43,521	11	43,155	13	45,150	15	71,900	9
China	37,975	15	40,945	13	44,813	12	51,150	13	56,862	10
France	33,446	18	28,453	20	42,636	14	63,791	9	84,735	6
Indonesia	45,916	14	41,034	12	33,133	18	98,348	5	82,574	7
Italy	126,614	3	127,504	3	126,494	2	121,779	3	109,008	4
Malaysia	78,151	5	75,000	6	59,596	6	71,879	7	74,721	8
Mexico	126,700	2	132,849	2	102,600	3	125,137	2	129,078	2
Netherlands	216,085	1	224,214	1	162,459	1	230,438	1	205,379	1
Philippines	83,704	4	98,050	4	77,637	5	86,729	6	111,455	3
Total	858,840	---	890,463	---	779,563	---	965,673	---	1,017,051	---
World	1,716,935	---	1,727,457	---	1,607,154	---	1,879,505	---	1,805,896	---

Source: Food and Agricultural Organization of the United Nations Statistical Databases, 2002.

Table 7. Selected countries' total whey imports and ranking, 1996 through 2000.

	1996		1997		1998		1999		2000	
	Mt	Rank	Mt	Rank	Mt	Rank	Mt	Rank	Mt	Rank
Belgium	52,959	4	55,759	3	58,099	3	54,842	4	56,299	5
Canada	43,224	6	36,554	10	37,996	9	48,375	6	62,441	3
China	72,882	2	89,359	2	78,819	2	97,717	2	140,057	2
France	29,238	10	40,931	7	50,588	5	49,463	5	59,048	4
Germany	66,975	3	45,070	5	48,759	6	46,114	7	40,077	9
Italy	40,845	7	37,598	8	42,637	8	37,584	10	42,029	8
Japan	32,343	9	37,481	9	37,351	10	41,157	9	39,522	10
Malaysia	10,722	18	12,040	16	12,338	19	13,988	18	18,223	16
Mexico	48,636	5	49,174	4	56,642	4	55,947	3	55,031	6
Netherlands	251,310	1	217,543	1	248,474	1	292,637	1	252,099	1
Spain	37,147	8	43,362	6	44,869	7	44,225	8	49,109	7
Total	686,281	----	664,871	----	716,572	----	782,049	----	813,935	----
World	886,132	----	902,409	----	973,881	----	1,054,173	----	1,124,090	----

Source: Food and Agricultural Organization of the United Nations Statistical Databases, 2002.

Malaysia is a net importer of dairy products because its domestic dairy industry is relatively under developed and cannot produce enough milk to meet consumer needs (Malaysia Ministry of Agriculture, 2002). Dairy product self-sufficiency was about four to five percent during the 1990s (FAO Statistics, 2002).

The imports of all dairy products (in milk equivalent pounds) increased during the 1990 to 1997 period, for an annual growth rate of 8.6 percent (FAO Statistics, 2002). However, the 1997 Asian crisis hit Malaysia also. Due to currency depreciation and the economy slowdown, Malaysia's dairy product imports decreased significantly in 1998, when imports decreased from 1,339,006 metric tons in 1997 to 987,670 metric tons in 1998, for an annual decrease of 26.2 percent. In the 1990s, the average growth rate of all dairy products was about 6.3 percent for an overall increase of 531,995 metric tons (Table 8).

Malaysia imported 10,918 metric tons of butter and 4,995 metric tons of cheese in 2000. Butter and cheese imports into Malaysia increased in the 1990s, with annual growth rates at 7.4 and 12 percent respectively (Table 8). The 1997 Asian crisis caused Malaysia's butter imports to decrease in 1998, when imports decreased from 11,508 metric tons in 1997 to 7,284 metric tons in 1998, for an annual decrease of 36.7 percent. The strongest growth occurred on the whey market, where growth on average was 22.5 percent in the 1990s (Table 8).

Malaysia remains heavily dependent on dairy imports, such as powdered milk for its dairy product industry (USDA-FAS, 2002). In the 1990s, Malaysia's imports of dry whole milk increased at an average rate of 4.7 percent (Table 8). Between 1990 and 2000,

whole dry milk imports increased 16,910 metric tons, reaching a high of 66,000 metric tons in 1997 and a low of 40,786 metric tons in 1990 (Table 8).

In the 1990s, Malaysia's imports of dry skim milk increased at an average rate of 5.6 percent annually (Table 8). Between 1990 and 2000, the overall skim milk imports increased 27,287 metric tons, reaching a peak in 1995 when 85,709 metric tons were imported (Table 8). In 2001, Malaysia imported about 50,181 metric tons of dry skim milk (FAO Statistics, 2002). The industry is willing to import dairy ingredients from any source as long as the price is competitive and the quality is good (USDA-FAS, 2002).

Table 8. Malaysia dairy imports, 1990 through 2000.

Year	Milk Equivalent	Butter	Cheese	Dry Whole Milk	Dry Skim Milk	Whey
Metric Tons						
1990	760,587	6,840	1,743	40,786	47,434	2,986
1991	911,001	9,964	1,728	43,308	61,373	3,149
1992	998,450	9,895	1,930	48,075	66,890	3,249
1993	1,065,096	9,692	2,152	49,314	72,132	5,801
1994	1,175,404	10,273	2,715	55,103	71,558	9,919
1995	1,287,178	10,222	2,812	54,407	85,709	10,476
1996	1,232,386	8,986	3,410	53,152	78,151	10,722
1997	1,339,006	11,508	2,800	66,000	75,000	12,040
1998	987,670	7,284	3,237	44,857	59,596	12,338
1999	1,180,192	9,765	4,260	54,203	71,879	13,988
2000	1,292,582	10,918	4,995	57,696	74,721	18,223
Average Annual Growth (%) 1990-2000	6.3	7.4	12.0	4.7	5.6	22.5

Source: FAO Statistical Databases, 2002.

Exports of Dairy Products from the U.S.

In the 1990s, Malaysia did not import much butter and cheese from the US, and the US share was very small (Table 9). Most of the butter imports were from Australia and New Zealand (Austrade, 2002). In 2000, Malaysia's total butter imports were 10,918 metric tons (Table 8), with no butter imports from the US (Table 9). Malaysia imported 4,995 metric tons of cheese in 2000 (Table 8), and the US accounted for one percent (Table 9). In 2001, Malaysia imported about 5,400 metric tons of cheese (FAO Statistics, 2002). Oceania supplied 90 percent of those imports in 2001 (USDEC, 2002). Major challenges facing US exporters are price, lack of familiarity with the Malaysian religious inspection requirement and lack of Halal certification by the Malaysian religious authority (requisite for Malaysia's large Muslim population) (USDEC, 2002).

Malaysia does not produce milk powder. As a result, all of the whole dry milk and nonfat dry milk consumed are imported. In 2000, Malaysia imported 74,721 metric tons nonfat dry milk (Table 8). In this category, New Zealand and Australia led with about two-thirds of the total nonfat dry milk imports (USDA- FAS, 2001). The share of US nonfat dry milk imports was about two percent of the total imports (Table 9). Additionally, Malaysia did not import much whole dry milk from the US, and the US share was very small (Table 9).

Australia is also a major supplier of whey to Malaysia (USDA-FAS, 2001). Not as in other Southeast Asian countries, the US hasn't dominated Malaysia's whey market. In 2000, the US share of whey imports was 8.8 percent, around 1,597 metric tons (Table 9).

Table 9. Selected dairy products exported from the US to Malaysia, 1991 through 2000.

Year	Butter ^a	% of All Butter Imports ^b	Cheese ^a	% of All Cheese Imports ^b	Whole Dry Milk ^a	% of All WDM Imports ^b	Non-Fat Dry Milk ^a	% of All NFDM Imports ^b	Whey ^a	% of Whey Imports ^b
	Mt	%	Mt	%	Mt	%	Mt	%	Mt	%
1991	1.7	0.0	0.0	0.0	3.5	0.0	3,178.3	5.2	505.8	16.1
1992	5.8	0.1	0.0	0.0	12.8	0.0	1,077.1	1.6	172.4	5.3
1993	169.1	1.7	16.5	0.8	8.3	0.0	13.1	0.0	137.8	2.4
1994	20.8	0.2	25.2	0.9	34.6	0.1	51.8	0.1	142.3	1.4
1995	16.0	0.2	19.6	0.7	29.6	0.1	50.0	0.1	319.5	3.0
1996	18.0	0.2	10.7	0.3	22.1	0.0	673.8	0.9	347.0	3.2
1997	5.2	0.0	23.7	0.8	51.6	0.1	1,648.9	2.2	576.5	4.8
1998	3.1	0.0	26.8	0.8	8.3	0.0	1,940.3	3.3	259.6	2.1
1999	17.0	0.2	228.6	5.4	45.2	0.1	1,780.7	2.5	79.8	0.6
2000	0.0	0.0	49.4	1.0	32.1	0.1	1,479.8	2.0	1,597	8.8

^a Source: United States Department of Agriculture Foreign Agricultural Service, 2003.

^b Data from Table 8.

Trade Policy and Tariff

Malaysia became a founding member of the WTO on January 1, 1995. Malaysia also participates in the Association of Southeast Asian Nations (ASEAN), the Asia-Pacific Economic Cooperation (APEC) forum and the East Asian Economic Caucus (EAEC) as well as in several other groupings with prominent trade objectives (WTO, 1997).

In Malaysia, there are campaigns promoting domestic products over imported food products, but as with all Southeast Asian countries, local dairy production is insufficient to meet consumer demand. Processors rely heavily on imported products. Thus tariffs are low on dairy products compared with other foods, and dairy import licenses are readily obtained (Falvey, 1999).

No duty is imposed on imports of milk fat, butter oil, nonfat dry milk, whole milk powder and dried whey. At present, butter has a two percent duty. Duties incurred for different kinds of cheese are between five to ten percent. Under the WTO commitment, present dairy duties will last until 2004. All dairy imports also have a five per cent sales tax on top of the import duty (USDA-FAS, 2002).

Milk or milk products must be accompanied by a valid import license issued by the Department of Veterinary Services of Malaysia permitting the importation into Malaysia. Milk or milk products must be accompanied by a veterinary health certificate dated within thirty days of import and signed or endorsed by a competent veterinary officer of the Government Veterinary Authority of the country of export (Malaysia Ministry of Agriculture, 2002). However, these requirements seemingly do not have much of an impact on dairy imports. In addition, all dairy imports, such as milk powder, cheese and

butter are required to be certified Halal, by the Malaysian religious authority, for consumption and usage as ingredients for further processing (USDA-FAS, 2002).

THE PHILIPPINES

Overview of the Philippines

The Philippines is located in Southeast Asia. It is an archipelago between the Philippine Sea and the South China Sea, to the east of Vietnam. The total area of the Philippines is 0.3 million square kilometers, slightly larger than the size of Arizona. The population was estimated to be 84.5 million, with a 1.99 percent growth rate in 2001 (CIA World Factbook, 2002).

