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# Brazil's Agrifood Exports: More Opportunities from NAFTA Expansion?



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## INTRODUCTION

Brazil enjoys a low-cost resource base for agricultural production and has easily raised output by expanding area and increasing productivity. Production expansion has exceeded the rate of increase in consumer demand. The domestic agrifood industry – production agriculture plus processing and distribution of food products – has undergone a process of rapid modernization, fueled by policy changes as well as capital inflows with accompanying transfer of new technology, and the development of supply chains. These changes have resulted in further reductions in production costs and greater efficiency, which in turn have increased exports. As a result, Brazil is an important trading partner and competitor of the NAFTA members and other Western Hemisphere countries.

Brazil's world trade position also reflects a sustained effort to expand trade and diversify its agrifood product trade and foreign markets. By playing an active role in the GATT Uruguay Round negotiations, through membership in the CAIRNS group, and the leadership shown in the Doha Round negotiations through the formation of the Group of 20 (G-20), Brazil has worked to liberalize global agricultural and food product trade.

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In addition to being a World Trade Organization (WTO) member, Brazil has several trade agreements in effect, including MERCOSUL (Southern Common Market Trade Agreement) and bilateral agreements with Peru, Cuba, Mexico, Trinidad and Tobago, Guyana, India, and the South African Customs Union. MERCOSUL, which was envisioned as a customs union among Brazil, Argentina, Paraguay, and Uruguay in 1991, led to the adoption of the Common External Tariff (CET), which applies to most goods.

Participation in the global, regional, and bilateral trade agreements noted above has led to varying degrees of harmonization of trade policies among the members, by reducing and/or eliminating trade barriers and harmonizing trade requirements. However, Brazil still remains blocked from important markets in the North American Free Trade Agreement (NAFTA) and East Asia regions due to sanitary and phytosanitary (SPS) restrictions. SPS restrictions have negatively impacted exports of nonprocessed meat due to the animal disease status of Brazil, while oilseeds are periodically denied entry into some import markets due to contamination with fungicides. The SPS restrictions faced by Brazil have resulted in faster development of the meat processing sector, thereby enabling greater exports of processed meats. Despite these constraints, Brazil is now the world's largest exporter of beef, poultry meat, sugar, ethanol, coffee, orange juice, and tobacco.

In line with the theme for the third annual North American Agrifood Market Integration Workshop to consider options for expanding NAFTA integration and the implications for trade, this chapter examines the impact on Brazil and NAFTA members from achieving broader economic integration under a NAFTA-Brazil regional trading agreement. In the scenario considered in this chapter, changes to exports and imports will be examined assuming elimination of tariffs and tariff-equivalents for agricultural commodities being traded among NAFTA members and Brazil in a manner that could be described as an augmented NAFTA with Brazil as a member and full implementation of the NAFTA. The focus of the analysis is on major traded products including soybeans, rice, wheat, other grains (predominantly maize), meats (beef, poultry, and pork meat), vegetables, fruits, nuts, and sugar. The analysis seeks to capture possible trade creation/diversion due to the implementation of a regional trade agreement between NAFTA and Brazil.

## **THE IMPORTANCE OF BRAZIL'S AGRIFOOD SECTOR**

Over the past decade, Brazil has been consolidating its position as an important agrifood producer and major food supplier to international markets. Production agriculture accounted for ten percent of the country's gross domestic product (GDP) in 2005, but with the associated supply

**Table 3.1:** Brazil's agrifood exports and GDP, 1995-2005.

Year	Agrifood Exports (bil. \$)	Total GDP (bil. \$)	Per Capita GDP (\$)	Agricultural GDP (bil. \$)	Agriculture as a share of total GDP
					(percent)
1995	11.82	704.14	4,440.28	56.11	8.0
1996	12.94	774.86	4,806.96	58.51	7.6
1997	15.90	807.22	4,932.32	57.58	7.1
1998	14.61	787.35	4,739.12	58.18	7.4
1999	13.77	536.32	3,179.51	39.57	7.4
2000	12.75	601.94	3,515.92	42.78	7.1
2001	16.08	510.09	2,932.87	37.99	7.4
2002	16.79	460.12	3,604.32	35.86	7.8
2003	21.01	506.29	2,831.43	44.96	8.9
2004	27.30	603.86	3,326.21	54.57	9.0
2005	30.92	795.65	4,323.31	66.06	8.3
Growth Rates (%)					
1995-2005	8.59	-2.61	-3.48	-1.10	---
2000-2005	19.52	5.89	3.40	10.47	---

**Sources:** Banco Central do Brasil; Confederação da Agricultura e Pecuária do Brasil.

chain, the agrifood sector accounted for 28 percent of the country's GDP (Confederação da Agricultura e Pecuária do Brasil). The agrifood sector also generates 27 percent of total exports and employs 18 million people, equivalent to 37 percent of the labor force.

