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DAIRY: ASSESSING WORLD MARKETS AND POLICY REFORMS: IMPLICATIONS FOR DEVELOPING COUNTRIES

Tom Cox and Yong Zhu

World dairy markets exhibit an extreme case of distortions traceable to a complex system of domestic and international trade barriers—including surplus disposal in the Quad countries (Canada, European Union, Japan, and the United States) and the Republic of Korea. Oceania (Australia and New Zealand)—which, with the Quad, dominates the export market—is a competitive exporter with few distortions. However, dairy interest groups in the Quad are entrenched, and prospects for policy reforms appear dim. Domestic price discrimination schemes in the Quad (minus Japan) rely heavily on the ability to close borders, suggesting that the emphasis in the Doha negotiations should be on commitments to lower border protection to force domestic reforms.

Despite the quagmire of distortions, dairy is a dynamic sector with much growth potential, especially in Asia, where dairy consumption has been propelled upward by income growth, urbanization, and westernization of diets. Dairy is also experiencing innovations in food processing, with value-added opportunities in traditional products and new dairy-based protein ingredients facing few trade barriers. Concentration and vertical integration in industrialized countries are also important sources of economies in procurement, processing and logistics, and foreign direct investment.

Policy reforms leading to free markets would pitch consumers against producers in most countries because of the large transfers implied by current policies and their removal. In importing countries with high barriers (Asia), consumers' gains are larger than producers' losses because the dairy sector is small. In competitively producing countries, consumers currently benefit from depressed world dairy prices and low trade barriers and have much to lose in undistorted markets, whereas producers have much to gain. The largest net welfare gains would accrue in the Quad, however, because large consumer gains and reduced budgetary costs for support policies would be much larger than producers' losses. In most other countries, net efficiency gains would remain small because the gains to one group would be offset by losses to the other. Our simulations also show the production gains from trade liberalization are captured by dynamic reformers attracting foreign direct investment and overcoming supply constraints and technology transfers.[1]

Background on the World Dairy Sector

Milk Production and Dairy Product Manufacturing

Milk and dairy products are expensive to produce. Production of animal feed uses three to nine times more land than production of food plants that produce the same amount of protein (Bender 1992). When food sufficiency is a problem in a country, dairy is probably not an appropriate way to produce food, because the nutritional conversion rate from grains to animals is low. In most developed countries, milk is produced by feeding animals concentrates made from grains—these can be used directly as human foods. Livestock feed requires on average 7 kilocalories input for each kilocalorie generated. The range extends from 16 for beef production to 3 for broiler chickens, with milk somewhere in between (Bender 1992).

Animal food production does not always compete with other food production, however. Some animals, including sheep and cows, can be fed on inedible agricultural and industrial by-products (with limited alternative uses) to produce highly nutritional foods, or they can be grazed on marginal land. Marginal land suitable for grazing is often on small parcels in remote areas with low population density. Shipping perishable dairy products to urban consumers is expensive, as many developing countries face production and distribution challenges that constrain milk production, such as poor infrastructure and limited refrigeration facilities.

In Argentina, Australia, Ireland, and New Zealand, milk production occurs generally on large pastures within reach of relatively efficient transportation systems and with the support of better human capital and technology. These factors provide considerable advantage to these countries in producing milk and dairy products in free-trade environments. However, pasture-based milk farming is seasonal and vulnerable to weather and natural disasters.

Although raw animal milk is nutritious, only 5 to 10 percent of milk is consumed in raw form in most developed countries. Most raw milk is processed into derivative products in these countries (FAO various years). These processing sectors can be significant sources of income and employment to local economies. Derivative dairy products, or manufactured products, can be either in liquid form (standardized milk, pasteurized milk, cream, partly or totally skimmed milk, buttermilk), or products no longer liquid (cheese, butter, cream, condensed and evaporated milk, milk powder, casein).

Development of the dairy industry requires good infrastructure. A good transportation system, availability of low-cost refrigeration technology, and good packing technologies are all prerequisites for an advanced dairy manufacturing sector. Most developing countries have poor conditions for dairy manufacturing. In those that lack an adequate milk supply and infrastructure to process and distribute milk, people reconstitute milk powder and butter oil back to fluid form to meet daily consumption needs. In many countries, commercial milk combination, which reestablishes the product's specified fat-to-nonfat solids ratio and solids-to-water ratio, is widely used.

Overall, approximately one-third of world milk is consumed in fluid form. About one-fourth is used in cheese making. The joint production of butter, milk powder, and casein uses roughly one-fifth of all milk. The remainder is processed into soft or frozen products, condensed and evaporated milk, or other dairy products.

Derivative products satisfy specific consumption needs. Simple technologies for separating and recombining nutritional components of milk have lowered the cost of processing and made it possible to adjust fat content to different dietary needs. Cheese and butter do not require advanced technology. The production of milk protein concentrates and whey and lactose milk fractionations, however, is relatively new technology. Milk protein concentrates and whey and lactose products are important in the world dairy markets, where most buyers are developing countries, countries with low self-sufficiency in dairy production, and developed economies with relatively low trade barriers on these products.

Skim milk powder, whole milk powder, butter oil, and even butter are important inputs in a special dairy processing practice called milk reconstitution, a technology that converts milk powder, milk fat products, and other dairy products back to fluid milk for consumption or for making other dairy products. With the rapid development of

dairy processing technology, milk reconstitution becomes commercially practical and desirable, even in more advanced dairy-producing countries where fresh milk is readily available.

Fluid milk is a major product of milk reconstitution in developing countries. In developed countries and countries with dairy foods in the traditional diet, "hard" dairy products, such as cheese, are produced through milk reconstitution. The recent growth of trade in milk powder and butter oil is partially attributable to the improvement in milk reconstitution technology in many dairy-importing countries. Milk reconstitution overcomes high transportation and storage costs. Trade distortions and investment decisions in the dairy manufacturing sector also make reconstitution desirable. Many developing countries reconstitute fluid milk based on cheap milk powder available in world markets. For example, Mexico makes cheese by reconstituting imported skim milk powder and adding vegetable oil (filled milk).

Besides technical difficulties and additional costs involved in milk reconstitution, other problems limit the practice of this technology. The reconstituted dairy products are often considered to be inferior substitutes for fresh-milk-based products. In addition, milk reconstitution from dried dairy ingredients often induces a loss of nutrients due to the heat required to condense and dry milk.

World Milk Production Trends

In the last decade, world milk production was between 445 million and 470 million metric tons. The Quad and Oceania's share of this production was around 42 percent, while the share from Eastern Europe and the Former Soviet Union (FSU) fell steadily from 27 percent to 16.8 percent. There is some reason to expect that the decline in the share of Eastern Europe and the FSU in world milk production may be reversed as several key milk-producing countries (Poland, Hungary, and Baltic countries join the European Union (EU) in 2004.