Before the 1997 to 1998 Asian financial and currency crisis, the Philippine economy grew at about five percent every year. In 1998, the Philippine economy was hit quite hard by the Asian financial crisis and poor weather conditions. Its growth fell to 0.6 percent in 1998 from five percent in 1997. However, the Philippine economy recovered from the crisis, growing about three percent in 1999 and four percent in 2000 (CIA World Factbook, 2002). The Philippine economy is a mixture of agriculture, light industry, and supporting services, and the government has promised to continue its economic reforms. The Philippines tries to match the development pace with other industrialized countries of East Asia. The strategy includes improving infrastructure, furthering deregulation and privatization of the economy, and increasing trade integration. In 2001, the Philippines' gross domestic product (GDP) was approximately \$335 billion (purchasing power parity), with per-capita purchasing power parity of \$4,000. Agriculture accounted for 17 percent of its total GDP (CIA World Factbook, 2002).

The Philippines' total exports in 2001 were 37 billion, of which the US received 30 percent. The Philippines' total imports in 2001 were 30 billion, of which the US shipped 16 percent. The US and Japan are major trading partners of the Philippines. Future prospects of the Philippine economy depend heavily on the economic performance of these two major trading partners. Other trading partners are Singapore, Hong Kong, and EU countries (CIA World Factbook, 2002).

The Dairy Industry in the Philippines

Production of Dairy Products

Dairy farming is not new in the Philippines. Back in the 15th century, among the Filipinos and Spaniards, raw milk was collected from dairy animals and sold without pasteurization (Philippine National Dairy Authority, 2003). However, Philippine milk and dairy production has never been strong. Milk production was low, only providing about one percent of total domestic demand in 2000 (USDA-FAS, 2002).

In 1962, the Dairy Training and Research Institute (DTRI) was established with the assistance of the United Nations. Since then, the Philippine government started to promote the dairy industry in the Philippines. In 1964, the Bureau of Animal Industry was established to engage in the production, processing, and marketing of milk and milk products (Philippine National Dairy Authority, 2003). To increase self-sufficiency, farmer income, and conserve foreign reserves, the Dairy Industry Development Act was

passed by Congress in 1979. The Act created the Philippine Dairy Corporation (PDC) as the lead government dairy agency to carry out these objectives (Philippine National Dairy Authority, 2003). As government support increased, in the late 1980s, support from the private sector also increased. Several private dairy development foundations were founded in the Philippines. In 1995, the National Dairy Development Act of 1995 was signed into law, and legally created the National Dairy Authority (NDA). The main task of NDA is to ensure the development of the Philippine dairy industry (Philippine National Dairy Authority, 2003).

Despite efforts from government and private foundations, milk production was still very low in the 1990s. From 1992 to 1998, the Philippine milk production decreased from 15,420 metric tons in 1992 to 9,240 in 1998 (Table 1). In the 1992 to 1998 period, the Philippine milk production decreased at an average of eight percent every year. The production was 10,210 metric tons in 2000 (Table 1), and it accounted for only 0.83 percent of the total domestic consumption (Philippine National Dairy Authority, 2003). The decrease in milk production in the 1990s was due to the El Nino drought, which decreased forage and milk productivity. The low domestic milk output in the decade was also due to a small dairy animal population. In 2001, milking animals, such as cattle, water buffalo, and goat, used for dairy purposes were 8,600 head (both dams and does). Among those animals, dairy cattle were only 3,990 head (Philippine National Dairy Authority, 2003).

In the 1998 to 2000 period, milk production in the Philippines increased, from 9,240 metric tons in 1998 to 10,210 metric tons in 2000 (Table 1), an average increase of five percent per year. This increase was due to the increasing productivity and number of milking cows. Despite this increase, total domestic production still accounted for less than one percent of total domestic requirements. The country depends heavily on dairy imports to supply over 99 percent of its total demand (USDA-FAS, 2002).

The Philippines doesn't produce other dairy products, such as butter, cheese, dry skim milk, and whey. As a result, almost all milk and dairy products have to be imported from other countries to meet the domestic consumption. Although milk production is expected to increase slightly in the next few years through the programs of importation of dairy cows and bulls from Australia and New Zealand, Philippine milk and dairy production is not expected to increase significantly in the near future (USDA-FAS, 2002).

Table 1. Philippines milk and selected dairy products production, 1991 through 2000.

Year	Cow Milk, Whole, Fresh	Butter and Ghee	Cheese (All Kinds)	Whole Milk, Dry	Skim Milk, Dry	Whey
			Metric Tons			
1991	15,000	----	----	----	----	----
1992	15,420	----	----	----	----	----
1993	12,500	----	----	----	----	----
1994	12,100	----	----	----	----	----
1995	12,110	----	----	----	----	----
1996	11,500	----	----	----	----	----
1997	10,220	----	----	----	----	----
1998	9,240	----	----	----	----	----
1999	9,850	----	----	----	----	----
2000	10,210	----	----	----	----	----

Source: FAO Statistical Databases, 2002.

Demand for Dairy Products

As a result of historically low milk production, consumption of milk and dairy products is very low. As government concerns increased, the National Dairy Authority (NDA) was created in 1995 to ensure the development of the Philippine dairy industry. In order to develop domestic dairy production and milk consumption, several campaigns and programs were launched (Philippine National Dairy Authority, 2003). The first Nutrition Month was launched in 1995 to emphasize the importance of milk in everyone's daily diet and to focus on the status and needs of the local dairy industry. The NDA also signed an agreement with the National Nutrition Council in 1996 to increase peoples' awareness of the value of dairy products and to promote consumption of milk and dairy products. In addition, back in 1989, the School Milk Feeding Program (SMFP) was launched by the government to fight malnutrition in children nationwide (Philippine National Dairy Authority, 2003).

The government support for the general public awareness program and the school milk program caused the demand for milk and dairy products to continue increasing. The school milk program was expanded by the NDA. As a result, the NDA assistance of the dairy cooperatives has greatly increased milk consumption among school children. There is also a growing living standard in the Philippines and a general shift towards changing consumption patterns, which causes the demand for dairy products to increase (Philippine National Dairy Authority, 2003).

Milk consumption per capita increased at a rate of 3.6 percent on average every year in the 1990s, from 18.09 kilograms in 1991 to 23.19 kilograms in 2000 (Table 2). In 1998, per-capita milk consumption declined mainly due to the slow down of the Philippine economy (USDA-FAS, 1999). While the Philippines experienced the devaluation of its peso, dairy consumption didn't decline sharply, owing to parental concern over their children's nutrition. In addition, consumption of milk and dairy products in urban areas is estimated to be twice as much as the rural populace mainly due to their higher incomes, developed storage and distribution facilities (USDA-FAS, 1999).

The consumption of butter and cheese is low in the Philippines. However, the Philippines consume more cheese than any other country in Southeast Asia. In the 1990s, per-capita consumption of butter hasn't changed much, and it was 0.16 kilograms in 2000 (Table 2). Cheese is consumed at home and quick service restaurants (QSR). High-quality cheeses are not appreciated, and are used mainly as an ingredient rather than a food item. Cheese consumption has increased slightly in the 1990s, at a level of 5.3 percent per year (Table 2).

Milk powder is becoming more popular in the Philippines. Skim milk powder is used mainly in the manufacture of ready-to-drink milks and is also sold in retail packs. Whole milk powder is mainly used for infant formulas and other infant dietetics (USDA-FAS, 1999). The Philippines has a strong swine industry and a well-developed feed industry (USDEC, 2002). The feed industry uses about 12,000 metric tons of dairy ingredients annually. This is projected to grow more than 50 percent by the end of the decade

(USDEC, 2002). As a result, growth in per-capita whey consumption continued to be strong. The average increase was 12.8 percent annually in the 1990s (Table 2).

Table 2. Per-capita consumption of dairy products in the Philippines, 1991 through 2000.

Year	All Milk ^a	Butter	Cheese	Skim Milk ^a	Whole Milk ^a	Whey ^a
	Kilograms					
1991	18.09	0.16	0.14	12.17	4.14	2.05
1992	18.05	0.14	0.17	11.81	4.25	2.54
1993	17.35	0.15	0.17	11.71	3.66	2.22
1994	20.66	0.18	0.20	13.49	4.81	3.17
1995	22.48	0.15	0.21	15.52	4.44	3.72
1996	19.56	0.16	0.21	12.39	4.87	3.12
1997	21.68	0.17	0.24	14.19	4.86	4.01
1998	17.95	0.15	0.19	11.02	4.76	3.75
1999	18.69	0.14	0.20	12.07	4.32	4.43
2000	23.19	0.16	0.21	15.19	5.44	5.21
Average Annual Growth (%)						
1991-2000	3.6	0.8	5.3	3.8	4.1	12.8

^a Included food and other uses, such as cattle feed.

Source: FAO Statistical Databases, 2002.

The Philippine economy improved slightly in 2001; however, this did not translate into higher consumption of dairy products. Overall consumption of dairy products increased marginally due to the growing urban population (USDA-FAS, 2002). Domestically produced liquid milk is used to make fresh milk drinks with a very small amount going to small-scale cottage-processing industries engaged in dairy candies and white cheese production. The commercial processors rely heavily on imported milk and dairy products as their raw materials (USDA-FAS, 2002).

Imports of Dairy Products

The Philippines is one of the largest importers of milk and dairy products in the world. Increased domestic demand for dairy products and its historically weak dairy industry have caused over 99 percent of milk and dairy products to be imported every year (Philippine National Dairy Authority, 2003). In 2000, the Philippine total imports of dairy products (in milk equivalent pounds) were 1,713,585 metric tons (Table 3), which was 2.5 percent of the total world imports of dairy products (FAO Statistics, 2002). It ranked 11th among all importing countries in total dairy products imported (Table 3). For individual dairy products, the Philippines ranked twenty-second and twenty-seventh in imports of butter and cheese in 2000 (Tables 4 and 5). It ranked eighth in imports of dry whole milk (Table 6), and it ranked third and fourteenth in imports of dry skim milk and whey in 2000 (Tables 7 and 8).

In 2000, the Philippine share of total world imports of butter was about one percent. Its share of total world imports of cheese was 0.5 percent (FAO Statistics, 2002). Due to the Philippine's high usage of dry skim milk in dairy processing and repackaging, the Philippine share of total world imports of dry whole milk and dry skim milk was about 4.0 and 6.2 percent, respectively, in 2000. The Philippines share of total world imports of whey was about 2.6 percent in 2000 (FAO Statistics, 2002).

Table 3. Selected countries' total dairy imports (in milk equivalent) and ranking, 1996 through 2000.

	1996		1997		1998		1999		2000	
	Mt	Rank	Mt	Rank	Mt	Rank	Mt	Rank	Mt	Rank
Belgium	3,709,566	4	3,661,389	4	3,936,039	5	4,054,076	5	4,434,830	5
China	1,285,203	13	1,584,260	10	1,531,064	14	1,909,979	10	2,243,373	8
France	3,158,352	5	3,582,977	5	3,966,796	4	4,313,597	4	4,685,094	4
Germany	4,673,712	3	4,796,523	3	4,669,373	3	4,554,466	3	5,024,699	3
Italy	5,210,317	2	5,430,128	2	5,543,997	2	5,509,023	2	5,467,815	2
Mexico	1,912,993	8	2,121,080	8	2,021,171	7	2,217,376	7	2,310,820	7
Netherlands	6,385,562	1	6,061,069	1	5,633,207	1	7,113,321	1	6,297,773	1
Philippines	1,250,816	14	1,430,406	13	1,243,841	15	1,318,971	15	1,713,585	11
Spain	1,450,968	11	1,583,212	11	1,652,153	11	1,661,739	12	1,918,970	10
UK	2,393,522	6	2,476,914	7	2,537,039	6	2,667,275	6	2,710,840	6
USA	1,380,531	12	1,466,204	12	1,873,207	8	1,953,107	9	1,953,940	9
Total	32,811,542	----	34,194,162	----	34,607,886	----	37,272,930	----	38,761,739	----
World	59,844,367	----	62,626,024	----	62,478,356	----	66,593,229	----	68,138,509	----

Source: Food and Agricultural Organization of the United Nations Statistical Databases, 2002.