Agrifood exports and agricultural GDP have both grown faster than total exports and national GDP, respectively, since 1995 (table 3.1). Brazilian agrifood exports increased from about \$12 billion in 1995 to \$31 billion in 2005, with an annual growth rate of 8.6 percent. With devaluation of the currency in 1999 and 2001, total GDP declined, but has since rebounded, reaching \$795.65 billion or \$4,323 per capita. The share of agricultural GDP in total GDP rose between 2001 and 2004 and fell off a bit in 2005. Per capita income growth was negative during 1995-99, a trend that was reversed by economic reforms in 1999 (Gasques and Conceição).

### **POLICY REFORMS BRING MACROECONOMIC STABILITY AND FARM SECTOR EXPANSION**

The rapid expansion of Brazilian agriculture and significant growth of the agrifood sector began to take place in the mid-1980s when the import-substitution industrialization policy regime, which channeled resources to the industries and services sectors to the detriment of agriculture, was abandoned. The economic liberalization policies adopted in 1985 sought

to eliminate domestic and export taxes on basic crops and livestock products and quantitative restrictions on soybeans and meat (beef, pork, and poultry) exports. The privatization of state enterprises and increased domestic support to agriculture also contributed to the sector's growth.

However, the most significant economic factor affecting agricultural output in Brazil since the mid-1990s was introduction of the successful "Real Economic Stabilization Plan." Before 1994, Brazil experienced inflation levels generally well above 1,000 percent a year. To halt inflation, a new currency, the Real, was introduced, which was initially pegged to the US dollar and later followed a "crawling peg" policy of nominal depreciation of the Real against the dollar. The "Real Plan" stabilized the economy, reducing inflation to around five percent per year and set off a domestic demand boom that lasted for five years. In early 1999, Brazil adopted a floating exchange rate. The Real depreciated considerably, making Brazil an attractive low-cost supplier of food and agricultural products. That stimulus led to rapid expansion in soybean and meat production. Producer incentives and other forms of domestic support also contributed to the growth of agriculture.

Total support for Brazilian agriculture has varied over time and included support to producers, provided mostly through preferential credit and some tax exemptions to the sector. The financing of general services to agriculture, such as storage, marketing, distribution, agricultural research, and infrastructure has also been beneficial to Brazilian agriculture. Some of these direct and indirect subsidies and economic incentives still differ at the local, state, and federal levels and across commodities and sectors. More recent measures of support have focused on marketing and storage subsidy schemes through the use of hedging operations with the government helping producers engage in hedging. A recent study by the OECD estimates producer support – measured by the Producer Support Estimate indicator – at three percent of farm income during the 2002-04 period, a level comparable to the support provided in Australia (four percent) and New Zealand (two percent), and well below the OECD average of 30 percent.

The macroeconomic reforms under the "Real Plan" and the resulting economic and political stability during the 1990s along with rising incomes and elimination of remaining barriers to foreign direct investment (FDI) facilitated the entry of multinational companies into Brazil. Since then, foreign investment in Brazil's agrifood sector has been significant. For example, in 2005, Brazil received 35 percent of all foreign investment in the Latin American region. The single most important source of FDI has been the United States due to the proximity of Brazil to the US and their complementary cropping seasons (Banco Central do Brasil). Total FDI flows into Brazil during 2004 to the agrifood sector totaled \$113 billion,

second only to China among developing countries. Central Bank data reveals that Brazilian food manufacturing industries are less dependent on foreign capital in comparison to other manufacturing industries.

The introduction of multinationals and acquisition and mergers with domestic companies gave rise to a very dynamic food processing sector in Brazil (Jank, et al.). The sector is now expanding beyond Brazil's borders. For example, in January 2004, Brazil created a partnership with a Jamaican company to develop a \$7.7 million ethanol project through which Brazil will produce sugarcane-derived ethanol for export to the United States. Similar plans for joint Brazilian ethanol projects in Trinidad and Tobago and in El Salvador have also been announced.

In addition to establishing demand for primary agricultural products for processing and exporting, multinationals stimulated investment in agricultural research and development of integrated supply chains that link inputs with commodity production and distribution. Multinationals have also contributed directly to production increases by granting credit to producers to buy inputs (fertilizers, seeds, and chemicals), alleviating some of the difficulties that Brazilian producers have in seeking credit from commercial banks.

## **BRAZIL URGES GLOBAL AND REGIONAL TRADE POLICY REFORMS**

Brazil has been an active participant in world trade policy reforms, supporting establishment of the WTO, leading a group of developing-country exporters (the G-20) in their demands for further reductions in trade-distorting agricultural policies and, within the CAIRNS Group pushing for elimination of export subsidies for agrifood products. In addition to WTO-related trade policy reform, Brazil's active participation in regional trade integration is reflected by the signing of the 1991 MERCOSUL regional trade agreement with Argentina, Uruguay, and Paraguay.

