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THE DAIRY SECTOR OF IRELAND: A COUNTRY STUDY

Babcock Institute Country Study Team

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PREFACE

This is the fourth of a 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 selected foreign dairy producers, processors, exporters and government agencies. 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.

Previous Babcock country/regional studies and related Babcock Discussion Papers were: Oceania (2004), Babcock Institute Discussion Paper No. 2004-3, *The Dairy Sectors of New Zealand and Australia: A Regional Study*; Poland (2005), Babcock Institute Discussion Paper No. 2005-3, *The Dairy Sector of Poland: A Country Study*; and India (2006), Babcock Institute Discussion Paper No. 2006-2, *The Dairy Sector of India: A Country Study*.

We selected Ireland as a study country in 2007 for several reasons. Ireland employs a grass-based production system that is unique in the European Union (EU). This results in enviably low costs to produce milk, but creates challenges for processors because of extreme seasonality of production. Ireland represents a good case study of the effects of long-term use of milk production quotas. EU dairy quotas have stymied growth in Irish milk production and the method of allocating Ireland's country quota has affected the regional location of milk production. Ireland accounts for only about 4 percent of EU-27 milk production, but plays a much larger role in world dairy trade. Finally, primarily because of a restricted internal milk supply, Irish dairy cooperatives have expanded their operations through extensive non-dairy diversification and through joint ventures and direct investment in foreign dairy sectors, including the U.S.

The multi-disciplinary team assembled to conduct this study was comprised of 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, retired Director of the University of Wisconsin Center for Dairy Profitability (dairy production systems), Edward V. Jesse, University of Wisconsin-Madison Professor of Agricultural and Applied Economics (dairy marketing and trade), and Norman F. Olson, University of Wisconsin-Madison Emeritus Professor of Food Science and founder of the UW Center for Dairy Research (dairy processing).

The study team reviewed an extensive collection of government and academic reports, internet sites, and other information prior to visiting Ireland in May 2007. During the visit to Ireland, the team members made separate site visits according to their expertise. Professor Olson visited with dairy processing plant executives and dairy processing research staff at several locations. Dr. Frank visited dairy farms and interviewed staff at dairy production research centers. Professors Jesse and Dobson met with government officials, trade association staff, cooperative officials and university faculty.

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We are indebted to the University of Wisconsin-Madison Babcock Institute for Dairy Research and Development for providing financial support for this project.

We wish to express our sincere thanks to the numerous dairy industry experts we visited in Ireland who gave generously of their time and provided excellent information to the team. We thank in particular representatives of the Irish Dairy Board, the Irish Farmers' Association, the Irish Cooperative Society, the Faculty of Food Science and Technology and the Department of Food Business and Development at University College, Cork, Glanbia plc, Dairygold Co-operative Society Ltd., the Kerry Group, Carbery, J&L Grubb Ltd., Glynn Food Services, Moorepark Food Research Center, and the Rural Economy Research Center for their valuable insights.

THE DAIRY SECTOR OF IRELAND: A COUNTRY STUDY

Babcock Institute Country Study Team¹

EXECUTIVE SUMMARY

Dairying in Ireland has a long and storied history and has evolved in response to major changes in economic and political conditions. Dairy contributes measurably to Ireland's rural economy and immeasurably to Ireland's tourism income—with cows grazing contentedly in lush green paddocks, Ireland epitomizes dairying.

The Irish dairy production system is grass-based, coming closer to the New Zealand model than what is employed in most of western Europe. Our sense is that the system is probably optimal given Ireland's climate, with pasture growth in all but two to three months during the year. But while grazing and related seasonal calving results in enviably low costs of production, the system offers a challenge to dairy processors, yielding an extreme seasonal pattern of milk production. Plants scaled to handle peak production operate at a fraction of capacity during much of the year.

EU milk quotas, which have been in effect for more than twenty years, have had a profound affect on Ireland's dairy industry. Quotas put an abrupt halt to what had been steady growth in Irish milk production, fixing annual milk production at the country quota allocation. Since the country quota is allocated to individual producers on a regional basis, shifts in the location of milk production based on regional competitive advantages have been slow to occur. Quotas have also affected dairy farmer incentives, quelling the challenge to adopt yield-increasing practices.

The structure of dairy processing and marketing in Ireland is characterized by three larger cooperative processors and an extensive competitive fringe. However, Ireland's large cooperatives are small in comparison to major global dairy firms. Significant efficiencies could be gained by consolidation, but incentives to do so are weak. Cooperatives achieve efficiencies through co-processing and milk-sharing arrangements rather than by expanding procurement areas. The milk sharing strategies reflect, in part, the method of allocating quota and regional patterns of milk acquisition.

The Irish dairy processing sector is characterized by a heavy focus on bulk commodities (butter, milk powders and cheese). While Irish dairy companies enjoy some strong brand names, much of the country's production of dairy products is undifferentiated. Irish processors have historically made heavy use of EU intervention schemes for selling large quantities of dairy products.

With its small population relative to milk production, Ireland is heavily dependent on exports. Dairy exports represent more than 25 percent of total agricultural exports. In 2006, Irish dairy exports of €2.08 billion were 50 percent larger than value of U.S. dairy exports, while Ireland's milk production was 6 percent of U.S. milk production.

Private dairy processing research and development investment has been limited in Ireland, probably because of the smaller size of firms. However, public investment has been large relative to the size of the dairy sector. This reflects national recognition that dairy is important not only to rural development, but also to the overall economy.

Irish dairy cooperatives have used several strategies to remain viable. Diversification is a common strategy, sometimes into non-agricultural business ventures. Restructuring to allow public investment is also common. Glanbia has been very active in direct foreign investment and joint ventures overseas, including wholly-owned cheese plants in Idaho and a joint venture with U.S. dairy cooperatives in a New Mexico cheese plant.

¹ The Ireland study team members are William D. Dobson, Gary G. Frank, Edward V. Jesse, and Norman F. Olson. Jesse is the editor and corresponding author of this report.

Changes in EU dairy policies will have pronounced impacts on the Irish dairy industry. We believe most of this will be positive. As export subsidies and intervention prices are reduced, there will be much stronger incentives to shift product composition toward value-added products and away from bulk commodities.

The location of milk production within the EU and Ireland will change with the termination of EU milk quotas. Current conditions suggest that Irish milk production could increase by 20 percent or more if quotas were lifted. Unless impeded by Irish government policies to maintain production in disadvantaged regions, there will also be a significant shift in production from the north to the south.

GEOGRAPHICAL, CLIMATIC, POLITICAL AND ECONOMIC CONDITIONS IN IRELAND

Ireland's geography, climate, political environment, and robust economy shape the development of many industries in the country, including the dairy industry. Ireland's experiences as a member of the EU and with the EU's Common Agricultural Policy (CAP) also contain useful insights for people interested in economic and dairy policy development. This segment of the paper briefly discusses Ireland's characteristics and the country's experiences with the EU to provide background for the remainder of the Discussion Paper and to identify objectives for the study.

Ireland's Geography and Climate

The Republic of Ireland (Ireland) is located in western Europe, occupying five-sixths of the island of Ireland in the north Atlantic Ocean. Ireland borders the six northern (Ulster) counties that make up Northern Ireland, which is part of the UK. Ireland has 70,280 square kilometers of territory, making it approximately half as large as the state of Wisconsin [17]. In terms of terrain, the country has mostly level to rolling interior plain, surrounded by rugged hills and low mountains. Sea cliffs are prominent on the country's west coast.

Map of Ireland



Ireland has a temperate, maritime climate that is modified by the North Atlantic current. Thus, the country has mild winters, cool summers and generally high humidity. These climatic conditions have helped to produce the country's largely pasture-based dairy farming industry.

Ireland's Political History

The country has a stormy political history. English invasions of Celtic territory began in the twelfth century, igniting seven centuries of Anglo-Irish struggle. In Ireland, a failed 1916 Easter Monday Rebellion produced several years of guerrilla warfare that, in 1921, resulted in independence for 26 southern counties of Ireland from the UK. Six northern counties remained part of the UK. In 1948, Ireland withdrew from the British Commonwealth. The country joined the European Economic Community (EEC, the EU's predecessor organization) in 1973.

There have been calls to achieve a peaceful unification of Northern Ireland and Ireland. This has proven difficult because of the violent and bitter ethno-political conflict between the Nationalists, who are predominantly Catholic, and Unionists who are predominantly Protestant [77, Northern Ireland]. For the most part, Nationalists want Northern Ireland to be unified with Ireland. Unionists, on the other hand, want Northern Ireland to remain part of the UK.

Dairy industry officials interviewed by the study team saw little prospect for the joining together of Ireland and Northern Ireland into a single country. However, they predicted that economic integration of the two Irelands would occur fairly rapidly.

Ireland's Economy

Ireland has a small, modern, trade-dependent economy. Agriculture, once the most important sector, is now a substantially smaller component of the economy than industry and services. Industry accounts for 46 percent of GDP, 80 percent of exports and 29 percent of the labor force [17]. Agriculture accounts for 5 percent of GDP and 8 percent of the labor force.

An overview of Ireland's economy and its growth potential are provided in Table 1. In 2006, Ireland had a population equivalent to less than one percent of the EU-27 total and 1.4 percent of the U.S. total. Almost one-half of Ireland's population resides in the greater Dublin area.

Ireland's population growth rate (1.15 percent) and the net migration rate (+4.87 percent) for 2006 are substantially more rapid than comparable figures for the EU-27 and the U.S. Ireland's positive net migration rate reflects, in part, the return of Irish professional workers who, until recently, had been employed in foreign countries. In addition, many workers from countries in the expanded EU—e.g., Poland and the Baltic States—have come to Ireland in search of better jobs.

While Ireland's real GDP is only a small fraction of the totals for the EU-27 and the U.S., the country's real GDP per capita is large. In 2006, Ireland's real GDP per capita was essentially the same as for the U.S. Ireland's real GDP growth rate for 2006 was nearly twice as large as for the EU-27 and more than 60 percent higher than for the U.S. For many reasons, Ireland's smaller economy can grow at a faster rate than the large, mature U.S. economy.

Other figures in Table 1 identify a generally healthy Irish economy. In 2006, the unemployment rate in Ireland was half that of the average for the EU-27 and slightly lower than for the U.S. Inflation in 2006, while higher than in the EU-27 and the U.S., was manageable for Ireland's government. The country's Corruption Perceptions Index at 7.4 was similar to that of the U.S. and higher than the average for the EU-27. Ireland's Index of Economic Freedom of 7 also placed it in the top ranks of the 157 countries evaluated. Both statistics suggest that Ireland is not plagued by government regulations and associated corruption, which augurs well for Ireland's investment climate.

Together with ten other EU countries, Ireland adopted the Euro as its official currency beginning on January 1, 1999 [5]. However, Ireland's pound remained in circulation as a sub-denomination of the Euro until January 1, 2002. The recent strength of the Euro relative to the U.S. dollar has implications for Irish exports of dairy products and other items (Figure 1). In particular, Irish exports to the U.S. and other countries outside the Euro-zone (where in some cases currency appreciation was lower) have been rendered less competitive by the Euro's appreciation.

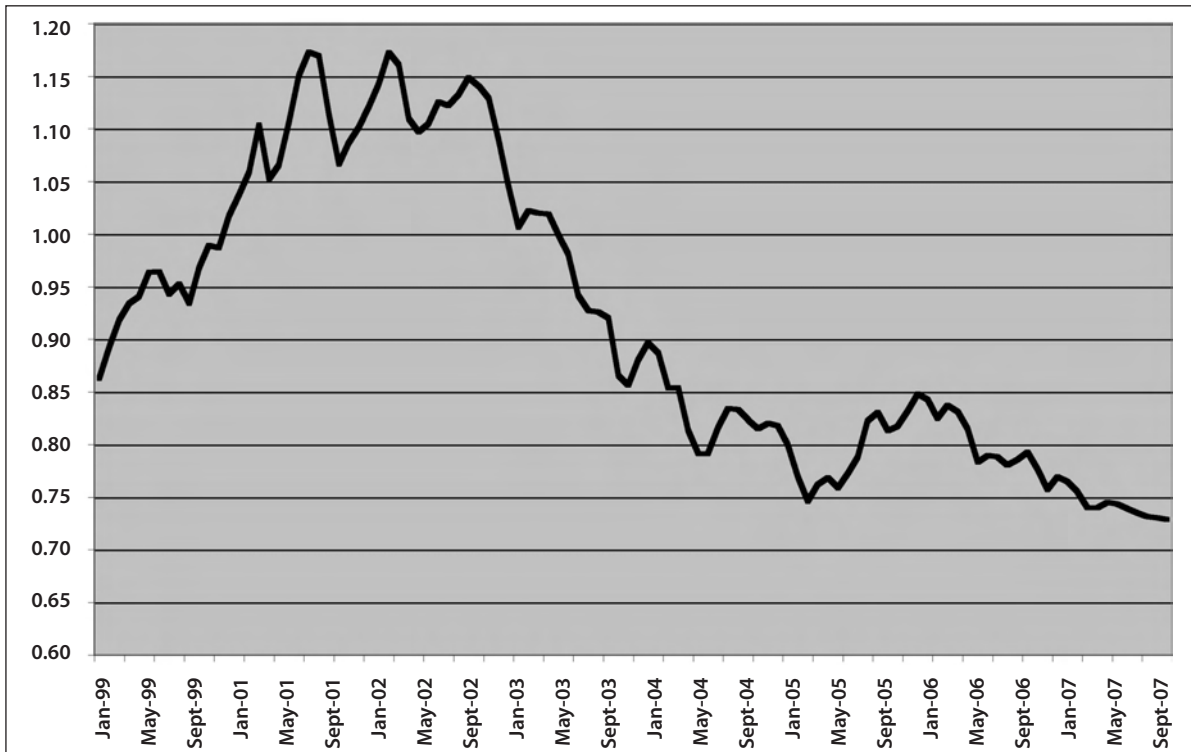
TABLE 1. Selected Statistics for Ireland with Comparisons to the EU-27 and the U.S.

| Item | Ireland | EU-27 | U.S. |
|---------------------------------|-----------|-------------|-------------|
| 1. Population (July 2006 est.) | 4,062,235 | 486,642,177 | 298,444,215 |
| 2. Populations Growth Rate (%) | 1.15 | 0.15 | 0.91 |
| 3. Net Migration Rate* | 4.87 | 1.50 | 3.18 |
| 4. GDP (PPP in U.S.\$Trillion) | 0.1772 | 12.82 | 12.98 |
| 5. GDP/Capita (PPP in U.S.\$) | 43,600 | 29,300 | 43,500 |
| 6. Real GDP Growth Rate (%) | 5.2 | 2.8 | 3.2 |
| 7. Unemployment Rate (%) | 4.3 | 8.8 | 4.6 |
| 8. Inflation Rate (%) | 3.9 | 2.2 | 2.5 |
| 9. Corruption Perceptions Index | 7.4 | 6.4 | 7.6 |
| 10. Index of Economic Freedom | 7 | 35 | 4 |

Sources: CIA World Factbook [17] for items 1 through 8. Item 9 was obtained from Transparency International [74]. Item 10 was obtained from O'Grady [62]. Items 1 through 6 and 8 are figures for 2006. Item 7 includes 2006 values for Ireland and the U.S. and 2005 for the EU-27. Item 9 values are for 2005. Item 10 values are for 2007. Key for interpreting Corruptions Perceptions Index: 10 = highly clean, 1 = highly corrupt. The Index for Economic Freedom represents a ranking for a country or group of countries where the rankings extend from 1 to 157.

*Migrants/1,000 population.

FIGURE 1. Nominal Exchange Rate: U.S. Dollars per Euro



Source: Economic Research Service, USDA. <http://www.ers.usda.gov/data/exchangerates>. Jul.—Dec. '07 Forecast based on moving average extrapolation.

The “Celtic Tiger”

While Ireland’s economy was doing well in 2006, economic conditions have cooled modestly from the time when the country earned the title of “Celtic Tiger.” The Celtic Tiger period began in the mid-1990s and lasted until about 2001 [77, Celtic Tiger]. From 1994 to 2000, Ireland’s real GNP growth rate averaged between 6 percent and 11 percent. In 2001 and 2002 the country’s economic growth rate fell to about 2 percent per year, reflecting a global slowdown in demand for many of Ireland’s products. After this period, economic growth in Ireland rose to about the 5 percent rate noted in Table 1 for 2006, ushering in what some have called “Celtic Tiger 2.”

The Celtic Tiger periods helped to raise Ireland from one of the poorest countries in the Europe to one of the richest. In the 1980s, Ireland was sometimes referred to as the “sick man of Europe.” In this decade, Ireland faced high emigration, 18 percent unemployment for much of the period, and economic mismanagement [77, Economic History of the Republic of Ireland]. Economic mismanagement manifested itself

in an overvalued currency, high tax rates, and massive government borrowing to support current spending and to prop up the currency.

Conditions in the Celtic Tiger periods have rapidly transformed Ireland’s economy. Thus, Ireland’s real GDP per capita was about 39 percent higher than the EU-25 average in 2006 [38].

What transformed Ireland’s from the “sick man of Europe” to a stellar performer? Views differ but many economists credit Ireland’s recent high economic growth rate to a low corporate tax rate, 10 percent to 12.5 percent during much of the late 1990s. Secondly, net transfer payments from other EU members to Ireland contributed a substantial component to Irish economic growth. Thirdly, Ireland’s membership in the EU gave Ireland access to Europe’s large markets, ending the country’s heavy dependence on exports to the UK. Finally, EU aid was used to increase investments in Ireland’s educational system and physical infrastructure, making the country a more attractive destination for foreign investment.

In recent high-growth periods, Ireland has developed strong competencies in high-tech industries. This

competency was reflected in the sizable operations established in Ireland by Dell, IBM, Apple and HP. Dell, whose activities were among the most prominent in the group, established its European headquarters in Limerick. As a result of growth of the country's computer industry, Ireland produced about 25 percent of all European PCs in the mid-2000s [77, Celtic Tiger].

While prospects for Ireland's economy are strongly favorable, the country's economy does have potential weaknesses. Residential construction, which makes up a substantial portion of Ireland's economy, may weaken in the next few years. In part, this will reflect global weaknesses in housing markets. Second, inflation pressures could build partly as a result of wage pressures and other developments. Third, Ireland is heavily dependent on high-priced foreign oil for its energy needs. Finally, Ireland's economy is subject to damage from external shocks, such as those in 2001 and 2002 when global demand shrunk for Ireland's computer-related products and other high-tech items.

The weaknesses associated with inflation are probably of most immediate concern. A recent report for the 12 months ending in March 2007 showed Ireland's consumer price inflation was 5.1 percent, substantially higher than the inflation figure for 2006 in Table 1 [71]. Increases in Ireland's inflation rate over the past several years have been due substantially to higher prices for services, which include prices for electricity, public housing, gas, telecommunications, medical fees, meals eaten out, housing, rent, mortgage interest payments, insurance, public transport, entertainment, recreation, and child care. Unlike many traded goods, the prices for service items are heavily insulated from international competition and contribute to inflation. Ireland's new government—which will be formed after the 2007 elections—will find it necessary to address the problem of rising inflation.

Wage inflation is also a concern for many Irish industries, including the dairy industry. This point is reflected in the following comment by a Dairygold Cooperative spokesperson [25]:

Dairygold will continue to invest in processing efficiencies but low margin dairy manufacturing operations such as ours cannot afford to absorb ongoing labor cost inflation over and above productivity gains.