South Asia (India and other South Asian Countries) and Sub-Saharan Africa increased their share of world milk production slightly from just under 20 percent in 1990 to more than 20 percent by 2000. Similarly, other developing countries and regions (China, Korea, other Southeast Asia, Middle East and North Africa, and Central and South America) increased their combined share from just over 10 percent in 1990 to almost 20 percent in 2000. These trends indicate significant changes in the production of milk in the developing regions. For example, growth in South Asia and the Middle East and North Africa was 3.8 percent annually, in sharp contrast to the negative growth of –3.5 percent recorded in Eastern Europe and the FSU.

About 25 percent of world milk was produced in Western Europe before the 1994 Uruguay Round Agreement on Agriculture (URAA) (FAO various years). After 1994 Western Europe's share of world milk production began to dip slowly, falling to 23 percent in 2000. Nevertheless, Western Europe remains a key factor in world dairy markets. The share of world milk production of the United States and Canada remained relatively constant at around 14 percent before (1989–1994) and after (1995–2000) the URAA. The share of Oceania in world milk production increased slightly, reaching 4 percent in 2000. Japan's share of world milk production remained relatively constant at around 1.5 percent over the same periods.

In China, Korea, and the rest of Southeast Asia, a steady increase in share occurred both before and after the URAA, reaching 2.8 percent in 2000. Much of the growth occurred in China and Korea. India, as well, showed a steady growth in share of world milk production before and after the URAA periods. That share stood at 13.8 percent in 2000. India appears to be expanding its activity in world export markets, particularly for butter fat products (butter, ghee/anhydrous milk fat). The share of other countries in South Asia reached 5.1 percent in 2000.

Central and South America showed strong growth in share of world milk production both before and after the URAA. Its share is now 10.5 percent. Expansion in this region is dominated by Argentina and, to a lesser extent, Uruguay, Brazil, and Mexico. Sub-Saharan Africa, including South Africa, has held relatively steady at around 3 percent of world milk production, suggesting that milk production and dairy processing are not expanding as rapidly in southern Africa as in other developing economies. Disparity in regional income growth likely plays a key role in this trend.

Trends in the World Dairy Trade

Dairy products exhibit two-way trade because they are differentiated products.[2] Over the 1989–2000 period, world dairy exports increased more or less steadily from 25.6 million to 39.1 million metric tons, with no difference between the pre- and post-URAA periods. World dairy exports are dominated by the developed economies (Quad and Oceania), but their share of the markets shrank from 87 percent in 1989 to 78 percent in 2000. Developed countries' share of world dairy exports grew an average 2.9 percent annually in 1989–2000. Exports represented 9.7 percent of the developed countries' total milk production in 1989; that share had grown to 12.4 percent by 2000. World dairy imports increased more or less steadily, from 26 million to 36 million metric tons (FAO, various years). World dairy imports in the pre-URAA period (1989–94) averaged 27 million metric tons, increasing to 33 million metric tons in 1995–2000 period.

Comparison of dairy exports as a share of total milk production before and after the URAA provides some informal evidence that the dairy trade liberalization during the Uruguay Round increased the importance of exports in the world's dairy economies. Developed countries' (Quad and Oceania) import market shares—16 percent (4 million metric tons) in 1989 and 20 percent (7 million metric tons) in 2000—grew an average 4.8 percent annually, but average annual growth was much faster after the URAA (7.3 percent). Japan is a large importer of high value-added dairy products, such as cheese and casein. Its demand for dairy products is driven by high incomes, more Westernized diets, and the inability of domestic supply to satisfy the demand growth despite protectionist policies.

Despite their decreased share of world milk production, Eastern Europe and the FSU increased their share in world dairy exports from 7.6 percent to 11.6 percent during the period under study. Those exports represented 1.3 percent of total milk production in the region in 1989 and increased more than three-fold, to 4.8 percent, by 2000. Eastern Europe and the FSU are relatively small importers, with imports fluctuating in the 3 million–4 million metric ton range. Import growth slowed in the years after the URAA (–5.9 percent). Low growth rates in gross domestic product (GDP), rather than URAA-induced trade liberalization, are likely responsible for most of these changes.

Other developing economies (China, Korea, other Southeast Asia, Middle East and North Africa, and Central and South America almost doubled their share of world dairy exports from 5.3 percent in 1989 to 9.6 percent by 2000; much of the increase came from the Southern Cone (Argentina, Chile, and Uruguay), where exports represented 1.9 percent of total milk production in 1989 and 3.6 percent by 2000.

In South Asia (India and other South Asian countries) and Sub-Saharan Africa (including South Africa), which are primarily importers, exports represented less than 1 percent of total milk production in 1989–2000. The share of world dairy imports for these two regions was 9–10 percent (3 million metric tons) over the same period. The dominant countries in these regions (India and South Africa) are either self-sufficient or net exporters. Overall, the participation of South Asian countries in world dairy trade has been limited, because most countries in the region strive for self-sufficiency in food; both imports and exports of dairy products are restricted by the government. Imports consist of intermediate products such as butter oil, milk powder, and condensed milk, mostly obtained from food aid programs from Western countries.

The Middle East and North Africa are significant importers of dairy products, accounting for 21 percent of total world imports of dairy products. Lacking natural resources to expand their milk production, the countries of this region will continue to rely on imports to meet their increasing consumption needs.

Import substitution policies and economic hardship in Central and South America have prevented these countries from fully exploiting their significant comparative advantage in agriculture, though some South American countries increasingly participate in world and regional dairy trade. Under more stable macroeconomic environments and regional trade agreements, Latin American countries, have increased trade volume considerably. Latin America imports about 18 percent of world dairy trade while exporting 2 percent. Mexico is the world's largest importer of milk powder, accounting for some 10 percent of total world trade. Brazil is a significant importer of dairy products,

most of which are imported from its Mercosur partners, Argentina and Uruguay. The European Union is also a big player in the Brazilian market, but Brazil's dependence on imports will likely change with the rapid adoption of new technology in domestic milk production and dairy processing.

Other African countries are net importers (mostly through food aid programs), accounting for about 6 percent of total world trade. Reduced government intervention in agriculture, propelled by the URAA and other factors, will result in reducing food aid to traditional recipients, including the Sub-Saharan countries. A significant proportion of food aid has been redirected to transitional economies. The affordability of commercial imports of dairy products (without current export subsidies) is questionable for many African countries.

