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**BABCOCK INSTITUTE DISCUSSION PAPER
NO. 2005-3**

THE DAIRY SECTOR OF POLAND: A COUNTRY STUDY

The Poland Country Study Team

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Finally, we extend a special thank you to Anna Wieliecka, our interpreter, tourist guide, historian, negotiator and good friend during our visit to Poland.

THE DAIRY SECTOR OF POLAND: A COUNTRY STUDY

The Poland Country Study Team*

INTRODUCTION

This is the second of a planned series of Babcock Institute reports on the dairy sectors of major dairy countries. These are comprehensive studies summarizing information relating to the competitiveness and likely future strategies of dairy producers, processors, exporters and government agencies in the selected country. This information is intended to help U.S. firms and policymakers develop appropriate strategies and policies to exploit export opportunities and to accommodate the actions of foreign dairy companies and foreign governments in exporting countries.

New Zealand and Australia were selected as the first study region in 2004. Our observations and conclusions were reported in Babcock Institute Discussion Paper No. 2004-3, *The Dairy Sectors of New Zealand and Australia: A Regional Study*.

In 2005, we selected Poland as a study country for a number of reasons: Poland is, by far, the largest dairy producer among the ten new countries that became part of the European Union (EU) on May 1, 2004 and ranks fourth in milk production within the expanded EU-25. Poland's dairy industry has been restructuring since the political reforms associated with the breakup of the former Soviet Union in the early 1990s. Prior to its accession into the EU, Poland was a significant dairy exporter, especially of milk powders and, more recently, cheese. EU Common Agricultural Policy (CAP) milk production quotas and other CAP programs will likely accelerate restructuring at the farm and processing levels and will certainly alter the nature of Poland's dairy trade.

A multi-disciplinary team was assembled to conduct this study. Team members and their specialties included J. Russell (Rusty) Bishop, Director of the University of Wisconsin-Madison Center for Dairy Research (dairy food manufacturing), William D. Dobson, University of Wisconsin-Madison emeritus professor of Agricultural and Applied Economics and Babcock Institute Agribusiness Economist (dairy trade and strategic behavior of agribusiness firms), Gary G. Frank, former Director of the University of Wisconsin-Madison Center for Dairy Profitability (dairy farm production economics), Edward V. Jesse, University of Wisconsin-Madison professor of Agricultural and Applied Economics and Babcock Institute director for international dairy trade and policy studies (dairy marketing and trade) and Michal Sznajder, professor and head, Department of Food and Agricultural Economics, Agricultural University of Poznan (Poland dairy institutions and policy).

The study team reviewed an extensive collection of government and academic reports, internet sites and other information prior to and following a ten-day visit to Poland arranged by Professor Sznajder. The team interviewed and heard presentations from dairy farmers, dairy processors, dairy trade association representatives and government officials, and obtained pertinent data and other unpublished information. Professor Sznajder also coordinated a day-long seminar at the Agricultural University of Poznan, during which faculty and graduate students made presentations about various aspects of the Polish dairy sector.

What follows is a synthesis of what we learned. First, we present an overview of the political economy of Poland. This is followed by descriptions of the dairy farm and dairy processing sectors, a summary of relevant policies affecting dairy production and processing, and an assessment of the strategic behavior of major dairy firms operating in Poland. We conclude with some observations about factors that will likely affect the future development of Poland's dairy industry.

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I. GENERAL BACKGROUND INFORMATION ON POLAND

This section consists of economic and other background information on Poland that will help to place in perspective findings relating to the country's dairy industry. The focus will be on the implications of the accession of Poland and nine other Central and Eastern European countries into the European Union (EU) on May 1, 2004. Poland is unique in that it has the largest population and largest dairy industry of any of the ten countries added to the EU-15 in 2004. The challenges that will face Poland and the EU during the next several years include those associated with integrating Poland's many small dairy farmers, and only partially modernized milk processing, and marketing sector into the EU-25 (Figure 1).

Geography and Population

Poland occupies 312,685 square kilometers of territory, 1.84 times the size of Wisconsin. The country

is located in Central Europe east of Germany, bordering Germany, Belarus, the Czech Republic, Lithuania, Russia, Slovakia and Ukraine (Figure 2). Poland's administrative divisions consist of sixteen provinces (voivodships) comprising 314 counties (poviats), which are made up of 2,478 communes (gminas). Warsaw, Poland's capital is also the largest city and the only city with a population greater than one million. Four other cities (Kracow, Lodz, Wroclaw and Poznan) have between 500,000 and 1 million inhabitants.

Poland had a population of 38.6 million people in mid-2004, giving the country a population larger than the combined populations of the other nine countries added to the EU in May 2004. Poland's population is equivalent to about 10 percent of the population of the EU-15 and 13 percent of the U.S. population. However, Poland's population growth rate is small—only 0.02 percent in 2004 (Table 1). Poland also had a small negative net population migration rate in 2004.

FIGURE 1. European Union Membership and Status of Non-Members



Source: http://www.nationsonline.org/oneworld/europe_map.htm.

FIGURE 2. Map of Poland



Source: http://www.lib.utexas.edu/maps/cia04/poland_sm04.gif.

Political Economy

Poland’s economy has had a turbulent history since the early 1900s, and even before. The country was incorporated into the Soviet sphere of influence in Eastern Europe immediately after World War II. By the end of 1989, the Soviet alliance had been swept away and replaced with the beginnings of a Western-style democracy and a free-market economy. While Poland retained limited amounts of private property—

mainly farms—during the period of Soviet control, the country has found it difficult to shake off problems experienced by the economy during that period. For example, the corruption that characterized many countries in the former Soviet Union still prevails in Poland. Thus, Poland’s corruption perceptions index for 2004 was about half that of the EU-15 and the U.S., indicating a relatively high level of corruption in the country (Table 1). Corruption manifests itself in a number of ways in Poland. For example, Poland’s courts are reportedly slow and frequently ineffective in settling contractual disputes between businesses. The pervasive corruption has obvious implications for the attractiveness of Poland as a destination for foreign direct investment.

Switzerland’s Institute for Management Development (IMD) gives Poland’s economy low marks for competitiveness, placing the country in fifty-seventh place out of sixty countries evaluated. Barteczko summarized the IMD’s comments as follows [2]:

The government is criticized for inconsistency in taking political decisions, protectionism, legal barriers for business and lack of social policy. Companies in Poland are no better. . . . Employees are unmotivated, managers are unreliable, marketing is inefficient and there are, apparently, no ethics in business.

While Barteczko’s summary may overstate the severity of the competitiveness problem facing Poland, the IMD figures show the country clearly is distant

TABLE 1. Selected Statistics for Poland with Comparisons to the EU-15 and U.S.

	Poland	EU-15	U.S.
1. Population (July 2004 est.)	38,626,348	381,517,250	293,027,571
2. Population Growth Rate (%)	.02	0.37	0.92
3. GDP per Capita (PPP in U.S.\$)	11,000	28,487	37,800
4. Real GDP Growth Rate (%)	5.3	2.2	4.4
5. Unemployment Rate (%)	18.8	8.1	5.5
6. Inflation Rate (Consumer Prices, %)	3.6	2.1	2.7
7. Corruption Perceptions Index	3.5	7.7	7.5

Sources: [26] for Items 1–3. Items 4, 5 and 6 are from [14]. Item 7 is from [24]. Items 1, 2, 4, 5, 6, and 7 consist of 2004 figures. Item 3 consists of 2003 figures. Key for interpreting the Corruption Perceptions Index: 10 = highly clean, 1 = highly corrupt.

from the top ranks of other countries in terms of competitiveness.

Poland's real Gross Domestic Product (GDP) per capita expressed in Purchasing Power Parity (PPP) terms reveals an additional economic challenge facing the country. Expressing real GDP per capita in terms of PPP takes into account several factors, including differences in prices and the cost of living in countries being compared. Thus, Poland's real GDP figure in PPP terms is higher than the nominal real per capita GDP for the country because the cost of living is lower in Poland than in many other countries. For 2003, Poland's real GDP per capita in PPP terms was only about 39 percent as large as that of the average country in the EU-15 and only 29 percent as large as the comparable figure for the U.S. Poland's real GDP per capita was also among the lowest in the ten countries added to the EU in May 2004. Only Latvia had a lower real GDP per capita figure in PPP terms. Poland had the dubious distinction of ranking second from the bottom in terms of real GDP per capita in PPP terms among the countries that became the EU-25.

Poland's unemployment rate at 18.8 percent in 2004, was sharply higher than the EU-15 average and the comparable U.S. figure (Table 1). Poland's unemployment rate was particularly high for the under age twenty-five group—more than one-third of the workers in this group were unemployed in early 2005 [33].

All is not gloomy, of course, for Poland's economy. The country's real GDP growth rate at 5.3 percent in 2004 was higher than the comparable figure for the U.S. and sharply higher than the 2.2 percent real GDP growth rate for the EU-15. While higher than in 2003, Poland's inflation rate was relatively low (3.6 percent) in 2004. Poland also has an educated population; literacy rates are near 100 percent in the country. This should help to facilitate economic growth in the next few years.

Exchange Rates and Adoption of the Euro

Poland has maintained a reasonably stable currency compared to both the U.S. dollar and the Euro in recent years. However, the Zloty increased in value relative to both currencies in the period immediately following Poland's accession to the EU—25 percent against the U.S. dollar from April 2004 (the month prior to EU

accession) to April 2005 and 17 percent against the Euro (Figure 3).

Poland's accession to the EU means the country must eventually adopt the Euro as its currency. The actual date that will occur depends partly on when the country meets the 1992 Maastricht Treaty criteria noted below [12]:

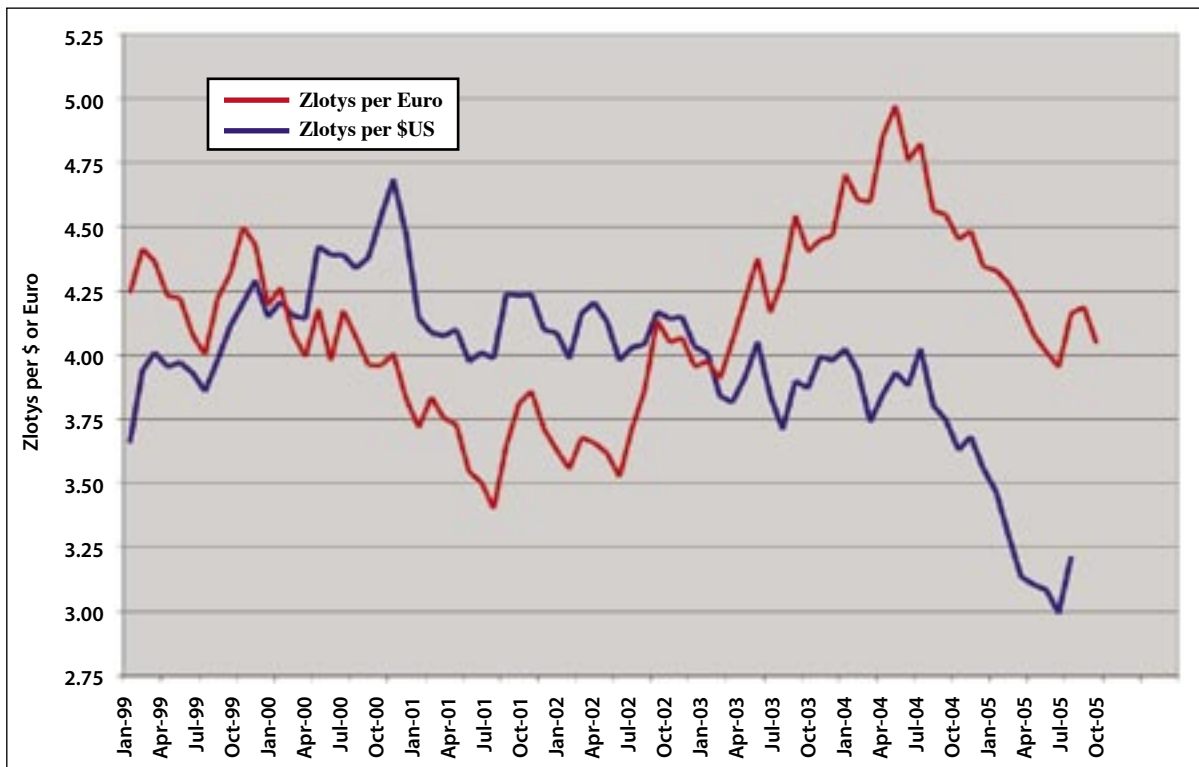
- Poland's inflation rate may not exceed the rate of the three countries with the lowest rate within the EU by more than 1.5 percentage points.
- Long-term interest rates in Poland may not exceed the rates of the three countries with the lowest rate by more than 2 percentage points.
- The country's current budget deficit may not exceed three percent of GDP; total government debt must be less than 60 percent of GDP.
- Poland must enter the European Exchange Rate Mechanism (ERM II) and keep its currency within a fixed (15 percent) range relative to the Euro for at least two years. The Zloty also must not be subject to pressures that would require strong central bank intervention or devaluation of the currency.

There are concerns about the country's ability to meet the deficit requirements and the interest rate requirements of the Maastricht Treaty. The country's budget deficit was 4.8 percent of GDP in 2004 or 1.8 percentage points more than allowed under the Maastricht Treaty. Poland also missed the interest rate requirements in 2004. Poland's problems associated with meeting the Euro zone requirements appear to be manageable, but the country will not enter the Euro zone in 2007, which is a target date for entry by Cyprus, Latvia and Malta. Target dates for Poland's entry into the Euro Zone are 2009 or 2010.

It is difficult to predict how much impact the Zloty will have on the international competitiveness of Polish dairy products. If Poland enters the Euro zone within the next few years, then it will be the Euro rather than Poland's Zloty that will influence the competitiveness of the country's dairy products both within and outside of the EU-25 over the longer-run.

But for the near term, the EU may be a more attractive market for Polish dairy products than the U.S. and other countries where the currency is pegged to the

FIGURE 3. Polish Zloty Exchange Rate



Source: The World Fact Book [28]. (<http://www.ers.usda.gov/data/exchangerates>). June–October 2005 values are extrapolated.

U.S. dollar. First, the removal of tariffs for intra-EU shipments of dairy products associated with Poland’s accession to the EU will increase the attractiveness of the EU market. Second, the larger appreciation (larger relative to the Zloty-Euro increase) in the value of Zloty compared to the U.S. dollar will add to the attractiveness of the EU. How long the current differentials among the Zloty, U.S. dollar and Euro will persist is, of course, unknown. Moreover, there is no clear consensus on whether the Zloty is currently undervalued or overvalued. Thus, the currency may adjust in uncertain ways relative to the U.S. dollar and Euro in the near term.

The Current Policy Environment in Poland

Policies affecting the competitiveness of Poland’s dairy industry are discussed in detail later in this report. This segment contains limited background information on the economic, trade and agricultural policies affecting Poland’s dairy sector to provide perspective on the

policy environment in which Poland’s farmers, processors and dairy exporters operate. The players will be discussed in the next three sections.