In 2001, the MERCOSUL Agreement expanded to include Chile and Bolivia as associated members. Under the MERCOSUL framework, Brazil has also signed various bilateral economic complementation agreements (with Mexico in July 2002, the Andean Community in December 2002, Peru in August 2003, and the group formed by Colombia-Ecuador-Venezuela in December 2003), as well as various other bilateral trade agreements (with the Andean Community in August 1999, Cuba in December 1999, Guyana in June 2001, and Trinidad and Tobago in June 2001). As a MERCOSUL member, Brazil is also in the process of negotiating a trade agreement with the European Union (EU) that will include agricultural commodities. MERCOSUL has also signed a preferential trade agreement with India (January 2004) and is in the process of negotiating a trade

**Table 3.2:** Brazil's agrifood exports and GDP, 1995-2005.

	Brazil		Other MERCOSUL	
	Bound	Applied	Bound	Applied
Beef (fresh/chilled/frozen)	55.0	11.5	35.0	11.5
Beef (prepared)	55.0	17.5	35.0	17.5
Pork (fresh/chilled/frozen)	55.0	11.5	35.0	11.5
Pork (prepared)	55.0	17.5	35.0	17.5
Broilers (whole and parts, frozen)	35.0	11.5	26.0	11.5
Prepared chicken meat	55.0	17.5	35.0	17.5
Soybeans	35.0	4.8	35.0	4.8
Soymeal	35.0	7.5	35.0	7.5
Soyoil	35.0	12.8	35.0	15.4
Sugar (raw)	35.0	17.5	35.0	18.8
Sugar (refined)	35.0	17.5	35.0	28.8
Ethanol	35.0	21.5	35.0	21.5
Corn	48.3	9.5	35.0	9.5
Wheat	55.0	10.0	35.0	6.0
Rice	55.0	11.5	35.0	11.5

**Sources:** Banco Central do Brasil; Confederação da Agricultura e Pecuária do Brasil.

agreement with the South African Customs Union (SACU), which includes Botswana, Lesotho, Namibia, South Africa, and Swaziland.

The MERCOSUL Agreement established a CET for 85 percent of the 9,371 tariff line products traded between the partners (table 3.2). It also provided for a ten-year transitional phase for the Agreement to be fully implemented. Some sensitive products were exempted from the Agreement: sugar, automobiles and parts, capital goods, and communications equipment.

Despite Brazil's active pursuit of trade liberalization, the import tariffs of its trading partners remain fairly high (see figure 3.1). The global average applied tariff for agrifood products is 19 percent. There is, however, significant variation in applied tariffs for different product groups. The highest average rates are for products in which Brazil has an export interest, including tobacco, processed meats, and prepared food. Brazil's average agrifood applied tariff is 12 percent, about two-thirds the global average of all countries.

### **BRAZIL'S EXPORT PERFORMANCE EXCEEDS EXPECTATIONS**

The combined effects of sound macroeconomic policies, reduced distortions in production agriculture, increased domestic demand for primary products due to the entrance of multinationals, and the subsequent competitive pressure on domestic companies have been positive factors

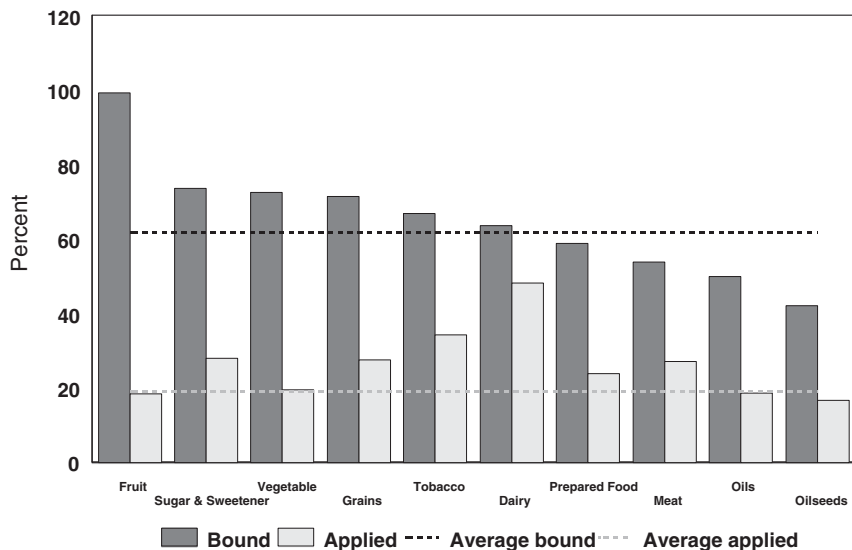


in Brazil's agrifood export performance. This performance is even more extraordinary when one takes into account the high tariffs on Brazil's imported production inputs (e.g., fertilizers, insecticides) and relatively high tariffs on Brazil's exported products in importing countries.