Trade and Domestic Policy Regimes in Key Producing and Consuming Countries

Developed Economies: Quad and Oceania

Most developed countries intervene in their domestic dairy sectors with a wide variety of policy instruments. Intervention prices (price support programs) establish minimum domestic prices that are generally well above world market levels. This is true for butter and skim milk powder (SMP) in Canada and the European Union; for butter, cheese, and SMP in the United States, although SMP is priced near world-market levels.

Canada and the European Union use a system of milk production and marketing quotas to limit the production of milk and reduce the cost of protecting the domestic milk- and dairy-processing sectors. These policies have generated substantive "quota rents" to the holders of the quotas.

Canada and the United States use classified pricing schemes to enhance market returns for dairy farmers based on how their milk is used. Generally these are price-discrimination schemes that administer higher prices to less elastic, higher-value-added, and more perishable product markets (beverage milks, soft and frozen products). To the extent that these premium markets are nontradable, such schemes can help insulate domestic markets from world market forces. In addition, because they increase milk prices above the competitive equilibrium price, more milk is generated, less premium milk is consumed (due to the higher administered prices), and the prices for manufactured milk are depressed relative to a competitive, nondistorted equilibrium. In a sense, these classified pricing schemes generate consumption cross-subsidies to manufactured products (and the consumers and processors who purchase these products) at the expense of the consumers of premium products. To the extent that these cross-subsidized manufactured products are exported, there is an open question as to whether the implicit, consumption cross-subsidies are in fact export subsidies.

In the case of Canada, several of the dairy classifications targeted to compete on export markets (the world or the U.S. market) have been deemed export subsidies generated by government intervention—hence countable against URAA export-subsidy commitments.

Canada, the European Union, and the United States also use a variety of other subsidies in production, marketing, and export financing. Among these are the European Union's consumption subsidies on butter (60 percent of EU butter is subsidized for use by the bakery sector) and skim milk powder (45 percent is subsidized for animal feed).

Market access under the URAA is controlled primarily by tariff rate quotas, a system of in-quota tariffs up to a negotiated limit, and a series of out-of-quota tariffs that are generally quite prohibitive. In addition, a variety of sanitary, phytosanitary, and technical trade restrictions (such as country-level standards of identity) act as nontariff barriers and impede global trade in dairy products.

Developed countries agreed in the URAA to increase their import quotas to 5 percent of consumption by 2000. Similarly, in- and out-of-quota tariffs were to be reduced 16 percent over six years, by 2000. Table 9.1 summarizes the URAA increases in dairy import quotas for the developed countries. Table 9.2 summarizes the URAA dairy product tariff reductions.

Under the URAA, the European Union and United States were obliged to make the greatest increases in access to their domestic markets, particularly for cheese, butter, butter oil, and skim milk powder. Australia, Canada, and Japan endured less market access change under the URAA since many of their dairy product imports were already in

TABLE 9.1 Dairy Import Quotas for the Developed Countries under the URAA
(1000 tons)

Country/Region	Policy Regime	Cheese	Butter, Butter Oil	Skim Milk Powder	Whole Milk Powder
Western Europe	BASE	37.0	79.5	41.2	0.7
	GATT 2000	123.1	91.3	69.2	1.1
	GATT 2005	194.7	101.0	92.6	1.5
Eastern Europe	BASE	6.9	12.6	10.5	3.0
	GATT 2000	8.8	20.9	19.0	5.0
	GATT 2005	10.4	27.8	26.1	6.7
Japan	BASE	na	3.5	99.8	0.0
	GATT 2000	na	3.5	99.8	0.0
	GATT 2005	na	3.5	99.8	0.0
Australia	BASE	11.5	na	na	na
	GATT 2000	11.5	na	na	na
	GATT 2005	11.5	na	na	na
Canada	BASE	20.4	2.0	0.9	0.0
	GATT 2000	20.4	3.3	0.9	0.0
	GATT 2005	20.4	4.4	0.9	0.0
United States	BASE	116.4	7.5	1.3	0.5
	GATT 2000	136.4	13.1	5.3	3.4
	GATT 2005	153.1	17.7	8.6	5.9

na — Not available

Data source: International Dairy Arrangement, Fifteenth Annual Report. November 1994.

BASE and GATT 2000 follow the URAA of the GATT (General Agreement on Tariffs and Trade), assume linear changes.

GATT 2005 projects the Uruguay Round Agreement linearly to 2005.

excess of the requirement of 5 percent of domestic consumption (by 2000). The level of most out-of-quota tariffs is prohibitive, with the result that tariff rate quotas act as pure import quotas for many products in developed countries.

The heavy intervention in domestic dairy markets by the developed countries often generates surplus production relative to domestic consumption requirements. Because the domestic policies usually keep domestic prices above world market levels, many developed countries—particularly Canada, the European Union, and the United States—are forced to export these surpluses with considerable subsidy. Those export subsidies depress world market prices, making cost-effective dairy production more difficult in many developing countries. While frustrating potential milk producers, consumers in these developing countries gain substantively from the transfer of wealth, which comes in the form of cheaper dairy imports.[3]

Since Australia substantially deregulated its domestic market in 2000–01, domestic market protection has been radically reduced. Currently, Australian dairy exports are without explicit export subsidies.

Eastern Europe and Baltics

Among World Trade Organization (WTO) members in Eastern Europe, only the Czech Republic and Estonia use Green Box policies to support their domestic dairy industry. These policies are limited. Under its Domestic Food Aid Plan, the Czech Republic donates milk to schools. The program's monetary value reached $0.74 million in 2000. At the same time, the Czech government paid $4.7 million in support to dairy cow herds through structural adjustment assistance provided through an investment aids plan. The monetary value of Estonia's school milk program value was small ($0.6 million in 2001) (Megli, Peng, and Soufi 2002).

The dairy industry is important in Eastern Europe. Many countries in the region use Amber Box policies to support its development. Some even

TABLE 9.2 Tariff Reductions for Dairy Products under the URAA, by Region
(US$/ton for specific duties, percent for ad valorem tariffs)