Poland’s government adopted low border protection measures and allowed nearly free market prices for agricultural products in the years immediately after the country’s emergence from Soviet control. Polish farmers complained about the loss of income and persuaded the government to provide higher border protection and price supports for certain agricultural products. In response, Poland’s government put in place border protection measures that were roughly equivalent to 20 percent tariffs and established guaranteed minimum prices for dairy products, wheat and rye. Beginning in 1992, the guaranteed minimum prices for these products were implemented by Poland’s Agricultural Market Agency (AMA)—a role the agency played until the eve of Poland’s accession to the EU. Later in the 1990s, the AMA took on other roles, including the task of managing strategic agricultural reserves, providing preferential credit to grain producers and warehousing

activities. The AMA assumed a still larger role after Poland joined the EU, administering all EU intervention programs in Poland.

Poland's government recognized the need to upgrade the country's farms and processing plants to meet EU requirements and make Poland's agricultural sector competitive in the expanded EU. Poland employed the Agency for Restructuring and Modernization of Agriculture (ARMA) as one vehicle for carrying out this task. The ARMA offered the following restructuring programs [13]:

- Credit for construction of new buildings, food processing plants and related activities at half the commercial lending rate, which often averaged about 35 percent prior to EU accession.
- Five percent loans for new farmers less than forty years of age.
- Five percent loans to farmers for purchase of additional farm land.
- Loans at 5 percent to 13 percent interest for creation of new farms approved by the Ministry of Agriculture.

Like the AMA, the ARMA became a paying agency. In 2002, ARMA disbursed funds for the EU's Special Accession Program for Rural Development (SAPARD). The SAPARD program was created to support sustainable agricultural and rural development in countries preparing for accession to the EU [13]. Among its tasks was to improve marketing channels and food quality control.

Poland and other Central and Eastern European countries were required to demonstrate that they had established government structures capable of administering the SAPARD funds effectively. In addition, the funds carried a 50 percent co-financing requirement. In 2003, after experiencing some significant difficulties, Poland was able to obligate nearly the full amount allocated to the country by the EU—€1.2 billion—via the ARMA paying agency. The main beneficiaries in Poland, chiefly processing plants and a limited number of large farms, have until 2006 to complete SAPARD-funded projects. SAPARD funds are being replaced by EU Structural and Cohesion Funds available to all regions of the EU with per capita incomes less than 75 percent of the EU average.

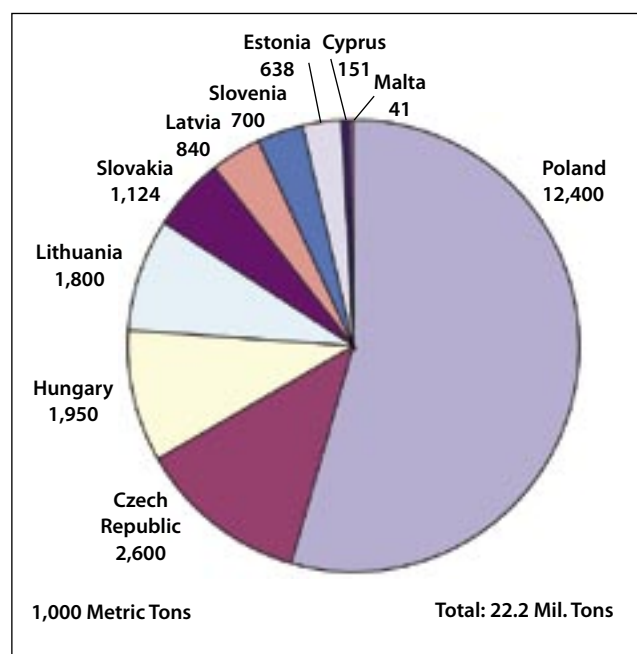
The Poland Dairy Sector in the Context of the EU-25

Poland is the dominant dairy country among the ten countries that entered the EU on May 1, 2004. Using FAO data for comparison purposes, Poland accounted for 56 percent of reported 2004 milk production in the ten accession countries. Poland produced five times more milk than the Czech Republic, in second place (Figure 4). Within the EU-25, Poland ranked fourth in milk production in 2004 (behind Germany, France and the UK) accounting for 8.7 percent of total EU-25 production (Figure 5).

A host of difficult agricultural issues had to be dealt with before the ten Central and Eastern European countries became eligible to join the EU. Among the most significant was whether Poland and the other Central and Eastern European countries would be immediately eligible for the full range of direct payments that EU-15 producers receive.

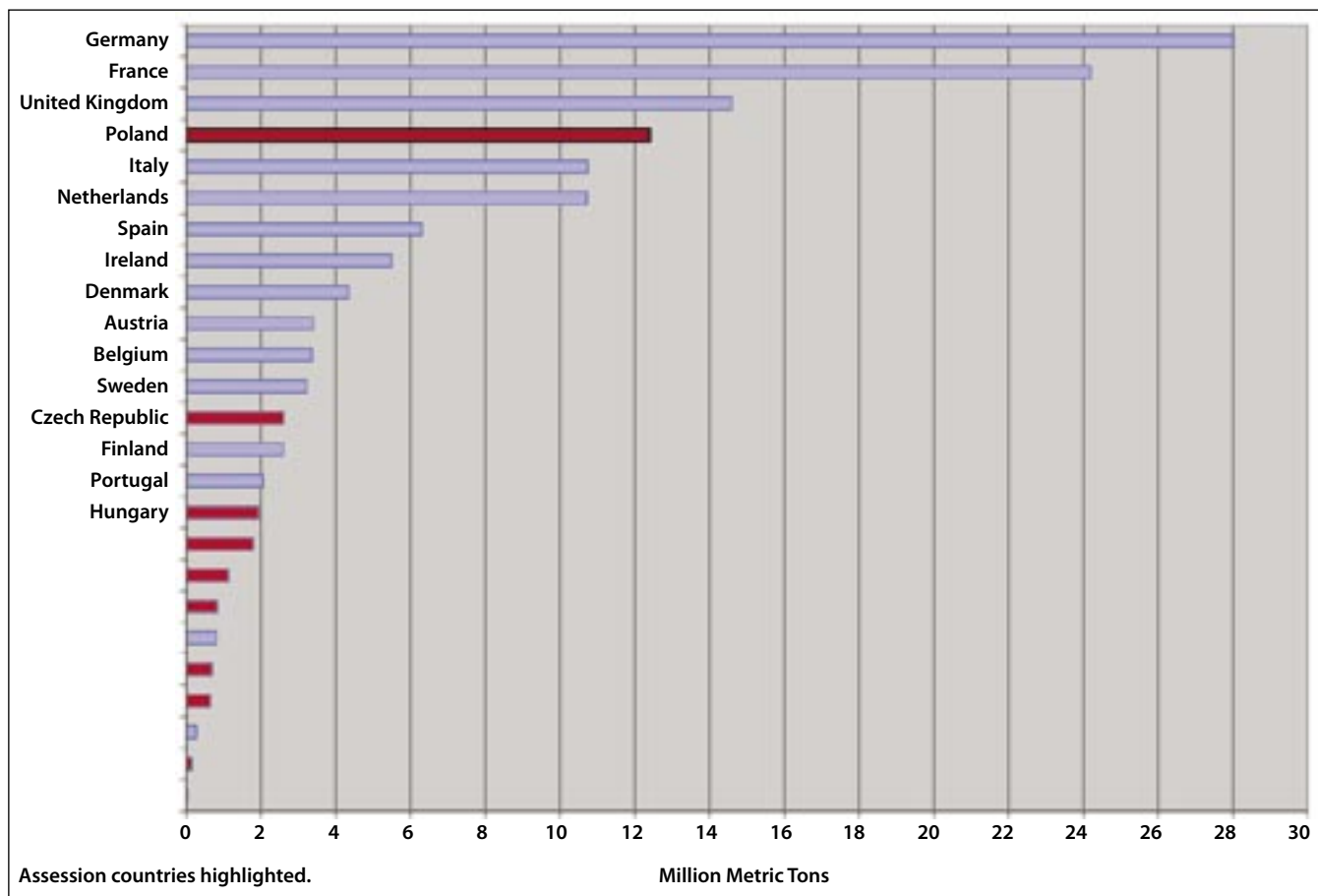
The original EU position statement, issued on January 30, 2002, called for a ten-year transition period before Poland and the nine other accession candidates would be eligible for the full range of direct payments enjoyed by EU-15 producers. Poland and the other

FIGURE 4. 2004 EU Accession Countries: 2004 Cow's Milk Production



Source: FAOSTAT [26].

FIGURE 5. EU-25 Cow's Milk Production, 2004



Source: FAOSTAT [26].

countries resisted what they described as a lengthy transition period. The final agreement reached at the 2002 Copenhagen Summit resulted in a major compromise consisting of the following provisions [13]:

The 10-year phase-in remains and the EU will still provide only 25 percent of the payments during the first year. However, national governments are allowed to top off these payments each year by a maximum of 30 percent, so that payments during the first year of accession could be as much as 55 percent of what current EU farmers receive. (Central and Eastern European) governments are allowed to use part of the rural development funds that the EU will provide after accession to finance the higher direct payments.

Allocation of dairy quotas—especially for Poland—was a particularly contentious issue in accession negotiations. The original country requests for quotas and

the initial and final EU offers for Poland and seven other accession countries with significant dairy industries, appear in Table 2.

Several noteworthy points are evident from the figures in Table 2:

- Of the eight countries in Table 2, Poland obtained the largest milk quota of 8.96 million metric tons (49.4 percent of the eight country total).
- In addition to the 8.96 million metric ton quota, Poland will conditionally receive a 416 thousand ton quota reserve for 2006. This reserve is to account for an expected increase in retail demand for milk following a decrease in on-farm consumption as farm populations migrate to urban areas.
- The EU's final offer of quota for Poland was only 1 percent higher than the EU's original proposal.

TABLE 2. EU Allocation of Milk Quota to May 2004 Accession Countries (Metric Tons)

Country	Original Country Request	Initial EU Proposal	Final EU Offer	Reserve for 2006
Czech Rep.	3,100,000	2,505,553	2,682,143	55,788
Estonia	900,000	562,633	624,483	21,885
Hungary	2,800,000	1,946,333	1,947,280	42,780
Latvia	1,200,000	489,474	695,000	33,253
Lithuania	2,250,000	1,459,000	1,646,939	57,900
Poland	13,740,000	8,875,000	8,964,017	416,126
Slovakia	1,235,900	946,150	1,013,316	27,472
Slovenia	695,000	463,333	560,424	16,214

Source: Cochrane [3,4].

- The 8.96 million metric ton quota represents only 65 percent of Poland's request for quota. Other countries represented in Table 2 received larger percentages of their requested quota allocation from the EU. On average, the other countries received 75 percent of the requested quota.

The EU quota for Poland's milk production—even when supplemented by the reserve for 2006, which brings the total to 9.38 million metric tons—will restrict the size of Poland's dairy industry. Poland's milk production averaged about 11.8 million metric tons during 2000 through 2004, which is about 26 percent more than will be allowed under the quota.

Fluid milk consumption in Poland averaged 4.8 million metric tons per year during 1999–2004. Thus, fluid consumption during this period was equivalent to 51 percent of the quota total. If fluid consumption remains the same after the EU quotas become effective, this leaves approximately 4.6 million metric tons of milk for processing into manufactured products.

How will the milk available for processing into manufactured dairy products in Poland be used? How will the country's dairy exports change? The FAS-USDA Agricultural Counselor for Poland, advanced an interesting hypothesis relating to these questions in 2003 [29]:

In a longer time frame of five to ten years, the milk quota at the level agreed to by the EU may not be sufficient to cover growing domestic demand for milk and dairy products, so Poland may be forced

to import certain dairy products as well as reduce exports of NDM, WMP and cheese.

This hypothesis will be investigated in this paper. In particular, findings will be presented on how the product mix and export mix of Poland's dairy industry partially summarized in Table 3 will change because of the EU quotas and other developments. In addition, the paper will assess how Poland's role in the international dairy industry will change over the next decade and what the probable changes mean for the U.S. dairy industry.

TABLE 3. Production and Exports of Selected Dairy Products for Poland, 2003 and 2004

Product	2003	2004
Cheese		
Production (1,000 mt)	195	220
Exports (1,000 mt)	45	65
Exports as % of Production	23	30
Butter		
Production (1,000 mt)	167	164
Exports (1,000 mt)	9	27
Exports as % of Production	5	16
Milk Powders (SMP and WMP)		
Production (1,000 mt)	176	170
Exports (1,000 mt)	108	129
Exports as % of Production	61	76

Source: Rynek Mleka [22].

II. DAIRY PRODUCTION SECTOR

General Description

The current dairy cow population in Poland is about 2.7 million animals. Although dairy cattle are found throughout the country, they are more heavily concentrated in the northeast (see Figure 6—Warsaw is the empty space center right). Poland has an estimated 875,000 farms with dairy cows, which translates to an average herd size of 3.1 cows. Approximately 83 percent of dairy farms have three cows or less. Holsteins are the predominate breed, comprising 90 percent of the Polish dairy herd. An estimated 90 percent of cows are artificially inseminated. Poland has been importing U.S. and Canadian semen for many years.

There were an estimated five million dairy cows in Poland in 1989, indicating a loss of more than two million cows since the end of Soviet control. The down-

ward trend in cow numbers has been mostly offset by improvements in the genetic quality of dairy cattle, animal nutrition and dairy management, all of which increased average milk yield by about one-third since 1989. Annual milk production per cow was about 4,100 liters in 2004 (Figure 7).

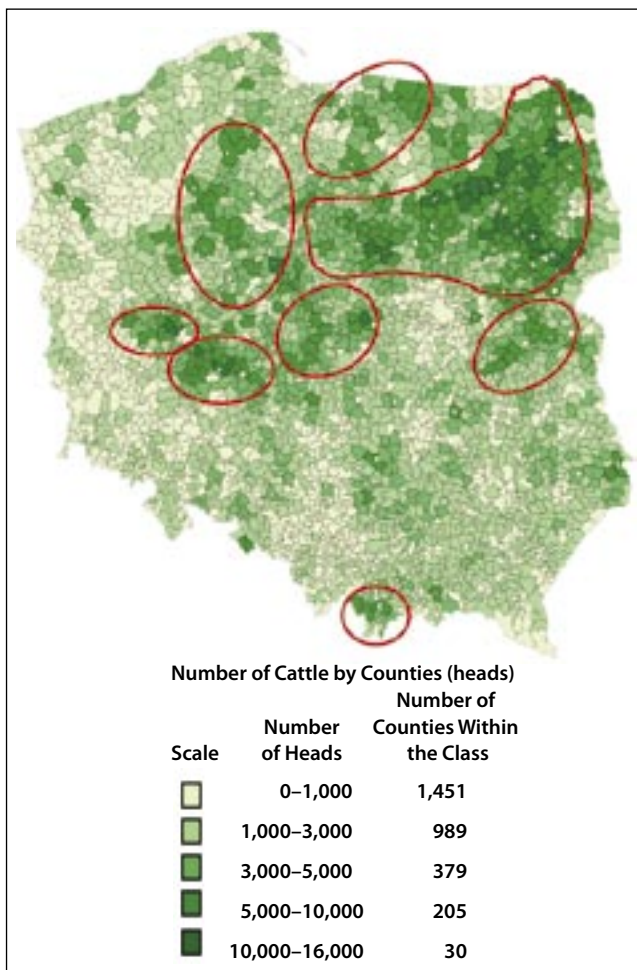
Poland's milk production and deliveries to processing plants fell off rapidly after the end of Soviet control in 1989. This was the result of terminating guaranteed prices to farmers and a major increase in imports of dairy products from the EU, displacing domestic production. Production has been very stable at about 11.5 billion liters per year since 2000. Deliveries to plants have increased steadily, reaching nearly eight billion liters in 2004 (Figure 8).