Prospects for Agriculture in Ireland's Economy

As noted earlier, Ireland's overall economy benefited substantially from membership in the EEC and later the EU. The same is true of the country's agricultural sector. For example, the dairy industry has been the recipient of relatively large intervention payments and export subsidies for dairy products. Ireland's dairy industry did find it necessary to make substantial structural adjustments to qualify for EEC and EU payments. For example, prior to entering the EEC, Ireland's Dairy Board was required to relinquish its quasi-monopoly exporting privilege as a condition for Ireland's membership in the EEC [43]. Ireland's dairy industry also had to comply with EEC milk production quotas when those were introduced in 1984 (See Table 2).

Ireland's dairy industry currently faces the need to make new adjustments. As indicated in Table 2, Ireland's dairy industry and other segments of the country's agricultural economy now face a different policy environment, characterized by a multifunctional role for agriculture, the move from market supports to at least partially decoupled direct payments, and to lower intervention prices. Expansion of milk quotas and a reduced super-levy for over-quota milk production are likely after the 2008 "health check," and outright abolition of milk quotas is likely after 2014/2015.

Ireland's dairy industry appears not to have thrived as fully as certain other parts of Ireland's economy in recent years, and there is no evidence that it is positioned as strongly as it might be to prosper under the new policy environment that is emerging. The comprehensive Prospectus-Promar International (PPI) study on the Irish dairy sector completed in 2003.. noted that Ireland's dairy industry faces numerous challenges, including those noted below [66]:

- The pronounced seasonality of milk production in Ireland's largely pasture-based dairy farming system creates excess capacity in milk processing plants during several months of the year, producing processing inefficiencies.
- Lacking the scale economies achieved by major foreign competitors, Ireland's somewhat fragmented dairy processing industry is less efficient than that of competitors in Denmark, the Netherlands, and New Zealand. In part,

TABLE 2. Key EEC and EU Developments Affecting Ireland’s Dairy Industry

| Date | Development |
|------|---|
| 1962 | The CAP came into force in the EEC, emphasizing community preference, market unity, and financial solidarity. EEC food self-sufficiency was an important early objective of the CAP. |
| 1973 | Irish Dairy Board relinquishes quasi-monopoly exporting authority to comply with EEC competition rules, as a condition for Ireland’s entry into the EEC. |
| 1973 | Ireland enters EEC. |
| 1984 | Farm milk quotas are introduced in the EEC to reduce milk and dairy product surpluses. Milk quota programs were periodically renewed by the EEC and EU, potentially remaining in effect until 2014/2015. |
| 1997 | The EU Agriculture Council defined the European model of agriculture as having a multifunctional role encompassing preservation of the countryside, food safety, environmental protection, and animal welfare. |
| 1999 | The EU’s Agenda 2000 Agreement of March 1999 reinforced the move from market supports to direct payments, an initiative launched in the MacSharry Reforms of 1992. |
| 2003 | The Mid-Term Review of Agenda 2000 Agreement provided for the full decoupling of EU direct payments from production for milk production, livestock production, and arable crops. Intervention prices for butter were reduced by 25 percent in four steps beginning in July 2004 and ending in July 2007. EU skim milk powder intervention prices were reduced by 15 percent, consisting of five percent cuts in 2004, 2005, and 2006. |
| 2004 | EU expands from 15 to 25 countries. Poland, one of the countries added to form the EU-25, is an important milk-producing country. |
| 2005 | EU dairy farmers begin to receive direct payments. |
| 2006 | EU Agriculture Commissioner identifies 2014/2015 as a possible date for abolition of EU milk quotas. |
| 2008 | EU dairy policies will be scrutinized as part of the “health check” prescribed as part of the 2003 CAP reform. This may involve additional reductions in EU milk intervention prices and an assessment of the impact of milk quotas. |

Sources: [10, 15, 32, 58, 69, 76].

this reflects the fact that dairy processing consolidation in Ireland has not proceeded as far as in Denmark and New Zealand, in particular.

- The dairy product mix in Ireland’s dairy industry has not fully kept pace with changes in customer demands in export markets. Ireland’s dairy industry remains too heavily dependent on butter, whole milk powder, and skim milk powder and lags behind major competitors in developing value-added (differentiated) dairy products.
- Ireland’s dairy industry has relied more heavily than the dairy industries of many other EU countries on intervention prices, export subsidies, and other support provided under the EU’s CAP. EU dairy programs are undergoing change and will provide less support to Ireland’s dairy industry in the future.

- Ireland’s reliance on EU dairy programs has reduced the incentives of the dairy industry to innovate regarding new product development.

Objectives

Ireland’s dairy industry is aware of the challenges facing the industry. Leaders in the industry also recognizes that it has the luxury of time to adjust effectively to unfolding changes in EU policies. The challenges facing Ireland’s dairy industry emphasize the following questions, which are addressed in subsequent sections of this report:

- How effectively is Ireland’s dairy industry adjusting to changes in the economic and dairy market environment? Has the industry effectively positioned itself to address the challenges noted above? The dairy industries of the U.S. and other

countries face some of the same challenges being encountered by Ireland, thus Ireland's experience may provide useful insights for the U.S. and world dairy industries.

- What lessons can the U.S. dairy industry draw from the experiences of Ireland's dairy industry with regard to developing additional, profitable value-added products? Which differentiated products hold the greatest promise? In 2007 the Government of Ireland awarded via the Dairy Investment Fund \$155 million for 19 capital investment projects designed to develop new dairy products and new processing capabilities in Ireland's dairy industry [19]. The capital infusion is expected to result in an additional \$233 million from industry for development of new, differentiated dairy products and new processing capabilities. Insights are provided on whether the capital infusions will produce strong, positive results for Ireland's dairy industry.
- How effectively is Ireland's dairy industry preparing for changes in EU dairy policies? The reduction in EU intervention prices, reductions in dairy export subsidies, and the possible elimination of milk quotas in EU countries will profoundly affect international dairy markets. Ireland will provide a useful case study of impacts of changes in EU policies on that country's domestic dairy industry and provide implications for other countries influenced by changes in EU dairy policies. Insights can also be gained about whether Ireland's heavily regulated and protected industry (which in some ways is like the U.S. dairy industry) has a high probability of adjusting effectively to EU policy changes.

Implications for Nature of Our Country Study

This country study differs from previous country studies that the Babcock Institute has carried out for New Zealand-Australia, Poland, and India. While a limited amount of descriptive material is included on the nature of Ireland's dairy industry, this material represents a smaller segment than in previous country studies since ample descriptive information on

Ireland's dairy industry is available from other readily accessible sources. The other differences relate to the unique characteristics of Ireland's dairy industry. Thus, sections are included on industry conditions and trends, and on strategies of firms such as Ireland's Dairy Board, Glanbia, Dairygold Cooperative, and the Kerry Group. Whether Ireland's dairy industry will adjust successfully to changes afoot in world dairy markets will depend partly on the effectiveness of strategies of such firms. Questions relating to the likely effectiveness of Ireland's use of advanced technologies for developing value-added dairy products are also considered in these sections. Finally, the probable changes in EU-CAP dairy policies are identified and the implications of the changes in the CAP for the dairy industries of Ireland, the rest of the EU, and the U.S. are analyzed.

Synopsis

Ireland's geography, climate, political environment and economy will shape the development of the country's dairy industry in numerous ways, including those noted below:

- Ireland's rapidly growing "Celtic Tiger" economy provides strong domestic demand for dairy products. However, it also has inflated costs for dairy processing firms, created farm labor shortages and higher farm labor costs.
- Ireland's entry into the EEC and EU has substantially improved Ireland's economy and expanded the market for the country's dairy products.
- The strengthening of the euro relative to the U.S. dollar and certain other currencies has reduced the competitiveness of Ireland's export-dependent dairy industry in non-euro zone markets.
- Sweeping reforms in prospect for the EU-CAP will reduce opportunities for Irish dairy processors to "sell dairy commodities into the CAP" and encourage Ireland's dairy processors to increase production of value-added dairy products.

- Ireland’s dairy processors have begun to adjust strategies to deal with changes in the economic and political environment.

The unique characteristics of Ireland’s dairy industry are taken into account in structuring the questions addressed in this country study.

DAIRY PRODUCTION SECTOR

General Characteristics

Dairy production in Ireland is unique among developed countries. It is more similar to New Zealand than other Western European countries in being predominantly grass-based with seasonal calving. Ireland’s climate necessitates more reliance on supplemental feeding than New Zealand, but the production system can be described as “bare bones.” Consequently, both production costs and milk yields per cow are low by Western standards.

Prior to the introduction of EU milk quotas in 1984, milk production in Ireland had been increasing—from 3.6 billion liters in 1975 to 5.7 billion liters in 1985. After adjustments to the quota regime, production has been constant at about 5.1 billion liters, roughly equivalent to the Irish country milk quota (Figure 2). This compares to about 10 billion liters produced annually in Wisconsin. Ireland accounts for about 4 percent of current EU milk production (Table 3).

Ireland’s grass-based milk production system includes seasonal calving in order to match the feed requirements of lactating dairy cows with grass growth. Cows are bred to freshen near the time of peak grass growth in April and are dried off in late fall. This results in a pronounced seasonal pattern of milk production (Figure 3). Processing plants scaled to accom-

modate maximum monthly milk production operate at substantially less than full capacity much of the year.

Dairy farm numbers in Ireland have fallen rapidly, although the rate of loss moderated somewhat after quotas were instituted. In 2006, there were approximately 22,400 dairy farms compared to 50,000 in 1991 and more than 140,000 in 1973 (Figure 4).

Ireland dairy farms are small by U.S standards and in comparison to other major EU dairy countries. The average herd size in 2006 is estimated to be 48 cows, which compares to about 90 cows per herd in Wisconsin. Comparing farms and cow inventory data by herd size is more revealing. In 2001 (the latest available size distribution data for Ireland), more than 40 percent of Ireland’s dairy farms had fewer than 30 cows (Figure 5). The comparable value for Wisconsin was 16 percent, only 3 percent of Ireland dairy farms had 100 cows or more compared to 16 percent for Wisconsin and less than 10 percent of Ireland’s dairy cows were in herds of 100 cows or more compared to 44 percent for Wisconsin (Figure 6).

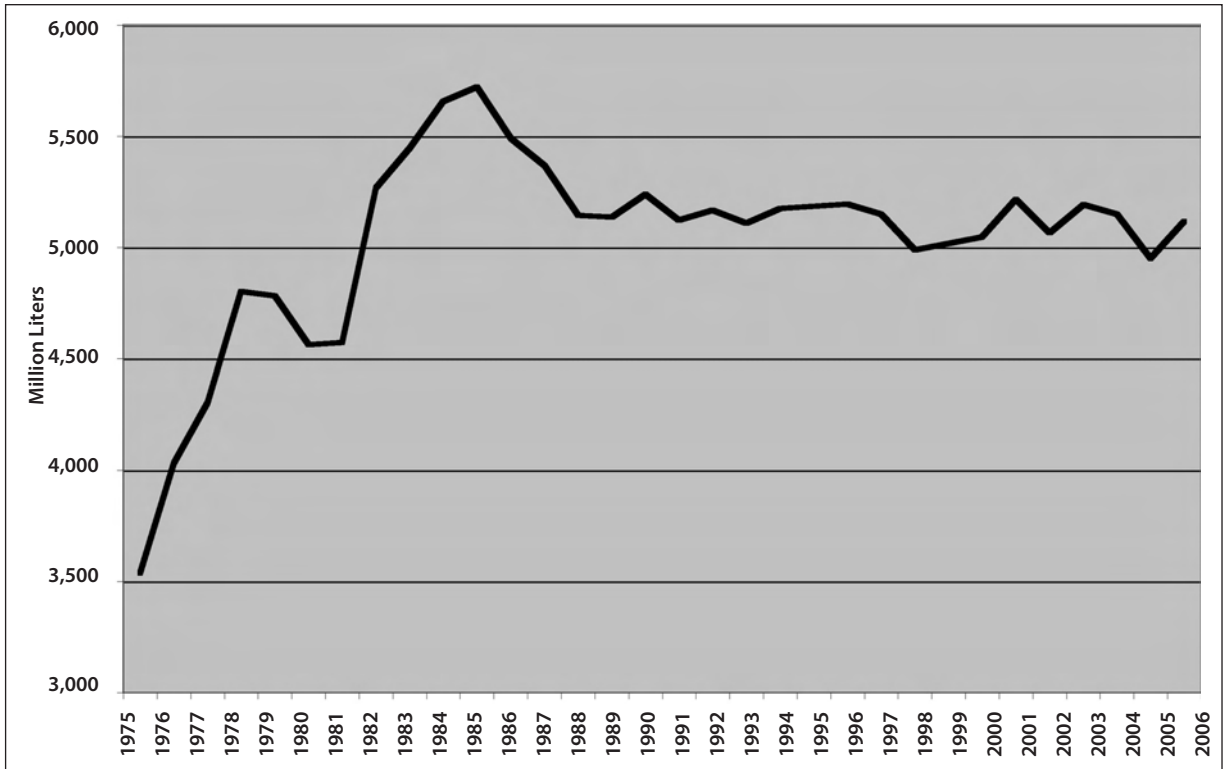
Dairy cows in Ireland decreased steadily from their peak of more than 1.5 million head in 1984 to less than 1.1 million in 2006 (Figure 7). Milk yield per cow over the same period increased from 3,800 liters per year to 4,700 liters. Yield increases have been uneven over

Table 3. Irish Dairy Production Sector Within the EU-25, 2006

| Measure | Ireland | EU-25 | EU-25 Leaders | |
|----------------------------------|---------|-----------|---------------|----------|
| | | | Country | Value |
| Dairy Farms (1,000) | 22.4 | 1,339.9 | Poland | 625.0 |
| Dairy Cows (1,000) | 1,082.0 | 22,313.0 | Germany | 4,143.0 |
| Cows per Farm (No.) | 48.3 | 16.7* | Czech Rep | 162.6 |
| Milk per Cow (MT) | 4.8 | 7.3 | Denmark | 8.3 |
| Milk per Farm (MT) | 230.0 | 106.0 | Czech Rep | 1,106.0 |
| Total Milk Production (1,000 MT) | 5,234.0 | 130,354.0 | Germany | 27,138.0 |

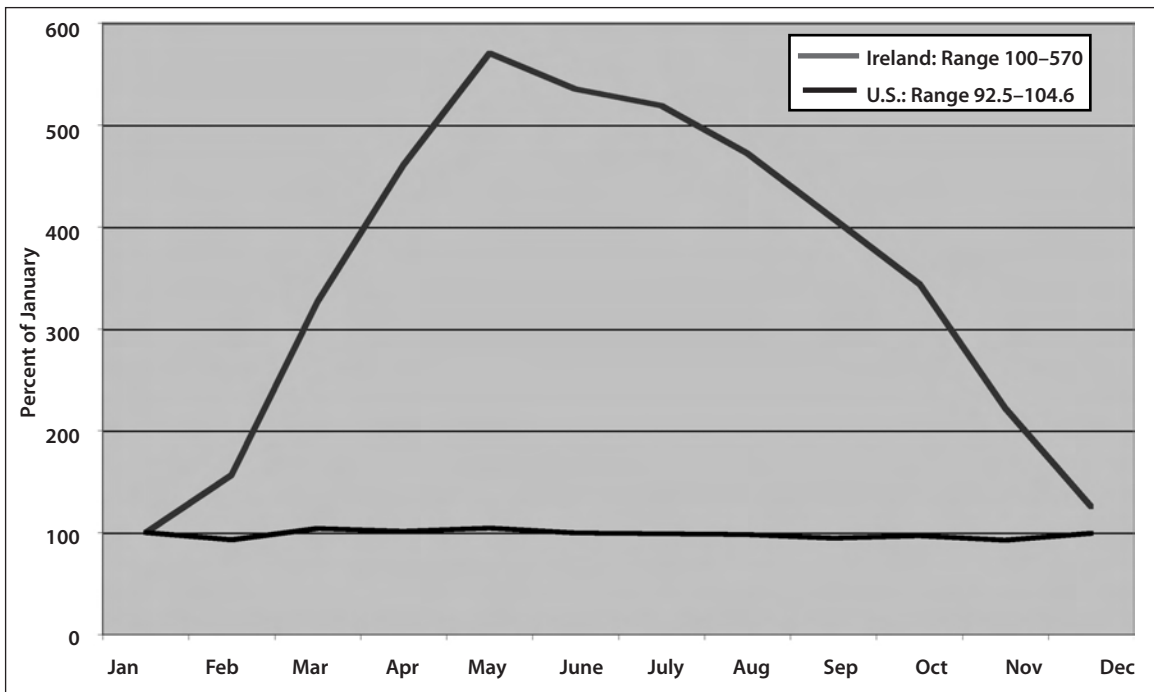
*The average EU-25 dairy herd is 38.1 head excluding Latvia, Lithuania and Poland.
Source: Dutch Dairy Board [65].

FIGURE 2. Irish Milk Production



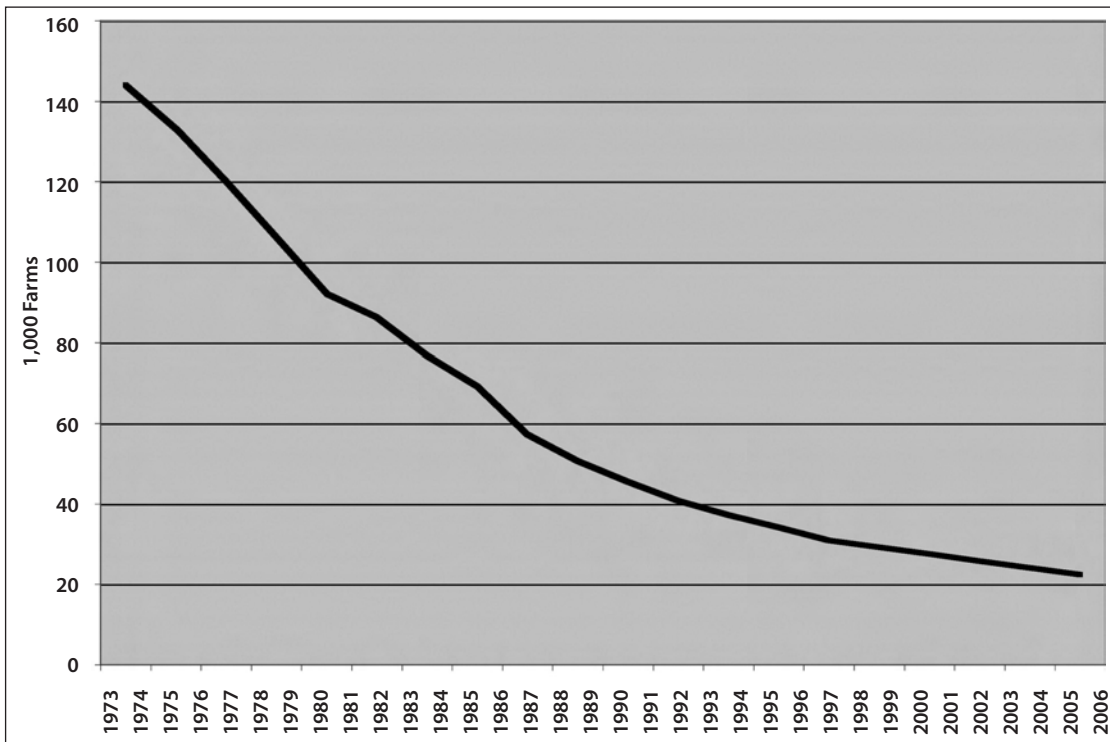
Source: Central Statistics Office, Republic of Ireland [18].

FIGURE 3. Ireland and U.S. Monthly Milk Production Indices, 2006



Source: Central Statistics Office, Republic of Ireland [18].

FIGURE 4. Number of Ireland Dairy Farms



Source: 1973–2001 Central Statistics Office, Republic of Ireland [18]. 2001–06 extrapolated from Dutch Dairy Board [65].

time, reflecting the heavy influence of weather conditions on the quantity and quality of grass.