Table 4. Selected countries' total butter imports and ranking, 1996 through 2000.

	1996		1997		1998		1999		2000	
	Mt	Rank	Mt	Rank	Mt	Rank	Mt	Rank	Mt	Rank
Belgium	100,015	5	103,759	5	101,137	4	100,491	4	112,073	4
Egypt	50,225	7	37,759	8	35,253	9	43,115	8	44,141	7
France	109,919	4	137,381	3	133,670	2	129,819	1	148,302	1
Germany	132,955	1	156,822	2	134,930	1	123,476	2	131,121	2
Italy	48,315	8	52,087	7	60,124	7	46,864	7	41,167	8
Mexico	18,529	14	24,793	9	27,325	10	34,047	9	34,078	9
Morocco	28,050	9	16,457	15	22,104	12	19,818	12	27,357	10
Netherlands	68,782	6	94,022	6	69,879	6	96,933	5	86,887	5
Philippines	11,227	22	12,185	20	10,739	22	10,038	26	12,381	22
Russian	125,810	2	169,698	1	83,053	5	53,200	6	53,857	6
UK	111,619	3	101,210	4	109,287	3	122,076	3	122,922	3
Total	805,446	---	906,173	---	787,501	---	762,047	---	814,286	---
World	1,203,892	---	1,321,235	---	1,213,138	---	1,217,796	---	1,261,586	---

Source: Food and Agricultural Organization of the United Nations Statistical Databases, 2002.

Table 5. Selected countries' total cheese imports and ranking, 1996 through 2000.

	1996		1997		1998		1999		2000	
	Mt	Rank	Mt	Rank	Mt	Rank	Mt	Rank	Mt	Rank
Belgium	176,745	4	186,681	5	197,185	4	199,602	5	208,949	5
France	151,238	7	153,718	7	167,326	7	188,472	6	213,138	4
Germany	458,261	1	476,361	1	441,518	1	417,503	1	424,721	1
Greece	50,747	12	68,059	11	94,838	9	67,341	11	76,944	10
Italy	294,875	2	305,861	2	305,419	2	318,681	2	347,233	5
Japan	164,164	5	171,407	6	183,448	5	186,905	7	205,123	6
Netherlands	92,067	9	84,895	9	100,869	8	116,845	8	122,438	8
Philippines	14,722	26	16,892	25	14,260	26	15,029	29	16,327	27
Spain	81,511	10	81,046	10	86,363	10	94,223	9	104,688	9
UK	258,704	3	261,775	3	249,191	3	272,312	3	268,613	3
USA	154,764	6	142,793	8	170,557	6	203,042	4	192,342	7
Total	1,897,798	---	1,949,488	---	2,010,974	---	2,079,955	---	2,180,516	---
World	2,688,552	---	2,843,580	---	2,786,286	---	2,887,650	---	3,093,644	---

Source: Food and Agricultural Organization of the United Nations Statistical Databases, 2002.

Table 6. Selected countries' total dry whole milk imports and ranking, 1996 through 2000.

	1996		1997		1998		1999		2000	
	Mt	Rank	Mt	Rank	Mt	Rank	Mt	Rank	Mt	Rank
Algeria	67,865	3	88,882	2	103,724	2	105,507	2	96,340	2
Belgium	66,029	5	53,781	9	54,362	7	46,786	10	57,289	7
Brazil	115,586	1	101,169	1	133,742	1	145,983	1	108,609	1
China	58,981	7	68,234	5	62,598	5	83,985	4	83,011	4
Malaysia	53,152	9	66,000	6	44,857	12	54,203	6	57,696	6
Netherlands	94,413	2	77,736	3	71,376	4	101,713	3	89,672	3
Philippines	36,476	11	39,656	12	40,511	13	36,958	12	56,072	8
Sri Lanka	35,027	12	37,364	13	48,788	10	48,308	9	49,070	9
Thailand	50,430	10	69,180	4	50,237	8	49,791	8	48,249	10
Venezuela	66,321	4	51,842	10	84,115	3	52,042	7	64,759	5
Total	644,280	---	653,844	---	694,310	---	725,276	---	710,767	---
World	1,281,604	---	1,357,158	---	1,401,542	---	1,439,868	---	1,418,968	---

Source: Food and Agricultural Organization of the United Nations Statistical Databases, 2002.

Table 7. Selected countries' total dry skim milk imports and ranking, 1996 through 2000.

	1996		1997		1998		1999		2000	
	Mt	Rank	Mt	Rank	Mt	Rank	Mt	Rank	Mt	Rank
Algeria	58,468	9	78,893	5	87,040	4	71,272	8	91,339	5
Belgium	51,781	12	43,521	11	43,155	13	45,150	15	71,900	9
China	37,975	15	40,945	13	44,813	12	51,150	13	56,862	10
France	33,446	18	28,453	20	42,636	14	63,791	9	84,735	6
Indonesia	45,916	14	41,034	12	33,133	18	98,348	5	82,574	7
Italy	126,614	3	127,504	3	126,494	2	121,779	3	109,008	4
Malaysia	78,151	5	75,000	6	59,596	6	71,879	7	74,721	8
Mexico	126,700	2	132,849	2	102,600	3	125,137	2	129,078	2
Netherlands	216,085	1	224,214	1	162,459	1	230,438	1	205,379	1
Philippines	83,704	4	98,050	4	77,637	5	86,729	6	111,455	3
Total	858,840	---	890,463	---	779,563	---	965,673	---	1,017,051	---
World	1,716,935	---	1,727,457	---	1,607,154	---	1,879,505	---	1,805,896	---

Source: Food and Agricultural Organization of the United Nations Statistical Databases, 2002.

Table 8. Selected countries' total whey imports and ranking, 1996 through 2000.

	1996		1997		1998		1999		2000	
	Mt	Rank	Mt	Rank	Mt	Rank	Mt	Rank	Mt	Rank
Belgium	52,959	4	55,759	3	58,099	3	54,842	4	56,299	5
Canada	43,224	6	36,554	10	37,996	9	48,375	6	62,441	3
China	72,882	2	89,359	2	78,819	2	97,717	2	140,057	2
France	29,238	10	40,931	7	50,588	5	49,463	5	59,048	4
Germany	66,975	3	45,070	5	48,759	6	46,114	7	40,077	9
Italy	40,845	7	37,598	8	42,637	8	37,584	10	42,029	8
Japan	32,343	9	37,481	9	37,351	10	41,157	9	39,522	10
Mexico	48,636	5	49,174	4	56,642	4	55,947	3	55,031	6
Netherlands	251,310	1	217,543	1	248,474	1	292,637	1	252,099	1
Philippines	16,113	16	21,144	15	20,179	14	24,312	14	29,150	14
Spain	37,147	8	43,362	6	44,869	7	44,225	8	49,109	7
Total	691,672	----	673,975	----	724,413	----	792,373	----	824,862	----
World	886,132	----	902,409	----	973,881	----	1,054,173	----	1,124,090	----

Source: Food and Agricultural Organization of the United Nations Statistical Databases, 2002.

Due to its small dairy industry, the Philippines is not competitive with other countries' dairy industries. Milk and dairy products are much cheaper to import than to produce domestically. Every year over 99 percent of the milk and dairy product consumption are imported from abroad (USDA-FAS, 2002). In the Philippines, most dairy imports are in the form of dry skim milk, dry whole milk, evaporated milk, buttermilk, whey powder, and fresh milk. Most imported dairy products are then recombined to produce a number of different dairy products to satisfy its domestic demand. Australia, New Zealand, and the US are the main suppliers (USDA-FAS, 2002).

The Philippine dairy self-sufficiency rate is very low and is expected to continue, even though the government has attempted to increase dairy production in recent years. In the 1990s, domestic production remained at less than one percent of total dairy requirements. The average growth rate of all dairy product imports (in milk equivalent pounds) was 5.2 percent (Table 9). A significant increase occurred in 2000 when imports increased from 1,318,971 metric tons in 1999 to 1,713,585 metric tons in 2000, for an annual increase of 30 percent (FAO Statistics, 2002).

The 1997 to 1998 Asian financial crisis hit the Philippines quite hard. As a result, lowered income and the slowed economy caused dairy consumption and imports to decrease; however, Philippine dairy imports recovered rapidly to the pre-crisis level in 2000. In 2000, Philippine total dairy imports were 1,713,585 metric tons (Table 9).

Table 9. Philippine dairy imports, 1991 through 2000.

Year	Milk Equivalent	Butter	Cheese	Dry Whole Milk	Dry Skim Milk	Whey
	Metric Tons					
1991	1,004,874	10,001	8,989	29,865	75,786	9,490
1992	1,040,932	8,940	10,966	29,965	75,126	11,999
1993	1,014,807	9,721	11,262	26,701	75,559	10,747
1994	1,261,488	11,816	13,980	35,379	88,424	15,699
1995	1,382,759	10,566	14,518	34,239	103,592	18,821
1996	1,250,816	11,227	14,722	36,476	83,704	16,113
1997	1,430,406	12,185	16,892	39,656	98,050	21,144
1998	1,243,841	10,739	14,260	40,511	77,637	20,179
1999	1,318,971	10,038	15,029	36,958	86,729	24,312
2000	1,713,585	12,381	16,327	56,072	111,455	29,150
Average Annual Growth (%) 1991-2000	5.2	4.8	7.2	8.8	5.2	14.8

Source: FAO Statistical Databases, 2002.

The Philippines do not produce butter and cheese. As a result, to satisfy domestic consumption, dairy products are imported. In the 1990s, the average growth rate of butter was 4.8 percent (Table 9). Butter imports reached a peak in 1997 at 12,185 metric tons; however, the Asia financial crisis caused butter imports into the Philippines to decrease during the period from 1998 to 1999. From 1991 to 2000, butter imports increased 2,380 metric tons. In 2000, the Philippines imported 12,381 metric tons of butter (FAO Statistics, 2002).

The Filipinos consume more cheese than any other countries in the region. Cheese imports increased gradually in the 1990s, except in 1998. The average growth rate was 7.2 percent (Table 9). In 1998 cheese imports were 14,260 metric tons for a 16 percent

decline from 16,892 metric tons in 1997. Between the year 1991 and 2000, cheese imports increased 7,338 metric tons, and cheese imports reached a peak in 2000 at 16,327 metric tons (Table 9).

In the 1990s, the Philippines imported milk and dairy products mostly in the form of milk powder, which accounted for over 65 percent of total dairy imports (USDA-FAS, 1999). Significant decreases of nonfat dry milk imports occurred in 1996 and 1998. In 1998, nonfat dry milk imports were 77,637 metric tons, 21 percent below the 98,050 metric tons imported in 1997. Imports of nonfat dry milk increased from 1999 to 2000, a result of shifting imports from liquid milk to dry milk. Whole milk powder imports declined due to price considerations. Skim milk powder was usually cheaper than whole milk powder (USDA-FAS, 2002).