The housing, feeding and milking of dairy cows in Poland exhibits extreme diversity. At one end of the spectrum, one cow is housed in a pen or tied outside to a stake and fed and milked by hand. At the other extreme, several hundred cows are housed in modern, free stall barns with drive-through feeding and liquid manure handling; milked in an automated computer-connected parlor; and fed a total mixed ration. Facilities, herd management and milk yields on the most modern farms are equivalent to those observed on state-of-the-art U.S. dairy farms. In between these extremes are pre-1950 barns with hand milking, and Soviet era barns and milking systems. Some of these facilities have been retrofitted in the last decade and many others will likely be modernized using funds provided as part of Poland's accession process (see Section IV).

Polish dairy farms can be divided into two main categories—those that ship their milk to a processing plant (wholesale sellers) and those that sell their milk (usually unpasteurized) directly to consumers (direct sellers) or produce only enough milk for the farm family. Based on quota allocation, about 360,000 farms have wholesale milk sales. These farms accounted for about 70 percent of estimated total production of 11.5 billion liters in 2004. The top 10,000 of those farms (less than one percent of all farms) accounted for about 40 percent of Poland's total 2004 milk production.

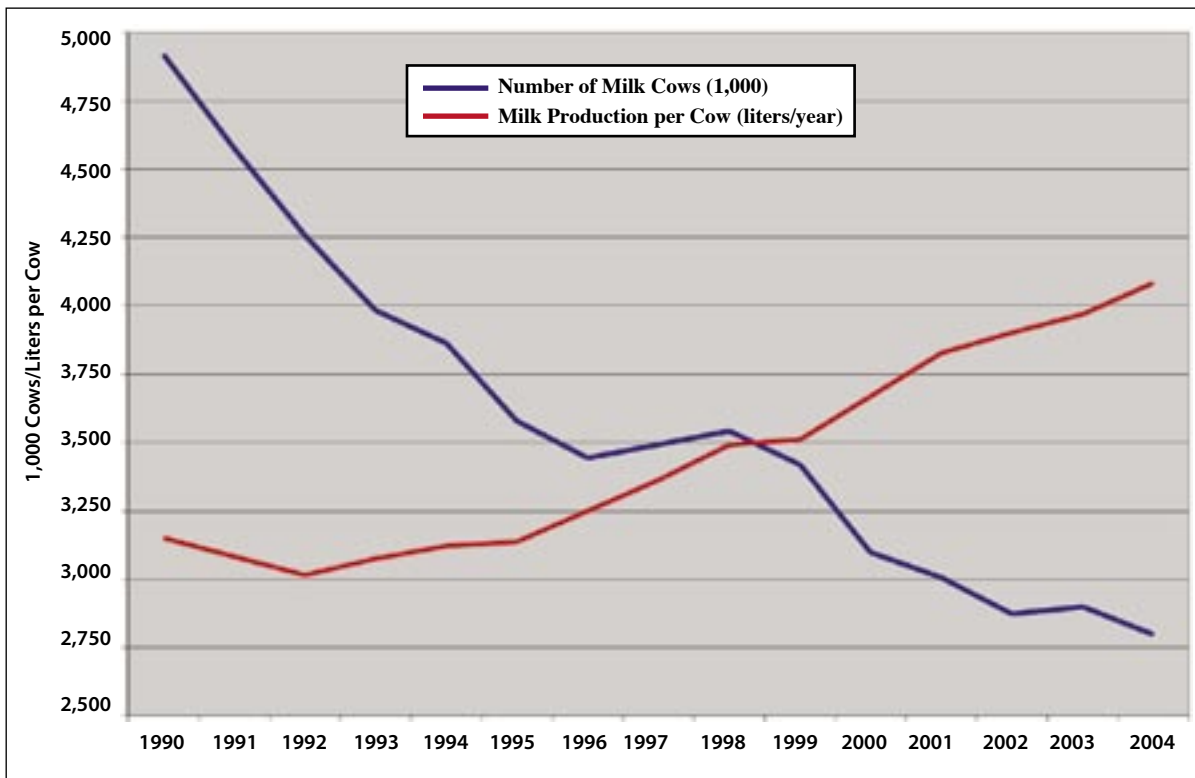
Poland's accession into the EU involved meeting EU standards for milk quality, at least for dairy farms

FIGURE 6. Poland Dairy Cattle by Census District



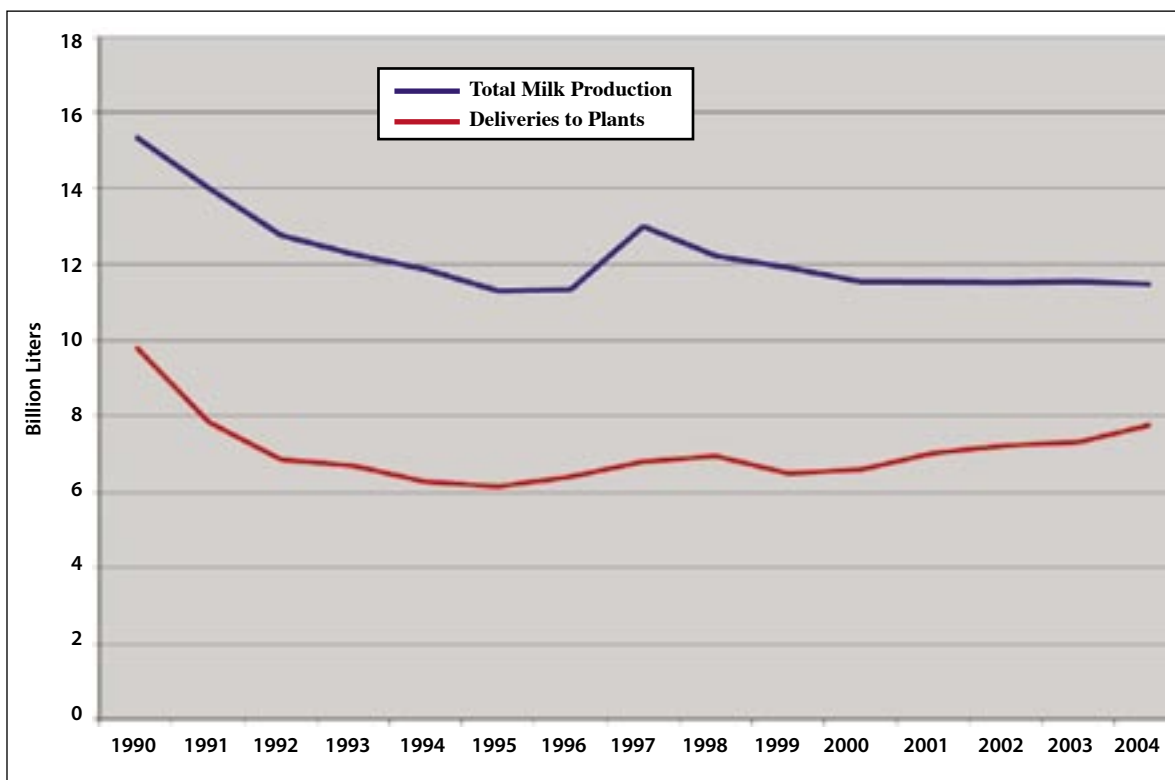
Source: Grupa [15].

FIGURE 7. Poland Cow Numbers and Milk Yield Per Cow



Source: 1974–2002—PolishDairy.com.pl; 2003–04—[11].

FIGURE 8. Poland Milk Production: Total and Sold to Plants



Source: 1974–2002—PolishDairy.com.pl; 2003–04—[11].

selling milk to plants. These standards included a maximum somatic cell count (SCC) of 400,000 cells per ml., which is well below the 750,000 standard for meeting Grade A requirements in Wisconsin. Farms unable to meet this and other EU standards can, until 2006, still sell milk to plants, but only to those plants that sell exclusively on the domestic market. These transition farms are eligible for special grants to cover the full cost of investments necessary to meet EU standards.

We were unable to determine how receiving plants enforced farm-level quality standards. Some plant managers insisted that they had never observed a violation, which seems unrealistic. Others noted a procedure was in place to identify farms in violation and take corrective action if necessary.

Farms producing directly for the consumer or for their own families are typically very small and their numbers are dwindling. But at the same time, the percentage of one-cow dairy farms has increased slightly from 1996 (42 percent) to 2002 (46 percent). These one-cow farms are likely have a cow for either economic or traditional reasons. The Polish economy, while robust, has a high level of unemployment (18 percent in May 2005). The highest unemployment is in rural areas where unemployment rates are estimated to be as high as 40 percent. Therefore, having a dairy cow may be an economic necessity for many rural Polish families. In addition, the tradition of Polish dairy-farming cannot be discounted. Many families have had a cow for generations and a cow will be on that “farm” as long as someone living there remembers the hard times and food shortages of bygone years.

Not all farms that sell their milk directly to consumers are staying in business because of tradition or the inability of the owner to find another job. When the EU quota system was set up, 464 thousand tons was set aside for direct suppliers and 82,000 direct suppliers received quota. Of these, 60,000 received a quota of less than ten tons per year or 27.4 kilo per day (sixty pounds). However twenty-five direct suppliers received quota of more than five hundred ton per year or 1,370 kilos per day (3,014 pounds).

Application of EU Production Quotas

Upon accession, Poland became subject to the EU Common Agricultural Policy (CAP), which has

included country-specific milk production quotas since 1984.

During early negotiations, Poland requested a country quota of 13.7 million tons [3]. This volume was larger than total milk production and much larger than the volume of milk that was delivered to plants. The EU countered in 2002 with 8.9 million tons, with 7 million tons allocated to wholesale suppliers and 1.9 million tons to direct suppliers.

Subsequent negotiations resulted in a total quota of 8.964 million tons, only fractionally above the initial EU position. However, Poland was granted a (provisional) additional quota of 0.416 million tons to be effective in 2006, provided that internal consumption increases by at least that amount.

Poland’s AMA was responsible for allocating the country quota to individual farms. There were various methods of distributing quota to farms.

Wholesale suppliers were granted quota based on documented milk deliveries to plants between April 1, 2002 and March 31, 2003. Wholesale supplier quota totaled approximately 7.47 million tons. Wholesale suppliers received all the quota they requested.

Direct suppliers were allocated quota based on any evidence they had concerning the sale of milk directly to consumers. Some had actual receipts but most of the direct sales quota was allocated based on the farms’ reported cow numbers. The total amount of direct sales quota applied for was 0.716 million tons but only 0.464 million tons was allocated to direct sellers. This meant

TABLE 4. Allocation of Poland’s Milk Quota

Annual Milk Production in Tons	Direct Sellers	Wholesale Sellers
<10	60,070	191,388
10–20	16,276	75,078
20–50	4,796	61,183
50–100	553	21,287
100–250	176	6,864
250–500	46	790
>500	25	583
Total	81,942	357,173

Source: Agricultural Market Agency [1].

that each producer received only 64 percent of the quota requested (Table 4).

The initial allocation left a national reserve of approximately one million tons. On January 1, 2004, dairy farmers could begin applying for additional quota from the national reserve. This quota was allocated to those farmers who could prove they had low production in the 2002 marketing year, that they were in the process of expanding or they had other acceptable justification for receiving more quota than they were granted in the initial allocation. Currently, all of the national reserve has been allocated and some trading of quota among holders is beginning to occur.

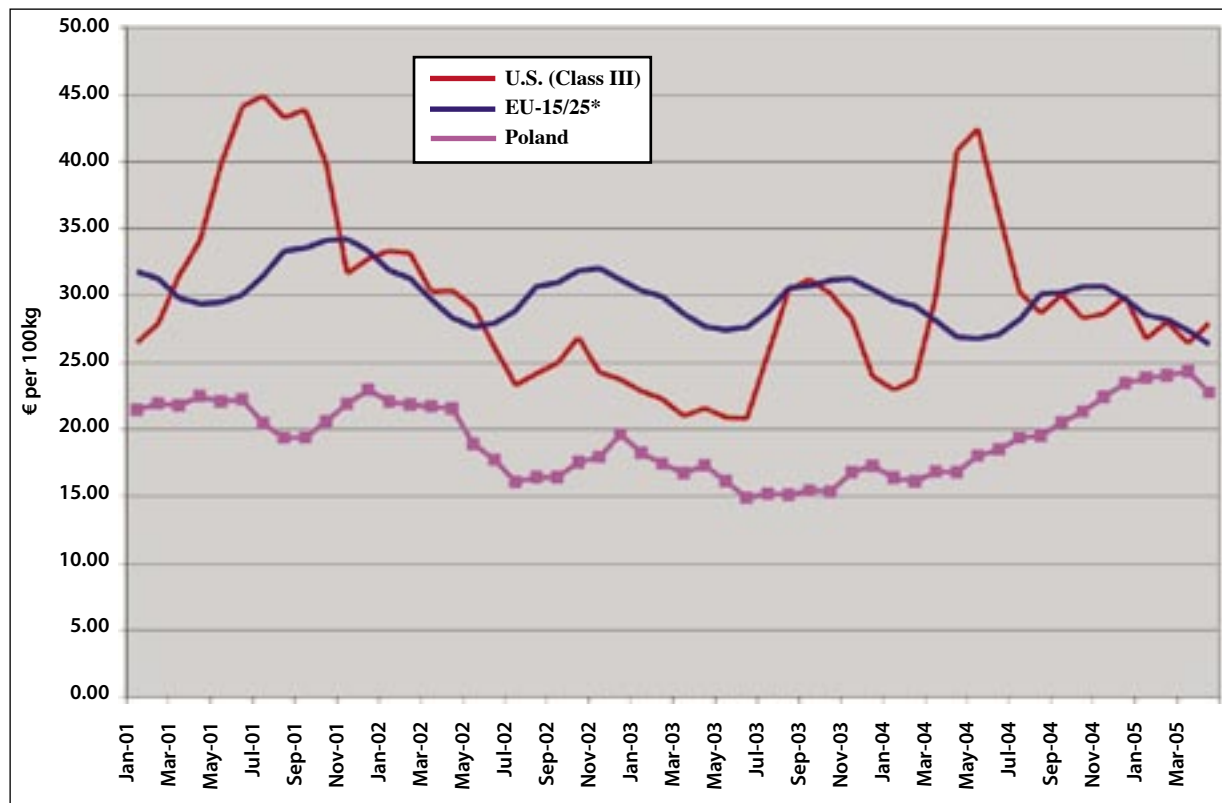
April 1, 2004 was the start of the first milk quota year for Poland. For this year Poland was excused from paying a levy if their national quota was exceeded, which was moot since wholesale and direct sales are expected to fall short of the country quota.

EU rules state that a country may allocate milk production quota nationally or by region. Poland chose

the regional option. This has resulted in regional variation in demand for quota depending on relative regional profitability. Anecdotally, the current range in quota prices is \$0.06 to \$0.30 per liter (\$2.75 to \$13.60 per cwt.).

Quota prices will likely go higher in the second quota year, which started April 1, 2005, especially if Poland exceeds its national quota and is subject to a levy. The levy is one and one-half times the milk price and is collected from dairy farmers who exceed their individual milk quota. It is likely some individual producers will be well below their individual quota. Because of this, the levy to the individual producer could be less than one and one-half times the milk price. However, some dairy processors are beginning to withhold 30 percent of the pay price from above-quota milk to build a fund to pay any levy and to discourage overproduction.