The application of EU milk quotas had a pronounced impact on animal species numbers in Ireland. Dairy cow numbers fell as yield increases meant fewer cows were required to meet the fixed country quota. In the meantime, beef cow numbers more than doubled before leveling off at about 1.2 million head, slightly larger than the dairy cow herd (Figure 8). Hog numbers also increased rapidly, from 1 million head prior to imposition of milk quotas to 1.8 million early in the decade, before sliding in the last few years. These changes demonstrate that with quota restrictions on milk production, Ireland’s grass and other animal feeds were significantly reallocated across species. At the same time, the historical changes indicate that dairy cow numbers and milk production could be substantially increased without more acreage devoted to grass by reducing the number of food animals.

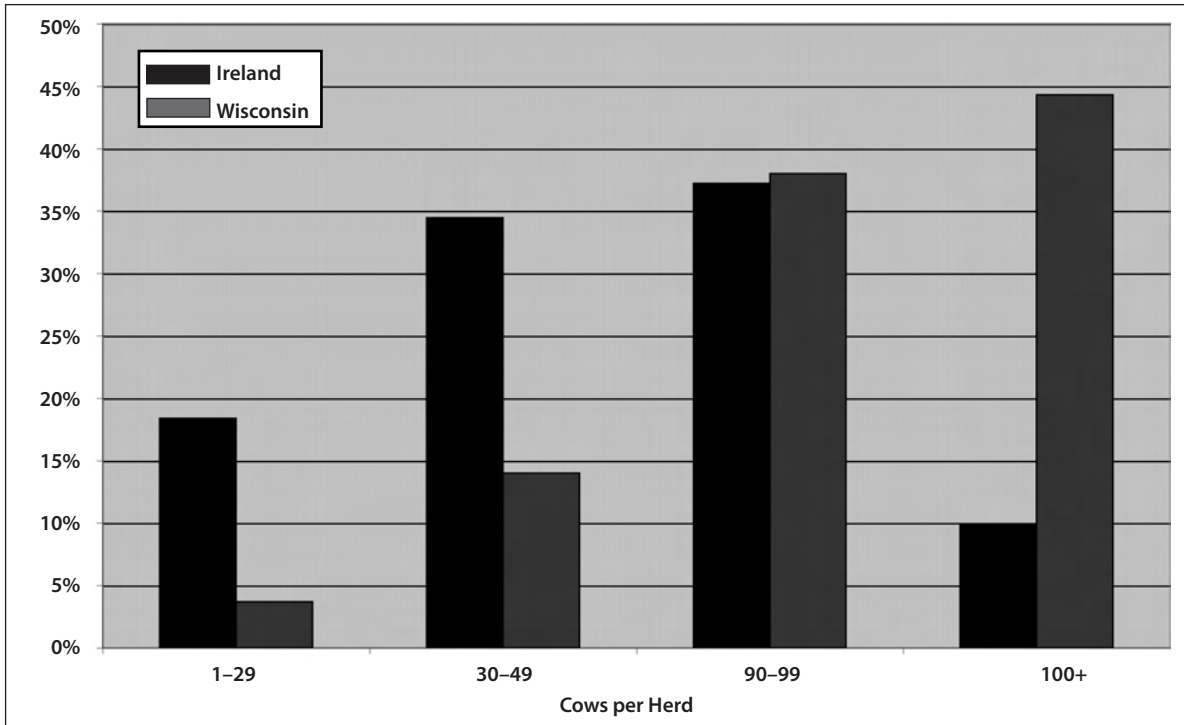
The Irish Dairy Production System²

The Irish dairy production system is fairly uniform among dairy farms. The system is grass-based and dairy cows are fed only small amounts of forages and grain. Approximately 90 percent of Ireland has a grass growing season of nine months or more. This allows Irish dairy farmers to let their cows harvest their own forage for much of the year. Animals can be put on pasture as early as February 1 and can remain there until as late as mid-December.

Rotational grazing is typically practiced with fifteen to twenty paddocks on each farm. Cows graze in each paddock for one or two days before being moved to another paddock. Generally, fences are not moved within individual paddocks. Heifers are grazed on the more distant paddocks and are not moved as often. Each year some grass silage is harvested, usually by

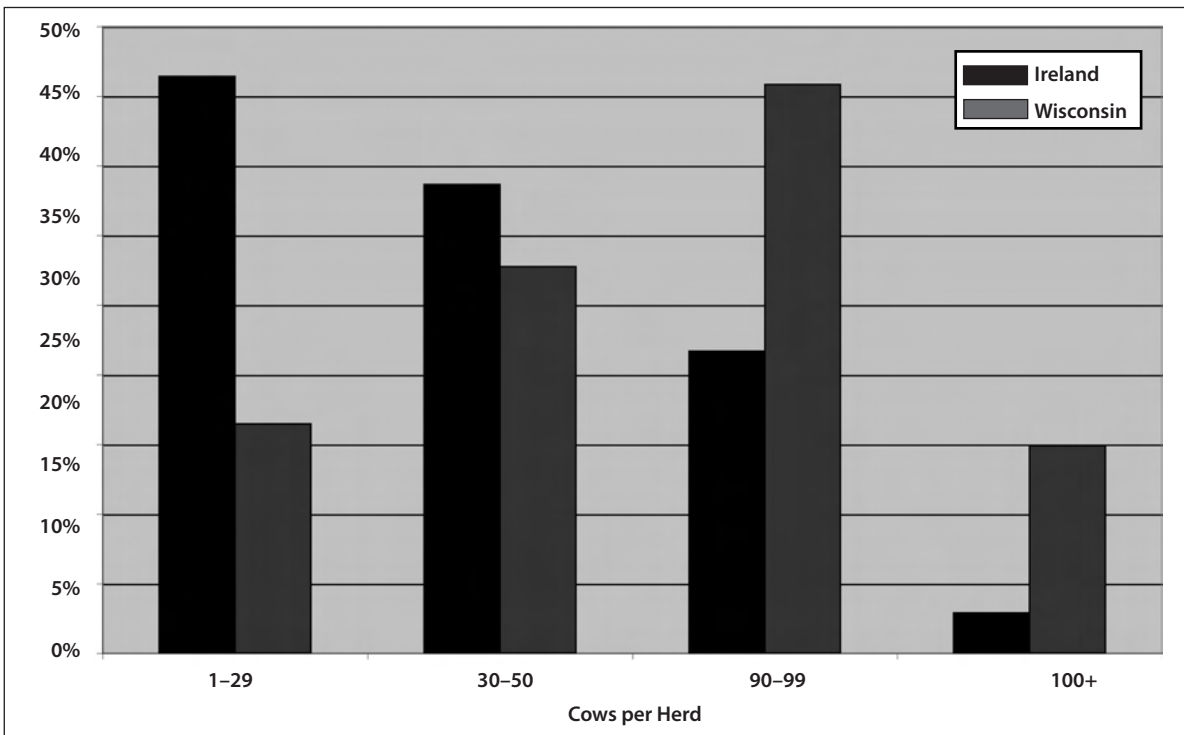
²Information on the Irish dairy production system was obtained from Moorepark Dairy Research fact sheets, Farm Management Data Handbook, on farm visits and personal communication with Pdraig French, Brendan Horan, Michael O’Donovan and Frank Buckley.

FIGURE 5. Percent of Dairy Cows by Herd Size



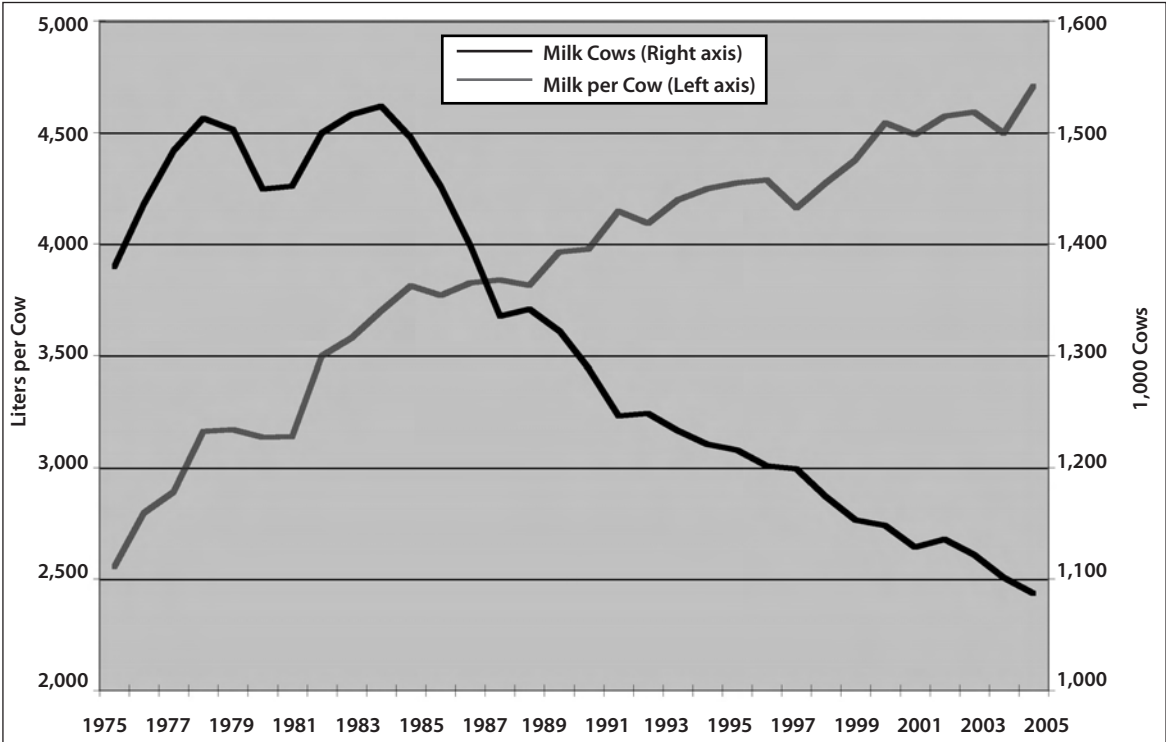
Source: Ireland, Central Statistics Office, Republic of Ireland [18]. Wisconsin, <http://www.nass.usda.gov/index.asp>.

FIGURE 6. Percent of Dairy Farms by Herd Size



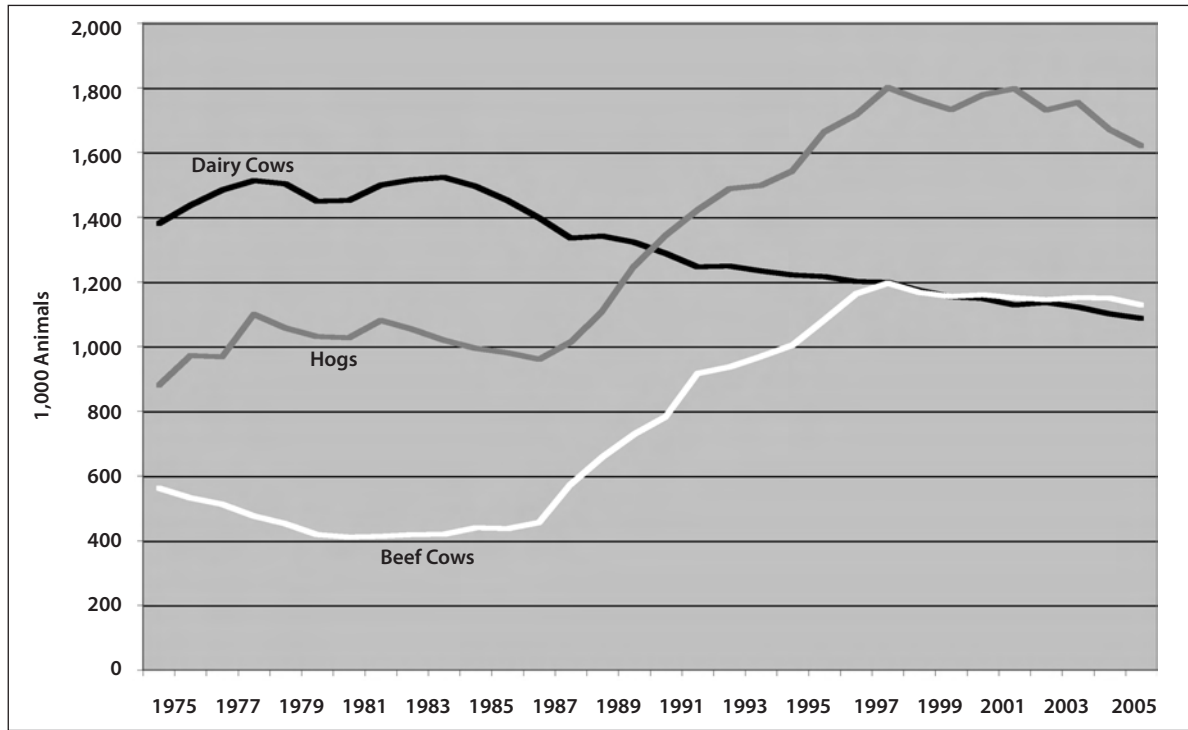
Source: Ireland, Central Statistics Office, Republic of Ireland [18]. Wisconsin, <http://www.nass.usda.gov/index.asp>.

FIGURE 7. Irish Milk Cows and Yield



Source: Central Statistics Office, Republic of Ireland [18].

FIGURE 8. Ireland Cattle and Hog Inventory



Source: Central Statistics Office, Republic of Ireland [18].

custom operators, and stored in covered piles. This provides needed forage during the brief non-grass growing season.

Irish dairy farmers employ seasonal calving to match their dairy production system with the grass growing season. Calving normally begins in late January or early February and breeding is scheduled so that all their cows calve within a 75-day window. Cows that calve outside the window are usually culled at the end of their lactation because of the difficulty of getting them bred back to calve within the window.

Irish dairy farmers have only a few pieces of equipment—a trailer, a manure spreader, a tractor with a front-end loader and an ATV or two. They have limited buildings because the cows are outside except during milking. They have a milking barn (parlor) with a few maternity pens and small calf pens.

Cost of Production

Because of its grass-based dairy production system, Irish dairy farms incur enviably low costs of production compared to most developed countries. In Table 4, we compare costs summarized from the financial records of Irish dairy farms with costs summarized for Wisconsin dairy farms with 100 or less cows. The Wisconsin records were collected by various farm management associations and analyzed using the Agriculture Financial Advisor software developed by the University of Wisconsin's Center for Dairy Profitability. Only Wisconsin herds with 100 cows or less were used in the summary in order to obtain an average herd size comparable to the average in the Ireland sample. The Wisconsin herds consist of a mixture of management types and include both management intensive rotational grazing operations as well as conventional confinement operations.

Wisconsin dairy farmers included in the cost summaries received a lower milk price (\$33.31 versus \$37.56 per 100 kilograms)³ than Ireland dairy farmers in 2005. Ireland dairy farms had lower milk production per cow (4,629 versus 8,995 kilograms) and, consequently, much lower income per cow—only 68 percent as much as Wisconsin dairies on a per cow basis.

The percentage of income received from various components of income on Irish and Wisconsin dairies are different. In 2005, Wisconsin dairies receive 76 percent of their income from milk sales versus 64 percent on Irish dairies. Ireland dairies receive 18 percent of their income from program payments versus 5 percent in Wisconsin. Wisconsin dairies sell more “other” items (mainly crops) than Ireland dairies—8 and 1 percent, respectively. In addition, most Ireland dairies raise their bull calves for beef, so cattle sales are a much higher percentage of an Ireland dairy's income—15 percent versus 5 percent for a Wisconsin dairy.

Per cow expenditures in some of cost categories are similar (e.g., Crop Chemical & Fertilizer, Custom Hire, Utilities and Veterinary, Medicine and Breeding). Wisconsin expenditures in cost categories that involve feed purchases and crop production are about double those experienced in Ireland, and more than double for Paid Wages, Seeds (for planting) and Property Taxes.

Overall, Ireland dairy farmers' total costs per cow are only about half of Wisconsin dairy farmers' total expenses per cow, excluding the value of unpaid labor and management. However with lower milk yield per cow, Ireland costs per 100 kg. milk equivalent are 88 percent of Wisconsin's.

The value of unpaid labor per cow in Ireland is subject to some debate and varies substantially among sources. Table 5 uses a value in the lower range of estimates. This yields Return to Equity Capital of \$572 per cow in Ireland versus \$394 per cow in Wisconsin.

Irish dairies had \$808 invested per cow in machinery and equipment versus \$2,200 on Wisconsin dairies. Overall Irish dairies had more investment per cow than Wisconsin dairies, \$20,682 and \$12,400 respectively. This is mainly due to the high value of land in Ireland—approximately \$10,000 per acre in 2005 and reported prices of \$15,000–\$25,000 per acre in 2007. Debt per cow on Irish dairies was \$989 in 2005; Wisconsin's debt per cow was \$2,584.

Table 5 attempts to draw a closer comparison between Ireland and Wisconsin dairy costs by using only farms from the Wisconsin sample that utilize rotational grazing. While graziers in Wisconsin use more supplemental feed than in Ireland, other costs would

³The average exchange rate in 2005 used in this analysis was US\$1.25 per euro.

TABLE 4. Dairy Cost of Production Comparison, Ireland and Wisconsin, 2005

| | Ireland* | Wisconsin** | | |
|--|-----------------------|--------------------|-----------------------------|------------------|
| Number of Farms in Sample | 324 | 450 | | |
| Average number of cows per farm | 48.8 | 63.1 | | |
| Kilograms Milk Sold per cow | 4,629 | 8,995 | | |
| Investment per cow (\$US) | 20,682 | 12,400 | | |
| Debt per cow (\$US) | 989 | 2,984 | | |
| | Values per Cow | | Values/100 Kilograms | |
| Income | Ireland | Wisconsin | Ireland | Wisconsin |
| Milk Sales | \$1,739 | \$3,087 | \$23.88 | \$25.38 |
| Calf Sales | \$52 | \$127 | \$0.71 | \$1.05 |
| Cattle Sales | \$419 | \$198 | \$5.75 | \$1.63 |
| Program Payments | \$492 | \$218 | \$6.76 | \$1.79 |
| Other | \$34 | \$331 | \$0.47 | \$2.72 |
| Non Cash Income | \$0 | \$89 | \$0.00 | \$0.73 |
| Total Income | \$2,735 | \$4,051 | \$37.56 | \$33.31 |
| Expenses | | | | |
| Crop Chemicals & Fertilizer | \$179 | \$204 | \$2.45 | \$1.68 |
| Custom Hire | \$129 | \$121 | \$1.78 | \$1.00 |
| Purchased Feeds | \$331 | \$649 | \$4.55 | \$5.34 |
| Fuel, Repairs, Machinery Operating | \$200 | \$361 | \$2.75 | \$2.97 |
| Interest | \$54 | \$147 | \$0.74 | \$1.21 |
| Paid Wages | \$78 | \$344 | \$1.07 | \$2.83 |
| Rent | \$57 | \$126 | \$0.78 | \$1.03 |
| Seeds (for planting) | \$10 | \$121 | \$0.13 | \$0.99 |
| Property Taxes | \$0 | \$56 | \$0.00 | \$0.46 |
| Transport | \$14 | \$65 | \$0.20 | \$0.54 |
| Utilities | \$92 | \$105 | \$1.27 | \$0.86 |
| Vet, Medicine & Breeding | \$125 | \$156 | \$1.72 | \$1.29 |
| Miscellaneous | \$209 | \$380 | \$2.88 | \$3.13 |
| Depreciation | \$236 | \$410 | \$3.25 | \$3.37 |
| Other Non Cash Expenses | \$0 | -\$1 | \$0.00 | -\$0.01 |
| Total Expenses | \$1,716 | \$3,245 | \$23.56 | \$26.68 |
| Net Farm Income from Operations | \$1,019 | \$806 | \$14.00 | \$6.63 |
| Capital Sales | \$0 | \$14 | \$0.00 | \$0.12 |
| Net Farm Income | \$1,019 | \$821 | \$14.00 | \$6.75 |
| Value of Unpaid Labor & Mgt. | \$447 | \$427 | \$6.14 | \$3.51 |
| Return to Equity Capital | \$572 | \$394 | \$7.86 | \$3.24 |

* Estimates of Ireland production costs were obtained from the National Farm Survey 2005 and the efforts of Anne Kinsella, Rural Economy Research Center, Teagasc, Athenry, Ireland [55].