Country/ Region	Policy Regime	Policy Instrument	*Cheese*		*Butter, Butter Oil*		*Skim Milk Powder*		*Whole Milk Powder*	
			In-Q	Over-Q	In-Q	Over-Q	In-Q	Over-Q	In-Q	Over-Q
Western Europe	BASE	Specific duties	547	3,643	1,189	3,971	639	1,956	1,773	4,102
	GATT 2000		768	2,362	1,225	2,572	632	1,561	1,760	3,486
	GATT 2005		952	1,295	1,255	1,406	626	1,232	1,750	2,972
Eastern Europe	BASE	Ad valorem	53%	181%	39%	187%	67%	200%	40%	160%
	GATT 2000		59%	133%	39%	142%	66%	164%	40%	102%
	GATT 2005		65%	92%	39%	105%	65%	134%	40%	54%
Japan	BASE plus	Ad valorem	50%	50%	35%	35%	1.3%	15%	30%	30%
		Specific duties	0	0	0	13,406	0	4,954	0	10,228
	GATT 2000 plus	Ad valorem	32%	32%	35%	30%	13%	13%	30%	26%
		Specific duties	0	0	0	11,397	0	4,210	0	8,691
	GATT 2005 plus	Ad valorem	17%	17%	35%	25%	13%	11%	30%	22%
		Specific duties	0%	0%	0%	9,723	0	3,500	0	7,411
Australia	BASE	Specific duties	71	1,068	74	1%	37	1%	37	1%
	GATT 2000	or ad valorem	71	905	0	1%	0	1%	0	1%
	GATT 2005		71	769	0	1%	0	1%	0	1%
Canada	BASE	Specific duties	56	3,794	193	3,483	48	1,720	48	3,315
	GATT 2000		24	3,231	83	2,915	21	1,462	21	2,820
	GATT 2005		0	2,761	0	2,442	0	1,247	0	2,408
United States	BASE plus	Ad valorem	10.5%	0.0%	5.0%	5.0%	0.0%	0.0%	0.0%	0.0%
		Specific duties	0	1,924	62	2,004	33	1,018	68	1,320
	GATT 2000 plus	Ad valorem	10.5%	0.0%	4.3%	4.3%	0.0%	0.0%	0.0%	0.0%
		Specific duties	0	1,636	62	1,703	33	865	68	1,122
	GATT 2005 plus	Ad valorem	10.5%	0.0%	3.6%	3.6%	0.0%	0.0%	0.0%	0.0%
		Specific duties	0	1,395	62	1,453	33	738	68	957
Mexico	BASE	Ad valorem	50%	95%	35%	35%	0%	139%	0%	139%
	GATT 2000		49%	89%	31%	31%	0%	131%	0%	131%
	GATT 2005		47%	84%	27%	27%	0%	124%	0%	124%
South America, North	BASE	Ad valorem	56%	66%	59%	60%	65%	68%	49%	82%
	GATT 2000		49%	58%	56%	57%	59%	31%	46%	75%
	GATT 2005		44%	51%	53%	54%	54%	56%	43%	69%
South America, South	BASE	Ad valorem	37%	37%	37%	37%	36%	36%	36%	36%
	GATT 2000		36%	36%	35%	35%	35%	35%	34%	34%
	GATT 2005		36%	36%	34%	34%	33%	33%	32%	32%

Data source: International Dairy Arrangement, Fifteenth Annual Report, November 1994

BASE and GATT 2000 follow the URAA of the GATT (General Agreement on Tariff and Trade) and assume linear annual changes.

GATT 2005 projects the Uruguay Round Agreement linearly to 2005. "In q" and "over q" are in quota and above quota tariff rates respectively.

increased their support to the dairy industry during the WTO implementation period. Hungary increased its support for cow milk from $17.7 million in 1996 to $58.5 million in 1998 (nonspecific component of the aggregate measure of support). In 1995 and 1996 Slovenia spent $5.5 million on milk (increasing to $6.6 million in 1997 and 1998) and $9 million on ice cream in 1997 (decreasing to $0.8 million in 1998). Compared with negligible support before 1998, Poland increased its market support for butter to $6.5 million and $1.9 million in 1999 and 2000, respectively.

Some countries apply tariff rate quotas (TRQ) on dairy imports to protect their domestic markets. The Czech Republic applies TRQs to milk, cream, yogurt, butter, and ice cream. While the fill rate for ice cream and yogurt is relatively high, it is low for butter and even less for milk and cream (less than 1 percent). Similarly, the fill rates for butter in Slovenia and the Slovak Republic are quite low as they are for milk and cream in Hungary and Poland. The resulting reduction in market access contributes to distortions in world dairy markets, but the levels are small, reflecting the modest levels of both trade and support.

The countries of Eastern Europe use different methods to administer TRQs. The Czech Republic uses a first-come-first-served method to allocate them. Hungary uses licenses on demand. For milk and cream Poland applies licenses on demand; for other dairy products it uses the applied-tariff method. Slovenia and the Slovak Republic apply a license-on-demand method to allocate TRQs. No matter which method is used, additional import costs are incurred, and imports are restricted.

Milk powder, butter, cheese, casein, yogurt, creams, and some other dairy products receive export subsidy from the Czech Republic, Poland, and the Slovak Republic. The actual level of export subsidies is much lower than the commitment levels, however, and these levels have been decreasing over time.

Latin America

A major question regarding the future of dairy policy and trade agreements in South America is whether the Mercosur countries will join with the NAFTA countries in creating a Free Trade Area of the Americas, or FTAA. Initiated in 1994 with negotiations to be finished by 2005, the FTAA project is considered a single undertaking: nothing is agreed until all is agreed. If implemented, major changes can be expected for trade policies in South America, especially for the Mercosur countries (Megli 2002).

Current trade policies in South America revolve mainly around the Mercosur policies for the four main economies of Argentina, Brazil, Paraguay, and Uruguay. Negotiations are under way to bring Chile and Bolivia into full member status, and future negotiations are expected to take place for Colombia, Peru, and Venezuela.

The implementation of a set of common external tariffs and a substantive (if not total) elimination of internal tariffs and nontariff barriers in Mercosur countries began in 1995. Certain products or regions are exempted from these regulations until 2006. Mercosur has 11 different tariff levels bounded by 20 percent; exceptions can be greater than 20 percent but no more than 35 percent. As a result of this common market, trade among the member countries increased from $4.7 billion in 1991 to $18 billion in 1998.

Other trade agreements exist between countries in South America. The Andean Group consists of Bolivia, Chile, Colombia, Ecuador, and Peru, while the Group of Three is made up of Colombia, Mexico, and Venezuela. Bilateral agreements are also common (Bolivia-Mexico; Brazil-Argentina). Chile's tariff rates are around 8 percent for most dairy products. Peru has rates of 20 percent on most dairy products, with a surcharge of 5 percent. Both countries are members of the Asia Pacific Economic Cooperation (APEC). Argentina's agricultural sector enjoys export rebates that range from 1.4 to 10 percent. Brazil has a system of export credits and cash advances for exported products.

East Asia and South Asia

Income, price, tastes, age, and geography are main factors affecting dairy consumption in Asia.[4] China, India, Indonesia, Japan, the Republic of Korea, Malaysia, Philippines, Thailand, and Singapore—all WTO members—are the main dairy producers and consumers in the region. Because dairy products are not necessary products in Asia, income is the major factor affecting their consumption. When income goes up, dairy consumption will increase, as can be seen from the experience of China, Japan, and the Republic of Korea. Although the three countries show similar patterns of food consumption behavior, Japan's per capita GDP is much higher than those of Korea and China, and its per capita consumption of dairy products is 66 and 23 kilograms more, respectively.