FIGURE 9. Milk Price Comparison



* EU-15 average before May 2004, EU-25 average after May 2004

Milk Prices

Farm milk prices in Poland have traditionally been low relative to EU-15 countries. From January 2001 through April 2004, the Poland monthly milk price averaged €0.1865 per liter, €0.12 per liter below the EU monthly price [21]. However, milk prices in Poland have increased steadily since accession, closing the gap to less than €0.05 by early 2005 (Figure 9). This relative increase is the result of stronger export opportunities, the elimination of barriers to milk movements between Poland and the EU-15 countries and a strengthening of the Zloty against the Euro.

Prior to accession, Poland farm milk prices exhibited a significant seasonal pattern counter-cyclical to a pronounced seasonal pattern in milk production (Figure 10). Between 2000 and 2004, plant deliveries in July averaged 150 percent of deliveries in February. However, the seasonal spread in deliveries has been narrowing

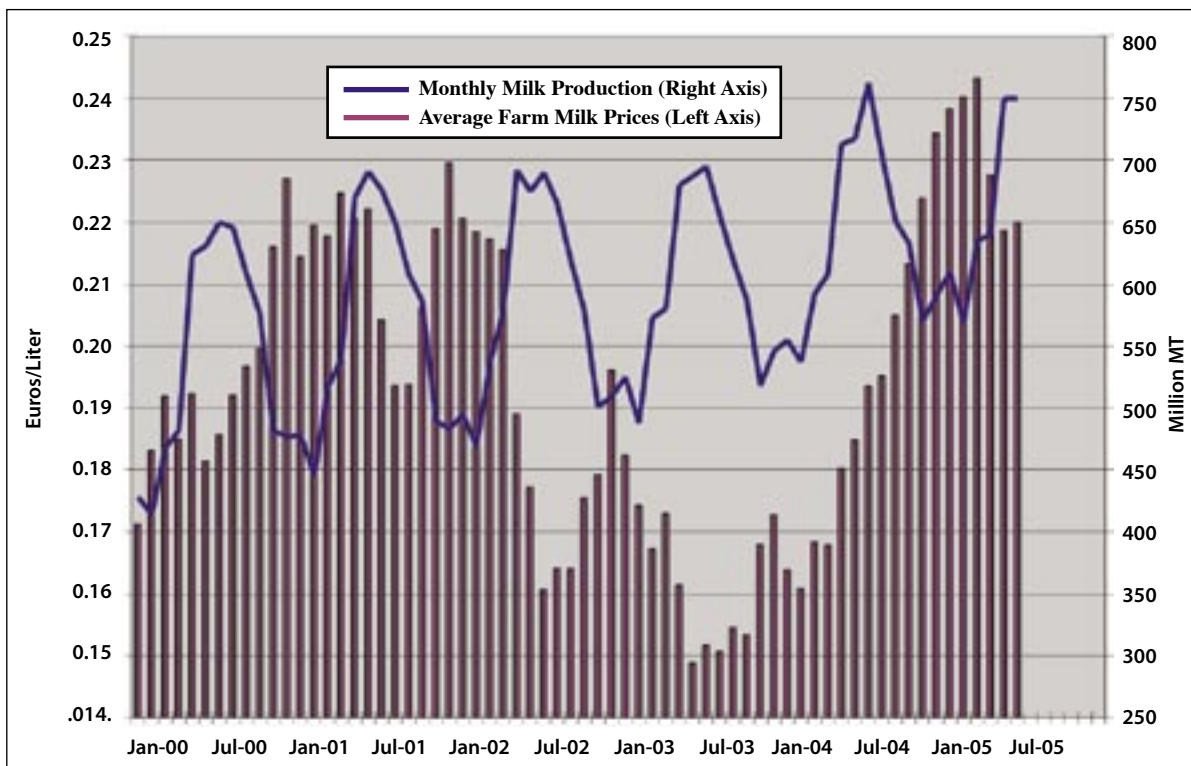
Cost of Production

The Institute of Agricultural and Food Economics (IERiGZ) extracted the 2004 financial records of a number of small- to medium-sized dairy farms. Table 5 compares costs derived from these financial records to those of 132 Wisconsin dairy farms with fewer than fifty cows. The Wisconsin records were collected by various farm management associations and analyzed using the Agriculture Financial Advisor (AgFA) software developed by the University of Wisconsin's Center for Dairy Profitability.

Table 5 shows that Wisconsin dairy farmers received a higher milk price (\$0.37 versus \$0.33 per kilogram) than Polish dairy farmers in 2004 as well as more income per kilogram of milk sold (\$0.44 versus \$0.38). Polish dairy farmers received only 42 percent as much total income as small Wisconsin dairies on a per cow basis.

Polish dairy farmers' cost per cow is only 37 percent of Wisconsin dairy farmers' total expenses, excluding

FIGURE 10. Poland Monthly Milk Production and Prices



Source: Rynek Mleka [22].

TABLE 5. Dairy Cost of Production Comparison, Poland and Wisconsin, 2004

	Poland*	Wisconsin**		
Number of cows	30	42		
Kilograms Milk Sold per cow	4050	8336		
	Values per Cow		Values per Kilogram	
	Poland	Wisconsin	Poland	Wisconsin
Incomes				
Milk Sales	\$1,104	\$3,076	\$0.27	\$0.37
Calf Sales	\$102	\$116	\$0.03	\$0.01
Cull Cow Sales	\$61	\$194	\$0.02	\$0.02
Other	\$0	\$353	\$0.00	\$0.04
Non Cash Income	\$0	-\$30	\$0.00	\$0.00
Total Incomes	\$1,267	\$3,709	\$0.32	\$0.44
Expenses				
Breeding Fees	\$57	\$47	\$0.01	\$0.01
Crop Chemicals & Fertilizer	\$14	\$158	\$0.00	\$0.02
Custom Work hired	\$16	\$77	\$0.00	\$0.01
Purchased Feeds:	\$412	\$574	\$0.10	\$0.07
Fuel	\$55	\$106	\$0.01	\$0.01
Insurance	\$14	\$71	\$0.00	\$0.01
Interest	\$0	\$140	\$0.00	\$0.02
Paid labor wages	\$10	\$237	\$0.00	\$0.03
Supplies	\$0	\$145	\$0.00	\$0.02
Repairs	\$27	\$227	\$0.01	\$0.03
Seeds (for planting)	\$14	\$93	\$0.00	\$0.01
Taxes	\$6	\$66	\$0.00	\$0.01
Utilities	\$35	\$101	\$0.01	\$0.01
Veterinary & Medicine	\$55	\$97	\$0.01	\$0.01
Miscellaneous	\$56	\$312	\$0.01	\$0.04
Depreciation	\$82	\$362	\$0.02	\$0.04
Other Non Cash Expenses	\$0	-\$38	\$0.00	\$0.00
Total expenses	\$853	\$2,775	\$0.21	\$0.33
Net Farm Income				
Net Farm Income	\$414	\$934	\$0.10	\$0.11
Less Value of unpaid labor & management	\$157	\$552	\$0.04	\$0.07
Equals Return to Equity Capital	\$257	\$382	\$0.06	\$0.05

*Estimates of Polish production costs were obtained through the efforts of Anna Wielicka and the Institute of Agricultural and Food Economics (IERiGŻ). Costs in Zlotys converted to U.S. Dollars using average 2004 exchange rate of 3.667 Zlotys per Dollar.

**Wisconsin production cost for herds with fewer than 50 cows [32].

the value of unpaid labor and management. In addition, the Polish dairy farmers' value of unpaid labor and management is estimated at approximately one-third that of small Wisconsin dairy farms. The cost structures differ throughout, but the bottom line shows the Return to Equity Capital is remarkably similar, on a per cow basis.

The IERiGZ also has an enterprise budget estimating the cost of production at \$15.33 per one-hundred kilograms (\$6.97 per one-hundred pounds), excluding labor. The other estimates, including labor, were \$26.00, \$28.00 and \$30.33 per one-hundred kilograms (\$11.82, \$12.73 and \$13.78 per one-hundred pounds) for large, medium and small dairy farms, respectively.

The International Farm Comparison Network (IFCN) estimates 2003 Polish milk production costs at \$17.50 per one hundred kilograms on the small twenty-cow dairy and \$14.50 per one hundred kilograms on the larger fifty-cow dairy. These compare to estimates of \$31.60 per one hundred kilograms in the EU-15, \$28.00 in the U.S and \$17.00 in New Zealand.

The assets and liabilities of Polish dairy farms were not available to make comparisons on relative rates of return.

Dairy Support Infrastructure

Productivity Testing. The Polish Federation of Cattle Breeders and Producers of Milk is twelve years old and currently has 505,000 cows on test, approximately 17 percent of the national herd. The cost is \$30 per cow per year.

Animal Health. There is a two-tiered veterinary structure. State-paid veterinarians provide on-farm inspection of the farm production practices and of animal feed processing. These veterinarians utilize four modern labs, testing milk for antibiotic residue, somatic cells and bacteria. Polish standards are now the same as the EU: zero antibiotic residues, a maximum of 400,000 somatic cells and a maximum bacteria count of 100,000.

Private veterinarians, paid by farmers, do all types of animal care. They appear to be as versatile as veterinarians in the EU and U.S. They carry a wide range of medicines and are well-versed in many other treatment options, including surgery. There appears to be

an ample supply of these veterinarians—farm managers noted that they do not have a problem getting one to come to their farm on weekends, holidays or late at night.

Dairy Equipment. Many dairy equipment companies are trying to establish a presence in Poland, therefore equipment supplies and repair personnel are abundant and relatively inexpensive. In addition, the high unemployment rate in Poland makes it easy for dairy equipment companies to hire qualified personnel.

Extension. Agricultural extension services are provided at both the voivod and national levels. Voivods, where agriculture is important, fund Advisory Service Centers (ODRs) that have affiliated field staff who work directly with farmers (equivalent to U.S. county extension agents). The National Advisory Center for Agriculture and Rural Development (NACARD), financed by the Ministry of Agriculture and Rural Development, maintains seven regional agricultural centers within Poland.

Estimated total staffing for ORDs and NACARD combined was 5,300 in 2004, including 3,000 field advisors. Much of the extension effort has recently been directed at helping farmers comply with EU quality and other standards and with completing applications for various forms of EU assistance. Dissemination is through conventional extension means, including one-on-one advising, training courses and seminars, exhibitions at agricultural fairs and other events, various publications and web sites.

Poland's extension service benefited substantially from a major collaborative effort between the Ministry of Agriculture and Rural Development and USDA's Cooperative State Research, Education and Extension Service (CSREES) during the early 1990s transition period. Developmental activities included locating U.S. county agents in local Poland extension offices. The result appears to be a well-functioning extension service, though one that is challenged by the diverse needs of Poland's nearly two million farmers.

Research. Poland's Ministry of Agriculture and Rural Development operates seventeen research institutes, two central laboratories, and one research

and development center. Total staffing in 2003 was about 1,130, including 179 persons holding the rank of professor. About 700 national research projects and 110 international projects were reported in 2003. Dairy-related research is conducted at five of these national institutes and includes cattle breeding and reproduction, animal health, ruminant nutrition, food processing, agricultural mechanization, and food and agricultural economics. The Institute for Agricultural and Food Economics is roughly equivalent to USDA's Economic Research Service.

The Polish Academy of Sciences includes three institutes that conduct research related to the dairy sector: the Institute of Animal Physiology and Nutrition, the Institute of Genetics and Animal Breeding, and the Institute of Animal Reproduction and Food Research.

Six Polish universities conduct research related to the dairy sector. Relevant departments are noted in Table 6. Some of these institutions operate an estimated

total of twenty-one off-campus experimental farms. In addition to the degree programs and other academic programs offered by these institutions, dairy-related instruction and academic degrees are provided at several other universities.

Factors Affecting Long Term Supply Growth

The critical constraint to growth in Poland's milk production is the size of the national milk quota. Without the quota constraint, there appears to be potential for rapid growth. The processing sector is currently operating below capacity, and is modernizing and expanding with the help of EU grants. There are EU grants available to modernize and expand housing, feeding, and milking systems on dairy farms. There are abundant and competitive veterinarian and other services and supplies available. The cost of labor is low, and dairy farmers are excited about the new higher

TABLE 6. Poland Universities Conducting Dairy-Related Research

University	Departments
Agricultural University of Wroclaw	Food Science Veterinary Medicine Biology and Animal Science
Hugo Kotaj Agricultural University	Animal Breeding and Biology Food Technology
August Cieszkowski University of Agriculture (Poznan)	Animal Science Food Science and Technology Food and Agricultural Economics
University of Warmia and Mazury (Olsztytn)	Animal Bioengineering Veterinary Medicine Food Sciences
Warsaw Agricultural University	Veterinary Medicine Animal Science Human Nutrition and Consumer Science Agricultural Economics Food Technology
Agricultural University of Lublin	Veterinary Medicine Biology and Animal Breeding Agricultural Engineering

Source: Consultant Group on International Agricultural Research, Agricultural Science and Technology Indicators (<http://www.asti.cgiar.org/profiles/poland.cfm?arow=152>).

EU prices. The price received by Polish dairy farmers increased almost 40 percent from 2003 to 2004.

However, quota allocated under the accession agreement limits production expansion to less than one-half million tons and that expansion can occur only if justified by expanded per capita consumption of dairy products.

There is considerable debate in Polish dairy circles regarding whether producers will adhere to quotas. Some argue that Polish farmers' long history of independence and resistance to government controls suggest either covert attempts to evade quotas or civil disobedience to increase quota assignment when the current quota becomes binding. Others believe that the threat of individual farm levies will be sufficient to discipline dairy farmers and ensure compliance.

Conclusions

- The structure of the Polish dairy industry will become increasingly bimodal. The number of "large" farms will continue to grow. Many farms with one to three cows will remain because of tradition. Attrition will be greatest among small dairy farms (four to twenty cows), as

these operators exit due to the unattractiveness of trying to operate a small farm versus other employment opportunities.

- The size of the Polish dairy herd will decrease rapidly as production per cow increases and the full effects of the milk production quotas are felt.
- EU cost sharing monies for production sector capital improvements will increase the demand for and the price of milk quota.
- The number of dairy supply and equipment vendors will decrease more rapidly than the number of dairy farms.
- On-farm milk use will decline as the number of farms with dairy cows declines.
- Poland will change its policy of allocating quota regionally, so that quota can be bought and sold on a national basis.
- The cost of quota will be one of the top five expense items in Polish milk production costs within five years.
- Whether Poland will receive its maximum additional quota of 0.416 million tons in 2006 is uncertain.

III. POLAND'S DAIRY PROCESSING SECTOR

Poland's dairy processing sector is in transition, moving rapidly toward higher levels of processor concentration, a reduced role for dairy cooperatives and greater foreign direct investment. The quantity of milk sold by direct distributors promises to decline substantially from current levels, and will be replaced by plant-processed milk and dairy products.

Number and Status of Dairy Processors

Hochland officials reported that at the end of 2002 there were 412 milk processing plants in Poland [16]. The average yearly volume of milk processed at the plants was twenty million liters, a volume only three-fourths as large as the average quantity of milk processed by dairy plants in the EU-15 countries. The ten largest dairy processing plants in Poland—those processing more than one hundred million liters of milk annually—accounted for about 25 percent of the

industry's output. Utilization of Poland's dairy processing capacity was only about 60 percent in 2002.