Brazil is now the third largest exporter (in value terms) of agrifood products in the world, after the EU and the United States. Exports of major commodities have grown at phenomenal rates since 2000 (table 3.3). This growth has been accompanied by changes in the direction and composition of agrifood exports, moving away from exports of tropical products such as coffee and orange juice, to processed products (meats, soybean products). As a result, in 2005, Brazil was the number one exporter of sugar, ethanol, coffee, orange juice, tobacco, beef, and poultry meat; the second largest exporter of soybeans and soymeal; and the fourth largest exporter of pork and maize. Major markets for Brazilian agrifood products are the European Union (34 percent share), China (eight percent), Russia (nine percent), and the United States (six percent).

Brazil's overall trade surplus in 2005 reached an all time high of \$42 billion, a 25 percent increase over a year earlier, with agriculture playing a major role. Brazil's agrifood sector accounted for over two-thirds of the 2005 trade surplus at \$27.5 billion (figure 3.2). An agrifood trade surplus of that magnitude makes Brazil the largest agricultural surplus trader in

**Figure 3.1:** Global agrifood product import tariffs.



Source: Regmi.<sup>a</sup>

Note: <sup>a</sup> Tariff averages calculated using Agricultural Market Access Database and WTO Member-submitted *ad valorem* equivalent estimates.



**Table 3.3:** Brazil's dominance in world agriculture, 2005 rankings.

	World rank in exports	World rank in production	Global exports market share (%)	Exports in 2005 (million \$)	Annual Growth Rates 2000-2005 (%)
Sugar	1	1	42	3,919	20
Ethanol	1	1	51	766	79
Coffee	1	1	26	2,533	11
Orange juice	1	1	80	796	4
Tobacco	1	1	29	1,380	15
Beef	1	2	24	2,944	32
Poultry	1	3	35	3,770	31
Soybeans	2	2	35	5,345	22
Soymeal	2	2	25	2,865	13
Pork	4	4	13	1,252	40
Corn	4	3	35	121	48

**Sources:** USDA Foreign Agricultural Service; Global Trade Information Services data.

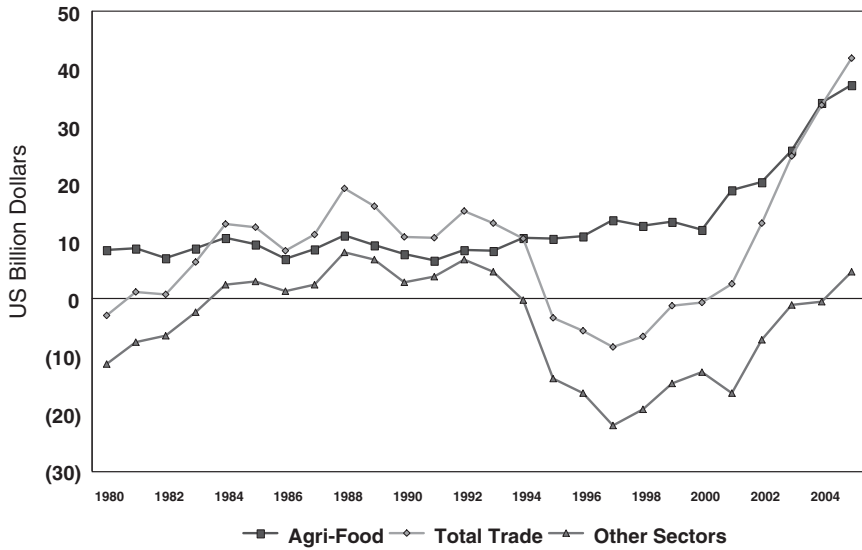
**Notes:** Harmonized codes: sugar (1701), ethanol (2207), coffee (0901), orange juice (2009), soybeans (1201), beef (0201/0202/160250), poultry meat (0207/160231/160232/160239) pork (0203/160241/160242/160249), soymeal (2304), corn (1005), and tobacco (2401). Rankings and market share include the EU-25.

the world (GTIS data). The value of Brazil's 2005 agrifood exports reached \$30.9 billion, led by soybeans and products, sugar, ethanol, beef, pork, and poultry. Brazil also imports commodities that it does not produce competitively, including wheat. However, the value of those imports was \$3.4 billion in 2005, equivalent to only 11 percent of the value of agrifood exports.

Agrifood trade includes primary bulk commodities, semi-processed products, horticultural products, and processed food products. Primary bulk product exports grew eight percent annually during 1997-2005, compared to nine percent annually for processed products and five percent annually for semi-processed products (figure 3.3). Horticultural products, which include fruits, vegetables, flowers, nuts, and spices, have grown at a rate of ten percent per year since 1997; however, the volume of horticultural exports is low as SPS regulations restrict access to foreign markets.