** 2005 Wisconsin production costs for herds with 100 or less cows were obtained from the University of Wisconsin–Center for Dairy Profitability.

TABLE 5. Cost Comparison, Ireland and Wisconsin Grazing Farms, 2005

| | Ireland* | Wisconsin** | | |
|--|-----------------------|--------------------|-----------------------------|------------------|
| Number of Farms in Sample | 324 | 42 | | |
| Average number of cows per farm | 48.8 | 68.6 | | |
| Kilograms Milk Sold per cow | 4,629 | 7,593 | | |
| Investment per cow (\$US) | 20,682 | 8,840 | | |
| Debt per cow (\$US) | 989 | 2,350 | | |
| | Values per Cow | | Values/100 Kilograms | |
| Income | Ireland | Wisconsin | Ireland | Wisconsin |
| Milk Sales | \$1,739 | \$2,793 | \$23.88 | \$26.97 |
| Calf Sales | \$52 | \$151 | \$0.71 | \$1.46 |
| Cattle Sales | \$419 | \$190 | \$5.75 | \$1.84 |
| Program Payments | \$492 | \$126 | \$6.76 | \$1.22 |
| Other | \$34 | \$109 | \$0.47 | \$1.05 |
| Non Cash Income | \$0 | \$80 | \$0.00 | \$0.77 |
| Total Income | \$2,735 | \$3,449 | \$37.56 | \$33.31 |
| Expenses | | | | |
| Crop Chemicals & Fertilizer | \$179 | \$73 | \$2.45 | \$0.71 |
| Custom Hire | \$129 | \$129 | \$1.78 | \$1.24 |
| Purchased Feeds | \$331 | \$664 | \$4.55 | \$6.41 |
| Fuel, Repairs, Machinery Operating | \$200 | \$258 | \$2.75 | \$2.49 |
| Interest | \$54 | \$139 | \$0.74 | \$1.35 |
| Paid Wages | \$78 | \$137 | \$1.07 | \$1.33 |
| Rent | \$57 | \$77 | \$0.78 | \$0.74 |
| Seeds (for planting) | \$10 | \$47 | \$0.13 | \$0.46 |
| Property Taxes | \$0 | \$54 | \$0.00 | \$0.52 |
| Transport | \$14 | \$52 | \$0.20 | \$0.50 |
| Utilities | \$92 | \$79 | \$1.27 | \$0.76 |
| Vet, Medicine & Breeding | \$125 | \$106 | \$1.72 | \$1.03 |
| Miscellaneous | \$209 | \$340 | \$2.88 | \$3.28 |
| Depreciation | \$236 | \$310 | \$3.25 | \$3.00 |
| Other Non Cash Expenses | \$0 | \$11 | \$0.00 | \$0.11 |
| Total Expenses | \$1,716 | \$2,477 | \$23.56 | \$23.92 |
| Net Farm Income from Operations | \$1,019 | \$972 | \$14.00 | \$9.39 |
| Capital Sales | \$0 | \$21 | \$0.00 | \$0.21 |
| Net Farm Income | \$1,019 | \$993 | \$14.00 | \$9.59 |
| Value of Unpaid Labor & Mgt. | \$447 | \$427 | \$6.14 | \$4.12 |
| Return to Equity Capital | \$572 | \$566 | \$7.86 | \$5.47 |

* Estimates of Ireland production costs were obtained from the National Farm Survey 2005 and the efforts of Anne Kinsella, Rural Economy Research Center, Teagasc, Athenry, Ireland [55].

** Production costs for grazing herds were obtained from the University of Wisconsin–Center for Dairy Profitability.

be expected to more closely match those experienced in Ireland.

Wisconsin grazing herds had less income per cow (\$3,449) than Wisconsin composite dairy herds with 100 cows or less (\$4,051), but more income than Ireland dairies (\$2,735). Total per cow expenses were \$2,477 versus \$1,716 on Ireland dairies and \$3,245 on Wisconsin dairies with 100 cows or less. The Return to Equity Capital on Irish dairies and Wisconsin grazing dairies was nearly identical, \$572 and \$566 per cow, respectively, both higher than for composite Wisconsin dairies with 100 cows or less (\$394).

The Total Expenses, excluding Value of Unpaid Labor and Management, per 100 kilograms of milk equivalent was \$23.56 on Ireland dairies. It was \$23.92 and \$26.68 on Wisconsin grazing farms and other Wisconsin dairies with 100 cows or less, respectively.

Milk Prices

Figure 9 compares milk prices in Ireland and the U.S. Both price series are expressed in euros per liter

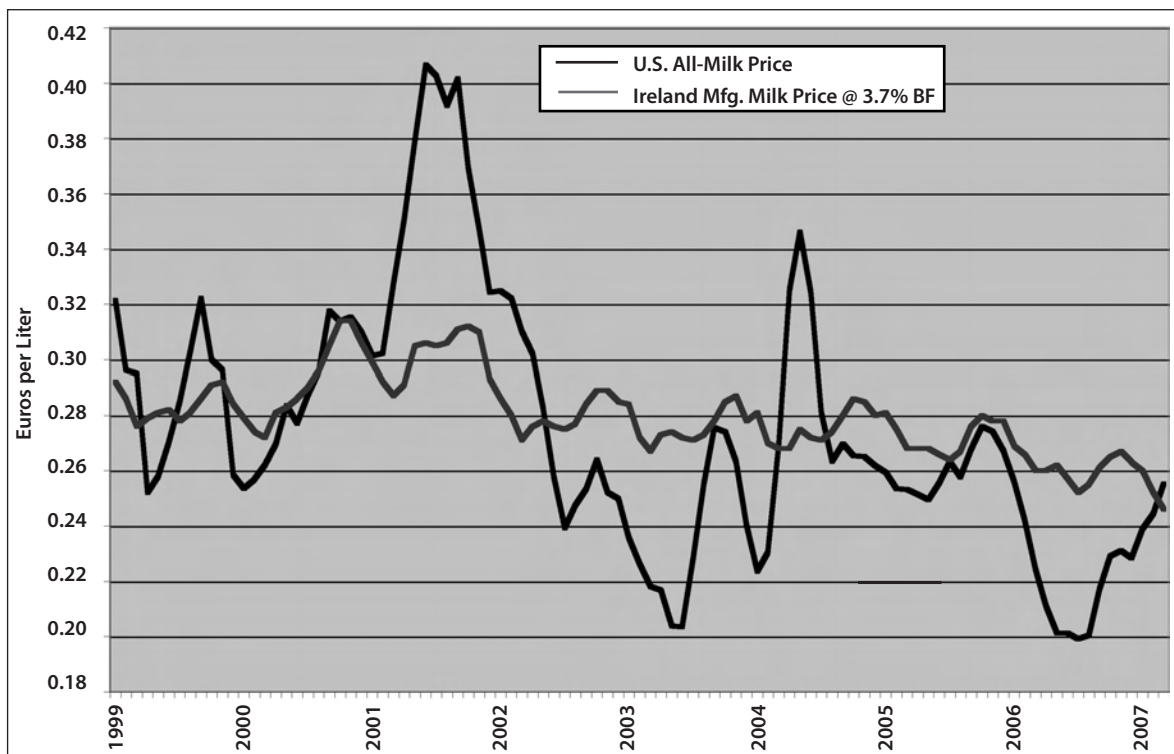
based on prevailing monthly exchange rates between the dollar and the euro. To better compare prices between countries, the Ireland price is fat-corrected to 3.7 percent, which is approximately the U.S. average butterfat test. Over the time shown, the average milk price was almost the same, but the Ireland price was considerably more stable, with a standard deviation of 1.4 euro/cents per liter versus 4.6 euro/cents for the U.S.

The Ireland milk price also shows a distinct downward trend since 2002. This is related to the gradual reduction in support prices under the EU CAP. The reduction in milk prices has been offset in part by the institution of direct payments to dairy farmers in 2005.

Dairy Support Services⁴

Productivity Testing: The Ireland Cattle Breeding Federation (ICBF) has established a national infrastructure for dairy cattle breeding. In 1998, 40 percent of milk record dairy cattle had no known sire and 85%

FIGURE 9. Irish and U.S. Milk Prices



Source: Ireland, Central Statistics Office, Republic of Ireland [18]. U.S., <http://www.nass.usda.gov/index.asp>.

⁴Information on dairy support services was obtained from Farm Management Data Handbook and from personal communication with Eddie O'Callaghan, Brendan Horan, Michael O'Donovan and Frank Buckley.

no known dam. By 2005, these figures were reduced to 23 percent and 7 percent, respectively.

Currently, Ireland has only about one-third of its dairy cows in milk recording. To address the problem of low participation in productivity recording, a system of electronic milk recording was launched nationwide in 2006.

The ICBF has worked with Teagasc to develop a breeding index to address some of the problems facing grazing seasonal calving dairy farms. The index has evolved over time to increase the weights applied to fertility relative to milk yield. Index elements related to ease of calving, beef production, and animal health have been added to the index since 2005.

Animal Health: Given the seasonal calving grazing dairying system used in Ireland, one of the biggest problems that dairy farmers encounter is getting cows pregnant at the right time of the year. From 1990–2000, first service fertility dropped 10 percent to 45 percent. Research in Ireland and elsewhere has shown that this decline in cow fertility is attributable to adverse changes in cow management, genetics, nutrition, environment and herd health.

Veterinary Programs: Ireland dairy farmers only infrequently use veterinary services for routine animal health monitoring and vaccinations. They mainly rely more heavily on government-sponsored and financed schemes like TB and BSE testing. They also use AI-reproduction technicians for assistance in addressing some herd health problems.

Dairy Equipment: Dairy equipment and supplies are readily available in Ireland, but appear to be expensive relative to Wisconsin standards. Moreover, Ireland's robust economy and low unemployment rate makes it difficult for dairy equipment companies to hire and retain qualified personnel.

Research and Extension Support

Dairy production-related research and extension in Ireland is primarily through Teagasc, The Irish Agri-

cultural and Food Development Authority.⁵ Teagasc is a broad-based Irish government agency that provides research, advisory services, and training to farmers, agribusinesses, and rural communities. Created in 1988, it is administered through an 11-member board of directors. Teagasc is funded through a combination of government outlays, user fees, commodity levies, and EU competitive research grants. Teagasc employs a staff of 1,600 at about 100 locations throughout Ireland and has an annual operating budget of more than €170 million.

Research: Teagasc's dairy production-related research is concentrated at the Moorepark Dairy Production Research Centre near Fermoy. Moorepark includes five separate farm units housing 600 dairy cows and employs about fifty scientists and technicians. The Teagasc website lists five areas of dairy production research at Moorepark: Breeding/Fertility, Grazing Techniques, Regional Milk Production, Nutrition and Milk Quality.⁶

Economic research on the dairy production sector is carried out at Teagasc's Rural Economy Research Center at Athenry, near Galway. The Center's Farm Surveys Research Department is responsible for conducting and summarizing extensive surveys that monitor financial conditions for representative farms. The Agricultural Economics Unit focuses on the effects of technological and policy changes on the economic performance of farms. The Center also has a collaborative arrangement with the Food and Agricultural Policy Research Institute (FAPRI) at the University of Missouri to develop macro (policy analysis) and micro (farm-level impact) models. Teagasc disseminates research results through reports, conferences, and via farm advisors. A national dairy conference is sponsored annually that consists of a mix of presentations from scientists, farmers, and dairy processors.

Extension: Extension in Ireland is user-funded. The Teagasc Advisory Service has 40,000 paying clients among the roughly 100,000 farmers of all types in Ireland. Teagasc maintains a staff of eighty technical dairy advisors. Each advisor is expected to gener-

⁵Teagasc is an Irish language word that literally translates to "instruction" in English [77, Teagasc].

⁶Specific projects within Teagasc's five areas of dairy production research can be found at: <http://www.teagasc.ie/research/dairy.htm>.

ate 30,000 euros annually through fees paid by dairy farmer clients. Fees are based on farm size, and each advisor has 100–200 clients. The technical assistance program consists of two farm visits plus office and phone consultations and a newsletter. The areas of technical support are grass management, nutrition, soil fertility, breeding, and new buildings.

Teagasc dairy advisors also sponsor and arrange monthly discussion groups around various dairy farm management topics for an additional client charge. The most popular discussion group is profit management. In addition, advisors monitor the physical and financial status of about 100 dairy farms using funds provided by processors.

The stated goal of the Teagasc dairy advisory service is for farmers to achieve a cost of production of €0.13 per liter and a gross margin of at least €0.20 per liter. The cost side of this goal is addressed mainly through making optimum use of grass. The profit objective is augmented by increasing milk protein.

About one-half of the staff of the overall Teagasc Advisory Program is associated with the Rural Environment Protection Scheme (REPS). REPS is a government sponsored and funded system to encourage adoption of environmentally-friendly farming practices. Participating farmers are reimbursed for costs to implement practices identified in environmental protection plans developed with the assistance of technicians affiliated with approved planning agencies. Currently, farmers receive an average of €10,000 to €12,000 per year for REPS compliance. REPS is co-financed 75 percent by the EU and 2 percent by the Ireland Exchequer.

Teagasc is the largest REPS planning agency, having completed more than 40 percent of all REPS plans submitted to date. Teagasc also provides ongoing support services to its REPS clients for implementing their plans and maintaining required records. They charge farmers €1,200 to prepare a REPS plan and €400 per year for maintenance assistance. Teagasc offers REPS courses at locations throughout the country.

Education and Training: Teagasc administers a large number of farm training, continuing education, and agricultural/horticultural degree programs, some independently through training centers and research centers and some in collaboration with Irish universities.

A number of advanced certificates are offered, including a certificate in dairy herd management. The certificate program includes twenty weeks of classroom instruction at one of two agricultural colleges followed by a twelve-week internship at an approved training farm.

Farm-Level Government Programs and Policies

Milk Quotas: The EU milk quota system has a major effect on Irish dairy farmers' production decision-making. Each dairy farm is assigned a specific annual maximum volume of milk that can be marketed through processors. If that volume is exceeded, then the farm operator is assessed a penalty (super-levy) per liter of sales that exceed the assigned quota. The penalty exceeds the value of the milk, making over-supply potentially very costly.

However, exceeding quota does not necessarily yield a super-levy, at least on the entire excess marketings. The overall EU milk quota is distributed to EU member countries in proportion to individual farm quotas. Ireland, in turn, distributes its country quota to producers through the dairy firms contracted to market their milk. If the country quota is exceeded, only farmers marketing through milk buyers who collectively over-produced are subject to a super-levy. And among those plants, deliveries under quota offsets deliveries over quota, reducing the total over-quota penalty. Despite possible dilution of the super-levy, dairy farmers closely monitor production near the end of the marketing year (April–March). Farmers may dry up cows early, sell cows to other farmers under quota, or even discard milk if they are in danger of over-supplying their quota.

Quota may be leased year-by-year and may be permanently transferred among producers. Ireland introduced a unique auction system for permanent quota exchanges for the 2007–08 marketing year. Separate auctions were held for each milk buyer. Potential sellers submitted bids and potential buyers submitted offers. An “equilibrium price” for each auction was established based on minimizing “excess demand” (bid volume less offer volume). The equilibrium price was the transaction price for buyers who bid for quota at least the equilibrium price and sellers who offered quota at no more than the equilibrium price.

Farmers offering quota for sale at auction (whether their offer was accepted or not) were required to transfer 30 percent of their offered volume to a “restructuring” pool to be distributed at a fixed price of €0.12 per liter to producers in four disadvantaged groups. Sale of the transfer-reduced quota volume in a subsequent auction will not be subject to the transfer.

The results of the first auction illustrated the relative regional profitability of milk production in Ireland as well as the effect of allocating Ireland’s country quota through dairy cooperatives and other milk buyers. The equilibrium prices ranged from €0.11 to €0.23 per liter, depending on location. The highest quota prices came from the south and west, where a longer grazing season yields lower production costs.

EU-CAP milk quotas are likely to be abolished after 2014/2015. A CAP “Health Check” in 2008 is expected to result in an increase in country quotas, perhaps as large as 3 percent, and possibly a reduction in the super-levy.

Payment Schemes: Until 2005, Irish dairy farmers were eligible to receive a number of separate EU-CAP payments, most tied to current production levels. These included per-animal payments for suckler cows, bulls for beef and other slaughter animals. Certain crops grown on dairy farms were also eligible for CAP payments per acre. As part of EU-CAP reform, most production-based payments were decoupled from current production in 2005 and consolidated into a Single Farm Payment (SFP) based on land holdings. Decoupling meant farmers received payments whether or not they produced the crops or livestock upon which the previous payments were based.

Dairy farmers did not receive direct payments prior to 2004, when a payment of €0.012 per liter of quota was introduced to compensate for reductions in price support levels for butter and skim milk powder. That

payment rate was increased to €0.024 per liter in 2006 and to €0.036 in 2007 and beyond. Furthermore, in 2006 the milk payment was decoupled from quota and added to the SFP. The added payment was tied to quota held on March 31, 2005. After that date, dairy farmers’ SFP was fixed regardless of their actual level of milk production.

Direct payments represent a large portion of farm income in Ireland. In 2005, direct payments for dairy farmers were estimated to represent nearly 50 percent of family farm income. For farms classified as “dairy plus other,” the comparable value was 78 percent. For livestock farms other than dairy, direct payments exceeded family farm income [29].

Synopsis

The dairy production system that has evolved in Ireland is well suited to the country’s climate, resulting in relatively low costs of production in comparison to most other EU countries. Ireland’s dairy industry has benefited from relatively strong:

- Dairy support services,
- Research and extension support,
- Education and training support, and
- The beginnings of EU-CAP reforms.

However, overall industry growth has been limited by EU-CAP milk quotas. Moreover, the manner in which quotas have been applied has limited restructuring and geographical relocation of milk production within the country. In the absence of quota restrictions, milk production in Ireland probably would increase by at least 20 percent, production would shift from the northern and central regions to the southeast, and average herd size would increase substantially.

THE DAIRY PROCESSING SECTOR

Brief History⁷

Because of climate and environment, production of milk and dairy products has long been a major compo-

nent of Ireland’s agricultural sector. The country was among the world’s largest producers of dairy products in the early 19th century, with butter the primary dairy product into the 20th century. The introduction of the

⁷This section draws heavily from the appendix of the Prospectus-Promar International report (PPI) [66].

centrifugal separator into Ireland in the 1870s transformed the country's dairy processing sector from farm- to factory-based and promoted collective ownership of processing plants through cooperatives.

The numbers of creameries reached almost 800 plants by 1920. Because of wartime disruptions in dairy markets in the 1920s, many of these plants were forced out of business. Government intervention through the Dairy Disposal Company (DDC), established in 1927 consolidated the industry through the acquisition of failing creameries.

Despite government price supports in the 1930s, low prices discouraged expanding milk production and growth in processing until World War II and the European recovery phase following the war. Processing plant numbers continued to fall due to consolidation and scale-dependent technology, but milk production grew steadily.