W. Molstad, FAS-USDA Agricultural Counselor for Poland, reported in 2005 that the number of dairy plants in Poland had continued to decline from the total reported by the Hochland officials. According to Molstad, there were 356 dairy plants in Poland in early 2005 [31]. Of this total, 212 were eligible to make sales in the EU-25 market based on plant sanitation, milk quality and other standards. The remaining 144 plants were in transition status, they have until the end of 2006 to meet EU standards. Until these standards are met, transition plants can only sell dairy products within Poland.

Transition plants tend to be older dairies with obsolete equipment. Despite the availability of modernization funds, our sense is that most of these plants will go out of business by the end of the transition period.

EU-eligible plants in Poland generally employ state-of-the-art processing procedures and equipment comparable to those used in Western Europe. Monitoring of processes and testing of products is conducted by regional laboratories containing modern equipment.

Role of Dairy Cooperatives

The Polish cooperative movement dates back 120 years. At the end of the period of Soviet control, Poland's dairy processing sector consisted of 712 processing plants operated by 320 dairy cooperatives [20, p. 19]. These cooperatives did essentially all of the commercial dairy processing in Poland. In 1989, after the end of the Communist era, the number of cooperatives initially rose as a few large processors were split up into smaller cooperatives as part of a privatization drive. Of the more than 700 milk processing plants run by the cooperatives in the late 1980s, 500 were more than thirty years old.

Stanislaw Michalski, board president for Poland's National Union of Dairy Cooperatives, reported that at the beginning of the 1990s, there were about 400 dairy cooperatives in Poland. That number had declined to about 160 cooperatives by early 2005. Michalski estimated that dairy cooperatives accounted for about 80 percent of milk collection and processing in 2005. Proprietary firms accounted for the remaining 20 percent.

Polish dairy cooperatives are exclusively operating cooperatives; that is, they both procure member milk and process it into dairy products. This is in contrast to U.S. dairy cooperatives, many of which specialize in procurement, subsequently selling the milk to proprietary processors.

Despite an apparent 60 percent reduction in the number of dairy cooperatives over the last twenty-five years, our assessment is that there are still far too many operating in Poland. The small size and local nature of cooperatives suggests that many are designed to accommodate a dairy production sector that is rapidly disappearing. Absent a major consolidation effort, many existing cooperatives will be unable to compete.

Market Leaders

Poland's market leaders in certain dairy product categories include the following:

- **Mlekpól** [19, pp. 17–18]. This firm is the largest dairy cooperative in Poland, obtaining milk from some 12,500 producers. In 2003, the firm ranked 223rd among the 1,500 largest companies in Poland. Mlekpól produces the widely-recognized brand called LACIATE, the leading UHT milk brand (35 percent market share) sold in Poland. Mlekpól is also a major exporter. Milk powder is the cooperative's largest export item, but it also exports cheese, butter, condensed milk, creams and whey products.
- **Danone** [10]. This French firm had worldwide sales of €13.7 billion in 2004. It claims to be the number one seller of fresh dairy products in the world and is the leading seller of fluid milk products in Poland. Danone, Hochland and Zott (Germany) are the leading advertisers of branded dairy products in Poland.
- **Mlekovita** [8]. This Polish firm was the third largest producer of fluid milk products for the Polish market in 2003, ranking behind only Danone and Mlekpól. A series of investments in Mlekovita's factories was one factor leading to the its growth. The company upgraded its Wysokie plant, enabling the facility to produce two million liters of milk per day. Overall the firm increased its milk processing capacity by about 20 percent in 2003 to about 530 million liters. In addition, Mlekovita opened two new plants for production of butter and cheese.
- **Hochland** [16]. This German-based firm is the market-leading producer of processed cheese in Poland, with 56 percent of the market in January 2005. Its market share is four times larger than that of its next biggest competitor. The company has cheese plants in Kazmierz, Baranowo and Wegrow.
- **Lacpól** [20, p. 23]. After the end of the Communist period, Lacpól initially was owned by the Central Union of Dairy Cooperatives in Poland, but ownership was switched to seventy member cooperatives after the dissolution of the Central Union of Cooperatives. Lacpól currently owns nine processing plants and is the country's largest producer of milk powder. In the early 1990s, Lacpól was reportedly Poland's largest

dairy exporting firm. One dairy processor likened Lacpol's activity in the early 1990s to that of the New Zealand Dairy Board, which until late 2001 was the monopoly exporter of New Zealand's dairy products. However, Lacpol clearly is not a near-monopoly exporter of Poland's dairy products at present. Some Polish cooperatives and proprietary firms export through Lacpol, but many firms export dairy products for their own account. Lacpol's future in Poland's uncertain dairy export market appears unclear.

Processing and Consumption of Polish Dairy Products

Poland's dairy processing industry is in the early stages of a transition from manufacturing and consumption patterns based solely on price competition to patterns based on product quality as well as price. The range of products consumed in Poland includes fluid milk, hard cheeses (Gouda-type), soft/fresh cheeses (quark, mold-ripened, etc.), processed (melted) cheese, yogurts, cream and butter. Presently, cheese consumption per capita is 10.3 kg per year, most of which is consumed at breakfast, compared to 19 kg in the EU-15 and 15 kg in the U.S. The breakdown of cheeses consumed in Poland is 61 percent fresh, 28 percent hard, 7 percent processed and 4 percent other (soft, mold-ripened, etc.). Pasteurized milk, with a shelf-life of five to seven days, UHT milk and liquid yogurts lead the fluid product category. Poles consume 170 kg per capita of total dairy products. Consumer trends reflect those of Germany; therefore, current consumption patterns in Germany may signal the future for Poland.

A "3-A-Day" marketing program has been initiated, which promotes the sale and consumption of milk, yogurt and cheese for nutritional benefits. With a healthy economy and reasonably priced products, this effort should lead to increased consumption of dairy products domestically, as has been the case in the U.S.

These consumption data do not include the major category of exported dairy products, namely various powders, including SMP, whole milk powder, blended powders and whey powders. Polish "Milk Protein Concentrate (MPC)" is actually sodium caseinate blended with skim milk powder (SMP), not membrane separated and concentrated dairy proteins.

Recently, Poland has increased its production of cream, processed cheese, whole milk powder and yogurts, and decreased production of SMP and casein. This trend is likely to continue if certain issues of competitiveness are realized and corrected. These issues include: high manufacturing costs, low efficiency of milk and dairy product processing and manufacturing and over-staffed facilities, especially within co-operatives.

How Poland's Dairy Processing Sector is Likely to Evolve

Poland's dairy processors have different views on how the sector will evolve. However, almost every market participant believes that substantial additional concentration will occur. There is also a consensus that the sector's exports will be constrained by EU milk production quotas.

Evolution of Cooperatives. Views differ sharply on the share of Poland's milk that will be processed by cooperatives and the number of cooperatives that will remain in business in five to ten years. Michalski of Poland's National Union of Dairy Cooperatives speculates that the country's dairy cooperatives will retain 75 to 80 percent share of the milk collection and processing in 2010, and the number of cooperatives will fall to 50 to 70 by about 2015. By contrast, Dr. Klemens Ciesielski, a representative of an association of Polish dairy processors, predicts that in ten years the number of cooperative plus proprietary dairy firms will be fewer than fifty. He also forecasts there will be a 50:50 split in the percentage of milk processed by proprietary firms and cooperatives in ten years.

Cooperatives clearly face challenges if they are to remain competitive in the future. The study team witnessed one dramatic success story: Lazur Dairy Cooperative, which produces up-scale, specialty mold cheeses. In 1990, Lazur cooperative had nine hundred members. In 2005, the cooperative had only seventy members but the seventy members—all of whom had on-farm bulk milk tanks that helped them produce high-quality milk—marketed 50 percent more milk than the original nine hundred. The cooperative sold specialty cheeses to supermarket chains and exported cheese to the Czech Republic and Germany. The

returns from Lazur's cheeses permitted the cooperative to pay highly-competitive prices to producer-suppliers. The cooperative had also developed a sophisticated system for financing plant upgrades and expansion of the business.

Lazur's case is not typical. Scores of small dairy cooperatives remain in operation in Poland. As is the case in many countries, the farmer-members of the small cooperatives resist merging with larger, more efficient cooperatives out of fear of losing member influence and control. If members of the small cooperatives fail to merge or upgrade their operations, they will face the need to accept substantially lower milk prices.

Trends in Direct Sales. Direct producer sales (milk sold directly from farms to consumers) are expected to decline substantially in the next few years. The thinking is that direct sales of milk to consumers represent a labor-intensive activity that will be phased down as more farmers specialize in milk production for sale to commercial dairy processors.

Czubak and Malczewski outlined the evolving pattern of milk sales since the Soviet era, when price controls and state ownership of processing plants resulted in most milk sold through plants. Direct sales are expected to fall from about 1.7 million tons in 2000 to less than one million tons in 2005.

The decline in direct sales of milk forecast in Table 7 is in approximate agreement with other fore-

casts heard by the study team and those made by Molstad in early 2003 [29].

What, if anything, could change the figures? Direct sales are subject to a quota and 82,000 producers received direct sales quota. However, an unknown but presumably large number of direct sellers did not apply for quota. Poland does not appear to have an effective mechanism for monitoring sales of direct sales quota-holders. Accordingly, there will be incentives to expand direct sales beyond what is represented by quota allocated to direct sellers. These incentives may limit the amount of reduction in direct sales of milk.

Trends in Dairy Exports. Poland has been a net exporter of dairy products since 1989 and exports have increased steadily since 1999 (Figure 11). Preliminary export data for 2004 indicate a major increase in Polish exports, primarily to other EU countries. Several factors accounted for the increase, including higher world prices for dairy commodities, additional dairy product supplies available for export from Poland and the elimination of tariffs on Poland's sales to EU-25 markets that accompanied Poland's accession to the EU.

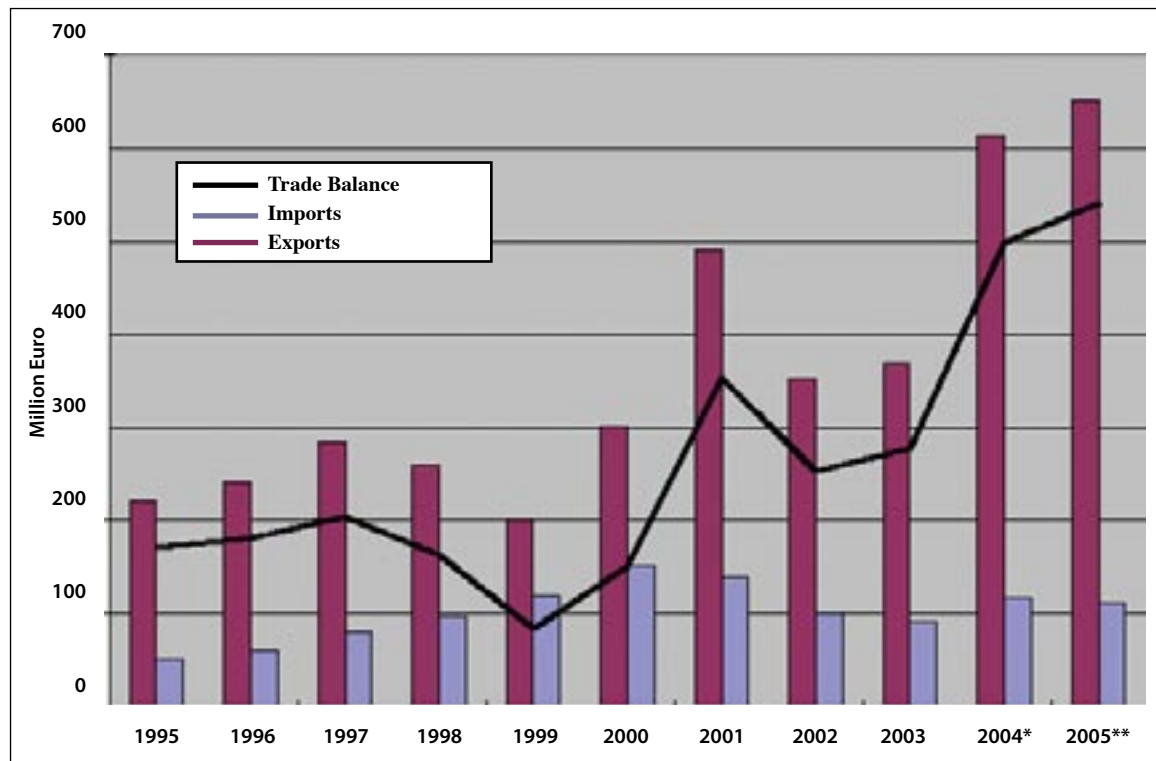
EU-15 countries took nearly half of Poland's dairy export value in 2004 compared to less than a quarter in 2003 (Figure 12). Between 2003 and 2004, milk powder exports to the EU-15 (mainly SMP and WMP) increased from €30 million to €122 million, cheese

TABLE 7. Distribution of Polish Milk Production (1,000 Metric Tons)

Year	Production	Farm Use	Sales to Plants	Direct Sales*
1989	15,296	4,232	11,385	338
1995	11,355	3,400	6,315	1,640
2000	11,494	3,280	6,487	1,676
2001	11,538	3,096	6,832	1,610
2002	11,527	2,930	7,007	1,590
2003	11,546	2,850	7,150	1,546
2004(E)	11,840	2,750	7,500	1,250
2005(F)	11,500	2,530	8,000	970

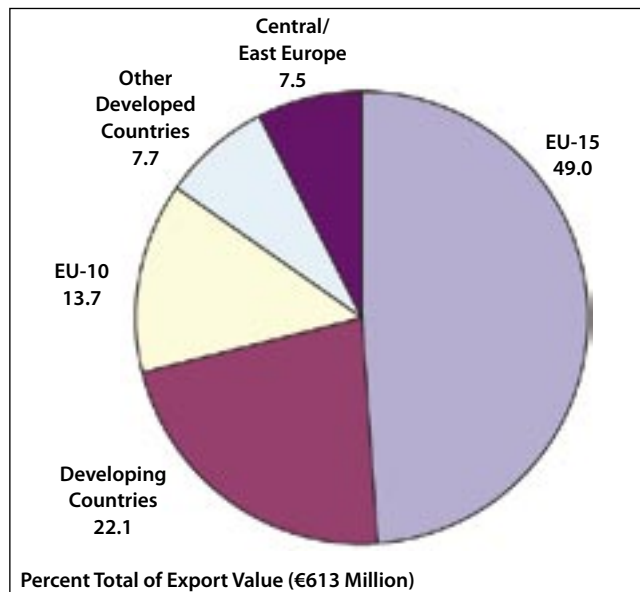
*Includes a small amount of sales to "other industries."
Source: Czubak [6]. (E) = Estimated; (F) = Forecast.

FIGURE 11. Poland Dairy Trade Balance



* Preliminary ** Forecast
Source: Rynek Mleka [22].

FIGURE 12. Destinations of Poland Dairy Exports, 2004



Source: Rynek Mleka [22].