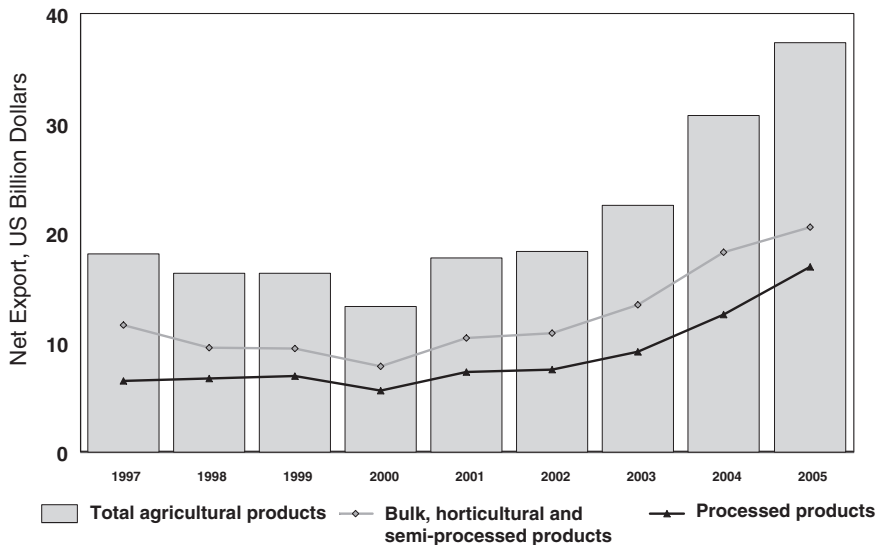
Since 2000, growth of Brazil's agrifood product exports has exceeded historical rates, with the value of processed agrifood product exports rising by an average of 20 percent per year. Between 2004 and 2005, the growth in exports of processed products accelerated even more, rising by 33 percent. This phenomenal growth has shifted historical trade shares dramatically, with processed agrifood products now accounting for 44 percent of agrifood exports and primary bulk commodities accounting for 25 percent.

**Figure 3.2:** Net trade balance of Brazilian exports.



**Source:** Calculations by USDA, Economic Research Service using Global Trade Information Services data.

**Figure 3.3:** Brazil's net unprocessed and processed agrifood exports.



**Source:** Calculations by USDA, Economic Research Service using Global Trade Information Services data.

## **AGRIFOOD PRODUCT PRODUCTION ENABLES AGRIFOOD EXPORTS**

The strong growth in Brazilian agrifood exports was possible because production of major crops (soybeans, corn, rice, edible beans, and wheat) doubled between 1970 and 1990, and doubled again between 1990 and 2005, reaching an all-time high of 108 million metric tons (MMT) in 2005. Production of minor field crops (cotton, oats, bran, and millet) accounted for an additional 15.4 MMT in 2005. The growth of edible beans and rice – major food staples – followed population increases, whereas the growth in soybean and corn production was linked to rapid growth in feed demand and rising profitability of soybean production.

Increases in crop production during the 1980s and 1990s were due almost entirely to yield growth, whereas after 1999, when the new exchange rate policy was adopted and regional policies encouraged production of soybeans in frontier regions, growth in crop production was due almost entirely to the expansion of area planted (Brandão, Castro de Rezende, and da Costa Marques). Rising foreign demand for meats produced with soybean meal, paired with low production costs and favorable exchange rates resulted in historically high producer income from soybean production. In 2005, soybeans were planted on 23 million hectares (56.7 million acres) compared to 12 million hectares in the early 1990s. In 2005, Brazil produced 59 MMT (2.168 billion bushels) of soybeans, representing 26 percent of global soybean output. In the same year, Brazil's exports exceeded 35 percent of global soybean trade. The EU, China, Iran, and Taiwan are the largest customers for Brazilian soybeans.

In the case of soymeal, the United States, Brazil, and Argentina are the major exporters. Increases in Brazil's soybean meal exports are limited by strong growth in domestic meal consumption, due to rapid expansion of the poultry and pork sectors, and by capacity constraints in the domestic soybean crushing industry. The EU is the largest customer for Brazilian soybean meal, followed by Iran and Thailand.

In the case of maize, yields are low by international standards – below 7,000 kg per hectare – due to lack of commercial varieties suitable to Brazil's tropical climate. Maize continues to present poor prospects in the major producing areas of the agricultural frontier in the Center West where profits are extremely low due to high costs, poor roads, and poor infrastructure. As a consequence, poultry producers in some years have been forced to import maize to supplement scarce domestic supplies, jeopardizing Brazil's traditional net exporting position for maize.