Between 1991 and 2000, whole milk imports into the Philippines increased 26,207 metric tons, from 29,865 metric tons in 1991 to 56,072 metric tons in 2000 (Table 9), for an overall increase of 87.8 percent. In the 1990s, the average growth rate for dry skim milk (nonfat dry milk) was 5.2 percent per year, and the average growth rate for dry whole milk was 8.8 percent per year (Table 9).

The growth of whey was the most impressive among dairy products. The growth rate was 14.8 percent annually (Table 9). The main reason behind this was the increasing usage of dairy ingredients in the well-developed feed industry.

Exports of Dairy Products from the U.S.

The Philippines is highly dependent on Australia and New Zealand for the supply of its dairy products (USDA-FAS, 2002). Australia accounted for 38 percent and New Zealand accounted for 29 percent of all dairy imports in 2002. The US and the Netherlands are the other two major suppliers, accounted for ten and four percent respectively (USDA-FAS, 2002).

In the last decade, the Philippines did not import much butter from the US, and the US share was very small (Table 10). Most of the butter and cheese imports were from Oceania countries. In 2000, the Philippine total butter imports were 12,381 metric tons (Table 9). The US only exported 4.4 metric tons of butter to the Philippines in that year (Table 10). The Philippine total cheese imports were 16,327 metric tons in 2000 (Table 9), and the US accounted for about six percent (Table 10).

During the early 1990s, the US had a very small percentage share of nonfat dry milk imports, ranging from zero to less than four percent from the period of 1991 to 1996. However, the US share of dry skim milk increased slightly in the late 1990s, ranging from 5.3 to 6.9 percent (Table 10). Although Oceania countries are expected to be the main sources for dry skim milk imports, the US has opportunities to increase its share in recent years, due to the reduced production in Australia. Unfavorable weather conditions reduced Australia dairy production and its dry skim milk price increased in recent years (USDA, 2002).

Table 10. Selected dairy products exported from the US to Philippines, 1991 through 2000.

Year	Butter ^a	% of All Butter Imports ^b	Cheese ^a	% of All Cheese Imports ^b	Whole Dry Milk ^a	% of All WDM Imports ^b	Non-Fat Dry Milk ^a	% of All NFDM Imports ^b	Whey ^a	% of All Whey Imports ^b
	Mt	%	Mt	%	Mt	%	Mt	%	Mt	%
1991	0.0	0.0	368.7	4.1	4.9	0.0	2,792.4	3.7	9,613.4	101.3 ^c
1992	1.6	0.0	307.4	2.8	12.9	0.0	2,929.0	3.9	5,486.8	45.7
1993	0.0	0.0	298.9	2.7	105.8	0.4	22.9	0.0	5,366.8	49.9
1994	0.0	0.0	464.7	3.3	91.6	0.3	30.7	0.0	5,793.5	36.9
1995	55.2	0.5	152	1.0	1,862.0	5.4	624.5	0.6	5,468.5	29.1
1996	55.0	0.5	421.3	2.9	395.2	1.1	1,865.1	2.2	5,229.7	32.5
1997	203.6	1.7	762.3	4.5	64.7	0.2	6,811.2	6.9	7,330.8	34.7
1998	0.0	0.0	937.9	6.6	44.3	0.1	4,205.7	5.4	7,060.3	35.0
1999	0.0	0.0	1,015.6	6.8	11.4	0.0	5,979.0	6.9	12,892.1	53.0
2000	4.4	0.0	981.8	6.0	72.8	0.1	5,961.8	5.3	15,681.6	53.8

^a Source: United States Department of Agriculture Foreign Agricultural Service, 2003.

^b Data from Table 9.

^c The reason for this discrepancy is unknown and needs further analysis.

During the early 1990s, the US had a very small percentage share of whole dry milk imports, ranging from zero to about 5.4 percent. The US share of dry whole milk reached a peak in 1995 of 5.4 percent, with 1,862 metric tons (Table 10).

The US has dominated the Philippines whey market in the 1990s, where the US market share of whey imports has never been less than 29 percent. In 2000, the US share of whey imports was 53.8 percent, about 15,681.6 metric tons (Table 10).

Trade Policy and Tariff

The Philippines has been a WTO member since 1995. The primary objectives of Philippine agricultural policy are to "promote industrialization and full employment based on sound agricultural development and agrarian reform, through industries that make full and efficient use of human and natural resources, and which are competitive in both domestic and foreign markets" (WTO, 1999).

As a result of the Uruguay Round, the Philippines introduced tariff quotas through the minimum access volumes (MAV) system to replace the import prohibitions (WTO, 1999). In the Philippines, there are no import restrictions or quotas on imported dairy products, although a value added tax of ten percent applies (Austrade, 2002).

Import duties on dairy products are low because domestic production is very low. Import duties on butter are seven percent, and will decrease to five percent in 2004. Import duties on cheese, including whey cheese and curd, are three percent. Processed cheese has a seven percent tariff on it, and will decrease to five percent in 2004. Import

duties on milk powder and whey are three percent (USDA-FAS, 2002). In addition, tariffs for other fats and oils derived from milk have been reduced from three to one percent (USDA-FAS, 2002). Import duties will decline further by 2004 under the Philippine World Trade Organization commitments (USDA-FAS, 2002).

The Philippine importers of dairy products and ingredients must obtain an import permit and veterinary quarantine certificate from the Philippine Department of Agriculture (DA). In July 2002, the DA imposed a ban on milk powder produced by a Danish company, because the imported milk powder was contaminated with components of lubricating oil and microscopic steel flakes. The DA subsequently lifted the ban on September 5. Since then, all imported dairy products must be certified by an independent verification agency (USDA-FAS, 2002).

THAILAND

Overview of Thailand

Thailand is located in the center of South East Asia, bounded by the Andaman Sea and the Gulf of Thailand to the south. The total area of Thailand is 514,000 square kilometers, slightly more than twice the size of Wyoming. The population of Thailand in 2001 was about 62.35 million, with a 0.88 percent growth rate (CIA World Factbook, 2002).

Thailand's economy has been enjoying the world's highest growth rate from 1985 to 1995, averaging almost nine percent annually. In 1997, the Asia financial crisis hit Thailand very hard, and the economy contracted to about one percent in 1998. Thailand entered a recovery stage in 1999, expanding at 4.2 percent and grew at 4.4 percent in 2000. The rapid recovery largely was due to strong exports, which increased about 20 percent in 2000. However, an ailing financial sector and the slow pace of corporate debt restructuring, combined with a softening of global demand, slowed growth again in 2001 to 1.4 percent (CIA World Factbook, 2002). In 2001, Thailand's gross domestic product (GDP) was approximately \$410 billion (purchasing power parity), with a per-capita purchasing power parity of \$6,600 and agriculture accounted for eleven percent of the total GDP (CIA World Factbook, 2002).

Thailand's total exports in 2001 were \$65.3 billion of which the US received 23 percent. Thailand's total imports in 2001 were \$62.3 billion of which the US composed 11 percent. The main trading partners of Thailand are the US, Japan, China, Malaysia, and Singapore (CIA World Factbook, 2002).

Dairy Industry in Thailand

Production of Dairy Products

Neither dairy cattle nor dairy farming is indigenous to Thailand. Before 1960, Thailand had no domestic dairy industry. As a result dairy products are not commonly found on Thai dinner tables or in household refrigerators even now. Later in 1950s, the Department of Livestock and Development (DLD), a government sector, had launched several small dairy-farming projects, which sparked some interests among Thai farmers (Chantalakkana, 1995).

Conventional dairy farming was first introduced to Thailand by the help of the Danish government. In 1962, the Thai Danish Farm and Training Center (TDDF) was established in the Muak Lek area, as a joint venture between the Thai and Danish Governments. This farm was established as a demonstration and training farm for new dairy farmers in the area. Muak lek became the country's first and largest dairy community and still is to these days. In 1971, the Thai Government took over responsibility and the project was organized under the management of the “the Dairy Farming Promotion Organization of Thailand (DPO)” (Muangcharoen and Panichkriangkrai, 1996). The DPO has been vigorously playing a key role in Thai dairy industry and has long been expanding its wing to cover 12 regional dairy centers throughout the country.

Milk production in the Nong Pho area started almost at the same time as in Muak Lek, but in a different way. The farmers were already established there, with smaller pieces of land, but they were more progressive and had the assistance of the Department of Livestock Development (DLD). Gradually, dairy farming had also flourished around

Nong Pho district. In 1971, a cooperative dairy plant was built, and the milk production, the organizations of milk processing and milk marketing have all been most impressive (FAO, 1991).

Before 1980, locally produced milk was expensive compared with recombined milk from imported product and the Thai government initiated a program to increase self-sufficiency in milk. In 1982 the government started restricting imports of fresh milk and milk powders. Since 1983 local milk production has expanded rapidly. In 1982, Thailand had 13,700 cows producing 27,240 metric tons of milk. By 1991 the number of cows and amount of milk had increased six-fold. There were 12,000 dairy farms and the average herd size was 6.3 cows in that year (Falvey, 1999).

The government of Thailand has concluded that its dairy industry is an important facet of the country's agricultural economy and that steps should be taken to strengthen the industry. In 1999, the total domestic production of fresh cow milk was around 465,000 metric tons. Cattle numbers rose from 0.33 million head in 1998 to around 0.44 million in 1999 (FAO Statistics, 2002).

In 2000, Thailand's fresh milk production was about 0.5 million metric tons, accounting for only 0.1 percent of the world production of fresh milk (490.3 million metric tons). There was a six percent annual increase in fresh milk production in that year (FAO Statistics, 2002). About 49 percent of milk production is processed for ready-to-drink fresh milk, and the rest for recombined milk. Milk production is insufficient to meet the rising demand generated by the population growth and the better standard of living. Dairy products, particularly in the form of milk powder, butter, and cheese are thus imported. Thailand also has produced whey for several decades. The whey production in

2000 was 21,700 metric tons, accounting for only 1.1 percent of the world production and four percent of the US whey production (Table 1).

Table 1. Thailand milk and selected dairy products production, 1991 through 2000.

Year	Cow Milk, Whole, Fresh	Butter and Ghee	Cheese (All Kinds)	Whole Milk, Dry	Skim Milk, Dry	Whey ^a
Metric Tons						
1991	142,253	----	----	----	----	19,000
1992	177,000	----	----	----	----	19,000
1993	134,011	----	----	----	----	19,000
1994	205,407	----	----	----	----	19,000
1995	307,229	----	----	----	----	19,000
1996	343,388	----	----	----	----	19,000
1997	385,728	----	----	----	----	19,000
1998	437,116	----	----	----	----	19,000
1999	464,514	----	----	----	----	20,000
2000	494,692	----	----	----	----	21,700

^aWhey production in milk equivalent pounds.

Source: FAO Statistical Databases, 2002.