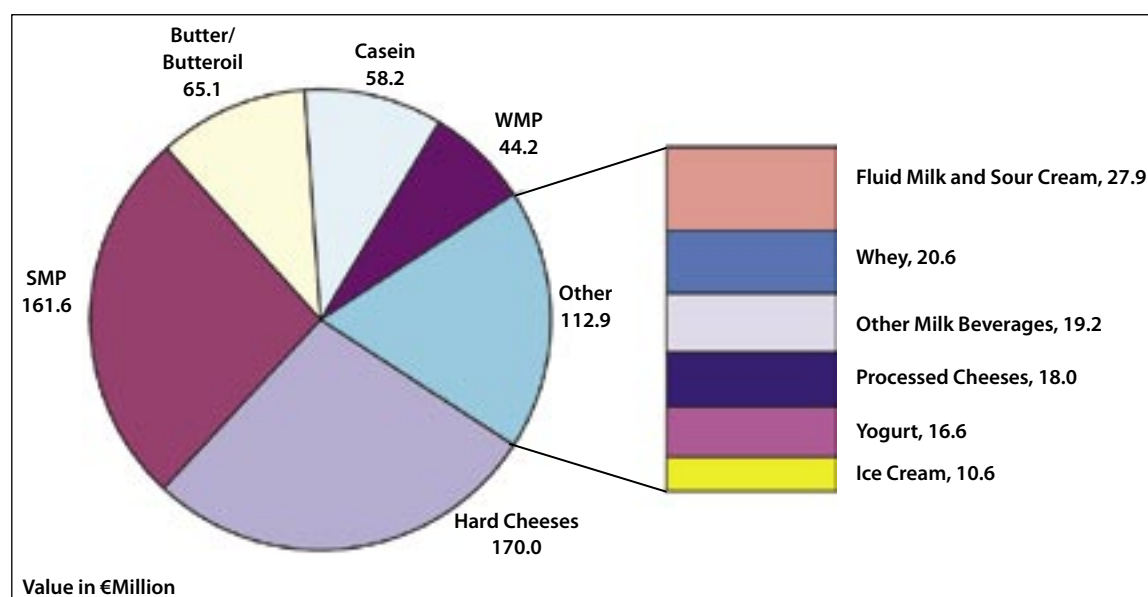
exports from €30 million to €78 million and butter exports from €18 million to €54 million.

Skim milk powder has historically been the principal Polish dairy export commodity, but exports of hard cheese exceeded the value of SMP exports in 2004 (Figure 13). Cheese, milk powders and butter accounted for nearly 90 percent of 2004 dairy export value.

For reasons discussed later in the paper, most of Poland's future dairy exports are likely to be concentrated in the EU-25 countries. The amount and nature of Poland's dairy exports are much more uncertain. The binding EU milk production quotas will likely change Poland's product mix in the direction of higher cheese production and lower milk powder production and exports.

An Ongoing Transition. Poland's dairy processors are improving the quality of their products due to their adherence to EU regulations (including HACCP systems) and use of new technology. The processing industry understands the need to enhance labor

FIGURE 13. Poland Dairy Exports, 2004



Source: Rynek Mleka [22].

efficiency, concentrate processing activities and procure low-priced raw materials to be competitive within the EU-25. Currently, manufacturing capacity is much greater than raw milk quota, resulting in processors operating at 60 percent of capacity on

average. The closing of out-dated, inefficient facilities will narrow the gap and future shifts in manufactured product categories toward more value-added items will further help to balance milk production and processing capacity.

IV. POLICIES INFLUENCING THE COMPETITIVENESS OF POLAND'S DAIRY INDUSTRY

Policies that will affect the competitiveness of Poland's dairy sector are primarily the economic and trade policies of the EU and its Common Agricultural Policy (CAP). When Polish officials began negotiations to join the EU in the early 1990s, they recognized that the country would be required to meet a host of conditions to qualify for membership. In broad terms, the conditions that Poland and other candidates for accession had to meet were spelled out after the Copenhagen Summit in June 1993 as the so-called Copenhagen Criteria, which specified that [5, p. 4]:

- The candidate countries achieve stable institutions that guarantee democracy, legality, human rights, and respect for and protection of minorities.
- That candidate countries have a working market economy, capable of competing effectively on EU markets.

- That candidate countries be capable of accepting all the membership responsibilities—political, economic and monetary.

The last two criteria, in particular, had to be met by accession candidate countries partly via suitable economic, trade and agricultural policies.

Poland, of course, satisfied the Copenhagen Criteria and in voting held on June 7–8, 2003, the Polish people approved a referendum measure to join the EU by a 77.5 percent positive vote [5, p. 1].

The European Union Common Agricultural Policy

It is useful to briefly describe the evolution of the EU's CAP to see how these policies will affect Poland's dairy sector and other components of the country's agricultural economy. The CAP dates back

to the early 1960s when the European Community's Treaty of Rome specified the following objectives for its common Agricultural Policy:

- Increase agricultural productivity by promoting technical progress and the optimum use of the factors of production, particularly labor.
- Ensure a fair standard of living for the agricultural community.
- Stabilize markets.
- Assure the availability of food supplies.
- Ensure that supplies of food reach consumers at reasonable prices.

The second and third objectives proved to be costly to achieve, requiring very large farm payments and export subsidies. The CAP has absorbed as much as 64 percent of the total EU budget (1990), but in 2004 that share has gradually declined to less than 50 percent of the EU budget.

The CAP has undergone periodic reforms, partly in response to high treasury costs and partly to accommodate World Trade Organization concessions. An important change in the basic approach to farm price and income support occurred in November 1997, when the EU Agriculture Council defined the European model of agriculture as having a multi-functional role. This role included maintaining the countryside, conserving nature, contributing to the vitality of rural life, responding to consumer demands and concerns regarding food quality and safety, protecting the environment, and safeguarding animal welfare. Farm payments should be made to reward farmers for enhancing these various agriculture attributes rather than for producing commodities. Subsequent reforms of the EU-CAP have reflected these considerations.

In June 2003, in what was heralded as a fundamental reform of the CAP, EU officials decided that, in the future, the majority of farm subsidies would be made independently of the volume of production (decoupled) through a hectare-based Single Area Payment System (SAPS). In order to reach agreement, a confusing system of partial decoupling was agreed to that added more bureaucracy and administration to the CAP. Nonetheless, it appears that the CAP is irrevocably committed to expansion of decoupling as a key component of its farm policies. SAPS, at reduced

rates, was applied intact to the ten May 1, 2004 accession countries.

As part of an EU-25 reform measure, a budget ceiling for the CAP has been proposed that would go into effect in 2007 [30]. Under the budget constraint, direct payments to farmers would be reduced by 19 percent from 2007 to 2013 for farms receiving more than €50,000 in annual support and by 12.5 percent for farms receiving €5,000 to €50,000 of annual support. Poland's Agriculture Minister has proposed that these reductions apply only to EU-15 members, but Agriculture Ministers from the EU-15 argued that accession countries should be included in the reductions.

As part of CAP reform, the EU has proposed that intervention prices for milk, butter and grains be reduced and that farmers be compensated for reduced incomes. The proposed cut in intervention prices for dairy products amounts to about 28 percent [30].

Policies to Help Poland Qualify for and Succeed as an EU Member

Many steps were taken by the EU and the Government of Poland (GoP) to help the country qualify for and succeed as an EU member. The remainder of this section focuses on those measures that relate to Poland's agricultural sector, with emphasis on the dairy industry.

As a member of the EU-25, Poland's agricultural sector is eligible for benefits under the EU's CAP if it meets a plethora of requirements. However, Poland will not qualify for full EU-CAP benefits until 2013. During a transition period, many programs for Poland's agricultural sector will be hybrid EU-CAP and GoP-supported programs.

Certain measures supported by the EU and the GoP were payments to Polish farmers to help them adjust to operating under EU food safety and sanitation requirements, foster farm consolidation and modernization, and promote farmer support for EU membership. The main agricultural support programs for Poland and authorized expenditures in 2004 are noted in Table 8 [31].

The EU and GoP provided 53 percent and 47 percent, respectively, of the financial support for the three programs in 2004.

TABLE 8. Funding for Poland Agricultural Support Programs, 2004

Program	Funding (€1,000)		
	EU	GoP	Total
Direct Payments	827,890	582,015	1,409,905
Rural Area Development	646,800	813,000	1,459,800
Sector Operational Payments	279,000	138,000	417,000
Total	1,753,690	1,533,015	3,286,705

Poland's paying agency for these agricultural payments is the Agency for Restructuring and Modernization of Agriculture (ARMA). ARMA has broad responsibilities for certifying eligibility for funding, and allocating and monitoring the use of funds. The agency also administers a number of other programs related to agricultural and rural development.

Direct Payments. As noted earlier, Poland will not qualify for the full EU SAPS payments that will be received by EU-15 farmers until 2013. In 2004, the SAPS rate of payment was 25 percent of the full rate. During the transition period, it will increase by five percentage points per year between 2004 and 2007 (40 percent in 2007), and by 10 percent per year from 2007 through 2013, when it reaches 100 percent.

The EU allowed accession countries to "top off" the SAPS payment with internal funds. In the case of Poland, the EU allowed use of some funds allocated to RAD programs to be reallocated to topping off direct area payments. Poland increased the direct payment to 50 percent in 2004, adding 11 percent from Rural Area Development (RAD) funds and 14 percent from internal sources to the 25 percent provided by the EU. Its plan is to continue to use some RAD money in 2005 and 2006 for topping off and then internal funds exclusively from 2007 through 2012 to accelerate phasing in the full payment.

The total direct payment rate per hectare in 2004 was about five hundred zlotys for field crops, pastures and meadows. Dairy farmers could receive a larger payment per hectare on some land because an EU payment for nursing cows was folded into the per-hectare payment for pastures and meadows. Farmers began receiving payments in October 2004 and payments for the 2004 crop year continued until April 30, 2005.

About 1.4 million farmers made claims for direct payments, but by early 2005, fewer than 500,000 claims had been approved.

Rural Area Development (RAD). RAD funds are allocated for three uses, designated Priority A, Priority B and Other Actions:

- *Priority A* deals with the enhancement of competitiveness of farm holdings. These funds are used to promote early retirements by farmers, support semi-subsistence farms and support producer groups.
- *Priority B* deals with sustainable and multifunctional development with emphasis on environmental issues. Priority B funds are used to support less favorable areas, environmental and animal welfare programs, programs to meet EU standards and forestry projects.
- *Other Actions* are primarily Special Action Program for Agriculture and Rural Development (SAPARD) projects that were begun prior to accession, and some technical assistance. SAPARD funds were an important source of dairy plant modernization funds in the pre-accession and early post-accession periods.

Particularly relevant to dairy are RAD programs to assist dairy farmers in complying with EU standards with respect to milk quality and manure management. Dairy farms with fewer than thirty cows are eligible to receive 100 percent of the funds necessary to construct appropriate manure storage facilities, and purchase milking and cooling equipment if they are not already in compliance.

Sectoral Operation Program (SOP). This program is designed to restructure and modernize the food industry and promote rural development. Polish agriculture could potentially receive support amounting to €1,784 million from this program during 2004 to 2006. Of this total, €1,193 million (67 percent) will originate from the EU budget and €591.5 million (33 percent) will be obtained from the budgets of Poland's national and local governments [31]. In addition, private sector cost-sharing of €945 million will be required, raising total related investment to €2.7 billion.

Several SOP activities will benefit dairy producers and processors:

- *Investments in agricultural holdings.* Dairy farmers can receive up to 300,000 Zlotys to invest in housing, milking and other dairy facilities. A maximum cost share of 50 percent is required. Young dairy farmers in Less Favored Areas can receive 65 percent of investment costs.
- *Young farmer stipend.* Individuals under the age of forty with minimum vocational qualifications and an acceptable business plan can receive 50,000 Zlotys to start a farm.
- *Reimbursement for vocational training.*
- *Financial support for agricultural extension.*
- *Improvement of processing and marketing.* Dairy plants are eligible to receive up to 20 million Zlotys to defray modernization costs. To be eligible, the plant must manufacture dairy products (casein is not eligible) produced from milk originating from the EU-25.

Poland's Restrictions on Foreign Purchases of Farmland

The programs described above were structured partly to foster farm consolidation and agricultural development. However, Poland and the EU have left in place one program that fails to advance such objectives. Poland's accession agreement with the EU allows current restrictions on foreign purchases of farmland to continue for an additional twelve years [7]. However, a shorter transitional period will cover foreigners who have established themselves in Poland as self-employed farmers. Such foreigners will be allowed to purchase Polish farmland in three or seven years on

the condition that they have been leasing and cultivating the land in question for three years or seven years (in the Voivodships of Varmia and Masuria, Cuiavia and Pomerania, Western Pomerania, Lubusz, Greater Poland, Lower Silesia and Opole) prior to the property purchase [5, p. 8].

Poland's current legal restrictions on foreign purchases of farmland date back to a 1920 law that allows foreign interests to buy only small parcels of land. Larger plots can be acquired only with the permission of the Ministry of Interior, which must consult with the Ministry of Agriculture on every decision. These requirements, while not impossible to meet, make foreign purchases of farmland difficult. Poland's government is apparently concerned that foreigners would move swiftly to buy cheap farmland and victimize Polish farmers if restrictions on foreign ownership were eased.

Dadak argues that restrictions on foreign purchases of farmland hold down land prices, impede farm consolidation and slow agricultural development. Farmland prices in Poland are low compared to most of the EU-15. Prior to the accession, the average farmland price in the EU-15 was seven and a half times higher than the price of the comparable asset in Poland [7, p. 277]. Moreover, Dadak argues, farm consolidation has been slow to materialize in Poland and development of Poland's agricultural sector has failed to keep pace with development of the non-agricultural sector.

While making it feasible for foreigners to purchase farmland would contribute to higher farmland prices in Poland, it is not evident that this would substantially increase farmland prices and foster stronger agricultural sector development. Farm consolidation and agricultural development problems are complex and a host of changes in addition to allowing foreigners greater freedom to purchase farmland will be needed to remedy these problems successfully. Moreover, at present it is not clear that foreigners would have strong, profit-based incentives to purchase Polish farmland even if the transactions were more feasible to make.

EU-CAP Price and Income Support for Poland's Dairy Industry

In addition to the direct aid provided by EU programs administered by the ARMA, Poland's dairy

industry receives price and income support in several ways from the EU's CAP. These include:

- Intervention purchase programs for supporting prices of butter, cheese and nonfat dry milk (NDM).
- Private storage aid schemes for butter, cheese and NDM.
- Processing aid schemes for butter, concentrated butter and cream.
- Processing aid schemes for NDM intended for production of casein, caseinates and animal feed.
- Aid for promoting consumption of milk and milk products in schools.

Poland's dairy industry has used the different intervention, processing, storage aid and consumption schemes available to the country. Among the intervention programs, the butter program appeared to be getting the greatest use in 2004. Poland's systems for administering the intervention and aid programs appear to be fully functional.

Poland's dairy industry is also eligible to use the EU's dairy export subsidy program, which can be used to make Poland's manufactured dairy products competitive in international markets at times when EU prices exceed world prices. The dairy quotas mentioned numerous times earlier in the report represent a key component of the support. This supply control measure is used throughout the EU-25 to support dairy product prices and limit the need for intervention purchases of nonfat dry milk, butter and cheese.

Poland's AMA administers these and many other CAP programs in Poland, including the complex milk quota system described earlier in Section II. AMA officials have taken steps to provide for efficient administration of the quota system. Training programs for a range of people involved with the quotas were established in three phases. The first involved training of AMA headquarters personnel and personnel employed at regional branch offices. The second phase involved training personnel at milk purchasing plants and advisory organizations. The third phase involved training farmers. One high level AMA official charged with administering the quotas said the biggest challenge she encountered was in getting information to the hun-

dreds of thousands of Polish dairy farmers on how the quotas actually work.