The Irish Dairy Board (IDB) was created in 1961 to coordinate export marketing. The IDB adopted the brand name, Kerrygold, initially for butter exports to Britain and later for exports of cheese and other dairy products around the world. The IDB's role as a monopoly exporter ended with Ireland's entry into the EEC in 1973, and the company reorganized as a federated cooperative with operating cooperatives as members.

The industry began to diversify away from its heavy reliance on butter starting in the 1960s. Cheese production increased more than ten-fold between 1960 and 1973. While butter remained the most important manufactured product, skim milk from butter production changed from a waste product that was returned to farms, to a valuable export commodity in the forms of skim milk powder and casein. Production of chocolate crumb and infant formulas also increased.

EU quotas introduced in 1984 essentially fixed domestic milk production and thus had a major impact on dairy processing. Dairy firms seeking to grow had to do so through mergers and acquisitions or through overseas expansion.

Current State of the Industry

Industry Scope and Structure: The processing sector has evolved into a bifurcated system because of deliberate actions of the government, economic constraints, and the evolution of niche markets. In 2001,

PPI estimated that six Irish dairy firms accounted for 80 percent of milk volume processed. Coexisting with these larger firms are small- and medium-sized firms that satisfy niche markets and the domestic market.

Despite consolidation, even the largest Irish dairy companies remain small relative to those in competing dairy export countries. In 2001, one firm processed 80 percent or more of the milk in both New Zealand and Denmark, and two firms processed 80 percent or more of the milk in the Netherlands. None of the leading Irish dairy firms are ranked among the top twenty world dairy companies, which include ten companies based in the EU plus Nestle, headquartered in Switzerland.

The PPI report recommended that Ireland's dairy industry adopt strategies to reduce the number of butter, milk powder, casein and whey product processing plants to four sites [66, p. 93]. In the early 2000s, there were eleven butter plants, eleven milk powder plants, and seven casein processing plants in Ireland.

While there could be advantages to further concentration of Ireland's dairy processing businesses, the current competitive environment does not appear to provide strong incentives for rapid further industry consolidation. Indeed, for the sort of consolidation in commodity processing that PPI recommended, some sort of central coordinating organization in Ireland's dairy industry with the power to force or provide strong incentives for such consolidation would be required.

The major focus of the Irish dairy industry is producing bulk dairy commodities—butter, cheddar-type cheese, skim milk powder and casein. About 80 percent of the milk processed by Irish dairy plants is used for these products (Table 6).

Output of butter has been quite stable at 130–145 thousand MT since 1995 (Figure 10). Annual cheese production has grown by about 60,000 MT over the same time. Casein production has been around 40,000 tons with an apparent fall-off in 2004. Production of skim milk powder has decreased. But given the stability of butter production, either more butter is being produced from cream skimmed from cheese milk or more skim milk powder is being used for further processing into end uses other than casein, such as milk protein concentrates.

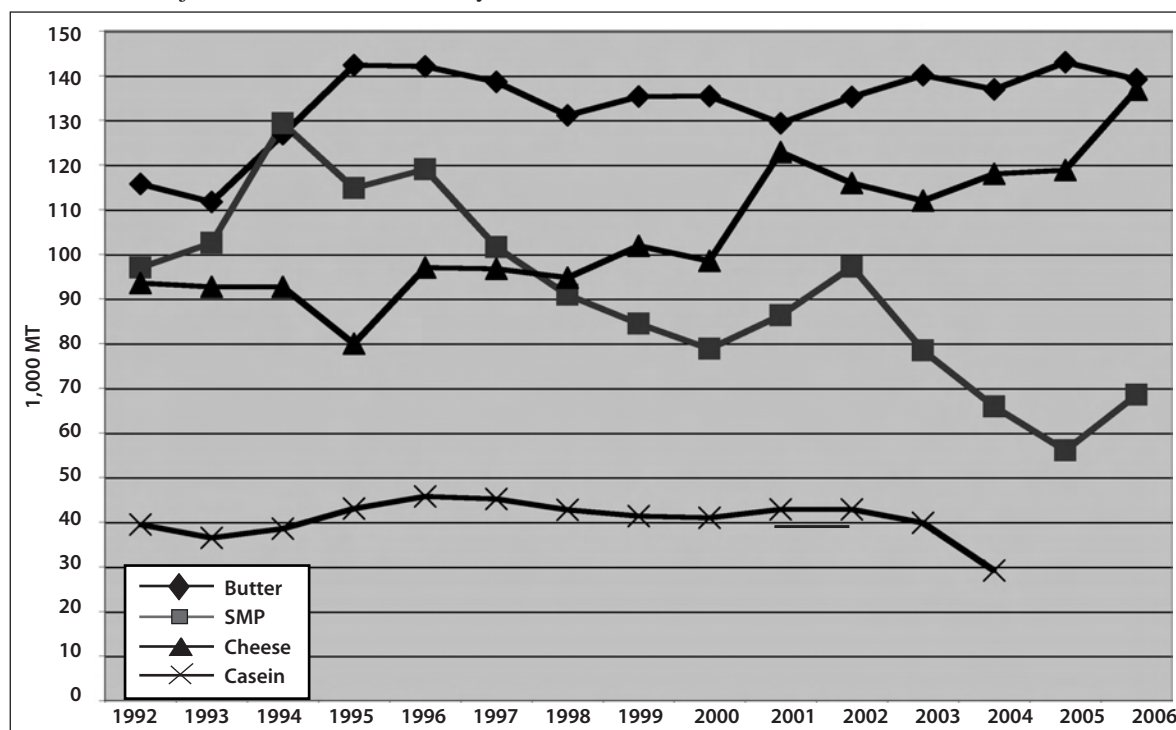
Among EU countries, Ireland's bulk dairy commodity production is relatively sizeable only for butter and

TABLE 6. Ireland Milk Supply and Disposition

| | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 |
|-------------------------|-----------------|-------|-------|-------|-------|-------|-------|
| | 1,000 MT | | | | | | |
| Milk Sold Off Farms | 5,012 | 5,184 | 5,036 | 5,200 | 5,180 | 4,915 | 5,079 |
| Milk Used in Households | 44 | 44 | 44 | 35 | 38 | 34 | 35 |
| Imported Milk Intake | 304 | NA | 279 | 349 | 377 | 550 | 566 |
| Total Milk Output | 5,361 | 5,228 | 5,559 | 5,584 | 5,515 | 5,500 | 5,680 |
| Milk used for: | | | | | | | |
| Liquid Consumption | 512 | 519 | 519 | 489 | 519 | 437 | 505 |
| Cream | 229 | 225 | 219 | 207 | 206 | 233 | 241 |
| Whole Milk Powder | 322 | 327 | 210 | 252 | 252 | 269 | 256 |
| Butter/Skim Milk Powder | 3,016 | 2,968 | 3,104 | 3,121 | 3,141 | 3,185 | 3,099 |
| Cheese | 999 | 1,257 | 1,172 | 1,092 | 1,060 | 1,158 | 1,294 |
| Chocolate Crumb | 147 | 80 | 210 | 140 | 128 | 132 | 126 |
| Miscellaneous | 583 | 614 | 597 | 695 | 662 | 839 | 867 |

Source: Central Statistics Office, Republic of Ireland [18]. Does not include casein production, which is considered further processing of SMP. Milk output and disposal do not coincide due to byproducts.

FIGURE 10. Major Irish Manufactured Dairy Products



Source: Central Statistics Office, Republic of Ireland [18].

TABLE 7. Irish Production of Selected Dairy Products Compared to EU-25 Production, 2006

| Product | Ireland | EU-25 | EU-25 Leaders | |
|-------------------|----------|----------|---------------|----------|
| | 1,000 MT | | Country | 1,000 MT |
| Cheese | 138.9 | 7,881.0 | Germany | 2,001.5 |
| Butter | 137.1 | 1,858.5 | Germany | 438.2 |
| Whole Milk Powder | 35.0 | 774.8 | France | 159.7 |
| Skim Milk Powder | 68.6 | 929.0 | France | 270.2 |
| Fluid Milk | 539.0 | 32,835.0 | U.K. | 6,812.0 |

Source: Dutch Dairy Board [65].

skim milk powder. Ireland accounted for 7.5 percent of total EU production of these two products in 2006. Germany's production of butter was three times Ireland's, and France's production of SMP was four times that of Ireland (Table 7).

There has been ongoing investment by processors in infrastructure since the last round of significant capital investment in the 1980s. However, another round of major capital investment may be required to replace existing plants in the medium term. More than 70 percent of the processors surveyed as part of the PPI study indicated that part of their current technology was either in need of upgrading or is only adequate for current needs. Some processors are already finding it

difficult to meet certain product specifications of their customers with existing equipment and this is expected to intensify with increased demand for greater product customization. Some processors may find it difficult to upgrade facilities because of low profitability levels and cash reserves. Coupled with these constraints the industry must address food safety, quality and environmental standards in the world market and in the EU specifically.

Product Diversification: Although the Irish dairy processing industry is heavily oriented towards commodity products as shown in Table 8, shifts in product array are suggested by the values of "other" dairy prod-

TABLE 8. Internal Versus External Sales of Irish Dairy Products, 2001

| Product type | Value of sales | Percent of | Value of | Percent of |
|-------------------------|----------------|-------------|---------------|-------------|
| | within Ireland | total sales | export sales* | total sales |
| | €1,000 | % | €1,000 | % |
| Butter | 67,883 | 14 | 407,387 | 86 |
| Cheese | 107,799 | 25 | 330,156 | 75 |
| SMP | 42,050 | 23 | 138,371 | 77 |
| Casein | 47,456 | 14 | 292,772 | 86 |
| WMP | 5,722 | 3 | 178,682 | 97 |
| Whey Powder and Lactose | 39,916 | 38 | 65,792 | 62 |
| Yoghurt and Cream | 87,828 | 91 | 8,707 | 9 |
| Functional Foods | 1,618 | 4 | 38,826 | 96 |
| Liquid Milk | 306,609 | 100 | 0 | 0 |
| Other** | 254,699 | 86 | 41,816 | 14 |
| Total (Excl. Other) | 706,882 | 33 | 1,460,692 | 67 |

* Irish Dairy Board and direct exports.

** Defined as intermediate sales between processors.

Source: PPI [66, p. 128]

ucts and “functional foods.” The total value of other products ranks fourth after casein but most of these products are sold within Ireland. The value of functional foods is low and they are primarily exported.

Product array is, of course, heavily influenced by the export market with butter, cheese and caseinates dominating. Cheddar cheese accounted for almost 70 percent of cheese exports in 2001 even though some producers are diversifying into other varieties such as mozzarella. The UK was the receiving market for 83 percent of Ireland’s total cheese exports in 2001; this level has remained consistently high throughout the last decade.

Major Dairy Processing and Exporting Firms: Ireland’s dairy processing and marketing sector might be described as the Big Four processor-exporters plus a competitive fringe. The Big Four consists of the Irish Dairy Board (IDB), Glanbia, Dairygold Cooperative and the Kerry Group. The IDB is a federated cooperative that markets the products of member manufacturing cooperatives. The other three firms are cooperative/public limited companies.

Revenues for 2006 and information on the geographic scope of operations for Ireland’s Big Four processor-exporters appear in Table 9. The firms’ 2006 revenues ranged from approximately €0.5 billion for

Dairygold Cooperative to €4.6 billion for the Kerry Group. With the exception of the Kerry Group figure, the 2006 revenues for the four Irish firms are relatively small compared to competing firms in international markets. For example, Fonterra of New Zealand and Arla of Denmark-Sweden had 2006 revenues of €6.4 billion and €6.2 billion, respectively [44, 6]. International dairy-food giants such as Nestle, Kraft, Unilever and Danone had revenues that were many times larger than IDB, Glanbia and Dairygold.

Ireland’s Big Four dairy processor-exporters exhibit substantial geographic dispersion in sales and foreign direct investment. This pattern, of course, is most evident in the figures for the Kerry Group, which sells food ingredients and other food items in 140 countries.

Irish Dairy Board (<http://www.idb.ie>).⁸ Established in 1961, the IDB’s major function is to market the products of its member manufacturing cooperatives and dairy companies. The IDB accounts for approximately 50 percent of Ireland’s dairy exports and owns the well-known Kerrygold brand. The Board’s main product lines can be divided into three main segments: Consumer Business, Food Ingredients, and Commodity Trading.

TABLE 9. Revenues and Geographic Scope of Operations for Ireland’s Big Four Dairy Processor-Exporters, 2006

| Firm and Location of Headquarters | 2006 Revenues (Billion Euros) | Geographic Scope of Operations |
|--|--------------------------------------|---|
| Irish Dairy Board Dublin, Ireland | 2.074 | Export sales made to 93 countries in 2006. The Board operates DPI Specialty Foods through which it distributes perishable and dry specialty food items in the U.S. |
| Glanbia Kilkenny, Ireland | 2.100 | Maintains operations in Ireland, Europe, and the U.S. and has joint venture businesses in the UK, U.S. and Nigeria. |
| Dairygold Cork and Mallow, Ireland | 0.543 | Main operations are located in Ireland with subsidiaries in the UK, U.S. and Germany. The firm has entered into a joint research program with Meiji of Japan. |
| Kerry Group Tralee, Ireland | 4.646 | Sells food ingredients, flavoring products and other food items in 140 countries. The Group has manufacturing facilities in 19 countries and international sales offices in 20 other countries. |

Sources: 2006 annual reports for indicated companies and Wright Report [78].

⁸ Company web site addresses are noted in parentheses. Much of the information on dairy firms was obtained from their web sites, which are not separately denoted in the list of references.

The Board’s subsidiaries, located in Europe and the U.S., market a number of branded consumer products, dairy ingredients, and specialized grocery, delicatessen and gourmet food items of both Irish and non-Irish origin. In markets where the IDB does not have a subsidiary, the firm’s sales are managed from Dublin through a network of distributors.

In 2006, export sales of the IDB among the 93 countries noted earlier were grouped as follows [49, p. 15]:

| Country or Region | Percent of IDB Export Sales |
|-------------------------|-----------------------------|
| UK | 24 |
| Other EU | 45 |
| Africa | 13 |
| North America | 11 |
| Central & South America | 2 |
| Middle/Far East | 4 |
| CIS | 1 |
| Total | 100 |

In 2006, the IDB was reorganized along divisional lines to form three key business units: Consumer Foods, Food Ingredients, and Distribution Plus, Inc., the Board’s specialty food distribution business in the U.S. This adjustment was made to meet “evolving needs of the marketplace” [49, p. 9].

Glanbia, plc. (<http://www.glanbia.ie>). Glanbia (“pure food” in Gaelic) was formed in 1997 from the merger of Avonmore Foods and Waterford Foods, two publicly traded dairy-food companies. The parent companies themselves were the product of numerous mergers and acquisitions, dating back to the 1960s and before.

Glanbia is organized into three core operating divisions: Food Ingredients (which includes Nutritionals), Consumer Foods (which encompasses Irish and UK businesses), and Agribusiness (which handles their farmer supplies). With four manufacturing sites in Ireland, Food Ingredients Ireland is Ireland’s largest milk processor, utilizing more than 40 percent of the total Irish milk supply. About 95 percent of all products are exported to markets in Europe, North America and Africa. The Food Ingredients Division includes several distinct but closely related businesses. These include Food Ingredients Ireland, Food Ingredients USA and a

number of joint ventures in various countries as well as a global sales operation. Food Ingredients USA operates four plants in Idaho. It is the largest producer of barrel cheese in the world, processing 1.6 billion liters of milk per year, about one-third of the Idaho supply.

Glanbia Nutritionals supplies the global nutrition industry including functional foods, sports nutrition, infant and clinical nutrition, and supplements.

In the international area, Glanbia is a partner with Dairy Farmers of America, Inc. (DFA) and Select Milk Producers, Inc. (Select) in Southwest Cheese Company LLC, a US\$190 million cheese and whey manufacturing plant at Clovis, New Mexico. Glanbia has a 50 percent stake in the business.

Glanbia entered into a 50:50 joint venture in 2003 with PZ Cussons plc to build a US\$25 million facility in Nigeria to supply branded evaporated milk and milk powder to the local Nigerian market. A joint marketing venture with Conaprole of Uruguay was established in 2003 and is based in Mexico. It markets dairy ingredients into Latin American markets; a manufacturing facility was built in 2005 in Mexico.

Glanbia’s Consumer Foods business is the leading supplier of branded and value-added liquid milk, fresh dairy products, natural cheeses and fresh soups in the Irish retail market. It processes 260 million liters into liquid milk and consumer products. This division intends to be Ireland’s premier supplier of chilled foods and nutritious beverages to the retail and food service sectors. Cheddar cheese will remain dominant, but Glanbia plc has a 51 percent interest in a joint venture with Leprino Foods for the EU pizza sector.

The Kerry Group plc (<http://www.kerrygroup.com>). Kerry has grown internally and through a series of acquisitions in its relatively short history. Its current yearly sales are in excess of €4 billion and it has operations in nineteen countries across five continents. European markets account for 65 percent of sales, American markets 27 percent, and Asia Pacific markets represent 8 percent of total sales. Kerry supplies more than 10,000 food, food ingredients and flavor products to customers in 140 countries worldwide. It has manufacturing facilities in nineteen countries and international sales offices in twenty other countries.

The Kerry Bio-Science division was established in May 2004 to produce and market bio-ingredients

and pharma-ingredients to the pharmaceutical, culinary, snack, bakery, confectionery, dairy and beverage industries worldwide. Sales and operations are managed from three regions: the Americas; Europe, Middle East and Africa; and Asia Pacific. It operates nine manufacturing units located in Europe, North America and the Pacific Rim, and has two application and research and development centers in Europe and the U.S. Products that are manufactured and marketed include protein hydrolysates, emulsifiers, yeast, enzymes, hydrocolloids, cultures and fermentation products. It supplies specialized ingredients for functional foods and drinks, supplements, infant formula and enriched sports drinks.

The Consumer Foods Division has focused on alliances with retail partners in selected European markets. Kerry Foods has become a leading producer of chilled consumer food products in Ireland and the UK through internal growth and a series of acquisitions in both branded and private label sectors.

Dairygold Co-operative Society Limited (<http://www.dairygold.ie>). Dairygold is the smallest of Ireland's Big Four dairy firms in terms of total sales, processing about 20 percent of Ireland's milk [47]. Dairygold represents the 1990 merger of two long-established cooperatives, Michelstown Cooperative (founded in 1919) and Ballyclough Cooperative (founded in 1908).

Dairygold is comprised of two divisions, Dairygold Food Ingredients (DFI) and Agri Trading, plus a non-farm dependent business, Reox Holdings. DFI manufactures and markets a range of cheeses, powders, whey and milk protein ingredients for use within the nutrition, pharmaceutical and general food sectors at facilities in Ireland and the UK. Cheeses include cream cheese, cheddar cheese, and hard Italian types in block, grated and liquid forms. Dairy ingredients marketed are caseins and caseinates, skim and whole milk powders, customized protein and fat mixes, and whey ingredients. Global sales occur in eleven countries in the EU, six in the Americas, nine in Africa and the Middle East, and seven in Asia.

Niche Marketers: The Big Four do business alongside many smaller dairy cooperatives and private companies. The Irish Cooperative Organization Society

reports that a total of 31 multi-purpose dairy cooperatives existed in Ireland in the mid-2000s [52]. Cooperatives and cooperative/public limited companies accounted for 99 percent of milk collection and 98 percent of milk processing in Ireland in this same period.

Some smaller companies have thrived by exploiting niche markets. Two examples are Carbery and Cashel.

Carbery (<http://www.carbery.com>). Carbery is a major international food ingredients, flavors and cheese manufacturer headquartered in Cork that has been in the dairy and food business for almost forty years. It has production, R&D, service and marketing capabilities in Europe and the U.S. The product portfolio includes more than twenty cheeses, value-added ingredients, alcohol from whey, and flavors for the food, beverage and nutrition industries. Cheese outlets include retail, food manufacturers, industrial applications, and foodservice, catering, and hospitality.