In developed countries and cities of developing countries, dairy products represent a small portion of total expenditure. Thus, consumers' reaction to price change is not highly sensitive. In rural areas of developing countries, however, where dairy products are a luxury, consumption is highly sensitive to price changes.

Most of the dairy products consumed in Asia are fluid milk, yogurt, and milk powder. In 1999, for example, Asia's consumption of fluid milk and milk powder accounted for 97 percent of dairy consumption.

People in dairy-producing areas tend to consume more dairy products than in other regions, due to easy and convenient access. This may explain why per capita dairy consumption in South Asia is higher than in East Asia, even though its per capita GDP is much lower.

From countries' notifications to the WTO Agriculture Committee, we find that only Japan uses Green Box policies to support domestic dairy market in school-lunch programs. Another potential user of this policy may be China, which has begun a program to provide subsidized milk for school children in some cities and expects to expand it to the rest of the country.

With the exception of Japan and Korea, most countries in East Asia show a negative or de minimus aggregate level of support for agriculture (Amber Box policy). Japan uses price support programs for certain dairy products (mainly butter and skimmed milk powder), and also makes deficiency payments for calves and milk manufacturing. In 2000 Japan's milk-producer support estimate (PSE) reached $4.7 billion; the nominal protection coefficient for milk in 1999 was 364 percent (OECD 2001). Korea's milk producers receive more than three times the world price for milk. The PSE for Korean milk reached $0.8 billion in 2000; the nominal protection coefficient in 1999 was 225 percent. No Asian country uses blue-box policies to support their dairy sectors.

East Asia protects its dairy markets, and entry of many imports is governed by tariff rate quotas and high tariffs. The scale and scope of tariffs differ widely, however. China, India, Japan, and Korea impose relatively higher tariffs on dairy products than do Indonesia, the Philippines, Malaysia, and Singapore. Ten dairy exports to Japan, five to South Korea, two to Malaysia, and just one to Indonesia are subject to tariff rate quotas. Japan's and Korea's tariff rate quotas are allocated on a global basis. For whey and skim milk powder, Japan's tariff rate quotas are allocated to producers and producer organizations or sellers of mixed feed. For skim milk powder, whole milk powder, and other milk and cream, Korea's tariff rate quotas are allocated according to the highest-price bidders at quota auctions held by the livestock products marketing organization. In Japan, the tariff rate quota fill rates for skimmed milk powder, whey, and butter are around 50 percent. South Korea and Malaysia have higher fill rates, but real imports are still lower than tariff rate quotas. Indonesia has out-of-quota imports, and the tariff rate quota fill rate is 100 percent.

World dairy trade liberalization would increase the region's imports.

The Middle East and North Africa

Dairy tariff levels in the Middle East and North Africa vary greatly among countries and products. They appear to be relatively high for nonconcentrated milk, cream, and yogurt, for example, and lower for milk powder and butter.[5] In addition to tariffs, countries implement regulations aimed at protecting dairy consumers from fraud. Such regulations impose technical requirements related to product composition and associated customs procedures such as sanitary certifications. There are various bilateral trade arrangements between the European Union and the countries of the region.

Import tariffs directly affect the supply of dairy products in the Middle East and North Africa. For instance, relatively high tariffs on milk powder tend to increase raw milk supply, while low tariffs on raw milk handicap local production. Also, low import tariffs on raw materials and equipment stimulate the production of processed dairy products and the derived demand for raw milk. Subsidies are not the main incentive tool used to encourage raw milk supply in the Middle East and North Africa. Where subsidies exist, they support production or transportation, but their level is not always effective.

The Impact of World Dairy Policy Reforms

Considerable scope remains for further removal of trade and domestic support policy distortions in the Doha Round. Even after full implementation of the URAA provisions by developed countries, almost 60 percent of world dairy trade will still be exported with subsidies (U.S. Dairy Export Council 1999). Market access provisions allow for tariff rate quotas with prohibitively high rates of out-of-quota duty (Griffin 1999). Also, special safeguards,

low minimum-access requirements, and small tariff reduction requirements for individual commodities undermine the market access provisions of the URAA (Coleman 1998). Thus, even after full implementation, world dairy markets will continue to be characterized by highly subsidized exports, limited market access, and heavy government intervention.

As part of the URAA, countries agreed to begin new agricultural negotiations by the beginning of 2000, and dairy groups in several countries have detailed their policy objectives and positions for the Doha Round. U.S. dairy industry representatives outlined their negotiating priorities early on (U.S. Dairy Export Council 1999). Those priorities include gradual elimination of export subsidies, reduction and harmonization of high tariffs, and tightening disciplines on domestic supports. By eliminating export subsidies and reducing import barriers, it is assumed that world prices will rise sufficiently for the United States to be competitive in world markets (Kirkpatrick 1998). Countries of the Cairns Group (with the exception of Canada), which represents small- and medium-sized agricultural exporters, are pushing for measures that go even further toward freer markets and liberalized trade (Cairns Group Farm Ministers 1998). While the negotiating goals of the European Union are not yet articulated, their priorities will likely involve minimizing increases in import access and reductions in export subsidies, as well as maintaining the Blue Box and the Peace Clause (Oxford Analytica 1998).

The implications of alternative proposals on developed versus developing countries are not well researched. This chapter addresses these questions by simulating various dairy policy liberalization scenarios using the University of Wisconsin-Madison World Dairy Model (UW-WDM).[6] The results of the simulations provide insights into the tradeoffs between the heavily protected developed economies and the developing economies, providing quantitative measures of the impact of those tradeoffs on economic welfare and world trade.

World Dairy Deregulation Scenarios

A first scenario, discussed here in detail, contemplates full dairy sector liberalization: all trade and domestic support policies are removed between 2001 and 2005. Full world dairy sector liberalization combines two other scenarios: free dairy trade, and no domestic support. The free-dairy-trade scenario considers the elimination of all trade distortions for 2001 through 2005. All export subsidies and import tariff rate quotas (quotas, in- and out-of-quota tariffs) are eliminated. Domestic support policies are maintained as in the base scenario. This should increase world trade, increase world market prices, and put considerable strain on several domestic support policies (intervention price programs, in particular) in the protected dairy sectors. The no-domestic-support scenario eliminates all domestic supports from 2001 to 2005. These measures include intervention prices for the European Union (SMP), Canada (butter and SMP), the United States (butter, SMP, cheese), and other countries; the elimination of classified pricing in the United States and Canada (modeled as a price premium for residual—fluid, soft, and frozen—products over manufactured products); and elimination of production and marketing quotas in the European Union and Canada.