Demand for Dairy Products

Because the dairy industry is relatively new in Thailand, dairy products are not commonly found on Thai dinner tables or in household refrigerators. Although the number of farms and dairy communities were gradually increasing, the consumption of dairy products was, then, adopted in a very limited circle of educated people (Muangcharoen and Panichkriangkrai, 1996). The drastic change in the industry occurred during the early 1980s when the government launched a campaign on fighting malnutrition in children of the rural area. The general public was encouraged to supplement milk and dairy products to their children's daily diet. The campaign was very successful and, to a certain extent, has altered the food habit of the entire nation. Dairy

farming, as a repercussion, has been promoted and provided with strong support from both government and private sectors (Muangcharoen and Panichkriangkrai, 1996).

The strong and continuing government support for the general public awareness program and the school milk program caused the demand for dairy products to continue increasing. The school milk program managed by the National Milk Drinking Campaign Board for schools has greatly increased milk consumption among school children. In addition, there is also a growing living standard in Thailand and a general shift towards changing consumption patterns, which causes the demand for dairy products to increase (Austrade, 2002).

Milk consumption in Thailand is low by world standards. In 2000, per person consumption of all milk (in milk equivalent pounds) on average was only 21.27 kilograms. It was only about one thirteenth of that experienced in the US (FAO Statistics, 2002). Totally, the demand for all milk in Thailand was reported to be 1,335,763 tons annually in 2000. Of this, 37 percent of the total demand was produced domestically in that year. The remainder was imported primarily from Australia and New Zealand (FAO Statistics, 2002). However, around 50 to 60 per cent of all milk products consumed in Thailand are consumed in Bangkok, which has 15 percent of the population. In rural Thailand dairy product consumption averages only 2.5 kilograms per-capita per year (USDEC, 2002).

The growth rate for all milk consumption increased by 14 percent between 1989 and 1994 and was increasing at approximately six percent on average per annum in the 1990s (FAO Statistics, 2002). This was a result of Thai consumers paying more attention to a healthy diet and developing a growing awareness and demand for dairy products such as

milk and yogurt drinks (FAO Statistics, 2002). Although per-capita consumption of butter and cheese was very low in the 1990s, the growth was relatively high. Since 1991, growth of per-capita butter and cheese consumption increased about five and nine percent annually on average. Although consumption of skim milk decreased by 0.07 percent per year, the growth of per-capita whole milk and whey consumption continued to be strong (Table 2).

Table 2. Per-capita consumption of dairy products in Thailand, 1991 through 2000.

Year	All Milk Products ^a	Butter	Cheese	Skim Milk ^a	Whole Milk ^a	Whey ^a
Kilograms						
1991	14.47	0.21	0.02	9.44	4.36	3.07
1992	17.91	0.25	0.02	11.22	5.90	2.09
1993	14.85	0.22	0.02	9.31	4.90	2.31
1994	19.78	0.32	0.03	12.69	6.20	2.12
1995	24.22	0.16	0.02	13.70	9.60	3.01
1996	23.48	0.13	0.03	11.39	11.26	4.08
1997	27.03	0.21	0.02	12.06	14.13	5.95
1998	21.64	0.17	0.02	8.80	12.22	3.85
1999	22.14	0.18	0.02	8.96	12.58	5.23
2000	21.27	0.20	0.03	8.02	12.55	7.15
Average Annual Growth (%)						
1991-2000	5.87	4.80	9.26	-0.07	14.63	14.56

^a Included food and other uses, such as cattle feed.

Source: FAO Statistical Databases, 2002.

In 2000, Thailand's consumption on cheese was about 2000 metric tons. About 40 percent of the cheese consumption was processed cheese, and about 33 percent is pizza cheese. Pizza and retail outlets constituted the largest distribution channels, with about a 30 percent share each (USDEC, 2002).

Thailand's growth in cheese consumption is hampered by consumer price sensitivity. Cheese can be imported more cheaply from abroad than it can be manufactured domestically, and domestic dairy producers are shifting to products that are more profitable than cheese (USDEC, 2002). Domestic dairy companies shifted from cheese toward more profitable fresh milk and drinkable yogurt production. This leaves more opportunities for foreign dairy exporters to take advantage of Thailand's cheese market. Thailand's well-developed feed industry is the second largest user of dairy ingredients, using about 30,000 tons annually, mostly whey permeate and dried sweet whey in swine feed. This is projected to grow by more than 40 percent by the end of 2010. The US, Australia and New Zealand are preferred suppliers (USDEC, 2002).

Imports of Dairy Products

Thailand is a net importer of dairy products, and it is also one of the major importers of dairy products in the world. In 2000, it ranked 16th among all countries in total dairy products imported (in milk equivalent pounds) (Table 3). For individual dairy products, Thailand ranked 21st, 10th, 12th, and 13th in imports of butter, dry whole milk, dry skim milk, and whey, respectively, in 2000 (Tables 4, 5, 6, and 7).

In 2000, Thailand's share of world imports of dairy imports (in milk equivalent pounds) was about 1.67 percent (FAO Statistics, 2002). For butter, dry whole milk, dry skim milk, and whey, Thailand's share of world imports were about 1.0, 3.4, 2.9, and 2.9 percent, respectively. Due to low consumption in cheese, imports of this product was only 1,666 metric tons in 2000, well below 0.1 percent of world imports of cheese (3,093,644 Mt) (FAO Statistics, 2002).

Table 3. Selected countries' total dairy imports (in milk equivalent) and ranking, 1996 through 2000.

	1996		1997		1998		1999		2000	
	Mt	Rank	Mt	Rank	Mt	Rank	Mt	Rank	Mt	Rank
Belgium	3,709,566	4	3,661,389	4	3,936,039	5	4,054,076	5	4,434,830	5
China	1,285,203	13	1,584,260	10	1,531,064	14	1,909,979	10	2,243,373	8
France	3,158,352	5	3,582,977	5	3,966,796	4	4,313,597	4	4,685,094	4
Germany	4,673,712	3	4,796,523	3	4,669,373	3	4,554,466	3	5,024,699	3
Italy	5,210,317	2	5,430,128	2	5,543,997	2	5,509,023	2	5,467,815	2
Mexico	1,912,993	8	2,121,080	8	2,021,171	7	2,217,376	7	2,310,820	7
Netherlands	6,385,562	1	6,061,069	1	5,633,207	1	7,113,321	1	6,297,773	1
Spain	1,450,968	11	1,583,212	11	1,652,153	11	1,661,739	12	1,918,970	10
Thailand	1,130,498	17	1,392,123	15	1,008,043	16	1,077,533	19	1,140,017	16
UK	2,393,522	6	2,476,914	7	2,537,039	6	2,667,275	6	2,710,840	6
USA	1,380,531	12	1,466,204	12	1,873,207	8	1,953,107	9	1,953,940	9
Total	46,861,224	----	34,155,879	----	34,372,089	----	37,031,492	----	38,188,171	----
World	59,844,367	----	62,626,024	----	62,478,356	----	66,593,229	----	68,138,509	----

Source: Food and Agricultural Organization of the United Nations Statistical Databases, 2002.

Table 4. Selected countries' total butter imports and ranking, 1996 through 2000.

	1996		1997		1998		1999		2000	
	Mt	Rank	Mt	Rank	Mt	Rank	Mt	Rank	Mt	Rank
Belgium	100,015	5	103,759	5	101,137	4	100,491	4	112,073	4
Egypt	50,225	7	37,759	8	35,253	9	43,115	8	44,141	7
France	109,919	4	137,381	3	133,670	2	129,819	1	148,302	1
Germany	132,955	1	156,822	2	134,930	1	123,476	2	131,121	2
Italy	48,315	8	52,087	7	60,124	7	46,864	7	41,167	8
Mexico	18,529	14	24,793	9	27,325	10	34,047	9	34,078	9
Morocco	28,050	9	16,457	15	22,104	12	19,818	12	27,357	10
Netherlands	68,782	6	94,022	6	69,879	6	96,933	5	86,887	5
Russian	125,810	2	169,698	1	83,053	5	53,200	6	53,857	6
Thailand	7,622	27	12,750	18	10,535	23	11,043	22	12,619	21
UK	111,619	3	101,210	4	109,287	3	122,076	3	122,922	3
Total	801,841	---	906,738	---	787,297	---	763,043	---	814,524	---
World	1,203,892	---	1,321,235	---	1,213,138	---	1,217,796	---	1,261,586	---

Source: Food and Agricultural Organization of the United Nations Statistical Databases, 2002.

Table 5. Selected countries' total dry whole milk imports and ranking, 1996 through 2000.

	1996		1997		1998		1999		2000	
	Mt	Rank	Mt	Rank	Mt	Rank	Mt	Rank	Mt	Rank
Algeria	67,865	3	88,882	2	103,724	2	105,507	2	96,340	2
Belgium	66,029	5	53,781	9	54,362	7	46,786	10	57,289	7
Brazil	115,586	1	101,169	1	133,742	1	145,983	1	108,609	1
China	58,981	7	68,234	5	62,598	5	83,985	4	83,011	4
Malaysia	53,152	9	66,000	6	44,857	12	54,203	6	57,696	6
Netherlands	94,413	2	77,736	3	71,376	4	101,713	3	89,672	3
Philippines	36,476	11	39,656	12	40,511	13	36,958	12	56,072	8
Sri Lanka	35,027	12	37,364	13	48,788	10	48,308	9	49,070	9
Thailand	50,430	10	69,180	4	50,237	8	49,791	8	48,249	10
Venezuela	66,321	4	51,842	10	84,115	3	52,042	7	64,759	5
Total	644,280	---	653,844	---	694,310	---	725,276	---	710,767	---
World	1,281,604	---	1,357,158	---	1,401,542	---	1,439,868	---	1,418,968	---

Source: Food and Agricultural Organization of the United Nations Statistical Databases, 2002.

Table 6. Selected countries' total dry skim milk imports and ranking, 1996 through 2000.

	1996		1997		1998		1999		2000	
	Mt	Rank	Mt	Rank	Mt	Rank	Mt	Rank	Mt	Rank
Algeria	58,468	9	78,893	5	87,040	4	71,272	8	91,339	5
Belgium	51,781	12	43,521	11	43,155	13	45,150	15	71,900	9
China	37,975	15	40,945	13	44,813	12	51,150	13	56,862	10
France	33,446	18	28,453	20	42,636	14	63,791	9	84,735	6
Indonesia	45,916	14	41,034	12	33,133	18	98,348	5	82,574	7
Italy	126,614	3	127,504	3	126,494	2	121,779	3	109,008	4
Malaysia	78,151	5	75,000	6	59,596	6	71,879	7	74,721	8
Mexico	126,700	2	132,849	2	102,600	3	125,137	2	129,078	2
Netherlands	216,085	1	224,214	1	162,459	1	230,438	1	205,379	1
Philippines	83,704	4	98,050	4	77,637	5	86,729	6	111,455	3
Thailand	67,174	8	70,991	8	53,041	9	56,036	11	53,024	12
Total	926,014	---	961,454	---	832,604	---	1,021,709	---	1,070,075	---
World	1,716,935	---	1,727,457	---	1,607,154	---	1,879,505	---	1,805,896	---

Source: Food and Agricultural Organization of the United Nations Statistical Databases, 2002.

Table 7. Selected countries' total all whey imports and ranking, 1996 through 2000.