Whey from Carbery's cheese operations is converted into alcohol, protein products, and natural dairy calcium; the latter two being used in sports foods and nutritional formulations. Alcohol is used in the beverages industry and for food, pharmaceuticals and industrial applications.

Cashel Farm House Cheese (<http://www.cashelblue.com>). Operated by J & L Grubb Ltd., Cashel focuses on a single branded product—blue cheese. It was the first farm house blue cheese operation in Ireland. Through their development of technology and innovative marketing, they sell cheese in specialty outlets in the U.K., the U.S., Japan, Australia and Ireland. Starting from a small base, they have expanded as their markets increased. The firm was awarded \$3.1 million from the Dairy Investment Fund to augment a \$7.9 million specialty blue cheese project, which involves capital investment in a new manufacturing facility that will double output and improve operational efficiencies [19].

Research and Development

Research related to dairy processing has a long history in Ireland, both in academic institutions and in government agencies.

University College Cork. The Faculty of Dairy Science was established in University College Cork (UCC) by the Irish Government in 1926 and has been an integral part of dairy education and research in Ireland since its inception. The present Faculty of Food Science and Technology has four departments: Food and Nutritional Sciences, Microbiology, Process Engineering, and Food Business and Development. Academic staff total more than fifty, with about equal numbers in each department. Research emphases related to dairy processing in the Faculty are: (1) cheese, dairy enzymology and starter cultures, (2) dairy and food ingredients, (3) microbiology, and (4) food safety.

The first category includes research on effects of milk enzymes on dairy products, ripening of cheese, flavor and physical properties of cheese, new cheese products and process technologies, and an extensive program on lactic acid cultures. The ingredients research area encompasses caseins and caseinates, whey protein concentrates, new products from chemical and enzymatic modification of proteins, and the heat effects on milk and milk products. There is a heavy emphasis on lactic acid bacteria in the microbiology area. Research focuses on optimization of growth and activity, control of bacteriophage, and basic research on genetics and physiology. The microbiology group interfaces with other research groups on microbiology of cheese ripening and basic research on pathogens. Food safety research focuses on development of new detection methods and on systems to control contamination and growth of pathogens.

Outreach activities of UCC are undergoing a substantial enlargement because of recent increased funding from governmental agencies. The Bio-Transfer Unit is a partnership between Enterprise Ireland and UCC. It facilitates the commercial development of UCC's bio- and life-science research and assists companies in identifying and accessing appropriate expertise and intellectual property from UCC. With the support of Enterprise Ireland, the BioInnovation Center is facilitating the incubation of emerging bio-science businesses by providing wet-laboratory facilities, offices and administrative support until they are ready to move into larger commercial premises. Outreach is coordinated by Relay, which is described later.

Teagasc.⁹ The Teagasc food research program is carried out at the Ashtown Food Research Center in Dublin and the Moorepark Food Research Center in Moorepark, County Cork. The Moorepark Food Research Center conducts basic and applied research and provides technological services to the dairy processing, food ingredients, nutritional food, and beverage sectors of Irish industry. Moorepark Food Research Centre is one of the foremost dairy research centers and it also emphasizes technology transfer to stimulate innovation in the dairy foods industry. The center staff numbers more than 100, most of whom have advanced degrees in science and technology. Research facilities have benefited from extensive investment in recent years.

The Center includes a 2,500 sq. meter pilot plant operated by the Teagasc subsidiary, Moorepark Technology Ltd. (MTL). MTL is a not-for-profit joint venture between Teagasc and Irish dairy companies, whose purpose is to facilitate R&D in the food industry. It offers pilot plant services and is an integral part of an overall package of contract research and consultancy services from Moorepark Food Research Centre. Customers include Irish food companies, multinationals and public institutions.

The Center's principal research program areas are: bioactive ingredients, food cultures, gut health, milk nutraceuticals, food structure, food protection and animal biotechnology. It is currently expanding its research program on foods for health with new laboratories and construction of an animal test facility for functional foods development. It is a partner with University College Cork in the Alimentary Pharmabiotic Center that is described later and in a new National Functional Foods Research Centre established by Enterprise Ireland.

Relay (<http://www.relayresearch.ie>). This outreach program is coordinated by Moorepark Food Research Centre and is described as a one-stop-shop for Irish food research information [67]. It is a project under the Food Institutional Research Measure (FIRM) funded through The Department of Agriculture and Food under the National Development Plan 2000–2006.

⁹The Irish Agricultural and Food Development Authority. See pages 18–19 for a more complete discussion of Teagasc activities.

Alimentary Pharmabiotic Centre (<http://www.apc.ucc.ie>). A major new thrust in Irish food research was initiated with the formation of this center, which will promote and coordinate the interface between food and medicine. It is a Science Foundation Ireland-funded center focusing on fundamental research on the role of gut micro-flora in human health. This is a joint effort between Science Foundation Ireland, UCC and the Moorepark Dairy Products Research Center. Researchers and clinicians from a broad range of disciplines investigate the mechanisms by which food-grade bacteria and bacteria in the gut affect human health. An important component of the center is education and outreach to the food and pharmaceutical industries.

Future Developments

Industry. The dairy industry will remain a dominant part of the Irish economy because of the environmental advantages of milk production and the importance of dairy products to the internal Irish economy and for export. The gross output of the dairy industry ranks third in the Food, Drink and Tobacco sector after meats (directly linked to dairy) and other food products [27]. The need for value-added dairy products is evident in the low ranking for the gross value category, where dairy ranks substantially below other food products, beverages and tobacco.

Exports. Ireland's food exports reached a record level of €8.1 billion in 2006, with dairy exports up 4 percent and beef up by 14 percent from 2005 (Figure 11). Dairy products and ingredients accounted for 26 percent of exports and was the largest segment. A medium-term outlook for EU agricultural markets made by the European Commission in February 2006 showing reasonably favorable trends to 2012 suggests that the EU is expected to remain an important outlet for Ireland's dairy and beef products [26].

The major outlet for Irish dairy exports is the EU, which took nearly two-thirds of total exports in 2005 (Figure 12). Great Britain accounted for about half of the EU total. The consequent challenge to the Irish dairy industry is to assess and maintain the array of products/ingredients that is most suitable for and competitive in the EU.

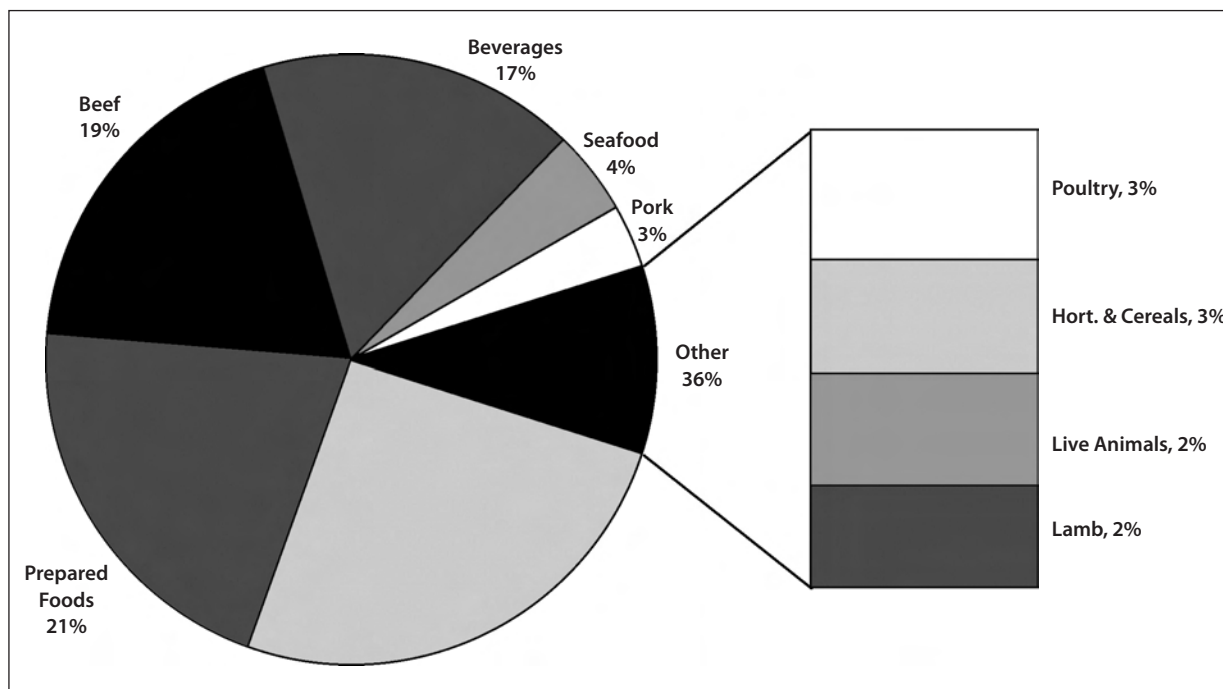
Domestic Markets. The home market in Ireland seems promising for a greater variety of dairy products. Presently, Ireland has the highest per capita consumption of milk in the EU, but the lowest per capita consumption of cheese [27]. This low cheese consumption is not caused by consumption of other high-protein products, since per capita consumption of meats is average or below average except for poultry products. It is likely that the domination of cheddar cheese has stifled growth because the UK has the second lowest per capita consumption of cheese in the EU. Recent trends in production of non-cheddar varieties, including mozzarella, indicate that the industry intends to expand the range of cheese varieties on the home market. The dramatic economic boom in Ireland over the past fifteen years, when increases in GDP were among the highest in the EU, undoubtedly has changed the buying habits of Irish consumers [41]. Even though growth will moderate, experts believe that growth will be 4–5 percent per annum out to the end of the decade. These trends suggest that consumers will be willing to purchase up-scale dairy products.

Product Diversification. The dairy industry will rely on commodity products for some time, but a move towards greater diversification and value-added products is advocated and has become part of public policy [28, 66, p. 89]. The PPI report compared the current product mix with what it indicated as optimal in 2003 as follows:

| Product Category | Actual Product Mix, 2001 | Optimal Product Mix, 2015 |
|------------------------------|--------------------------|---------------------------|
| Base Products | 65% | 45% |
| Value-Added Ingredients | 20% | 30% |
| Consumer Products | 15% | 20% |
| Functional and Organic Foods | 0% | 5% |

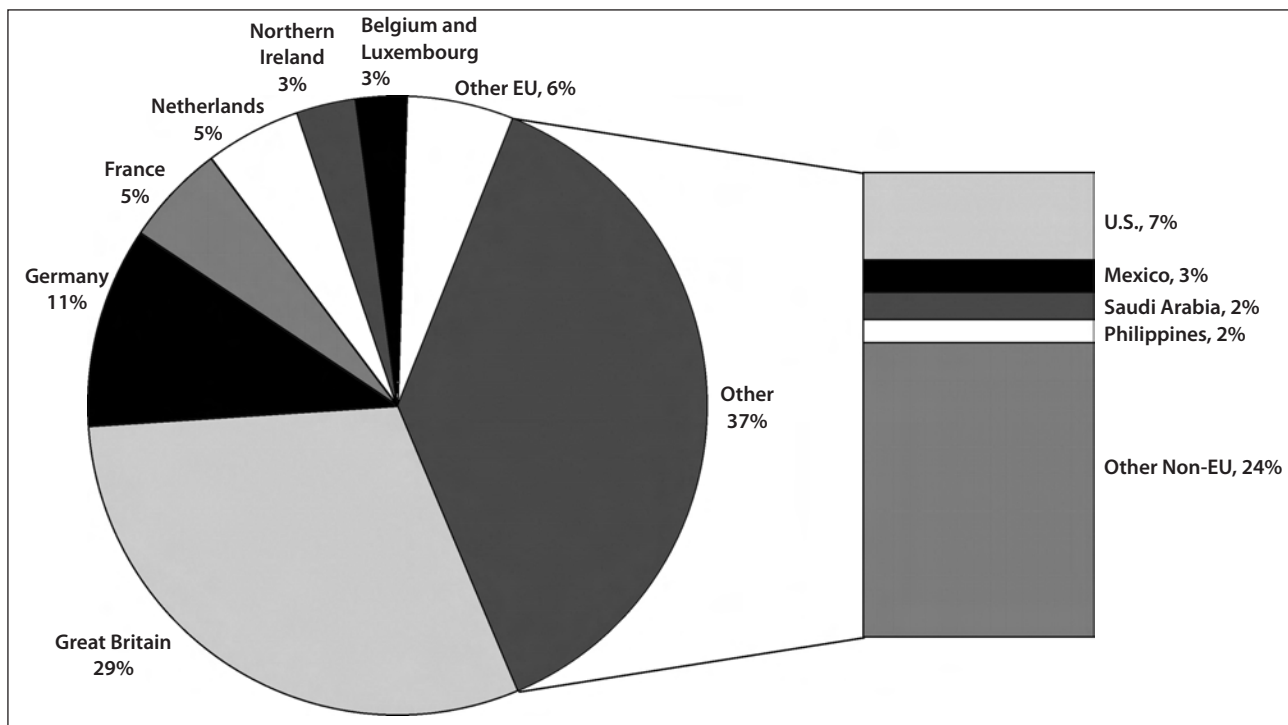
The shift from a commodity product base to a diversified value-added portfolio will require substantial planning and investment. However, Irish dairy firms described in this report have considerable experience in developing an array of products and technologies, and in producing and distributing branded products on the international market.

FIGURE 11. Irish Food Exports, 2006



Values in €Million. Total Export Value = €8.1 billion.
 Source: Central Statistics Office, Republic of Ireland [18].

FIGURE 12. Destination of Irish Dairy Exports, 2005



Values in €Million. Total Export Value = €2.0 billion.
 Source: Central Statistics Office, Republic of Ireland [18].

Other moves by industry indicate a change from production of commodities such as cheddar cheese to other cheese varieties. For example, Tipperary Cooperative will increase its cheese output over the next few years with a €13.5 million upgrade of its emmental cheese plant in Tipperary [51].

Consolidation. While some consolidation has taken place at the processing level, the major recommendations of the PPI report remain to be implemented. This is primarily the responsibility of the processing sector, but the Department of Agriculture and Food will take several initiatives to facilitate the recommendations [28]. It will continue to work with the processing sector to achieve optimum configuration within the sector, especially in terms of scale.

Government and Non-Governmental Agencies

National Plan. The Irish government has set in place an ambitious plan for transforming Ireland over the next decade [68]. The intent of the National Plan is to continue the same rate of economic growth as experienced over the past decade. Continued transformation is expected to be driven largely by the continuing increase in population, which will shift the economic base to more high value-added activities in both indigenous and foreign-owned industries.

The National Development Plan 2007–2013 proposes investment of some €184 billion as follows: economic infrastructure (€54.7 bil.), enterprise, science and innovation (€20.0 bil.), human capital (€25.8 bil.), social infrastructure (€33.6 bil.) and social inclusion (€49.6 bil.).

Agri-Food Sector. The Agri-Food Research Sub-Program of the National Development Plan 2000–2006 will invest €641 million to provide a scientific foundation and support for a sustainable, competitive, market-oriented and innovative agriculture, food and forestry sector. The funding will assist this sector to adjust to the changing business, economic and regulatory climates in a more open, market-driven economy without EU subsidies. The Plan emphasizes that environmental quality and food safety, combined with other quality-orientated dimensions, including concern for nutritional value and animal welfare, are central to

the longer-term international competitiveness of the Irish agri-food sector. The industry needs to reposition its product range from basic commodities to more differentiated products with higher added value.

Regulations. Trading on the EU and global markets will necessitate continued emphasis by industry, governmental agencies, and academic institutions to address issues such as regulations, food quality, labeling and safety. The Department of Agriculture and Food (DAF) appears to be the lead agency in these endeavors and will enforce food legislation in accordance with the terms of its service contract with the Food Safety Authority of Ireland (FSAI) and it will take a proactive role in prioritizing and delivering food safety initiatives in conjunction with the FSAI and Safefood, the all-island food safety body.

Enterprise Ireland. This national development agency is charged with the development of Irish companies to achieve strong positions in global markets and thereby increase national and regional prosperity. The organization has five main areas of activity: 1) achieving export sales, 2) investing in research and innovation, 3) competing through productivity, 4) starting up and scaling up, and 5) accelerating regional enterprise. Assistance is provided to international companies searching for Irish suppliers and for international companies wanting to set up food and beverage manufacturing operations in Ireland [41].

Research and Development. The Irish food industry's expenditure on R&D, at 0.3 percent of sales, is lower than in other sectors of the economy [28]. This is in part because the sector includes a large number of small and medium enterprises, which do not have the capability or expertise to engage in R&D. Industry has also relied heavily on the research capabilities of UCC and the Moorepark center of Teagasc. Larger firms are investing more in applied research and product development either through their own research units, contracting with Moorepark Technology Ltd., or with their suppliers.

Research Emphasis. The present strengths in dairy chemistry, process and product technology, and microbiology will be substantially augmented by biotech-

nology, nutrition and health-related research. The multi-disciplinary, multi-institutional Alimentary Pharmabiotic Center is one of the largest research programs to address a specific issue—gastrointestinal health [2]. Although the research will be principally carried out by public institutions and publications will be in the public domain, the Irish dairy industry should be in a good position to take advantage of the output from the center. Interactions with the researchers are easy geographically. Numerous pharmaceutical firms have facilities in Ireland, with thirteen of the top fifteen world pharmaceutical companies having substantial operations in Ireland.

Synopsis

- The Irish dairy processing sector has evolved into a bifurcated system consisting of four major processors-exporters and a substantial number of mid-sized and small cooperatives and private companies.
- Numerous national studies have proposed that major consolidation of the large dairy organizations is essential for the Irish dairy industry to compete in international markets. However, the current competitive environment does not provide strong incentives for rapid industry consolidation, a move that will require a coordinating organization in Ireland's dairy industry for implementation.
- The major focus of the Irish dairy industry is producing bulk dairy commodities—butter, cheddar-type cheese, skim milk powder and casein—with about 80 percent of the milk processed by Irish dairy plants being used for these products.
- The large dairy processing organizations have developed extensive value-added and branded

products for the domestic market and for export, and have established manufacturing and marketing facilities in foreign markets.

- Another round of major capital investment similar to what occurred in the 1980s may be required to replace existing facilities in the medium term.
- Research and development in Ireland has been sustained largely by academic institutions and governmental laboratories since investment by industry has been low compared to other sectors of the Irish economy. The Irish government has implemented a plan for transforming Ireland over the next decade. Enterprise Ireland, a national development agency, is charged with the development of Irish companies to achieve strong positions in global markets.
- In addition to supporting traditional dairy processing, a major new research thrust relates to the interface between food and medicine. This focus is strengthened by the extensive presence of pharmaceutical companies in Ireland. Enterprise Ireland is also facilitating bio-science start-up companies by providing facilities for product development.
- The dairy industry will remain a major part of the Irish economy because of the environmental advantages of milk production and the importance of dairy products to the internal Irish economy and to export revenue. The gross output of the dairy industry ranks third in the Food, Drink and Tobacco sector. The home market seems promising for a greater variety of dairy products, especially with the improved economy that promotes consumption of high-end products, such as specialty cheeses.

COMPETITIVE STRATEGIES OF IRISH DAIRY FIRMS¹⁰

This section focuses on the various strategies that Ireland's milk processors and exporters have used to adapt to the unique conditions in Ireland's dairy sector.