Because the United States incurred large costs in the base year (2000) through its intervention/price support program (about $500 million in SMP purchases), domestic deregulation would have strong impacts on U.S. milk prices. Similarly, given the large levels of rents from milk-production quotas in the European Union and Canada (35 percent and 40 percent of the domestic milk prices, respectively), elimination of these policies would sharply increase these countries' competitiveness (no quota constraints and sharply reduced production costs). Hence milk production would increase sharply even as milk prices and revenues drop.

Domestic deregulation would lower prices in the protected dairy economies and thus lower world dairy prices, but it would not necessarily widen access to competitive exports—unless out-of-quota tariffs became less prohibitive at the lower market prices. Moreover, the increased milk production for the European Union and Canada would need to find a market, potentially beyond domestic consumption, and so would likely displace base-level imports by these dairy sectors and reduce other countries' potential for export-market growth.

We focus our presentation of the simulation results on the main scenario (full liberalization) and refer readers to the annex tables for the separate second and third scenarios.

Full world dairy sector liberalization. Developed economies with dairy sectors characterized by strong protection from domestic and trade policies would experience large changes from full liberalization, with large transfers from producers to consumers. In the absence of rents from milk production quotas, EU milk prices would fall 23 percent by 2005, generating a moderately competitive EU milk sector and expanded production (approximately 8 percent at prices roughly 20 percent less than base levels by 2005). The expansion implies a potentially radical restructuring of the EU milk sector toward more efficient farms. Dairy exports would increase 16 percent, while imports would fall 50 percent by 2005, suggesting that lower domestic prices (intervention price floors having been eliminated) and larger domestic milk availability at sharply lower prices (due to quota elimination) would cut imports. Currently competitive exporters, therefore, would suffer. The current producer surplus would take a massive hit of $8.1 billion by 2005, and the social and political costs of the implied radical restructuring of the milk production sector would be nontrivial. Consumers would be the big gainers from deregulation (due to falling prices), with large welfare gains of $8.1 billion. Total government costs would fall slightly (lost tariff revenues offset by reduced costs of domestic support and export subsidies). Consumer and treasury gains would offset producer losses, yielding net welfare gains of $1.1 billion.

The scenario would work similarly in Japan. By 2005 Japanese milk production would fall by 23 percent, milk prices by 54 percent, and the producer surplus by 61 percent (or $3.2 billion). The concurrent removal of domestic regulations would have little effect because trade barriers sustain most of the domestic programs. Imports would increase by 134 percent, bringing consumers a surplus of $4 billion. Net government revenues would fall by $21 million (lost tariff revenues net of smaller domestic policy savings). Consumer gains would offset producer and treasury losses to generate net welfare gains of $1.1 billion.

While the dairy sectors in Canada and the United States use both trade policies and domestic support programs, they derive more protection from the former (subsidized exports and limited market access due to import quotas and higher out-of-quota tariffs). Under the full liberalization scenario, Canada's milk prices would drop by 44 percent and production by 4 percent, significantly more than under the no-domestic-support scenario. Dairy exports would fall by 6 percent, while imports would increase 215 percent (versus 80 percent export expansion and 5 percent contraction of imports, under the no-domestic-support scenario). Producer surpluses would be cut in half (to $1.4 billion) by 2005, but consumer welfare gains would be even greater at $1.6 billion (up 14 percent). Total government revenues would fall slightly (lost tariff revenues being not quite offset by gains from elimination of export subsidies, the intervention price program, and production and marketing subsidies). Consumer welfare gains would offset producer and treasury losses, yielding a net welfare gain of 2.7 percent ($385 million).

In the United States, milk production (–7 percent), prices (–12 percent), and producer surplus (–17 percent, –$2.7 billion) would fall sharply by 2005 under full liberalization, about three times more than under the no-domestic-support scenario. These relative impacts indicate that U.S producers enjoy substantive protection from current trade-policy distortions. U.S. exports would fall 61 percent (down 331,000 metric tons), while imports would more than double (130 percent, 510,000 metric tons) by 2005. U.S. consumers would gain $3.4 billion (4 percent); government costs would be reduced by $147 million (lost tariff revenues net of gains from eliminating intervention price and export subsidy costs). These gains would exceed producer losses by $2.7 billion to generate net welfare gains of $729 million (0.7 percent) by 2005.

As expected, Oceania's dairy producers and processors would gain under full liberalization, despite giving up large quota rents (especially New Zealand) associated with current preferential (quota) access to the protected developed-economy markets. As low-cost exporters, Australia and New Zealand would be able to fully exploit their comparative advantage in undistorted world dairy markets, increasing milk production by 6 percent, producer prices by 22 percent, and the producer surplus by 42 percent, or $1.1 billion, by 2005. Their exports would rise by 21 percent, or 429,000 metric tons, by 2005. The production and trade gains would be less than under the free-trade-alone scenario, because that scenario would not increase

TABLE 9.3 Full Liberalization of Trade and Domestic Support: Changes from 2005 Baseline

Country/Region	Milk Production (percentage change)	Milk Price (percentage change)	*Producer Surplus*		*Consumer Surplus*		Total Gov Rev/Costs ($US M)	*Total Welfare*	
			$US M	% Change	$US M	% Change		$US M	% Change
Developing Economies, Potentially Competitive Exporters									
India	1.4	1.2	972	6.0	(993)	−1.3	(2)	(95)	−0.1
Other Eastern Europe	4.3	4.4	55	11.4	(66)	−2.9	(36)	(13)	−0.5
South America, South	6.5	8.6	60	1.7	(516)	−2.8	(2)	(18)	−0.1
China, Mongolia	0.4	14.3	498	17.4	(57)	−0.4	(74)	(33)	−0.2
Poland	3.3	10.4	247	13.1	(236)	−1.9	(0)	9	0.1
South African Republic	3.8	24.2	669	37.0	(692)	−7.0	1	(22)	−0.2
Total:	2.6	—	2,501	9.3	(2,560)	−1.9	(114)	(173)	−0.1
Developing Economies, Net Importers									
Former Soviet Union	4.0	−1.0	2,562	23.1	(2,574)	−4.0	(443)	(16)	0.0
South America, North	−5.7	−1.0	(1,445)	−18.0	1,707	3.3	(133)	129	0.2
Other South Asia	−0.1	−0.1	(12)	−0.2	171	0.5	(248)	(284)	−0.7
Middle East	−0.1	−30.4	(32)	−0.5	160	0.6	(163)	1	0.0
Rest of World	−0.3	−8.3	(334)	−12.4	300	2.2	(138)	(81)	−0.5
Mexico	−2.9	−8.9	(41)	−1.5	(48)	−0.4	(107)	(197)	−1.3
North Africa	−0.5	10.6	(125)	−11.9	237	5.0	(47)	(51)	−0.9
Central America, Caribbean	−3.3	−13.0	(302)	−43.3	(219)	−5.3	(34)	(387)	−7.8
Korea, Rep. of, Dem. People's Rep. of Korea	−6.7	18.6	80	15.0	416	14.4	(4)	80	2.2
Southeast Asia	3.5	−0.3	(64)	−1.2	372	1.5	(363)	(55)	−0.2
Total:	0.0	—	298	0.7	521	0.2	(1,680)	(861)	−0.3
Developed	1.1	−20.7	(14,472)	−25.3	17,464	6.8	1,184	4,176	1.3
Developing	1.1	2.7	2,797	4.1	(2,039)	−0.5	(1,795)	(1,037)	−0.2
World	1.1	−7.8	(11,675)	−9.3	15,425	2.5	(611)	3,139	0.4