EU Trade Policies Affecting Poland and other Accession Countries

Poland and the other nine accession countries that entered the EU in May 2004 became subject to EU trade policy requirements, including those relating to the EU's commitments under the WTO. Trade policy changes affecting the accession countries can be summarized as follows [25]:

(Effective May 1, 2004), the ten new EU Member States adopt all aspects of the Common Commercial Policy: They will apply to all the EU bilateral trade agreements, the common external tariff and the EU trade defense measures. They will take on board the EU openness in external trade: overall, tariffs will decrease from 9 percent to 4 percent. In the WTO, the EU will speak for the 25 Member States, instead of 15 (emphasis supplied). The new Member States will take over the EU's multilateral trade commitments and obligations. . . . As new Member States forego their national trade policies, they must renounce their own bilateral free trade agreements with third countries. . . . The new Member States will also have to amend their international agreements with third countries and eliminate any trade or trade-related provision, or any other provision which would conflict with EU policies. This applies in particular to investment protection agreements with certain countries.

Poland will employ EU trade regulations governing food and agricultural products to stabilize the domestic market and monitor imports and exports. This will be accomplished partly through actions of Poland's AMA, which serves "As an administrator of foreign trade of agricultural and food products, . . . (and) is responsible for (issuing) import/export permits as well as reimbursement certificates, payment of export reimbursement, export fee calculation, administration fine enforcement and reports to the European Commission [31, p. 6]."

Poland's dairy industry will be affected by EU commitments under the Doha Round of WTO negotiations. In particular, the framework for modalities for further

agricultural trade negotiations agreed to by the EU and other countries in mid-2004 will produce changes in dairy trade that stem from the end of dairy export subsidies, increases in market access and reductions in trade-distorting domestic support.

The Eventual End to Dairy Export Subsidies. The framework for modalities calls for dairy export subsidies to be eliminated by a date to be negotiated. This will spell the end of the large EU dairy export subsidies. The big question relates to when dairy and other agricultural export subsidies will actually end. The U.S. has proposed that agricultural export subsidies end five years after the start of the implementation period for the Doha Round. The French have proposed an end date of 2015 to 2017. Among leading dairy exporters, the EU will experience the largest losses from terminating dairy export subsidies. The Uruguay Round WTO permits the EU to subsidize exports of 366,000 tons of butter, 243,000 tons of SMP and 305,000 tons of cheese. For comparison, the U.S. subsidy limits are 21,000 tons of butter, 68,000 tons of SMP and 3,000 tons of cheese.

Increases in Dairy Market Access. “Substantial improvements in agricultural market access” are required by the framework for modalities. However, WTO member countries are permitted to designate “sensitive” agricultural products for special, protective treatment. This injects so much uncertainty into market access negotiations that the framework for modalities is mostly a framework for additional negotiations on this issue. However, expect EU butter and cheese imports, which amounted to 5 percent and 2 percent, respectively, of EU-25 consumption in 2004, to increase after the Doha Round becomes effective.

Reductions in Trade-Distorting Domestic Support. The framework for modalities states that overall levels of the most trade distorting domestic support will be substantially reduced. What this means for the complex EU-25 dairy intervention system is unclear. Possibly the decoupling and other reforms of the CAP already announced will limit the amount of additional cuts in trade distorting domestic support for the Union’s dairy industry that will be necessary under the Doha Round.

Regarding the last point, the Danish Dairy Board reported in March 2005 that EU farm reform mea-

asures entailing reduced intervention prices for butter and SMP will lower the milk price level in the EU by about 20 percent over the next three years [9].

A Scenario Regarding the Future of the EU-25 Dairy Sector

The Danish Dairy Board predicted that developments will unfold in the EU dairy sector in the next decade approximately as follows [9]:

Taken together (the WTO measures and intervention price cuts) will result in the EU milk producers in 2015 no longer receiving a fair price compensation to counter the setbacks of having to limit their production every year. The ability of the quota system—through production curbs—to secure a price level within the Union which is higher than that of the surrounding world rests solely on the condition that import and export can be controlled. The WTO deals stretching into the farm area marked a decisive break with this condition and the consequences are now really beginning to materialize. . . . (An) overriding advantage of the quota system—a high and stable price level—will gradually vanish over the next ten years.

In response to this situation, the Danish dairy sector has called on the European Commission to adjust the quota system to facilitate the abolition of quotas in 2015 when the current EU quota regime is scheduled to end. The fact that the Danes called for an end of quotas does not necessarily mean that this will happen in 2015 since the EU-25 allies for such a position presently include only dairy groups in the UK, Germany and the Netherlands. But, the number of allies may increase if, as is likely, the price scenario outlined by the Danes materializes.

Summary of Policy Impacts

The EU-CAP and GoP have taken steps through policy measures to make Poland’s dairy industry more efficient and competitive. Successes have been achieved in farm consolidation, improved milk quality, improved milk production per cow and dairy plant upgrades. An irony, noted earlier, is that Poland’s dairy industry is being made more internationally

competitive at a time when EU milk quotas will limit the industry's ability to take advantage of the newly-created international competitiveness. Poland's Minister of Agriculture, Adam Tanski, apparently recognized the contradictions inherent in EU-CAP programs. Molstad summarized Minister Tanski's views on agricultural subsidies as follows [30]:

... Apart from the fact that he is a Minister of Agriculture and his role is to protect the interest of Polish farmers, he personally thinks that a complicated agricultural subsidy system is bad and gradual

abandoning of this system is a move in the right direction. He said that his dream would be to create in Europe a system without subsidies which works perfectly in New Zealand.

If, in a decade, the benefits for farmers of EU milk quotas decline in the fashion predicted by the Danish dairy industry, Poland's dairy industry may have greater incentives to join the camp favoring elimination of quotas. Poland's dairy industry may even support efforts to move in the direction dreamed of by Minister Tanski.

V. FORCES THAT WILL SHAPE POLAND'S DAIRY TRADE AND FOREIGN DIRECT INVESTMENT

The Polish firms Mlekpól, Lacpól and Polindus—to name a few—are prominent exporters of milk powder. At times, Polish milk powder has been marketed in competition with U.S. exports of milk powder in major markets such as Mexico and Algeria. Polish exporters of cheeses include the Polish branch of the French firm, Danone, and a host of other companies. While the U.S. was not a major destination for Polish cheeses, Polish firms did export 2,952 metric tons of cheese valued at \$11.3 million to the U.S. in 2004 [17]. Foreign direct investment (FDI) in Poland's dairy industry by firms such as Danone, Hochland, Arla and others also has been described elsewhere in the paper.

This section analyzes forces that will shape Poland's dairy exports, dairy imports and foreign direct investment (FDI) in the country's dairy industry over the longer-run. The dramatic changes that will be produced by EU milk production quotas on Poland's dairy exports and dairy imports are underscored.

The quantities and destinations for Poland's 2003 and 2004 exports of cheese, butter, NDM and whole milk powder appear in Table 9. These figures serve as benchmarks against which to compare expected future changes in Poland's dairy exports.

The impacts of Poland's 2004 accession to the EU are already evident in the figures in Table 9, which show that Poland has expanded exports to EU-15 countries, in particular from 2003 to 2004. The following section, which deals with forces that will shape the size and destination of Poland's future dairy exports and imports, indicates why accession-related devel-

opments and associated forces are important factors shaping trade.

Attributes Affecting Poland's Trade and FDI

Poland's dairy trade and FDI over the longer-run will be affected by attributes noted in Table 10. These variables should be regarded as only general indicators of the direction and magnitude of the impact of the different variables on international trade and FDI. However, they are relevant for predicting trade and FDI-related changes that will affect Poland's dairy industry.

While the attributes noted in Table 10 relate to trade flows between pairs of countries, they also help to explain trade flows between one country and other members of a trading bloc, such as the EU.

The impact on trade flows of variables, such as income level, economic size, physical distance and physical size, have the expected sign and show limited impacts. Other variables in the table, especially the common regional trading bloc, common polity and common currency have much larger impacts. Among other things, the large effect associated with membership in a common regional trading bloc suggests how important Poland's accession to the EU-25 will be to the country's trade with other EU members and how important Poland's eventual entry into the Euro zone will be to trade. The figures, of course, suggest that an increasing amount of Poland's dairy exports, dairy imports and dairy-related FDI will involve other EU member countries.

TABLE 9. Quantity and Destination of Selected Polish Dairy Exports, 2003 and 2004

Product and Destination of Exports	2003		2004	
	Exports (1,000 mt)	% of Total	Exports (1,000 mt)	% of Total
Cheese				
New Member States	15.4	29.6	20.6	25.8
EU-15	12.6	24.2	30.8	38.5
Other Countries	24.0	46.2	28.6	35.7
Total	52.0	100.0	80.0	100.0
Butter				
New Member States	0.1	1.1	2.0	7.4
EU-15	8.9	96.7	20.9	77.1
Other Countries	0.2	2.2	4.2	15.5
Total	9.2	100.0	27.1	100.0
Dry Milk (SMP and WMP)				
New Member States	1.6	3.6	2.6	2.0
EU-15	21.8	18.2	71.8	55.8
Other Countries	84.2	78.2	54.2	42.2
Total	107.6	100.0	128.6	100.0

Source: Rynek Mleka [22].

TABLE 10. Impact of Selected Variables on Trade Flows Between Pairs of Countries

Attribute	Change in International Trade (%)
Income Level: GDP per Capita (1% Increase)	+0.7
Economic Size: GDP (1% Increase)	+0.8
Physical Distance (1% Increase)	-1.1
Physical Size (1% Increase)	-0.2
Access to Ocean	+50
Common Border	+80
Common Regional Trading Bloc	+330
Common Polity (Political Organization)	+300
Common Currency	+340

Source: J. Frankel and A. Rose as quoted in Ghemawat [18].

P. Ghemawat, a Harvard Business School analyst, provides additional insights about the impact of distance, broadly defined, on trade and FDI that have relevance for Poland's future dairy trade and FDI in the country's dairy industry. Ghemawat uses the so-called Cultural, Administrative, Geographic and Economic (CAGE) distance framework, which consists of the elements shown in Table 11.

Impacts of elements of the CAGE distance framework on Poland's dairy trade and dairy-related FDI are likely to be as follows:

Cultural Distance. The Polish language is not widely used in countries other than Poland. While a substantial number of people in Poland's dairy industry are bilingual or multilingual, language does constitute a cultural distance factor that would at least modestly limit trade and FDI. Costs are incurred by importers and exporters of Polish dairy products for acquiring the services of interpreters or learning the language skills needed to enter into dairy-related trade or FDI contracts.

TABLE 11. Selected Elements of the CAGE Distance Framework

Cultural Distance	Administrative or Political Distance	Geographic Distance	Economic Distance
Different languages	Absence of colonial ties	Physical remoteness	Differences in consumer incomes
Different ethnicities	Absence of shared monetary or political associations	Lack of common border	Differences in costs and quality of natural resources, financial resources, human resources, infrastructure, and knowledge
Different religions	Government policies Institutional weakness	Lack of sea or river access Size of country Weak transportation or communication links	

Source: Ghemawat [18].

Administrative or Political Distance. The administrative or political distance factor relating to absence of shared monetary or political association will be of reduced importance to Poland’s trade and FDI in the future. Poland’s accession to the EU has produced an important political and trade association that will facilitate mutual dairy trade between Poland and the other members of the EU-25. Among the most important benefits of Poland’s accession to the EU-25 was the removal of tariff barriers to trade with the other members of this trading bloc. When Poland eventually gains entry into the Euro zone, the country will acquire an additional benefit that will facilitate dairy trade.

Government policies regarding the dairy industry have become increasingly shaped by the EU. Thus, EU milk and dairy product quality measures must be observed if a Polish firm is to export dairy products to other EU-25 countries. Market interventions to support dairy product prices also are governed by EU requirements and procedures.

Institutional weakness is a factor that has negative impacts on Poland’s dairy trade and FDI. For example, corruption—which reflects institutional weaknesses in Poland’s courts and other institutional shortcomings—manifests itself in a number of ways in Poland. Government regulations relating to businesses are not easy for foreigners and domestic firms to deal with. Corruption thus is an impediment to expansion of dairy trade and FDI that needs to be reduced if trade-related business is to proceed efficiently.

Geographic Distance. Geographic distance appears to be of limited importance as a barrier to Poland’s dairy trade or FDI in Poland. Air distances between Warsaw and other major cities are as follows:

Berlin = 325 miles

Paris = 856 miles

Amsterdam = 681 miles

Brussels = 724 miles

Moscow = 701 miles

Poland also has common borders with four EU-25 members: Germany, Czech Republic, Slovakia and Lithuania. It also has reasonably good highway links to trading partners and generally satisfactory communication links. While a substantial amount of Poland’s dairy product imports and exports will be made over highways, the country does have access to the Baltic Sea for in-shippments or out-shippments of dairy products.

Economic Distance. Poland’s relatively low average consumer incomes presumably represent a factor limiting FDI in Poland’s dairy industry. The USDA’s Agricultural Attache for Poland indicated that about 5 percent of Poland’s people are rich, 20–25 percent are in the emerging middle class and the remainder of the people are relatively poor. As noted earlier, Poland has the second lowest per capita GDP expressed in purchasing power parity terms of any country in the EU-

25. Poverty is particularly evident in Poland's rural areas. These income figures effectively limit sales of up-scale dairy products in Poland, whether those products are supplied by domestic or foreign firms.

Poland's dairy trade and FDI probably do not suffer greatly from differences in the cost and quality of natural and financial resources. However, as noted later, a strong Zloty may limit exports of dairy products in the near term. In addition, the advantage enjoyed by Poland via its low labor costs probably will be of limited value for expanding the dairy trade and FDI. Modern dairy plants make somewhat limited use of low-cost labor. Sophisticated dairy processing and exporting operations will require skilled personnel who are not available at low wage rates.

The material on trade between pairs of countries and the CAGE distance factors suggest that, in the absence of quotas, a generally favorable environment would exist for expanded exports of Poland's dairy products and greater FDI in the country's dairy industry. Poland's dairy industry has been strengthened and the ability of its firms to expand dairy exports has been produced by measures associated with the country's entry into the EU. As a result of Poland's accession to the EU-25, the quality of milk and dairy products has been upgraded to EU standards. This change occurred partly because EU funds were made available to finance the expansion and upgrading of farms and dairy processing companies. Perhaps equally important, Poland's dairy processing companies have been subjected to competition from other EU firms, forcing Polish firms to become more competitive in order to remain viable.

As a result of EU accession-related changes made in the industry, Poland's dairy products now sell at prices at or near parity with EU-15 dairy product prices. This contrasts sharply with the situation in the early 1990s. For example, Keane and Byrne, analysts with Ireland's Center for Cooperative Studies point out, during the first quarter of 1990, Polish NDM sold at discounts of 40 percent to 70 percent to world market prices [20]. The comparable discounts for butter ran from 30 percent to 55 percent in the same period. Polish casein exports in the first quarter of 1990 sold at discounts of about 45 percent to world market prices.

The irony is that, just as Poland's dairy industry has developed the capacity to become a more competitive

exporter, it will find that the EU milk production quotas will sharply limit the country's milk production and turn the country into a small exporter or net importer of dairy products. However, the quota regime will not instantly shrink Poland's dairy exports. There is likely to be a transition period of several years when Poland will remain a net exporter of dairy products. This period will be followed by times when binding quota constraints will reshape the product mix of Poland's dairy industry.