These conditions include a limited internal milk supply due to EU milk quotas, a limited domestic market

¹⁰ This is an abbreviated version of a Babcock Institute Discussion Paper 2007-3, which covers topics of particular interest to U.S. dairy manufacturers and exporters [33]. <http://babcock.cals.wisc.edu>.

due to a small population, and extreme seasonality in production due to a grass-based production system.

Other aspects of the competitive environment affecting Ireland's dairy processors will continue to shape firm strategies and influence their success. These include:

- Ireland's rapidly growing "Celtic Tiger" economy has created strong domestic demand for dairy products, but has put upward pressure on wages and processors' costs for electricity, gas, and insurance in recent years.
- Appreciation of the euro relative to the U.S. dollar and some non-euro zone currencies has made Irish dairy products less competitive in international markets outside the euro zone. This development is important since Irish firms export about 80 percent of dairy products produced in the country.
- Changes in EU dairy policies have created uncertainties for the industry. EU dairy policy changes include a move to decoupled direct payments as a method of supporting dairy farmer incomes, reductions in intervention prices for butter and skim milk powder, elimination of subsidies for firms using skim milk powder to produce milk replacer, and elimination of, or sharp reductions in, EU export subsidies for several dairy products. Milk quotas, which have been a fixture in the EU since 1984, are likely to increase after 2008 and be eliminated after 2014/2015.
- Profits available from "selling into the CAP" have caused Ireland to rely more heavily than many other EU countries on EU-CAP dairy intervention payments and dairy export subsidies. In Ireland, production of commodity dairy products (e.g., butter, casein and skim milk powder), which could be sold into intervention or exported with subsidies, has been emphasized. Profits from the CAP have retarded R&D efforts and industry efforts to develop new value-added (differentiated) dairy products.
- Ireland's pasture-based dairy farming system creates excess capacity in milk processing. Dairy processors operate at or near full capacity during

May, June and July, but at only about 60 percent of capacity on an annual basis. This places Irish dairy firms at a competitive disadvantage in terms of manufacturing costs to foreign processors, who enjoy a more even seasonal milk flow into their plants.

- Competitive pressures caused major consolidations in Ireland's dairy processing industry during the 1990s and early 2000s. However, this consolidation has not proceeded as far in Ireland as it has in New Zealand, Denmark, and the Netherlands, other countries with export-oriented dairy industries.
- Economic conditions in Ireland (e.g., limits on capital available from farmer members and limits on debt capital available from lenders) have encouraged Ireland's dairy cooperatives to develop innovative business arrangements. Several have devised cooperative-public limited company business structures that have enabled the hybrid firms to raise capital in the share market and gain other advantages.
- Current or prospective profit squeezes in Ireland's dairy business have created incentives for major Irish cooperatives to diversify into non-dairy product lines and engage in foreign direct investment.

Strategies of Ireland's Dairy Processors

We will first examine industry strategies of dairy firms in general, and then provide a more detailed analysis of strategies of Ireland's Big Four processor-exporters (IDB, Glanbia, Dairygold Cooperative and the Kerry Group).

Inferences regarding general strategies can be gleaned from the information on the awards made by Ireland's government to the country's dairy firms in 2007 (Table 10). Two major tendencies are evident. The first is that the government grants are aimed at changing the product mix of Ireland's dairy industry in the direction of more value-added products. Approximately two-thirds of the projects (measured by dollar value) are directed primarily at increasing the production of value-added products. The remaining one-third aims mostly at increasing the efficiency of production.

TABLE 10. Irish Government Awards to Dairy Processors, 2007

| Recipients | Amount (\$Mil.) | % for Increasing: | |
|---------------------|-----------------|------------------------|-----------------------|
| | | Value-Added Production | Processing Efficiency |
| Big Four Firms (3)* | 71.1 | 7 | 29 |
| Other Firms (9)* | 83.9 | 65 | 35 |
| Total | 155.0 | 68 | 32 |

Source: Cheese Reporter, [19].

*Numbers in parentheses indicate number of firms receiving government grants.

The second trend underscores the absence of incentives for further substantial mergers and consolidation of Ireland’s dairy industry. Nine non-Big Four firms received grants, suggesting that the government and the smaller firms themselves believed they have a chance to operate profitably as separate entities. Also, the grants to the three Big Four firms contain few, if any, incentives for mergers. It would be surprising if it were otherwise since the EU Competition Authority said that the grants should not be used to foster mergers.

Strategies of Ireland’s Big Four Processor-Exporters

Irish Dairy Board. As noted earlier, the IDB’s principal function is to market the products of its member manufacturing cooperatives and dairy companies—it does not manufacture products itself. The Board has flourished by exploiting the Kerrygold brand, which has broad global recognition.

Given the substantial number of smaller dairy cooperatives that operate in Ireland, there is a place in the country for an export marketing board. However, the IDB’s role may be increasingly confined to serving the needs of the smaller processors, since the processor-members of Ireland’s Big Four have the demonstrated ability to export products for their own account. Further consolidation among Irish dairy cooperatives will increase the incentives of remaining firms to independently market their own brands, both in Ireland and overseas.

Another threat to maintaining IDB operations relates to trends in development of value-added products in Ireland. As Ireland’s dairy firms develop certain new value-added products, they need to be in position

to work with final customers to explain the technical characteristics and applications of the products. Firms developing the new products also may wish to make price concessions to the final customer. It is difficult to explain technical characteristics or make needed price concessions when working through an intermediary such as the IDB.

Glanbia. Glanbia’s most prominent competitive strategy has been direct foreign investment and joint ventures with foreign companies. In particular, Glanbia’s initiatives in the U.S. (Food Ingredients USA and Southwest Cheese) are consistent with the objective of becoming a global dairy giant. However, the firm has a substantial ways to go before achieving such status.

How well are Glanbia’s strategies working? In its 2006 annual report to members, Glanbia noted the firm’s global market positions as follows:

- U.S.: Number 1 in barrel cheddar cheese and whey protein isolate, Number 3 in lactose, and Number 4 in total cheddar cheese.
- Ireland: Number 1 processor of liquid milk and cream (branded products), cheese, and butter.
- Europe: Number 1 supplier of customized nutrient premixes and pizza cheese.
- Global: Leading supplier of advanced technology whey proteins and fractions.

Glanbia officials interviewed by the study team confirmed that Southwest Cheese was performing up to expectations or better. The officials noted that the new technology incorporated in the plant was easier to install and performed better than retrofitted equipment installed to update Irish cheese processing operations.

A Glanbia official speculated that Southwest Cheese and other large cheese plants in the U.S. will effectively eliminate medium-sized commodity cheese plants as viable competitors in the U.S. While this comment may exaggerate the future structural change in U.S. cheese processing, it is noteworthy. It suggests that the U.S. cheese processing business in a few years will consist of a limited number of large commodity cheese plants located near western milk production areas and many smaller specialty cheese plants located in Wisconsin and elsewhere in the U.S.

Additional summary information on the focus and effectiveness of Glanbia's strategies appears as a progress report [46]:

Irish operations continue to focus on key aspects of business execution which drive performance, productivity, and cost competitiveness. International operations are expected to perform well in 2007 and Food Ingredients USA, Nutritionals and Joint Ventures are well positioned for good growth . . . Glanbia is successfully developing a strategic international presence, which today represents nearly 40 percent of revenue and profits. This gives the Group a strong platform from which to continue to grow and develop overseas.

The comments on the effectiveness of Glanbia's strategies suggest that the firm is working on improving the efficiency of Irish operations and plans to focus most of its growth in the U.S. and other foreign locations. The efforts to improve the Irish operations include working with Dairygold Cooperative to share milk assembly and milk processing functions. Each firm levies a toll charge on the other for reciprocal processing. These reciprocal arrangements provide some of the cost savings of mergers without actually requiring that the mergers take place.

In summary, Glanbia has implemented several growth-oriented strategies that other leading world dairy processors have pursued. These include securing milk supplies in the U.S. rather than in the quota-constrained Irish dairy industry, becoming more efficient in manufacturing by establishing large U.S. cheese manufacturing plants, and opening new markets in the U.S. and Latin America, all of which have helped Glanbia gain market share and market power.

Dairygold Cooperative. During the mid-2000s, Dairygold carried out a strategy study and rationalized activities that reduced the cooperative's work force and increased the efficiency of the firm's processing operations. The strategy study, carried out in 2005 and early 2006, specified key objectives for the cooperative [47]. The main change that emerged from this specification of objectives was the splitting of the cooperative into two components in 2006, consisting of:

- *Core Farm Businesses:* Milk processing and agri-trading units were tasked with maximizing farmer suppliers' income and farm gate prices, and minimizing farm input costs.
- *Reox Holdings plc:* The units in this unlisted plc were charged with maximizing the return from the cooperative's property, consumer foods, and home hardware assets. Reox Holdings' assets are expected to generate a dividend stream and yield shares with liquidity and real value.

Dairygold's individual farmer-members retain 100 percent ownership of the Core Farm Businesses and Reox Holdings. Reox shares can be held or sold by Dairygold's farmer-members at a time of their choosing. This flexibility with respect to holding or selling shares is a valuable attribute, which many cooperatives located outside of Ireland do not possess because of restrictive cooperative statutes.

Dairygold's Chief Executive described strategies of the firm as follows in the Cooperative's 2006 Annual Report [25, p. 4]:

Dairygold will . . . continue to develop and secure higher value markets for an increasing percent of its product range . . . Our successful move into the specialty cheese markets with Jarlsberg and Manchego cheese are examples of how this will be achieved and we will build on this success to add further value to . . . (producers') milk supply in the coming years.

Dairygold is fully supportive of industry initiatives to improve the efficiency and competitiveness of dairy processing capacity on a nationwide basis. We believe that our ground breaking co-processing arrangement with Glanbia points the way forward in this regard. The focus of the industry must be on efficient processing, regardless of the owner-

ship of the processing assets. This will allow precious resources to be concentrated on adding value through market innovation and new product development.

John Walsh, Dairygold's Chairman, described the above-mentioned co-processing arrangement with Glanbia as follows [25]:

2005 opened with our announcement of a groundbreaking co-processing arrangement with Glanbia plc. The Glanbia arrangement will see us take on 25 million gallons of milk annually from Glanbia from April 2006 for dairy processing at the Mitchelstown manufacturing facility while Glanbia will take some 9 million gallons of our cream for the contract manufacturing of Dairygold butter at its Ballyragget facility.

These comments are straightforward descriptions of strategies to increase the proportion of value-added products in the cooperative's portfolio and reduce processing costs via co-processing.

The Kerry Group, plc While no longer primarily a dairy firm, the Kerry Group of Ireland provides a dramatic example of a firm's successful strategic adjustments to a sometimes hostile economic environment.

The Kerry Group is now a diversified food ingredients, consumer foods and bioscience company. The firm grew from a small cooperative that had sales of about U.S.\$50 million in 1974 to a multinational company with sales of €4.6 billion (about U.S.\$6.1 billion) in 2006, a 122-fold increase.

Much of Kerry's growth in the late 1980s and 1990s was achieved by acquisitions of food ingredients companies. These acquisitions doubled Kerry's revenues about every five years during the late 1980s and 1990s. About two-thirds of the Kerry Group's revenues were obtained from food ingredient sales at the end of the 1990s.

In May 2004, when Kerry completed the acquisition of the former Quest Food Ingredients business, the Group established the Kerry Bio-Science division. This division innovates and applies new technologies relating to bio-ingredients and pharma ingredients for the pharmaceutical, culinary, snack, bakery, confectionery, dairy and beverage markets worldwide.

Implementing these strategies propelled the firm into a world leadership position in food ingredients and other highly differentiated products. Simultaneously adoption of these strategies and others noted below caused sales of Irish-based dairy products to decline to about 12 percent of the firm's total revenues in the mid-2000s.

Kerry's success in transforming itself from a small dairy cooperative into a profitable multinational firm provides lessons for dairy firms in Ireland and other countries. Kerry's early decisions were partly a product of an accident of history. However, those actions also reflect Kerry's decision to avoid tying its fortunes to the quota-limited Irish dairy industry. The firm pursued a strategy that involved exchanging Kerry Cooperative's assets for a majority holding in a public limited company. By selling Kerry shares on the Dublin and London exchanges, the Kerry Group was able to raise expansion capital. While Kerry's successes probably reside more with continuous, capable management than with converting to a plc., the change to a cooperative/plc may be worthy of emulation by capital-short cooperatives located outside of Ireland. Finally, Kerry's shift from commodity dairy products to differentiated dairy products, non-dairy food products, food ingredients, flavorings and bioscience products may be a model for other dairy companies.

Synopsis

In summary, the strategies of Ireland's dairy processors represent reasonable, orthodox adjustments to changes in the economic environment.

- The move on the part of the Irish processors to increase the production of value-added products is a suitable adjustment to the decline in EU-CAP subsidies for commodity dairy products.
- Glanbia's strategies recognize that a producer of commodity products must be a large-scale, low-cost producer if it is to be profitable over the longer-run. Hence the firm's decision to build the large cheese and whey processing plants in the U.S. appears sound.
- The problem of fragmentation of the industry has been addressed in a number of ways. The co-processing arrangements of Glanbia and

Dairygold represent efforts to achieve processing efficiencies approaching those of a large-scale operator without actually consolidating processing plants.

- The IDB may have a smaller market for its services in the future when a larger number of Irish processors begin to produce specialty dairy products. It is difficult to market such products

effectively through an intermediary such as the IDB.

- The one area where there appears to have been little strategic adjustment relates to problems associated with the pronounced seasonality of milk production. Glanbia, of course, has dealt with the problem partly by establishing large dairy processing operations in the U.S. where seasonality of production is lower.

IMPACT OF FUTURE EU-CAP DAIRY POLICIES ON IRELAND'S DAIRY SECTOR

The changes in the EU-CAP relating to dairy outlined earlier appear likely to materialize. Indeed, many Irish dairy industry officials and farmers interviewed by the study team accept forecasts that EU milk quotas would be expanded after the 2008 “health check” and be eliminated after 2014/2015, intervention prices for butter and NDM would remain at the lower levels established during 2004–2007 (or fall still more), and dairy export subsidies would be sharply limited in the future. Moreover, the officials and farmers believe that direct payments will largely replace market intervention as a method of supporting dairy farmer incomes in Ireland and the rest of the EU.

These are sweeping changes in dairy policies in an EU system that has been highly resistant to change. In particular, the budget pressures and economic inefficiencies associated with the CAP that for decades were supposed to bring about reductions in intervention prices and force reforms in other methods for supporting EU farmer incomes failed to produce such results until the late 1990s and early 2000s. Why are the dairy industries of Ireland and the rest of the EU now likely to experience these major changes? Could EU-CAP dairy policies do an about face of the type witnessed in the U.S. from 1996 to 2002?

What the CAP's History Suggests about Future EU Dairy Policies

The history of the EU-CAP provides insights regarding why fundamental changes in EU dairy policies and other agricultural policies are unfolding. The Treaty of Rome in 1957, which established the European Economic Community (EEC), defined the general objec-

tives for a common agricultural policy for the EEC [4, p.4]. The principles of the CAP were set out in July 1958. In 1960, the CAP mechanisms were adopted by the six founding member states and two years later the CAP came into being. When the CAP was established the following objectives were set forth for agricultural policies in the EEC [16]:

- Increase agricultural productivity by promoting technical progress and the optimum utilization 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 food supplies reach consumers at reasonable prices.

These CAP objectives remain largely intact but the mechanisms used to achieve them have evolved. Moreover, the CAP objectives were expanded in 1997 to include ambitious, multi-functionality objectives. In the early years of the CAP, market price support mechanisms were introduced that kept farm prices at agreed levels by a host of market interventions, export subsidies, and relatively high tariffs on imports of many non-EU agricultural products. The farm product prices guaranteed by the CAP, the lower risk environment produced by the CAP, and farm productivity gains produced the infamous “milk and wine lakes, butter mountains, and beef mountains” in the EU by the 1980s. Milk quotas were introduced in the EU in 1984 in response to dairy surpluses. Other supply-reducing mechanisms including “set-asides” were established

for certain other farm commodities. In 1992, Ireland's Ray MacSharry, the then EU Commissioner, steered through a major reform of the CAP to reduce growing intervention stocks of surplus products and meet demands from the then GATT to reduce the effects of EU subsidies on world markets.

Impacts of EU dairy export subsidies on world dairy markets illustrate, in part, why GATT members were concerned about EU subsidies. For example, the Australian Dairy Corporation showed that during the late 1980s and early to mid-1990s, the world price for NDM closely approximated the German wholesale price in the EU minus the EU export refund (export subsidy). It is hardly surprising that the EU export subsidies had a large negative impact on world prices of NDM since EU exports of NDM, most of which were subsidized during this period, represented a large share of NDM exports by the world's leading dairy exporting countries (Table 11). Specifically, EU exports of NDM accounted for about one-third of major country exports of this product in the mid-1990s. Exports of

this magnitude, which represented about one-third of EU production of NDM, could be expected to depress world prices for the product.

EU exports of NDM were substantially smaller in the mid-2000s after the EU stopped subsidizing exports of the product (Table 11). However, EU butter exports remained large as a percentage of exports of a major country of this product, staying at more than 30 percent during 2005 to 2007.

A report from Ireland's Department of Agriculture and Food described other aspects of the MacSharry reforms, as follows [16, p.6]:

The MacSharry Reforms were the first step away from a system of market supports to a system of direct payments to farmers. Substantial cuts were made in the level of support prices for the main products, while income support payments linked to production were made directly to farmers to compensate them for the price cuts. The MacSharry Reforms also included measures to encourage less intensive farming in the interests of the environment, to aid (establishment of forests on) . . . agricultural land and to provide a more attractive early retirement scheme for farmers over 55 years of age.

A second reform of the CAP—the Agenda 2000 Agreement of March 1999—furthered the movement launched by the MacSharry Reforms away from market price supports toward direct payments to farmers. The Agenda 2000 Agreement also emphasized food safety and environmental measures. The latter changes were consistent with multi-functional role for agriculture specified by the EU Agriculture Council in November 1997. Multi-functionality specifies that agriculture has a role in 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.

The Mid-Term Review of the Agenda 2000 Agreement in 2003 provided for the full decoupling of EU direct payments from production for milk, livestock production, and arable crops. And, as noted earlier, this review reduced intervention prices for butter and NDM by 25 percent and 15 percent, respectively, from 2004 to 2007. The new “Single Farm Payments” that were incorporated into the CAP as a result of the review,

TABLE 11. EU Nonfat Dry Milk and Butter Export Data
Selected Years, 1993–2007

| Product & Year | Exports (1,000 MT) | % of Major Country Total Exports* | % of EU Production |
|---------------------------|---------------------------|--|---------------------------|
| NDM | | | |
| 1993 | 292 | 33.6 | 23.0 |
| 1995 | 387 | 35.1 | 32.4 |
| 2000 | 358 | 29.8 | 33.2 |
| 2005 | 195 | 19.3 | 18.1 |
| 2006(P) | 130 | 12.4 | 13.3 |
| 2007(F) | 120 | 11.4 | 12.8 |
| Butter | | | |
| 1993 | 216 | 30.1 | 12.1 |
| 1995 | 187 | 27.7 | 10.7 |
| 2000 | 176 | 24.7 | 10.4 |
| 2005 | 342 | 43.1 | 15.9 |
| 2006(P) | 230 | 31.0 | 11.1 |
| 2007(F) | 220 | 30.2 | 10.7 |

Source: [45], 1998–2006.

P=Preliminary. F=Forecast.

*Major country total equals exports by important NDM and butter exporting countries as reported by [45].

link direct payments to farmers to cross compliance with respect to environmental quality, food safety, and animal welfare. Payment limitations for bigger farms were also included in the CAP under the review.

Mariann Fischer Boel, European Commission member responsible for Agriculture and Rural Development, provides a public goods-private goods rationale for the CAP's multi-functionality objectives and the associated cross-compliance requirements that must be met by EU farmers wishing to qualify for Single Farm Payments, as follows [11, p. 3].