In contrast, production of sugarcane and its products (sugar and ethanol) are major contributors to agricultural GDP – the total value of production

in 2005 was equivalent to 23 percent of Brazilian agribusiness gross income (Confederação da Agricultura e Pecuária do Brasil) and 15 percent of total agricultural export revenues. The growth in the sector resulted from the government mandated Proálcool program or Programa Nacional do Álcool (Brazil's national alcohol program), initiated in 1975 to regulate the ethanol content in gasoline. Simultaneously, credit and tax-exemption programs also spurred sugarcane production. As a result, Brazil is now the world's largest producer, consumer, and exporter of sugarcane, sugar, and ethanol. Brazil accounts for 60 percent of global raw sugar trade, 51 percent of world ethanol trade, and 38 percent of refined sugar traded internationally. Major Brazilian markets for raw sugar last year included Russia, Nigeria, Canada, and the United States. Major markets for Brazilian refined sugar included Middle Eastern and African countries, while major markets for Brazilian ethanol were the EU, India, and Japan.

With one of the world's largest commercial herds, at 170 million head, Brazil is the world's second largest commercial beef producer, yielding nearly eight MMT in 2004 compared with 11.3 MMT produced in the United States. Brazil's production system is based on grass with less than three percent of production located in feedlots. During the 2001-2003 period, Brazil was the fourth-largest beef exporter in terms of value, and the third-largest beef exporter in terms of volume. In 2004, Brazil became the world's largest beef exporter (by volume), surpassing Australia and the United States, with one-third in processed beef and two-thirds in fresh, frozen, and chilled beef. Total Brazilian beef exports represent 12 percent of the total value of Brazil's agricultural exports. Major Brazilian markets for fresh/chilled/frozen meats include the EU, Russia, Chile, Egypt, and Iran. Major markets for Brazilian processed meats are the EU and the United States.

## **SIMULATION OF NAFTA-BRAZIL TRADE LIBERALIZATION**

To assess the likely agricultural production and trade impacts of tariff elimination among Brazil and the NAFTA countries, we simulate a hypothetical agricultural trade liberalization scenario using the Global Trade Analysis Project (GTAP) model developed by Hertel and Tsigas. The GTAP model is a global trade, comparative static, computable general equilibrium (CGE) model, which estimates production and trade effects in the base year – currently 2001. The model includes, among other sectors, rice; wheat; other grains (mainly maize); vegetables, fruits, and nuts; oilseeds; beef; other meats (poultry and pork meat); and sugar. Regional groupings used in this analysis include NAFTA members (United States, Canada, and Mexico), Brazil, other MERCOSUL members (Argentina, Uruguay, and Paraguay), MERCOSUL plus members (Chile and Bolivia),

**Table 3.4:** Average applied MFN agricultural tariff rates, used in the NAFTA-Brazil trade liberalization scenario.

	Paddy rice	Wheat	Other grains	Fruits, Vegetables, Nuts	Oilseeds	Red meats	Other meats	Sugar
NAFTA	6.00	3.10	0.18	1.55	4.84	4.11	3.21	53.51
Brazil	10.0	10.0	8.0	8.0	8.0	16.0	16.0	16.0
Other MERCOSUL	10.0	10.0	8.0	8.0	8.0	16.0	16.0	16.0
Chile and Bolivia	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Other Western Hemisphere	17.66	0.00	9.46	24.11	10.74	15.87	21.20	19.50
Rest of the World	4.70	0.99	96.62	9.58	31.81	75.37	17.31	25.09

**Sources:** GTAP database and USITC.

other Western Hemisphere (other Central and South American countries), and all other countries grouped in a “rest of the world” region.

The scenario employed simulates a hypothetical free trade agreement in agriculture between NAFTA members and Brazil. In this scenario, Brazil and NAFTA members eliminate import tariffs on agricultural goods traded between Brazil and NAFTA members while continuing to apply most-favored-nation (MFN) tariffs to goods from most other countries in the world. Specifically, the NAFTA members apply MFN tariffs to goods from all other countries in the world, including Argentina, Paraguay, and Uruguay (the other MERCOSUL members), while Brazil applies MFN tariffs to goods from countries that are not members of either NAFTA or MERCOSUL.

Quantitative restrictions between Brazil and NAFTA countries are eliminated by converting existing quotas to estimated tariff equivalents. The work of the US International Trade Commission (USITC), which calculates the gap between the US and world prices of raw sugar, serves as the basis for reforming quantitative restrictions in the scenario analysis. The average applied agricultural MFN tariff rates, as calculated for use in the NAFTA-Brazil trade liberalization scenario are shown in table 3.4. The analysis does not consider changes to domestic agricultural support policies that are likely to be adopted in response to trade liberalization.

The SPS restrictions in place during the base period between Brazil and each NAFTA member country are assumed to remain in place in the simulation. The effects of the SPS restrictions are implicit in the base-year trade flows for fruits, vegetables, and nuts (FVN); beef, and other meat (pork and poultry meat) and in the point-of-origin import demand elasticities. Since the SPS restrictions remain in place in the scenario, the results may overestimate Brazil’s trade export expansion.