— Not available

Source: University of Wisconsin-Madison World Dairy Model (UW-WDM).

production in Canada and the European Union. Consumer losses would pale in comparison to the substantive producer gains, generating net total welfare gains of 8.8 percent, or $1 billion, by 2005.

Developing-country exporters would enjoy the same benefits from full dairy sector liberalization as Oceania, but at slightly lower levels of gain and with larger transfers from consumers to producers (table 9.3). Wider access to developed-economy markets and elimination of export subsidies would generate aggregate increases in milk production (2.6 percent), prices (1–24 percent), and producer surpluses ($2.5 billion, or 9.3 percent), suggesting substantial import-substitution and export opportunities available in some of these countries. However, the aggregate consumer surplus in the developing countries would fall by $2.6 billion (1.9 percent) because of the loss of subsidized imports and higher domestic prices (except in Eastern European countries). Together with the loss of tariff revenues ($114 million), aggregate consumer and taxpayer losses would slightly dominate producer gains, generating modest welfare losses ($173 million, or 0.1 percent) by 2005. The political economy of dairy reform is complex even in developing countries, because consumer and producer interests are diametrically opposed. The poverty implications are also stark, pitching poor consumers (who benefit from the current regime) against the rural dairy sector, which would gain under free markets.

Consumers in net-importing regions would gain or lose depending on the tradeoffs between increased world import prices (a negative impact) and increased dairy trade (a positive impact). The loss of previously subsidized imports can be offset by gains from broadly expanding trade depending on the size, composition, and direction of import price increases. Many governments currently tax their consumers—removing those taxes could offset price increases. Although there may be some opportunity to expand domestic production to substitute for previously subsidized imports, the cost-competitiveness of scale-efficient exporters makes this less viable for many of these countries that would experience negative impacts on milk production, prices, and producer surpluses under full liberalization. These producer surplus losses could be offset by consumer gains, notably in South America (dominated by Brazil), where dismantling Mercosur common external import tariffs would generate lower prices and large consumer gains ($1.7 billion, or 3.3 percent). Several regions would show substantive increases in production, price, and producer surplus, notably the FSU (with a producer surplus gain of $2.6 billion). Treasuries in all countries would suffer from lost tariff revenues. Aggregate treasury losses would amount to $1.7 billion exceeding modest aggregate producer gains of $298 million and consumer gains of $521 million. Net welfare losses would be $861 million by 2005.

Under full liberalization aggregate world milk production would rise by 1.1 percent by 2005. Average milk prices would decrease by 7.8 percent overall, falling 20.7 percent in the developed countries, while rising 2.7 percent in the developing countries, reflecting the modest loss to consumers in the latter countries on average. World dairy trade would expand by more than 2 million metric tons by 2005 as the impacts of domestic deregulation (chiefly quota removal) reinforced the impacts from the elimination of trade barriers. World producer surpluses would fall sharply in the developed countries (–$14.5 billion, –25 percent) while increasing in the developing countries ($2.8 million, 4.1 percent). Developed-country losses would be due primarily to the loss of quota value in the European Union and Canada, and to the removal of substantive domestic supports (in Japan and the United States).

Savings from elimination of domestic and export subsidies would exceed lost tariff revenues in the developed countries, generating a net treasury savings of $1.2 billion by 2005. In developing countries, where domestic supports are generally much smaller, their elimination would not offset the loss of tariff revenues, generating net increases in treasury costs of $1.8 billion, which could be an issue in some developing countries with few alternative fiscal sources. Aggregate world treasury revenues would fall nearly $611 million by 2005. Consumer welfare would increase by $17.5 billion in the developed countries, while falling $2 billion in the developing regions. In the developed countries, gains by consumers and taxpayers would exceed producer losses, generating $4.2 billion in net welfare gains by 2005. Just the opposite would occur in the developing regions, where producer gains would fail to offset consumer and treasury losses on average, yielding net welfare losses of $1 billion.

Because the markets of the developed countries are so much larger than those of the developing

world, aggregate consumer gains would be larger (at $15.4 billion) than aggregate producer losses of $11.7 billion and treasury losses of $611 million, yielding net welfare gains for the world of $3.1 billion by 2005. These aggregate patterns hide the variability in individual country impacts and the large transfers at work between consumers and producers within many countries.

Other scenarios. The free-trade scenario models the elimination in 2001 of export subsidies and all tariff rate quota barriers, while keeping substantive domestic supports in place. In the absence of changes in domestic support programs, free trade would decrease welfare overall, pointing to the fiscally unsustainable nature of domestic programs under conditions of free trade. Free trade would have the effect of stimulating domestic supports, possibly leading to violations of WTO ceilings on aggregate measure of support.

Under the scenario of free trade alone, trade-protected producers in developed economies would suffer substantive losses as their domestic consumers enjoyed world prices. In the protected developed countries, milk prices, exports, and producer surpluses would fall, while imports would climb. Elimination of export subsidies would not offset the loss of tariff revenues in Canada or the European Union, yielding net treasury and welfare losses in these countries. Exporting developing countries and Oceania's dairy producers and processors would realize strong gains due to free access to higher-priced, protected markets. Consumers in these countries would lose, but not as much as producers gain, resulting in net welfare gains. Consumers in net-importing dairy regions would gain or lose depending on the tradeoffs between increased import prices (a negative impact) and increased trade (a positive impact) from elimination of tariffs on imports into these regions.