	1996		1997		1998		1999		2000	
	Mt	Rank	Mt	Rank	Mt	Rank	Mt	Rank	Mt	Rank
Belgium	52,959	4	55,759	3	58,099	3	54,842	4	56,299	5
Canada	43,224	6	36,554	10	37,996	9	48,375	6	62,441	3
China	72,882	2	89,359	2	78,819	2	97,717	2	140,057	2
France	29,238	10	40,931	7	50,588	5	49,463	5	59,048	4
Germany	66,975	3	45,070	5	48,759	6	46,114	7	40,077	9
Italy	40,845	7	37,598	8	42,637	8	37,584	10	42,029	8
Japan	32,343	9	37,481	9	37,351	10	41,157	9	39,522	10
Mexico	48,636	5	49,174	4	56,642	4	55,947	3	55,031	6
Netherlands	251,310	1	217,543	1	248,474	1	292,637	1	252,099	1
Spain	37,147	8	43,362	6	44,869	7	44,225	8	49,109	7
Thailand	16,741	15	25,589	12	16,222	16	22,832	15	32,434	13
Total	692,300	----	678,420	----	720,456	----	790,893	----	828,146	----
World	886,132	----	902,409	----	973,881	----	1,054,173	----	1,124,090	----

Source: Food and Agricultural Organization of the United Nations Statistical Databases, 2002.

Thailand is a net importer of dairy products. Domestic milk production is not sufficient to meet consumer needs, falling short of demand by about 60 percent in 2000 (FAO Statistics, 2002). In the 1990s, the average growth rate of all dairy products (in milk equivalent pounds) was about seven percent (Table 8). A significant increase of imports occurred in 1994, when imports increased from 764,734 metric tons in 1993 to 1,012,396 metric tons in 1994, for an annual increase of 32.4 percent. The second largest increase occurred in 1997, when imports increased from 1,130,489 metric tons in 1996 to 1,392,123 metric tons in 1997, for an annual growth of 23 percent. The 1997 Asian currency crisis hit Thailand hard, and dairy imports decreased to about one million metric tons in 1998 (Table 8).

Table 8. Thailand dairy imports, 1991 through 2000.

Year	Milk Equivalent	Butter	Cheese	Dry Whole Milk	Dry Skim Milk	Whey
Metric Tons						
1991	721,718	11,903	1,185	18,286	50,905	11,715
1992	842,853	14,097	1,365	24,744	62,147	7,420
1993	764,734	12,378	1,135	24,656	52,375	8,530
1994	1,012,396	18,541	1,470	30,891	71,749	7,819
1995	1,130,684	9,135	1,607	42,192	79,919	11,813
1996	1,130,498	7,622	1,515	50,430	67,174	16,741
1997	1,392,123	12,750	1,756	69,180	70,991	25,589
1998	1,008,043	10,535	1,314	50,237	53,041	16,222
1999	1,077,533	11,043	1,382	49,791	56,036	22,832
2000	1,140,017	12,619	1,666	48,249	53,024	32,434
Average Annual Growth (%)						
1991-2000	6.8	7.6	7.4	13.6	2.7	17.1

Source: FAO Statistical Databases, 2002.

To satisfy the consumer's needs for dairy products, Thailand imported 12,619 metric tons of butter and 1,666 metric tons of cheese in 2000 (Table 8). Butter and cheese imports into Thailand increased, both with an annual growth rate at about eight percent.

The strongest growth occurred in the dry whole milk and whey market, where growth on average was 13.6 and 17.1 percent, respectively, in the 1990s (Table 8). Dry whole milk imports increased during the first half of the 1990s, but trended downward since 1997 from 69,180 metric tons in 1997 to 48,249 metric tons in 2000 (Table 8). Dry skim milk imports fluctuated during the 1990s, reaching a high of 79,919 metric tons in 1995 and a low of 50,905 metric tons in 1991 (Table 8).

Exports of Dairy Products from the U.S.

In the 1990s, Thailand's annual butter and cheese imports from the US fluctuated. The US shares of the total imports were quite low (Table 9). Total cheese imports into Thailand jumped from 1,666 for 2000 to 2,540 tons in 2001, three-quarters supplied from Oceania. The US was the fourth largest importer, with a seven percent share (USDEC, 2002).

Thailand needs to import milk powder as raw material for domestic dairy production and other related industries. As Thailand does not manufacture whole dry milk (WDM) and nonfat dry milk (NFDM), all consumption has been met by the imports. The US market share of NFDM imports into Thailand is less than 5.0 percent, due mainly to intense market competition from cheaper sources like Australia, New Zealand, the Czech Republic, and Poland. In 2000, the share of the US nonfat dry milk was about four percent of total skim milk powder imports (Table 9).

The US market share of WDM imports into Thailand was low during the 1990s, due mainly to competition from Australia, New Zealand, the European countries. During the period 1995 to 2000, the US virtually did not export whole dry milk to the country (Table 9). Additionally, there were no imports of the US whole milk powder in 2002 (USDA-FAS, 2002).

A growth in dairy product sales should favor the NFDM imports in 2002. This trend is reflected by a 40 percent increase over the first 8 months of 2002. However, the possible increase in actual imports through the whole year are still doubtful because the national dairy cooperative has requested the government to hold the planned additional quota allocation of 18,000 tons, claiming that large processing plants refused to buy all domestic supplies in October. Despite anticipation of continued growth in the dairy products market, the conservative administration of the import quota should limit NFDM imports to 60,000 to 70,000 metric tons in 2003 (USDA-FAS, 2002).

Moreover, the US started to dominate the whey market in the late 1990s, where the US market share of whey imports into Thailand has been as much as about 44 percent. In 2000, the US share of whey imports was 42 percent, around 13,629.1 metric tons (Table 9).

Table 9. Selected dairy products exported from the US to Thailand, 1991 through 2000.

Year	Butter ^a	% of All Butter Imports ^b	Cheese ^a	% of All Cheese Imports ^b	Whole Dry Milk ^a	% of All WDM Imports ^b	Non- Fat Dry Milk ^a	% of All NFDM Imports ^b	Whey ^a	% of Whey Imports ^b
	Mt	%	Mt	%	Mt	%	Mt	%	Mt	%
1991	---	---	---	---	13.0	0.1	3,834.4	7.5	4,160.0	35.5
1992	641.0	4.5	9.7	0.7	1.9	0.0	959.7	1.5	1,617.7	21.8
1993	---	---	0.9	0.1	259.3	1.1	---	---	1,707.5	20.0
1994	84.6	0.5	5.3	0.4	61.1	0.2	---	---	639.8	8.2
1995	---	---	---	---	2.8	0.0	97.3	0.1	2,651.2	22.4
1996	---	---	26.1	1.7	0.0	0.0	927.5	1.4	2,941.6	17.6
1997	---	---	89.8	5.1	0.0	0.0	6,026.3	8.5	5,168.3	20.2
1998	---	---	42.1	3.2	0.0	0.0	3,616.4	6.8	5,134.2	31.6
1999	---	---	16.3	1.2	4.6	0.0	3,230.2	5.8	10,148.5	44.4
2000	---	---	89.1	5.3	0.0	0.0	2,215.2	4.2	13,629.1	42.0

^a Source: United States Department of Agriculture Foreign Agricultural Service , 2003.

^b Data from Table 8.

Trade Policy and Tariff

The government of Thailand has concluded that its dairy industry is an important facet of the country's agricultural economy and that steps should be taken to strengthen the industry. As a result, the Thailand's dairy industry has grown under protection from competition provided by trade barriers, such as quantitative and tariff restrictions on imported products. Control on the import, marketing, distribution and sale of dairy products in Thailand is shared between a number of government bodies, including the Food and Drug Administration, the Customs Department the Ministry of Agriculture and the Ministry of Commerce (Austrade, 2002).

Customs duties range from 25 to 60 per cent on dairy products, plus other business and municipal taxes. There was also a local content scheme applying to imports of milk and milk substitutes (Butter oil, SMP, WMP). These regulations require importers to purchase two kilograms of locally produced raw milk for every kilogram of imported milk equivalent. However, consumption has risen sharply over the past decade, partly due to government efforts to promote milk use through subsidized schools programs, as well as rising incomes. The local content rules have eased recently as local supplies have not been able to keep up with demand (Falvey, 1999).

Thailand has been a World Trade Organization (WTO) member since 1995. Under WTO agreements, Thailand is required to open up its market to 23 products, including skim milk powder (SMP). The Thai dairy industry is heavily protected by tariffs and the FDA has strict import registration regulations, which can take up to six months to complete (Austrade, 2002).

Dairy products and in particular skimmed milk powder is a major import item. Thailand controls nonfat dry milk imports through the quota allocation system, which is subject to its WTO commitments. A tariff of five percent is levied on imports, but quantities exceeding the quota could face a 231 percent tariff, if the system were applied. Currently, all imports (in- and out-of-quota) enter at in-quota tariff rates (WTO, 1999). Thailand is scheduled to increase its minimum import quotas for nonfat dry milk from 45,000 metric tons in 1995 to 55,000 metric tons in 2004. A second tariff quota has been opened for non-concentrated milk and cream (USDA-FAS, 2002).

Thailand is also committed to the WTO to open a quota of 2,320 metric tons of unprocessed milk at a 20 percent tariff, with a rate of 43 percent for amounts exceeding the quota. The quota for ready-to-drink milk is 26.7 metric tons taxed at 20 percent. Further imports will be taxed at 87.6 percent.

Milk importers are required to register and obtain an import permit for each shipment from the Ministry of Commerce prior to import. It is expected that by 2004 the quota for ready-to-drink milk and unprocessed milk will increase to 2,400 metric tons, with an in-quota tariff rate of 20 percent (WTO, 2002).

Under the WTO agreement, the cheese import duty is 42 percent. The duty on raw milk is 20 percent, 44 percent applies to amounts that exceed the quota, which is 2,320 metric tons. Imported dairy products also attract a seven percent VAT, a business tax (1.5 percent for milk powder, butter oil and whey powder, nine percent for other dairy products) and a municipal tax, which is 10 percent of the business tax amount (WTO, 1999).

VIETNAM

Overview of Vietnam

Vietnam is located in Southeastern Asia, bounded by Laos to the west, the South Chinese Sea to the east, and China to the north. The total area of Vietnam is 329,560 square kilometers, slightly larger than New Mexico. The population was estimated to be 81.1 million, with a 1.43 percent growth rate in 2001 (CIA World Factbook, 2002).

Vietnam is a densely populated country. Substantial progress was achieved from 1986 to 1996 in moving forward from an extremely low starting point. The growth rate of the economy averaged around nine percent per year from 1993 to 1997. The 1997 Asian financial crisis highlighted the problems in the Vietnamese economy. Gross domestic product (GDP) growth of 8.5 percent in 1997 fell to six percent in 1998 and five percent in 1999. Growth then rose to 6.8 percent in 2000 and dropped back to 4.7 percent in 2001 against the background of a global recession. In 2001, Vietnam's GDP was approximately \$168.1 billion (purchasing power parity), with per-capita purchasing power parity of \$2,100. Agriculture accounted for 25 percent of its total GDP (CIA World Factbook, 2002).

Vietnam's total exports in 2001 were \$15.1 billion, of which the US received 5.1 percent. Vietnam's total imports in 2001 were \$15.3 billion. The main trading partners are Japan, China, Singapore, Thailand, and the US. The Vietnamese government has moved slowly in implementing the structural reforms to revitalize the economy and produce competitive, export-oriented industries. By the end of 2001, the US-Vietnam

Bilateral Trade Agreement went into force, and is expected to significantly increase Vietnam's imports from the US (CIA World Factbook, 2002).