The simulated trade impacts reflect trade creation – new trade among Brazil and the NAFTA countries that results from lower tariffs within the region and trade diversion – increased trade between Brazil and

**Table 3.5:** Percent changes in the volume of Brazil's exports from NAFTA-Brazil trade liberalization.

	Paddy rice	Wheat	Other grains	FVN	Oilseeds	Red meats	Other meats	Sugar
NAFTA	0.01	0.00	-0.02	3.40	8.81	27.12	5.80	1074.3
Other MERCOSUL	0.00	-0.02	-0.07	-1.31	-0.13	-0.88	-9.46	-0.86
Chile, Bolivia	0.00	0.00	-0.12	-0.01	-0.96	-6.18	-0.23	-0.03
Other W Hemisphere	-0.21	0.00	-0.37	-0.70	-4.09	-2.30	-3.50	-0.99
Rest of the World	-0.02	-0.03	-16.70	-8.40	-93.32	-68.43	-137.30	-61.83

**Sources:** GTAP simulation results.

**Table 3.6:** Percent changes in the volume of Brazil's imports from NAFTA-Brazil trade liberalization.

	Paddy rice	Wheat	Other grains	FVN	Oilseeds	Red meats	Other meats	Sugar
NAFTA	0.16	22.74	1.62	6.88	0.44	3.36	13.89	5.08
Other MERCOSUL	5.22	-15.84	0.45	1.69	2.39	2.91	-0.57	-0.29
Chile, Bolivia	0.00	0.00	0.00	0.01	0.00	0.01	-0.14	0.00
Other W Hemisphere	0.00	0.00	0.00	-0.01	0.00	0.01	-0.12	-0.02
Rest of the World	0.04	-0.04	-0.01	-0.09	0.01	0.03	-3.28	-0.74

**Sources:** GTAP simulation results.

NAFTA that takes place at the expense of trade with third countries such as the countries and country groupings in the Western Hemisphere and the rest of the world. The simulated impacts on exports and imports are summarized in tables 3.5 and 3.6, respectively.

The hypothetical NAFTA-Brazil trade liberalization scenario would reflect the sustained effort of both regions to expand trade and diversify their agrifood product trade and foreign markets. As Brazil faces reduced import tariffs from NAFTA members, it would increase its exports to NAFTA and divert trade away from nonparticipating regions in the Western Hemisphere, rest of the world, and to a lesser extent to other MERCOSUL members, which currently benefit from their preferential agreement with Brazil. NAFTA members would gain increased access to the Brazilian market with the elimination of Brazilian tariffs, with individual effects varying by commodity.

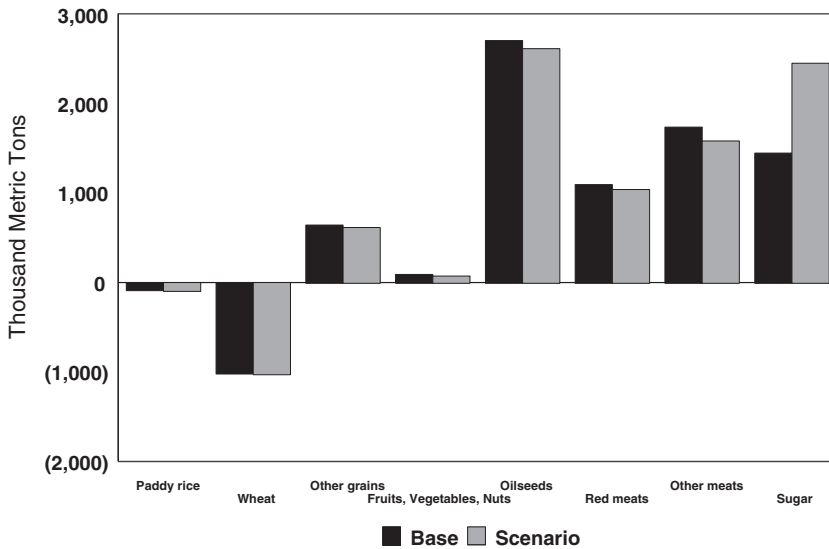
The hypothetical scenario of trade liberalization will give rise to changes in Brazil's crops, meats and processing sectors. As expected, elimination of the high tariffs applied to sensitive commodities by NAFTA members results in large increases in Brazil's exports of these commodities to the NAFTA markets and significant changes in the relative farm prices within Brazil. Conversely, elimination of high tariffs in Brazil leads to higher exports from NAFTA members into Brazil. Brazil remains a net exporter of most agricultural and food processing commodities in which it currently has a large global market share (i.e., maize; soybeans; meats; fruits, vegetables, and nuts; and sugar) and a net importer of rice

and wheat, commodities in which Brazil does not have a comparative advantage (figure 3.4).