The Challenging Transition Period

Poland's dairy industry is likely to adjust to the quota regime by increasing production of various cheeses, yogurt and selected fluid items, and by reducing UHT milk production and substantially curtailing SMP production. Butter production may expand modestly to satisfy domestic demand for the product. These adjustments will be carried out to channel available milk to higher value-added products and away from production of SMP—Poland's big export item.

Poland's transition to the quota regime will include the following developments that will soften the immediate impact of the quotas and produce gradual changes in the industry's product mix:

- Poland's milk producers face no binding constraint from the quotas in the first year of quota operations, limiting the actual adjustment required in this first year. Producers receive no penalty for exceeding assigned quotas in the 2004–2005 quota marketing year to allow them to shift to a quota regime in a manageable fashion.
- If granted, the quota increase of 416,000 tons in 2006 will limit the adjustment needed in the near term. This reserve quota will be allocated if retail demand for milk increases by at least an equivalent amount following an expected decrease in on-farm consumption and direct sales as Poland's farm populations migrate to urban areas.
- Processors will require time to secure the financing, equipment and technical skills required to switch from production of milk powder to cheese and fluid items. Ultimately,

such switches will be made or the processors will be forced out of business. Mainly this is because lower market returns from milk powders will compel processors of these items to pay lower prices to milk producers. This, in turn will create incentives for producers with alternative markets for milk to migrate to processors of cheese and fluid items who are able to pay higher farm milk prices. However, this process will not be instantaneous, and some producers will not find more profitable outlets for their milk. Thus, substantial milk powder production will persist for several years in Poland.

- Profitable niche export markets for milk powders may materialize. For example, Polindus of Krakow reported that it may negotiate a joint venture arrangement with Fonterra of New Zealand to serve as a supplier of milk powders to Fonterra's markets in Algeria. Fonterra is negotiating such arrangements in a number of markets to meet its supply commitments when New Zealand supplies run short. Fonterra also uses joint ventures to enable the firm to process New Zealand milk powders into higher value-added items and sell foreign-sourced powder for lower value-added uses.

Scenarios can be constructed that would allow Poland's dairy industry additional time to adjust to the quota regime. A period of short supplies and high prices for milk powders in international markets could allow milk powder production in Poland to continue to profitably absorb portions of Poland's quota-reduced milk supplies. One processor interviewed even suggested that milk powder production would fall sufficiently in the original EU-15 countries to allow Poland to become a profitable residual supplier of this item. While possible, such scenarios can't be counted on to allow Poland additional time to adjust to the quota regime.

Russia is a wild card for Poland's dairy exports. Russia is frequently the world's largest importer of butter and the third largest importer of cheese—ranking behind only Japan and the U.S. In the future, Poland's dairy firms are expected to sell most of the butter they produce in the domestic market. Poland's dairy industry may develop a product mix that will support cheese

exports after the transition period, but EU-15 firms that have geared up to export cheese to Russia will represent strong competition for Polish dairy firms in the Russian cheese market. Milk powders are presently a major export item for Poland, but this is unlikely to be true after milk quotas become binding, and Russia doesn't import much milk powder anyway. Thus, while Poland has proximity advantages for serving the Russian dairy market, it is uncertain whether Poland's dairy industry will secure a substantial share of that market in the future.

Poland's dairy exporters may see dairy exports constrained by the country's relatively strong currency during the transition period. Poland is expected to enter the Euro zone by 2009 or 2010, a change that will facilitate efficient trade transactions. But, before that time, Poland's exports may be limited by a relatively strong Zloty. The increase in FDI—and in EU payments—in Poland's agricultural and nonagricultural businesses, and the accompanying increases in the demand for Zloties, have fueled the rise in the value of the Zloty relative to the Euro and U.S. dollar. The generally favorable economic outlook for Poland's economy in the aftermath of accession and the continued sale of assets by Poland's government as part of privatization are likely to keep the Zloty relatively strong.

The Future of FDI in Poland's Dairy Industry

Foreign dairy firms are likely to make additional inroads into Poland's cheese and fluid milk processing and distribution industries. Foreign firms—including Danone, Hochland and Arla—are already strongly represented in the industry. These and other foreign firms are likely to concentrate on dairy items for which the income elasticity of demand is largest. This would put them heavily into hard cheese production.

Arla reports that the firm's European retail customers are looking forward to using fewer suppliers, a development that has implications for Arla's Polish operations. The Denmark-Sweden based Arla believes that its Polish cheese operations will help the firm offer cheeses at the lower end of the price scale, making the firm more attractive as a partner with its European customers for this business. Arla has previously not been active in this segment and plans to use its Polish cheese

operations to expand its business in this large segment of the European cheese market.

With a few exceptions, Polish firms tend to have relatively weak dairy brands. This will limit their ability to compete against the established international brands of companies such as Danone, Hochland and Arla. Thus, the foreign companies are likely to capture additional sales in major metropolitan areas with higher personal income levels.

However, profit squeezes are likely to be felt by both domestic and foreign-based processors as they seek to obtain additional shelf space in Poland's upscale supermarkets. These newer supermarkets are operating much like they do in Western Europe. Their operating strategy frequently involves pressuring suppliers to accept low margins on dairy products. This pressure is already evident in Poland.

While FDI is likely to increase in segments of Poland's dairy industry, those planning to enter or expand sales in Poland are aware of the difficulties that other foreign dairy firms have encountered in Poland. Foreign dairy firms that have chosen to leave or scale back their operations in Poland in recent years include the following:

- Land O'Lakes has exited from the dairy business in Poland.
- Kraft has exited from the cheese business in Poland, reportedly finding it difficult to compete effectively against Hochland.
- Nestle has closed down its fresh milk-based production in Poland and has sold its dairy plant

in Kobylinica by Slupsk, North Poland to the Polish Lacpol Corporation.

- Campina has decided to dispose of its Polish production and distribution activities. Campina will continue to focus on marketing value-added products such as dairy desserts, dairy drinks and yogurt in Poland.

While there appears to be no single factor that accounts for the exit of the foreign firms from Poland's dairy industry, the difficulties experienced by the firms suggests that Poland's dairy industry exhibits significant production and marketing challenges.

In summary, numerous opportunities and challenges would exist for expansion of Poland's dairy trade and FDI in the country's dairy industry. On balance, Poland's dairy industry is better equipped to export than it was before EU accession. However, the binding EU production quotas will prevent the industry from capitalizing on this improved position. After adjusting to the quota regime, Poland's dairy exporters will likely export the limited quantities of cheeses, creams for further processing, and milk powders not required for domestic consumption mostly to other EU countries—especially Germany, the Netherlands and France. Moreover, Poland's dairy industry undoubtedly will ask the EU for additional quota. However, a positive outcome from such a request is far from certain. Poland may find that its dairy exporters have paid a high price for EU accession and that resources will need to be taken out of the country's dairy sector because of the quotas.

VI. SUMMARY COMMENTS ON THE FUTURE OF POLAND'S DAIRY SECTOR

In this section, we will briefly summarize our principal conclusions and observations regarding the current status and future direction of Poland's dairy sector.

We begin by emphasizing that our overall impression of the Polish dairy industry is very positive. Dairy farmers, milk processors, dairy trade organization leaders and government officials are uniformly optimistic about the future of the industry, and for good reason. Poland has a long tradition of dairying and a strong dairy infrastructure that is adjusting well to evolving conditions. Poland's entry into the EU provides new

marketing opportunities and resources are moving into dairy to exploit these opportunities.

At the same time, Polish dairy industry leaders are realistic in recognizing the challenges that the industry faces as a new EU member. We focus on these challenges in our summary comments.

The dairy production and processing sectors must be quickly restructured. Stated bluntly, Poland has far too many dairy farms and dairy processing plants. The SAPARD, SOP and RAD programs provide an enor-

mous opportunity to direct funds toward rapid consolidation and enhanced efficiency of both farms and plants. To date, Poland has elected to utilize these funds to pursue a broad and diverse set of goals related generally to rural development and enhancing economic opportunities for rural residents. These are obviously important goals, but they are not necessarily compatible with the goal of rapid modernization of farming and food processing. There may be EU guidelines and constraints that restrict use of these funds or prescribe funding goals. Nevertheless, establishing eligibility requirements for funding modernization projects that help to ensure viability—for example, realistic minimum herd sizes and processing capacities—might be employed.

Poland's apparent comparative advantage in dairying may be tenuous. Various cost of production estimates consistently show Poland as a low-cost dairy producer. But Poland's low cost of production appears to be related mainly to the very labor-intensive nature of small-herd dairying—minimal housing facilities, hand milking, grazing as a major feed source—combined with a very low imputed opportunity cost for labor. This production model is not sustainable in the long run.

As the production sector restructures, the question of Poland's comparative advantage in dairy emerges. The modern dairy farms that we visited are increasing in number and likely represent an important segment of the future structural model. These farms would appear to have costs comparable to counterparts in EU-15. Labor costs are lower because of a lower wage structure. Feed costs in confinement operations are probably higher because of lower yields of grains and forages compared to many other EU countries, despite lower land values. Whether Poland retains a comparative advantage depends critically on future increases in wages and land values.

Funds to promote dairy restructuring and modernization may be constrained. Because of its large number of farmers, Poland has faced a challenge in implementing various funding programs to spur modernization of its agricultural sector. The Polish government has been reasonably successful in handling the complex EU paperwork and administrative duties

needed to permit many Polish farmers and businesses to avail themselves of EU funds. However, it is unclear whether the GoP will have the funds needed to pay for its share of the agricultural program costs. Poland's 2.1 percent growth rate in real GDP for the first quarter of 2005 was down from the 5.3 percent real growth rate recorded for the full year in 2004. Moreover, the new government expected to assume office in Poland in mid to late 2005 will face a number of budget constraints at a time when GDP growth is slackening. Therefore, whether the GoP will be able to meet its share of agricultural program costs beginning in late 2005 and 2006 is a substantive question.

EU milk quotas will be the major driving force shaping Poland's dairy sector. We have noted several times in this report the potential impact of EU milk quotas on various aspects of Poland's dairy industry. Quotas will heavily influence the rate of restructuring of the production sector, the composition of Poland's dairy product mix, dairy exports and direct foreign investment in processing. Unless its milk quota is increased significantly, we anticipate that Poland will become a net importer of dairy products in five to seven years. Quota restrictions will elevate the cost of milk production (because of the cost of acquiring quota) and shift domestic milk supplies increasingly into fresh products and cheese, and out of fluid milk and milk powders.

Why did Poland obtain such a restrictive milk quota from the EU during the accession negotiations? The most important reason is that Poland could not document to the EU in a satisfactory fashion the sales of milk made directly by producers to consumers. There were only limited records of direct milk sales comparable to records available for farm sales to commercial dairy plants. The assumption made by the EU apparently was that the large difference between milk production and adequately-documented sales was accounted for substantially by on-farm consumption.

Mr. Jersey Plewa, a Polish negotiator involved in EU accession negotiations relating to agriculture, thought that Poland might not be disadvantaged greatly by accepting a low milk quota for the early years of accession since the country might participate as a full member of the EU in 2007 or 2008 and secure a larger quota for the country. Getting a larger quota in

subsequent negotiations may not prove to be a viable strategy.

While it was an item of concern to Polish negotiators, the small dairy quota assigned to the country was not a deal breaker for Poland regarding EU accession. This was not surprising since many other agricultural and non-agricultural sectors gained from accession. Moreover, many Polish dairy farmers reportedly believed that quotas would be a useful mechanism for safeguarding their farm investments. The quotas, of course, would limit entry into dairy farming in Poland and limit competition, and quota would be a valuable asset to farmers who were in dairying at the time it was assigned. Finally, Poland's dairy industry seemed resigned to the fact that the industry would have to agree to whatever the EU required in terms of quotas and other requirements for EU accession.

Questions exist regarding how effectively the quota system will operate in Poland. One processor-exporter speculated that Poland might exceed the quota and escape penalties, as has been done more-or-less routinely in Italy. However, Poland's AMA has effective mechanisms in place for administering individual quotas and appears to be committed to effective enforcement.

While the quotas on milk farmers sell to commercial dairy processing plants are likely to effectively limit production, no quota enforcement machinery is available to limit production of milk for direct sale to consumers. It is possible, as some in Poland's dairy industry speculate, that direct sellers will decline in number and importance. However, incentives appear to exist for large producer-distributors to emerge to circumvent the quotas. This issue may need attention as experience is gained with quotas.

Dr. J. Rosa, Deputy Head of Mission for Poland's Embassy in Ireland, pointed out that milk quotas are more disadvantageous to Poland than most countries in the EU-15, because the quotas will be imposed in Poland before an expected large increase in productivity on Poland's dairy farms [23]. Rosa argued that many EU-15 countries already had achieved relatively high dairy farm productivity before quotas were imposed and thus were less constrained by the supply control measures. He predicted that average milk production per cow in Poland will increase from 4,232 liters per year in 2004 to 5,600 liters per cow in 2015

(32 percent). Because of the quotas, milk cow numbers will decline from 2.8 million in 2004 to 2.0 million in 2015. Among other things, the quotas will prevent the positive impacts of productivity improvements from transforming Poland's dairy industry into a major dairy exporter.

While Poland allows producers to buy and sell milk quota, there are potential shortcomings in the selling arrangements. First, there is no central clearing house or auction mechanism to facilitate efficient purchase and sale of quota—farmers simply negotiate the sale to neighbors or others found to be in the market for quota and report the transfer to the AMA. A clearing house or formal auction mechanism would provide useful information to producers on quota prices. This is important since a large spread exists in quota prices at present. The study team heard references to quota selling for as little as 0.20 Zlotys/liter (in a distress sale) to as much as 2.0 Zlotys/liter. Such a large price spread indicates problems of price discovery. Second, quota can only be traded within regions of Poland. This prevents Poland's milk production from gravitating to the most efficient milk production regions of the country. This, in microcosm, identifies a problem affecting the entire EU milk quota system. While complete within-country transfer of quotas is permitted in some other EU countries, transfer of quotas from country to country in the EU is not permitted. Hence, milk production is prevented from moving to the most efficient producing countries within the EU.

In the near term, Poland is not likely to be a significant factor in U.S. dairy product trade, but could represent growing opportunities for U.S. exporters of dairy genetics. In recent years, Poland's primary dairy exports to the U.S. have been milk powders, especially caseinates. In 2004, Poland was the fourth leading source of U.S. imports of caseinates, accounting for about 4,700 metric tons valued at \$13.5 million. Poland has been a relatively minor supplier of U.S. MPC and casein. As noted above, we predict that Poland's quota-restricted milk supply will be channeled increasingly into cheese and fresh products, meaning less milk will be available for milk powders. Consequently, we expect reduced U.S. imports of caseinates from Poland.

The U.S. is poorly positioned to export dairy products to Poland, both in economic and geographical terms. In the last ten years, the value of U.S. exports of dairy products to Poland has ranged between \$3 million and \$11 million. Exports have consisted almost entirely of frozen deserts, infant formula, and specialized foods and beverages containing dairy ingredients. As Poland's economy develops, sales of these imported dairy products will increase, but they are more likely to be supplied from the EU than the U.S.

With the inevitable modernization of Poland's dairy production sector, there will be growing demand for dairy facilities, services and production inputs. The demand for milking and feeding equipment will be met by EU companies. The U.S. is already a supplier of semen and embryos, and U.S. exporters should benefit as Poland's dairy herd restructures towards larger specialized operations.

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