Dairy Industry in Vietnam

Production of Dairy Products

Vietnam has a very small dairy industry. The dairy production sector is new. Since 1993, HVA International, a Dutch management and consultancy firm, has been involved in the development of dairy farming in Vietnam. In 1993, HVA International conducted a feasibility study for the establishment of a milk collection scheme and a dairy development program to stimulate the increase of raw milk production. Based on this study, the Dairy Farming Development Project was established (Vietnam Ministry of Agriculture, 2002). The introduction of a payment system with bonuses and penalties related to milk quality aspects has stimulated the production of high quality milk (Vietnam Ministry of Agriculture, 2002).

In recent years, dairy cattle play an important role in livestock production. Dairy cattle are given credit for changing the structure of animal breeds and increasing the total economic income of farmers. In 2001, Vietnam's total dairy cattle population was about 50,000 head. The annual increase rate of the dairy herd was more than 20 percent in 2001. Total domestic milk production in 2002 was 61,000 metric tons (FAO Statistics, 2002), but it only met about 10 percent of the domestic demand for dairy products.

Vietnam's dairy cattle development and milk production have market potential and a bright future (Tuyen and Giao, 2002).

However, dairy development in Vietnam faces many production and processing constraints, such as inefficiencies and a lack of basic infrastructure. Milk productivity in Vietnam is still limited when compared with the other countries. The government has paid more attention to milk production. The productivity of milk cows has improved in recent years. In 2000, the milk production per cow in Vietnam was about 3.5 metric tons per year. The main objectives of the dairy development plan of Vietnam from 2002 to 2010 is to increase milk production to meet more domestic dairy product demand and improve the income for rural farmers. Government policies have able to cut the importing milk bill and to support local farmers in setting up a domestic dairy industry. To achieve these goals, the number of dairy cattle in 2005 and 2010 would need to increase to 100,000 and 200,000 head respectively (Tuyen and Giao, 2002).

Milk production in Vietnam was increasing rapidly during the 1990s. However, the requirement of domestic consumption increased even faster, so Vietnam's milk production could not satisfy the domestic demand. Total milk production was 54,456 metric tons in 2000 (Table 1). Vietnam doesn't produce other dairy products, such as butter and cheese. Every year, about 90 percent of milk and dairy products have to be imported from abroad to meet the domestic consumption (Tuyen and Giao, 2002).

Table 1. Vietnam milk and selected dairy products production, 1991 through 2000.

Year	Cow Milk, Whole, Fresh	Butter and Ghee	Cheese (All Kinds)	Skim Milk, Dry	Whey
			Metric Tons		
1991	36,000	---	---	---	---
1992	36,800	---	---	---	---
1993	38,400	---	---	---	---
1994	39,200	---	---	---	---
1995	40,800	---	---	---	---
1996	42,400	---	---	---	---
1997	31,274	---	---	---	---
1998	32,863	---	---	---	---
1999	39,692	---	---	---	---
2000	54,456	---	---	---	---

Source: FAO Statistical Databases, 2002.

Demand for Dairy Products

In Vietnam, milk drinking has been regarded as infant food by tradition. It is not a food for grown ups. But over the last decade, rising incomes and increasing numbers of tourists have boosted the demand for milk, and an increasing availability of products is leading to a rise in dairy consumption. The Government policy seeking self-sufficiency in dairy production, and promoting dairy product consumption, will also hasten the growth in dairy demand (Austrade, 2002).

Increasing numbers of Vietnamese are adopting a more varied diet, placing greater demand on milk and dairy products. Milk consumption per-capita increased at a rate of 20.7 percent on average every year since 1991, ranging from 2.08 kilograms to 7.24 kilograms per-capita (Table 2). In 2000, milk consumption per-capita was 4.68 kilograms

(Table 2). Vietnamese people consume very little butter and cheese. In the 1990s, per-capita consumption of butter and cheese were well under 0.1 kilograms (Table 2). In 2000, Vietnam's total butter and cheese consumption was 4,400 metric tons and 1,300 metric tons respectively (FAO Statistics, 2002). Since 1991, the average growth rate in per-capita consumption of whole milk and skim milk was 32.0 and 2.6 percent respectively (Table 2).

Table 2. Per-capita consumption of dairy products in Vietnam, 1991 through 2000.

Year	All Milk ^a	Butter	Cheese	Skim Milk ^a	Whole Milk ^a	Whey ^a
	Kilograms					
1991	2.08	0.05	---	1.11	0.91	---
1992	2.22	0.04	---	1.25	0.88	---
1993	3.24	0.06	0.01	2.16	0.90	0.01
1994	6.77	0.08	0.01	5.52	0.90	0.06
1995	3.69	0.10	0.02	2.55	0.90	0.32
1996	4.16	0.07	0.01	3.01	0.92	0.32
1997	6.27	0.07	0.01	5.17	0.75	0.62
1998	7.24	0.06	0.01	6.08	0.77	0.20
1999	3.18	0.07	0.01	2.07	0.91	0.42
2000	4.68	0.06	0.02	3.29	1.09	0.86
Average Annual Growth (%)						
1991-2000	20.7	5.2	21.4 ^b	32.0	2.6	167.8 ^b

^a Included food and other uses, such as cattle feed.

^b Average annual growth rate (%) 1993 through 2000.

Source: FAO Statistical Databases, 2002.

Growth in per-capita whey consumption continued to be strong. The average increase was 167.8 percent annually in the 1990s (Table 2). Although Vietnam is the largest producer of pork in Southeast Asia, the country's feed industry is still in early stages of

development. Dairy ingredients used in swine feeds, such as dry whey and lactose, is not used extensively in the feed industry. The amount used as feed ingredients was at 8,000 tons in 2002, and is projected to grow by 80 percent by the end of the decade (USDEC, 2002).

To satisfy the domestic consumption on milk and dairy products, Vietnam has to import as much as 90 percent of the total consumption. A report on the development potential of the local dairy sector conducted by the Ministry of Trade multilateral trade policy assistance program found that 90 per cent of fresh milk substitutes were being imported, mostly in the form of skimmed milk and whole milk powder (Vietnam Ministry of Agriculture, 2002).

Imports of Dairy Products

Vietnam is a net importer of dairy products. Increased domestic demand of dairy products has caused about 90 percent of milk and dairy products to be imported every year (Tuyen and Giao, 2002). Vietnam is not a big importer of dairy products. In 2000, its total dairy imports (in milk equivalent pounds) were only 0.4 percent of the total world imports of dairy products (FAO Statistics, 2002), and was not ranked in the top 30 countries of total milk imports (Table 3). However, for individual dairy products, Vietnam ranked 22nd and 26th in imports of dry skim milk and whey respectively in 2000 (Table 4, Table 5).

In 2000, Vietnam's share of total world imports of dry skim milk was 1.4 percent. For whey, Vietnam's share of total world imports was about 0.5 percent (FAO Statistics, 2002). Due to the low consumption of butter and cheese, imports of these products were only 4,400 metric tons and 1,300 metric tons respectively in 2000 (FAO Statistics, 2002), well below 0.5 percent of total world imports of butter (1,261,586 metric tons) and cheese (3,093,644 metric tons) (FAO Statistics, 2002).

Table 3. Selected countries' total dairy imports (in milk equivalent) and ranking, 1996 through 2000.

	1996		1997		1998		1999		2000	
	Mt	Rank	Mt	Rank	Mt	Rank	Mt	Rank	Mt	Rank
Belgium	3,709,566	4	3,661,389	4	3,936,039	5	4,054,076	5	4,434,830	5
China	1,285,203	13	1,584,260	10	1,531,064	14	1,909,979	10	2,243,373	8
France	3,158,352	5	3,582,977	5	3,966,796	4	4,313,597	4	4,685,094	4
Germany	4,673,712	3	4,796,523	3	4,669,373	3	4,554,466	3	5,024,699	3
Italy	5,210,317	2	5,430,128	2	5,543,997	2	5,509,023	2	5,467,815	2
Mexico	1,912,993	8	2,121,080	8	2,021,171	7	2,217,376	7	2,310,820	7
Netherlands	6,385,562	1	6,061,069	1	5,633,207	1	7,113,321	1	6,297,773	1
Spain	1,450,968	11	1,583,212	11	1,652,153	11	1,661,739	12	1,918,970	10
UK	2,393,522	6	2,476,914	7	2,537,039	6	2,667,275	6	2,710,840	6
USA	1,380,531	12	1,466,204	12	1,873,207	8	1,953,107	9	1,953,940	9
Vietnam	230,284	42	364,338	29	398,526	28	187,592	47	274,922	38
Total	31,791,010	----	33,128,094	----	33,762,572	----	36,141,551	----	37,323,076	----
World	59,844,367	----	62,626,024	----	62,478,356	----	66,593,229	----	68,138,509	----

Source: Food and Agricultural Organization of the United Nations Statistical Databases, 2002.

Table 4. Selected countries' total dry skim milk imports and ranking, 1996 through 2000.

	1996		1997		1998		1999		2000	
	Mt	Rank	Mt	Rank	Mt	Rank	Mt	Rank	Mt	Rank
Algeria	58,468	9	78,893	5	87,040	4	71,272	8	91,339	5
Belgium	51,781	12	43,521	11	43,155	13	45,150	15	71,900	9
China	37,975	15	40,945	13	44,813	12	51,150	13	56,862	10
France	33,446	18	28,453	20	42,636	14	63,791	9	84,735	6
Indonesia	45,916	14	41,034	12	33,133	18	98,348	5	82,574	7
Italy	126,614	3	127,504	3	126,494	2	121,779	3	109,008	4
Malaysia	78,151	5	75,000	6	59,596	6	71,879	7	74,721	8
Mexico	126,700	2	132,849	2	102,600	3	125,137	2	129,078	2
Netherlands	216,085	1	224,214	1	162,459	1	230,438	1	205,379	1
Philippines	83,704	4	98,050	4	77,637	5	86,729	6	111,455	3
Vietnam	22,300	22	38,800	14	46,300	11	16,000	27	25,700	22
Total	881,140	---	929,263	---	825,863	---	981,673	---	1,042,751	---
World	1,716,935	---	1,727,457	---	1,607,154	---	1,879,505	---	1,805,896	---

Source: Food and Agricultural Organization of the United Nations Statistical Databases, 2002.

Table 5. Selected countries' total whey imports and ranking, 1996 through 2000.

	1996		1997		1998		1999		2000	
	Mt	Rank	Mt	Rank	Mt	Rank	Mt	Rank	Mt	Rank
Belgium	52,959	4	55,759	3	58,099	3	54,842	4	56,299	5
Canada	43,224	6	36,554	10	37,996	9	48,375	6	62,441	3
China	72,882	2	89,359	2	78,819	2	97,717	2	140,057	2
France	29,238	10	40,931	7	50,588	5	49,463	5	59,048	4
Germany	66,975	3	45,070	5	48,759	6	46,114	7	40,077	9
Italy	40,845	7	37,598	8	42,637	8	37,584	10	42,029	8
Japan	32,343	9	37,481	9	37,351	10	41,157	9	39,522	10
Mexico	48,636	5	49,174	4	56,642	4	55,947	3	55,031	6
Netherlands	251,310	1	217,543	1	248,474	1	292,637	1	252,099	1
Spain	37,147	8	43,362	6	44,869	7	44,225	8	49,109	7
Vietnam	1,775	32	3,467	27	1,100	42	2,400	32	5,000	26
Total	677,334	----	656,298	----	705,334	----	770,461	----	800,712	----
World	886,132	----	902,409	----	973,881	----	1,054,173	----	1,124,090	----

Source: Food and Agricultural Organization of the United Nations Statistical Databases, 2002.