In the last scenario, that in which domestic supports are eliminated but trade barriers remain, dairy producers in developed countries with strong domestic support and production controls would suffer as production quotas and associated rents were eliminated. Lower prices would lead inefficient producers to exit the market and nearly eliminate imports to these markets. In the European Union, producers would take a massive hit, offset by strong consumer welfare gains. Total government costs would fall, yielding substantive net welfare gains of $4 billion, much larger than under full liberalization results ($1.1 billion). Similar forces would apply in Canada. Dairy sectors that were more protected by trade barriers than domestic subsidies (such as Japan) would not experience such losses. The United States would bear the full brunt of domestic policy deregulation, as U.S. milk prices, production, and producer surpluses all would fall sharply. Reduced government costs and massive consumer gains would offset producer losses, however, leading to a net welfare gain. In Oceania, New Zealand would gain and Australia would lose under the no-domestic-support scenario. Milk production, prices, and producer surplus would rise across most of the developing world, but consumers in unprotected markets would face higher prices. Impacts on net importers in the developing world would be quite similar to those for potential developing-country exporters, with the notable exception of the FSU, where consumer gains would barely exceed producer losses to generate a breakeven net welfare impact.

Conclusions

The world dairy sector is complex and characterized by multifaceted domestic and trade policy distortions. The results of our simulation model (detailed by commodity, policy, and region) provide a quantitative measure of the economic and welfare impacts of those distortions across regions, producers, consumers, and governments. While the usual limitations of sectoral simulation studies should be kept in mind, the simulations confirm what most standard economic policy analyses suggest—that the numerous and sizeable distortions induced by most developed economies to protect their domestic dairy sectors have large and generally negative spillover effects on competitive exporters and developing countries. Liberalization would lessen those spillovers, creating opportunities for growth in the domestic and potentially export-oriented portions of the dairy sectors in developing countries, but several caveats must be noted.

Liberalization would also cut into the large benefits that now accrue to consumers who enjoy access to subsidized dairy products on world

markets thanks to the current protection regimes of the developed countries. Millions of these consumers live in poorer countries with low border protection and limited capacity to develop a dairy sector. The interests of these developing countries diverge starkly from those of others having an actual or potential dairy industry.

World Dairy Sector Growth: A Component Perspective

World product markets are increasingly driven by milk components (milk fat and fat fractionations; casein, whey, and other protein fractionations; and lactose). Current world growth trends are dominated by "industrial" demand for dairy-based ingredients—intermediate products, not consumer products. This growth in demand is driven by advances in food processing, both on the input side (fractionations of milk components) and the production side (processes that optimize cost and functionality using the evolving dairy-based ingredients), and by consumer demand for the final processed products. Shaping a competitive dairy sector in a world context will require producers to have component-based marketing plans, to organize incentive structures rewarding such plans, and to meet quality standards regimes. Making use of new dairy-based ingredients demands a moderately sophisticated food-processing sector and technology. Size and scale economies are important in many of these processes, suggesting differential advantages to larger firms and to firms with foreign direct investment backed by knowledge, expertise, and ready capital.

Prospects for World Dairy Policy Liberalization

Trends in dairy product development and markets occur in the context of current and evolving WTO agricultural trade negotiations. Short-term prospects for further dairy trade liberalization in developed markets may be somewhat limited, however. The heavily protected dairy sectors of Canada, the European Union, Japan, and the United States are not likely to open their markets before reducing subsidy levels. While the United States and Canada would likely support liberalization in grains, oilseeds, and livestock products, dairy remains an especially sensitive industry. Meanwhile, the European Union is absorbed in its expansion to the East and the new 2003 CAP reforms, which leave dairy relatively unchanged.

U.S. dairy policy as articulated in the 2002 Farm Bill increases domestic subsidies through the Milk Income Loss Contract program. Meanwhile, low-cost dairy exporters (Australia, Argentina, and Eastern Europe) will likely continue pushing hard for additional market access through lower tariffs, lower export subsidies, and increased import quotas.

The fundamental question is, "Who has the bargaining power in dairy issues?" The WTO meeting in Cancún in 2003 changed this calculus by creating strong opportunities for expansion of regional trade agreements (as opposed to a difficult global agreement) that will limit access by nonmembers.

Expansion of the European Union will provide protected access to new members, benefiting the dairy sectors in several Eastern European countries. However, managing the EU's structural milk surplus will remain challenging in the face of existing WTO commitments, the integration of Eastern Europe, and the relatively strong entrenchment of protectionist farm lobbies. The interests and influence of EU dairy processors and consumers, both of whom would benefit in a liberalized market, compete directly with the established interests of the milk producers.

Prospects for Developing Economies

The potential for domestic market growth is driven by population and GDP. Population growth stimulates consumption of traditional dairy products; whereas increased incomes favor growth in new value-added products. Slow GDP growth will stall consumption of both types of products.

What firms will supply the demand of growing populations of more affluent consumers in the developing world? Will they be local or multinational firms? Will they use local milk supplies, imported dairy ingredients, or some combination of the two? Industry structure and infrastructure are crucial to answering these questions. Scale efficient (low-cost) and innovative processing firms are likely to have competitive advantages in meeting these potential growth markets. Local versus multinational ownership will be influenced by access to and the cost of capital and by the firms'

marketing and procurement strategies. Foreign direct investment is often used to overcome market access limitations allowed by the current WTO agreement and regulations by countries that permit only domestically owned firms to import dairy products.

Export potential into the developed economies will be closely linked to further dairy trade liberalization characterized by increased market access and lower domestic subsidies. In this context, optimal world supply and demand will remain a crucial determinant of export prices and hence will define the competitive context of world trade. If recent trends continue, export markets should remain relatively competitive, with lower production costs and prices, but also with some structural weakness in demand due to macroeconomic factors. Discerning the differential potential for market growth in value-added products (which are sensitive to consumer income) versus bulk commodities (which are more responsive to price) will require careful consideration.

Overall, countries that are actual or potential dairy producers and exporters stand to gain from an unfettered market, but as liberalization occurs, special consideration should be given to poor consumers who are likely to suffer from higher consumer prices. Poor consumers in such countries will be hurt, at least in the short run, by a move to global free trade in dairy products unless special measures are taken.

Notes

1. The CD-ROM included with this volume contains an annex for this chapter presenting detailed market data and policy information by country, a description of the model used here, and additional tables of results of policy-reform simulations.

2. In this section all dairy products are expressed as total solids, milk equivalent, to facilitate comparisons.

3. The European Union and, to a lesser extent, Canada, and the United States have had substantive export subsidy allowances under the URAA and used them—a major impediment to the expansion of dairy production in many developing countries.

4. This discussion draws on Peng (2002).

5. See Soufi (2002) for further details.

6. The model is described on the CD-ROM that accompanies this volume. See also Zhu, Cox, and Chavaz (1999) and Cox and others (1999).

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