Farm products are private goods—goods for the market. Responsible stewardship of the land and compassionate treatment of farm animals are public goods. The Single Farm Payment and cross-compliance split private goods from public goods. Whereas private goods will be mainly for the market, public money will be primarily a reward for providing public goods. Some 90 percent of direct payments will depend on farmers' respect of high standards of environmental care, animal welfare and public health. They will not be linked to production. Through this approach, the CAP encourages our farmers to look after their land and animals in the way we expect, and removes conflict between these objectives and greater competitiveness. It does this in two ways. First, it leaves them free to produce whatever they can farm most competitively, without worrying about a possible impact on their cheque from the CAP. Secondly, it covers the extra costs that arise from standards which they have to meet but which others do not.

Thus, the history of the EU-CAP suggests that the legislative and conceptual foundations for reform of the CAP were firmly established in the 1990s and early 2000s.

The Impact of Budget Constraints on the EU-CAP

EU budgeting for the CAP is complex and difficult to evaluate. For the 2007–2013 EU budget cycle, spending on the CAP tentatively has been frozen in approximately real terms from 2007 until 2013 [42, p. 5]. However, at the UK's insistence there will be a budget review in 2008, which could further reduce EU

outlays for the CAP. The composition of EU spending for the CAP will also change.

The *Economist's* special report on the European Union said that an EU budget review scheduled for 2008 has acquired new significance for reasons relating partly to the CAP's still large claims on the budget [38, p. 11]:

The first (reason for the new significance) is that the (European) commission is taking it seriously. The EU budget, at just over €115 billion, or 1% of the Union's GDP, is relatively small. But it is also ludicrously archaic. (Former UK Prime Minister) Mr. Blair rightly pointed out the absurdity of devoting almost half of all EU spending to the CAP (though that is an improvement on the 1980s, when the CAP absorbed 70%) . . . The worst feature of the EU budget is that, to make up for spending so much on the CAP when some member countries have so few farmers, it is littered with rebates. The British rebate . . . is the best known but the Germans, Dutch, Austrians and Swedes now all have special rebates of their own. Indeed, the latest budget row in Brussels is over how far countries that get rebates should contribute to others' rebates.

This quote suggests how contentious and complex CAP budget issues have become. However, the *Economist* may understate the decline in the CAP's share of the budget. Rudloff, writing for Deutsche Bank Research, reports that the agriculture budget as a percentage of the EU budget declined from about 73 percent in 1979 to 40 to 41 percent in 2007 [70, p. 1].

Whether the UK will succeed in reducing CAP outlays during the latter part of the 2007–2013 EU budget cycle is uncertain. The UK has long-standing complaints about the limited benefits it receives from the EU-CAP. The reasons are not difficult to fathom. The UK with its small agricultural sector receives limited CAP payments from the EU budget and those to the dairy sector are particularly small. In part this is because UK dairy farmers do not presently fill the milk quota assigned to the country by the EU. Hence, the dairy quotas have zero value to UK farmers. The UK began to address the agricultural payment imbalance in the early 1980s. Specifically, in 1984 when the UK economy was depressed and the country was a net contributor to the EU budget, the UK obtained a rebate

from the EU, which continues in varying amounts to the present. Thus, during 2000–2006, the UK rebate averaged €3.8 billion per year [70, p. 11].

France and Germany, which have been net beneficiaries from the EU-CAP because of large payments for their dairy, beef, and cereals sectors, have resisted CAP budget cuts. However, the French may warm to additional CAP reforms for reasons noted in the *Economist* [38, p. 12]:

When farm subsidies took the form of price support, they had to be paid at EU level because products crossed borders. But as they switch to direct payments, the case for financing at EU level is weaker: there is no reason why national governments should not pay for their own farmers. Several countries favor partial national financing of the CAP, as does the budget commissioner, Dalia Grybauskaitė. More surprisingly, so do some influential Frenchmen . . . The French realize that, when the full panoply of farm support extends to Central Europe (it is now being phased in), they will become net contributors to the CAP (emphasis supplied). Indeed, opponents of future farm reform will be found not in Paris but in Warsaw and Bucharest.

The outcome of the haggling among EU members on budget is uncertain, but the changes in the composition of EU-CAP spending are more clearly defined. While EU spending on so-called Pillar 1 programs (mostly direct payments) will continue to dominate, more of the EU budget will be channeled into Pillar 2 programs (mostly rural development). Moreover, obligatory “modulation” began in 2003, which means an automatic annual reduction in direct payments, rising from 3 percent reduction in 2005 to a 5 percent reduction in 2007. The funds freed up are available for spending under Pillar 2 of the EU budget and must be co-financed from national funds.

EU budget outlays for Pillar 1 expenditures in 2004 were as follows in percentage terms [70, p. 5]:

| Program | Percent |
|--------------------|---------|
| Direct payments | 78 |
| Export subsidies | 9 |
| Intervention costs | 1 |
| Other | 12 |
| Total | 100 |

Dairy export subsidy costs dominate the export subsidy cost category for the EU. For example, the EU dairy export subsidies amounted to more than 80 percent of the EU export subsidy cost in 2003 [70, p. 9].

There is little or nothing in the EU budget picture that suggests a return to the budget environment that existed prior to the late 1990s and 2000. This is partly because the expansion of the EU to 27 members has changed the incentives facing the original members and those who joined in the 1970s. Thus, power brokers such as France and Germany may have incentives to go along with proposals from the UK for further reductions in CAP outlays. There may also be a move toward greater national financing of direct payments to farmers, somewhat along the lines indicated in the above quote from the *Economist*. In summary, incentives now exist for the sweeping changes of the type expected by Ireland’s dairy industry.

Comments from Mariann Fischer Boel on Reform of EU-Agricultural Policies

Fischer Boel has shouldered part of the task of championing the reform of the EU-CAP, a challenge she appears to relish. She has articulated the concerns about recent CAP impacts and has provided rationales for needed changes. If, as is likely, her preferences are largely accepted by the EU, expect extensive reforms of the CAP to materialize. This section lays out a few of her comments relating to modifications she believes are needed in EU agricultural policies.

Budget Constraints [10, p. 4]:

*I want to make it absolutely clear that I feel bound by the budget agreement reached by Heads of State in 2002 that secured the CAP budget until 2013 (Brussels ceiling). We owe it to our farmers who are still busy adapting to the fundamental 2003/4 reforms. We should not accept any budget cuts in 2009. But at the same time I would like to caution those that believe that we can keep on at the level we know today after 2013. **We will also need a strong CAP in the future. But it will have to be a slimmer CAP (emphasis supplied).***

Export Subsidies [10, p. 5]:

Although the Doha-round has so far not been concluded, I think it is a political reality that we will in

the longer run have to rely less and less on export refunds.

Decoupling [10, p. 5]:

. . . We need to take a closer look at our approach to decoupling. Maintaining agricultural activity spread across the European territory has for years been a vocation for us—it must remain so. There are many strong environmental and social reasons for sticking to these objectives. . . However . . . production related support is not the best way of achieving these goals. Instead the focus must be on agricultural activity rather than on the agricultural production. We therefore need to take close look at the conditions for full decoupling.

Simplification [12, pp. 5–6]:

. . . To survive the waves of external change which are beating against it, the CAP must have the strength of simplicity. So simplification will stay high on the agenda as we do our long-term thinking. . . The Single Payment Scheme, established by the reform of 2003 and developed in later reforms, gives us a very solid foundation for simplification of the CAP. When fully implemented in the form currently agreed, it will draw in 90% of direct payments to farmers, which were previously very diverse and complex; and it doesn't vary according to agricultural production (the aid is “decoupled,” from output).

Milk Quotas [14, p. 3]:

. . . I believe we should not renew the milk quota system when it expires in 2015 . . . 2015 is still some time away. But the dairy sector is very capital intensive. So if the writing is on the wall for milk quotas, there must be clarity about this sooner rather than later, so that the industry can begin to prepare. . . A quota expansion could make sense. If we are planning to untie farmers' feet (the Single Farm Payment untied their hands), should we not loosen the rope a little, to help them get used to the idea of mobility?

International Competitiveness [13, p. 5]:

. . . We are deadly serious about having a CAP which can face up to the discipline of the interna-

tional market and the expectations of the public. Uncompetitive industry shielded by high level of internal subsidies and protection has no place in the future CAP.

Doha Round Agricultural Trade Talks [13, pp. 6, 8]:

*In respect of domestic support, we have proposed a huge cut of 70 percent to trade-distorting subsidy. This has been possible because the Single Farm Payment fits into the Green Box of least-trade-distorting support. With regard to export competition, the European Union has offered to phase out its export refunds by 2013 . . . According to our (market access) offer which is formally on the table at this time, we would halve our average agricultural import tariff from 23 percent to 12 percent . . . There needs to be a dash of realism about what is politically possible. It's one thing to ask us for deep cuts to farm tariffs—to which we have agreed. **It's quite another thing to ask us more or less to end border protection, in such a way that large sections of our valued diverse farm sector would be swept away overnight** (emphasis supplied).*

Plea for a Market Oriented U.S. Farm Bill [13, p. 4]:

I can only urge the U.S. Congress not to write a Farm Bill that would be detrimental to the Doha Round. The 2002 Farm Bill rightly faced worldwide criticism when it was passed, as a move away from market-oriented farm policy. The 2007 Farm Bill should correct mistakes made in 2002, not reinforce them. The world is looking to the U.S. for a clear signal here.

Fischer Boel's comments probably provide a reasonably clear forecast of what to expect in terms of EU agricultural policies. There are few surprises in her comments. The forecast of a slimmer CAP after 2013 is no mystery given the budget environment in the EU. One item that is little publicized elsewhere is the need for simplification of the CAP. Fischer Boel's plea for simplification is logical given the complexity of the CAP, particularly now that the program applies in 27 countries. Finally, while her comments portend sweeping revisions and reforms in the CAP of the type expected by Ireland's dairy industry, she puts exporting countries on notice that access to EU farm markets will be preserved. Thus, non-EU exporters should

expect no big increases in export sales of dairy products and other farm products to the EU in the years ahead.

Implications of the EU-CAP Reform for the Dairy Industries of Ireland and the Remainder of the EU

The dairy industries of Ireland and the rest of the EU will experience a host of changes as a result of EU policy developments that are in prospect. While elimination of quotas is not certain, the political weight in much of the EU appears to be behind elimination of quotas after 2015. These devices have fallen out of favor in concert with the decline in EU intervention prices for dairy products. A second important change relates to the impact on world dairy markets and prices from a change in product composition that will flow from EU dairy policy changes.

Irish dairy industry officials and dairy farmers interviewed by the study team related the following about likely impacts of expanding, and ultimately eliminating, milk quotas:

- In Ireland milk quotas will likely increase by 2 to 3 percent per year after the 2008 “health check.” The size of the super-levy for over-quota production also is likely to decline after 2008. These two changes will help to produce a nearly seamless transition to the end of quotas after 2015.
 - For reasons discussed in detail earlier, milk production in Ireland under expanding quotas and the no-quota environment will increase most in southern Ireland, especially in the Golden Vale area.
 - Most officials and farmers interviewed predicted that overall milk production in Ireland would expand by 10 to 20 percent after quotas end, depending upon changes in milk production costs and labor availability.
 - Milk production in Northern Ireland increased by about 30 percent during the past decade when there were limited or no constraints on milk production from quotas in that country. Northern Ireland faced limited or no quota constraint because that country shared the UK’s quota,
- which generally has not been binding in recent years. The Northern Ireland experience suggests that milk production increases of 10 to 20 percent in Ireland may understate actual production increases after quotas end in the EU.
- The impact of eliminating milk quotas on overall EU milk production was more difficult for the Irish dairy industry officials to forecast. Some argued that overall milk production in the EU would not necessarily increase as a result of ending quotas given the cutbacks in milk production expected in some EU countries. However, they generally forecasted milk production increases for Ireland, Denmark, Sweden, Germany, and parts of France. Poland and Hungary represented question marks for the Irish dairy industry officials interviewed. However, The Babcock Institute’s country study of Poland suggests that the upgrades to that country’s dairy industry that preceded Poland’s entry into the EU will cause milk production there to increase once quotas are eliminated [9].
 - Quantitative evidence of where milk production will increase is provided by recent milk quota prices in countries where quota markets are well established. Quota prices have been highest in Holland, Denmark, parts of Germany, and the northwest of France. Hence, milk production increases probably will be among the highest in these countries or parts of countries after quotas end.
 - How much milk production will increase in Ireland and the rest of the EU after quotas end depends partly on how dairy farmers respond to decoupled direct payments. In theory, under a suitably-designed decoupled direct payments system, farmers would be expected to respond to supply and demand conditions in markets and exclude the decoupled direct payments in determining their supply response. However, it is not clear that Irish and other EU dairy farmers treat decoupled direct payments in this way. Some analysts argue that farmers add the direct payments to the market prices and make their supply response decisions taking into account both components of their compensation [8]. The

latter type of response will result in substantially greater milk supply response than the former.

The EU's influence on world dairy markets will decline in the years ahead as a result of the EU's lower export subsidies and lower intervention payments. Ireland's dairy product mix also will change to reflect the impacts of EU policy changes and the response of Ireland's dairy industry to shifts in consumer demand. A few key developments relating to these points appear below:

- Ireland has until recently placed a heavy emphasis on production of bulk products. For example, the PPI report indicated that in the early 2000s about 65 percent of Ireland's dairy product output consisted of low-margin, bulk products [66, p. 89]. Production of these products will decline as Irish processors respond to higher market prices for differentiated dairy products.
- Until recent years, Ireland relied heavily on sales of butter into intervention. During 1999 to 2002, Ireland (which accounted for about 9 percent of EU butter production) accounted for 27 to 35 percent of butter sold into EU intervention [45, 56]. The lower EU intervention prices for butter now make this market less attractive. In 1998, 1999 and 2002 (years covered by the PPI report when there were intervention purchases of skim milk powder), Ireland accounted for 26 to 38 percent of those EU intervention purchases [45, 56]. This is substantially higher than Ireland's production of skim milk powder, which comprised about 10 percent of the EU total in those years [45].
- The composition of output in Ireland's dairy industry is changing in the direction of increased production of specialty cheeses, partly as a result of the government grants that encourage such changes. Ireland's dairy officials said that the country was "punching below its weight" in production of higher margin cheeses and that it needs to expand production of these products.
- Ireland's production of casein—which has been an important export item for several of Ireland's large dairy processing firms—has declined as a result of the withdrawal of EU support for this

item. Many dairy processors in Ireland and other parts of the EU are making NDM rather than casein to increase returns under current market conditions.

- International market distortions stemming from EU dairy export subsidies will be substantially lower in the future. For example, no longer will EU export subsidies strongly influence prices for NDM. This opens the door for price leadership on the part of Oceania or the U.S. in world NDM markets. However, the EU may still exert strong influences on world butter prices since the Union likely will be required to subsidize exports of this product to keep price support costs at acceptable levels.
- EU shares of world dairy exports will continue to decline. In 1997, the EU accounted for about 44 percent of world dairy exports [1]. New Zealand was in the second position with about 28 percent of world dairy exports. By 2002–03, the EU's share had fallen to 31 percent and New Zealand's share had risen to 36 percent [24]. In the earlier period, the EU's large market share was supported heavily by the Union's export subsidies.
- Further declines in EU dairy export market shares can be expected in the years ahead as EU export subsidies find limited use. The downtrend in EU dairy export subsidies as indicated by the European Commission show EU dairy export subsidies of €2.4 billion for both 1985 and 1990 and about €1.5 billion for 2003 [70, p. 9].

EU farm milk prices will decline as the above changes unfold. Various studies predict price reductions (figured from prices in the early to mid-2000s) ranging from 15 to 27 percent, depending upon the study and the associated assumptions [15, 35, 36, 76]. How much EU farm milk prices actually will decline is essentially a guess. It is difficult to predict how much aggregate EU milk production will change as a result of increases in certain countries and declines in others following the phase-out and elimination of quotas and reduced intervention prices and export subsidies. The difficulty of forecasting EU milk production in the emerging policy environment is compounded by uncertainties regarding EU farmer supply response to

decoupled direct payments and the eventual outcome of the Doha Round of the WTO agreement. Direct payments for Irish dairy farmers under the EU-CAP—which from 2006 onward will be 3.5 euro cents per liter—will compensate the Irish farmers for some, but not all, of the price reductions.

Will the EU Do an About Face on CAP Reforms?

The probability that the EU will do a complete about face regarding CAP reforms is remote since incentives facing powerful EU member countries appear to favor continuing the reforms. However, expect some modification of the reforms outlined in Fischer Boel's comments. In particular, a return to higher expenditures for dairy export subsidies may arise if intervention prices produce unacceptable levels of sales into intervention for products such as butter. Such a change would be feasible since the EU will not be bound by the agreement signed onto by the Union at the Hong Kong, Doha Round WTO Ministerial meetings in December 2005 to end dairy export subsidies by 2013. The EU's agreement on agricultural export subsidies holds only if a Doha Round WTO agreement is eventually reached which, if it occurs at all, will take place in 2009 at the earliest. Finally, the real test of the durability of the reforms will occur when EU farm prices for milk and other agricultural products become sharply depressed for extended periods.

Synopsis

EU dairy policies are undergoing sweeping changes as part of a reform of the Union's CAP that began in the 1990s and early 2000s. For dairy, the changes that have occurred or are in prospect include expansion of EU farm milk quotas after 2008, elimination of milk quotas after 2014/15, cuts in EU intervention prices for butter and NDM, withdrawal of EU support for casein, curtailed use of dairy export subsidies, and replacement of market intervention with decoupled direct payments to dairy farmers.

What do the changes in EU dairy policies mean for Irish, EU, U.S. and world dairy markets?

- Subsidized exports of EU dairy products will continue to decline over the next few years. This will further reduce the EU's share of world

dairy exports, which has already fallen from about 44 percent in 1997 to about 31 percent in 2002–2003. Among other things, the reduction in subsidized EU dairy exports will increase world prices for NDM, expanding opportunities for U.S. and other exporters of NDM, and opening the door for international price leadership in NDM by the U.S. or New Zealand.

- Ireland and other EU countries are likely to increase production and exports of value-added dairy products and reduce production and exports of dairy commodities. With limited export subsidies, the EU cannot compete effectively with exporters from countries such as New Zealand in selling dairy commodities.
- Ireland's production of casein—which has been an important export item for several of Ireland's large dairy processing firms—already has declined as a result of withdrawal of EU support for this item.
- The location of milk production within the EU will change as a result of the end of EU milk quotas. Milk production is likely to increase in Ireland (perhaps by 20 percent or more), Sweden, Holland, Denmark, parts of Germany, and the northwest of France, and probably in Poland and Hungary. Lower milk production is likely in Italy and in parts of Germany and France. It is unclear how much overall EU milk production and farm milk prices will change as a result of eliminating farm milk quotas. Dairy exporters located outside of the EU will find it useful to monitor EU milk production, and milk and dairy product prices in the Union to determine whether (and for which products) the EU will be a competitive exporter after the dairy reforms.
- While the EU is making sweeping reforms in some aspects of dairy policy, the Union will retain strong border protection (mainly tariffs). Therefore, opportunities for U.S. firms and others to export dairy products to EU countries will remain limited after the reforms.
- The EU is unlikely to back away from the sweeping CAP reforms. The possibility of an about-face seems remote since the Union has strong incentives to continue the reforms and

current farm prices for most farm products, including milk, have tempered farmers' apprehension. Finally, the real test of the durability of the reforms will occur when

incomes for EU producers of milk and other agricultural products become sharply depressed for extended periods under the new regime.

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