The lack of domestically produced milk means that most of the milk and dairy products have to be imported from other countries. In Vietnam, most dairy imports are in the form of skim milk and whole milk powder. Most imported products are then reconstituted to produce a number of different products, including ultra high temperature (UHT) and pasteurized milk, flavored milk, and condensed milk (Vietnam Ministry of Agriculture, 2002).

In the 1990s, the average growth rate of all dairy product imports in milk equivalent pounds was 41.5 percent. A significant increase occurred in 1994 when imports increased from 144,788 metric tons in 1993 to 344,440 metric tons in 1994, for an annual increase of 138 percent. However, the 1997 Asian financial and currency crisis hit Vietnam quite hard, and the lowered income caused dairy consumption to decrease. A decrease of all dairy imports occurred in 1999, when imports decreased from 398,526 metric tons in 1998 to 187,592 metric tons, an annual decrease of 53 percent. In 2000, Vietnam's total dairy imports were 274,922 metric tons (Table 6).

Vietnam does not produce butter, cheese, dry skim milk, or whey. To satisfy the consumer's needs, all of those dairy products have to be imported. In 2000, Vietnam imported 4,400 metric tons of butter and 1,300 metric tons of cheese (Table 6). In the 1990s, the average annual growth rates for butter and cheese were 20 and 39.4 percent respectively (Table 6). The growth rate was relatively strong compared to other countries in the S.E. Asia. In the 1990s, the average growth rates of butter and cheese in Thailand were only 7.6 and 7.4 percent respectively (FAO Statistics, 2002).

Table 6. Vietnam dairy imports, 1991 through 2000.

Year	Milk Equivalent	Butter	Cheese	Dry Skim Milk	Whey
		Metric Tons			
1991	84,164	3,314	100	7,460	---
1992	84,130	2,700	240	8,586	---
1993	144,788	4,000	600	15,200	30
1994	344,440	5,500	730	39,500	330
1995	211,480	7,300	1,100	18,600	1,700
1996	230,284	5,400	780	22,300	1,775
1997	364,338	5,000	798	38,800	3,467
1998	398,526	4,200	784	46,300	1,100
1999	187,592	5,700	880	16,000	2,400
2000	274,922	4,400	1,300	25,700	5,000
Average Annual Growth (%) 1991-2000	41.5	20.0	39.4	47.4	239.0 ^a

^a Average annual growth rate (%), 1993 through 2000.

Source: FAO Statistical Databases, 2002.

Vietnam imported 25,700 metric tons of dry skim milk in 2000. The growth rate for dry skim milk on average in the 1990s was 47.4 percent (Table 6). The growth rate of whey imports was the most impressive among dairy products. The growth rate was high as 239.0 percent annually in the 1990s. Although the amount of Vietnam's total whey imports were not very high, with the development of its feed industry and tariff cut, whey imports would increase significantly in the near future (USDEC, 2002). In 2000, Vietnam's total whey imports were 5,000 metric tons (Table 6).

Exports of Dairy Products from the U.S.

In the 1990s, Vietnam did not import much butter and cheese from the US, and the US share was very small (Table 7). Most of the butter imports were from Australia, New Zealand, and France (Austrade, 2002). In 2000, Vietnam's total cheese imports were 1,300 metric tons, most of it imported from France. New Zealand and the US were minor suppliers (USDEC, 2002). The US share was only 0.3 percent in 2000 (Table 7).

Table 7. Selected dairy products exported from the US to Vietnam, 1991 through 2000.

Year	Butter ^a	% of All Butter Imports ^b	Cheese ^a	% of All Cheese Imports ^b	Non-Fat Dry Milk ^a	% of All NFDM Imports ^b	Whey ^a	% of Whey Imports ^b
	Mt	%	Mt	%	Mt	%	Mt	%
1991	---	---	---	---	---	---	---	---
1992	---	---	---	---	---	---	---	---
1993	---	---	---	---	---	---	---	---
1994	2.3	0.04	0.2	0.03	---	---	79.2	24.0
1995	19.1	0.3	0.6	0.1	38.3	0.2	1248.9	73.5
1996	---	---	---	---	56.0	0.3	804.1	45.3
1997	---	---	---	---	3,564.2	9.2	1322.0	38.1
1998	---	---	---	---	3,759.2	8.1	722.9	65.7
1999	---	---	---	---	2,869.3	17.9	1535.0	64.0
2000	---	---	3.0	0.2	3,069.2	11.9	1263.3	25.3

^a Source: United States Department of Agriculture Foreign Agricultural Service, 2003.

^b Data from Table 6.

Vietnam does not produce nonfat dry milk. All consumption has been met by imports. Vietnam needs to import nonfat dry milk as a raw material for the food processing industry. The US market share of nonfat dry milk imports increased in the 1990s. In 2000, the share of the US nonfat dry milk was about 11.7 percent of total imports (Table

7). Although Oceania countries are the main sources for nonfat dry milk imports, the US has opportunities to increase its share due to the implementation of the US-Vietnam Bilateral Trade Agreement and the following tariff cut (USDA-FAS, 2002).

The US started to dominate Vietnam's whey market in the late 1990s, where the US market share of whey imports has been as much as 65.7 percent. In 2000, the US share of whey imports was 25.3 percent, around 1263.3 metric tons (Table 7).

Trade Policy and Tariff

To make Vietnam less reliant on imported dairy products, the Vietnamese government has a ten-year master plan to expand its dairy industry starting in 2001. On the other hand, Vietnam's dairy production needs strong protection in preparation for the World Trade Organization accession, because Vietnam's dairy sector is one of the smallest in the world. The government concluded that the sector could not compete with imports in the absence of some degree of protection (Vietnam Ministry of Trade, 2002).

The Vietnamese government has admitted the importance of further liberalizing the economy and committing to global trade. As a result, Vietnam has actively participated in regional and global economic organizations such as AFTA and APEC. It started to negotiate for the WTO accession in 1995 (WTO, 2002). In 2001, Vietnam signed a Bilateral Trade Agreement (BTA) with the US. Under the agreement, Vietnam will sharply lower tariffs and other trade barriers on a wide range of American products that include dairy products. The agreement gives Vietnam the same trade access that the

United States sets for its other trading partners. In return, Vietnam must open its state-controlled markets to foreign competition and international standards (USDA-FAS, 2002).

Any business in Vietnam licensed to handle foodstuffs can import by its own right, but sometimes imports have to be through state-owned companies in order to handle Customs procedures. Under the preferential tax rate (PTR), there are 67 countries that have most favored nation (MFN) status with Vietnam, including the US, Australian, and New Zealand, etc. In addition, a value added tax (VAT) of 10 per cent applies across the board (Austrade, 2002). Current duties range from 5 to 30 percent on dairy products. The tariff on butter oil is five percent. The tariff on butter and other fat derived from milk is 20 percent. The tariff on unconcentrated milk is 20 percent. The tariff on cheese is 30 percent. The tariff on skimmed and whole milk powder is 15 percent (USDA-FAS, 2002).

SUMMARY

Over the last decade, the world total dairy imports increased. Since the establishment of the UR GATT in 1995, the share of EU dairy exports has declined, due in part to the impact of export subsidy limitations. As trade barriers and export subsidy levels are further phased down and world demand increases, the US is in a good position to gain greater access to the international markets. Although Australia and New Zealand are expected to be the primary gainers from the new trade environment, the US has the production capacity to be a major world supplier (Washington, 2000).

USDA support for the Indonesian school milk programs, initiated in 1999, has had a positive impact on child nutrition. These food aid programs have been positive for the US dairy industry, as programs have provided exposure for US dairy products in the Indonesian market among importers and manufacturers. Since the US dairy products are recognized as high quality, the increasing consumption of dairy products means dairy product imports from the US will increase as well. Given that Indonesia is a price sensitive market, the ability of US suppliers to take advantage of this opportunity will depend on their ability to provide competitively priced dairy products (USDA-FAS, 2002).

The Malaysian dairy industry is willing to import dairy ingredients from any source as long as the price is competitive and the quality is good. Although Australia and New Zealand enjoy the cost advantages of price and transportation, opportunities still exist for US producers to supply skim milk powder, full cream milk powder and dried whey

powder to the dairy industry in Malaysia. US dairy products are readily accepted by many Malaysian consumers. This is especially true of the affluent and relatively young segment of the population as well as the more than 100,000 Malaysians who have studied abroad. Supermarket buyers, particularly those in upscale outlets, are willing to try most new US food items, including dairy products, as long as they believe that the taste and other product characteristics appeal to Malaysian consumers. US dairy products must overcome their higher prices, the strong international and local brand names already built through advertising, and possibly limited distribution of US products (USDA-FAS, 2002).

The Philippine dairy industry is very small, and every year over 99 percent of dairy product consumption is imported. Although Australia and New Zealand enjoy the cost advantages of price and transportation, opportunities exist for US dairy producers to supply processed cheese, skim milk powder, and dried whey powder to the dairy products industry in the Philippines. US cheese is better known than those of the competitors in the Philippine market and has a positive image. US exporters can build on the US position as the Philippines' third largest cheese supplier (USDEC, 2002).

In Thailand, market opportunities for U.S. dairy products will be in the value-added dairy ingredients category such as whey protein concentrates, high calcium milk minerals, and lactose. Lower cost dairy ingredients such as sweet whey powder, whey permeate and lactose are also needed to reduce production costs. The USDEC representative for Southeast Asia has been active in promoting U.S. dairy products in the

region, especially dairy food ingredients. Because of these promotions, the US has become the leading supplier of whey to Thailand since 1995. Its market share was about 50 percent in 2001 and 2002 (USDA-FAS, 2002).

Given the growth in consumption and the higher living standard, Thailand will likely become an even larger importer of dairy products. Import growth would benefit from significant tariff reduction. In addition, the imports of dairy products from foreign countries tend to increase, due to the increasing demand from the tourists and business visitors. Although Oceania countries enjoy the cost advantages of price and transportation, and are expected to be the primary gainers of the significant tariff reduction and freer trade, opportunities for the US export growth still exist. In terms of whey products, the US has the advantage of competitive prices and the potential to expand US exports to dairy feed ingredient markets in Thailand. For cheese, the growth of quick service pizza restaurants also offers great opportunity for the US cheese exporters (USDEC, 2002).

Market opportunities for US dairy products will increase, as Vietnam is in the process of joining the WTO and has a bilateral trade agreement with the US. While the market for consumer dairy products is still in its infancy, changes in taste, demand for higher quality and, growing incomes of the Vietnamese in the urban areas mean that demand for imported dairy products is growing steadily. The Vietnamese prefer American products, and the US dairy products enjoy a good reputation and are reasonably priced compared to other imported products into Vietnam.

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