Elimination of the NAFTA average applied agricultural tariff rate on sugar used in the scenario and estimated at 53.5 percent, results in a ten-fold increase in the quantity of Brazil’s sugar processing exports to the NAFTA markets. This large increase in Brazil’s exports to NAFTA members is concurrent with a reduction in exports to the rest of the world, other Western Hemisphere countries and MERCOSUL countries, as Brazil still faces high tariffs for its sugar in these markets, since sugar was one of the products excluded from the CET regime under MERCOSUL. In this scenario, productive resources in Brazil move away from other crops and into sugarcane production. As a result, production of sugarcane rises by 10.4 percent, which represents a 24.6 percent increase in industrial production of raw and refined sugar, in order to supply the expanded export market.

Brazil remains a net importer of rice under NAFTA-Brazil scenario analysis. Elimination of Brazil’s ten percent tariff leads to a 0.2 percent increase in the quantity of rice imported from NAFTA and a 5.2 percent increase in the volume of rice imports from neighboring MERCOSUL countries (namely Uruguay, Argentina and Paraguay). Proximity of the markets and the existing CET which allows for duty free rice imports

Figure 3.4: Brazil net exports.





into Brazil from MERCOSUL makes them a more competitive supplier of rice to Brazil. NAFTA's share of the Brazilian market for rice has fluctuated, ranging from 35 percent of total imports into Brazil, to less than one percent of Brazilian rice imports. In the past, NAFTA members have been able to ship more rice into Brazil when rice supplies were tight within MERCOSUL. In Brazil, a possible regional trading agreement with NAFTA would lead to a 0.3 percent decline in the import price of rice, and a 5.9 percent increase in domestic demand for imported rice. In recent years, rice producers in Brazil, already facing higher production costs, have responded to increased competition from abroad and competition from sugarcane in southern Brazil by shifting land from rice into sugarcane, which is more profitable, ultimately resulting in a 9.1 percent contraction in domestic rice output.

The scenario results indicate that the elimination of Brazil's ten percent tariff on wheat imports from NAFTA would result in a 22.7 percent increase in wheat imports from NAFTA members (the US and Canada) and a 15.8 percent decrease in imports from MERCOSUL. Just over half of Brazil's consumption needs are met by imports making Brazil's one of the world's largest wheat importers. Overall, Brazil remains a net importer of wheat, with an 8.3 percent increase in domestic demand for imported wheat. In the scenario analysis, wheat production in Brazil falls by 9.4 percent. In the case of other cereals, Brazil remains a net exporter although total exports fall by three percent with lower availability of other cereals from domestic sources as land planted to other cereals is diverted to sugarcane.

Elimination of the current tariff on fruits, vegetables, and nuts (FVN) in Brazil of eight percent would lead to a 6.7 percent increase in imports from NAFTA members. However, Brazil would remain a net exporter of FVN. Current tariffs on fruits, vegetables, and nuts (FVN) from Brazil in the US and Canada are less than two percent while Mexico maintains high tariffs on FVN from Brazil. Brazil's exports to NAFTA members increase by 3.4 percent and decline to the rest of the world by 8.4 percent and to its other MERCOSUL partners by 1.3 percent.

Given Brazil's comparative advantage in oilseed production, Brazilian oilseeds remain competitive internationally. With elimination of the tariff, oilseed exports to NAFTA members (mostly Mexico) would increase by 8.8 percent, diverting trade away from the rest of the world. Similar to the case with other cereals, production shifts out of oilseeds into sugarcane, resulting in lower Brazilian oilseed production.

In the scenario results, Brazil would remain a strong net exporter of red and other meats products, with an increase of 27 percent in exports to the NAFTA market. However, since the SPS restrictions that are

assumed to remain in place are not explicitly captured by the model, the results may overestimate Brazil's trade export expansion. These results assume continuation of existing SPS restrictions, which means that Brazil's trade with NAFTA members would be limited due to the presence of FMD and Newcastle Disease in some regions of the country. Brazil's exports of red and other meats products to other markets decline as these markets maintain high tariffs on red and other meats products from Brazil, since they are not participants in the regional trade agreement (16 percent tariff averages in other Western Hemisphere countries and over 75 percent tariff average in the rest of the world).

### **Additional Factors Not Captured by the NAFTA-Brazil Trade Liberalization Simulation**

The GTAP simulation results do not take into account recent trade agreements signed in the Western Hemisphere. For example, the United States has negotiated bilateral trade agreements with Peru and Colombia and on 24 May 2006, Venezuela signed a protocol to become a full member of MERCOSUL within four years. This protocol details a timetable for Venezuela to adopt MERCOSUL's common external tariff and any necessary internal legislation. Further, the United States signed a trade agreement with five Central American countries (Costa Rica, El Salvador, Guatemala, Honduras, and Nicaragua) and the Dominican Republic in 2004 (CAFTA-DR). Prior to the agreement more than 80 percent of US imports from the Central American countries and the Dominican Republic already entered the United States duty free and approximately 99 percent of agricultural imports from the six countries entered the United States duty free. The CAFTA-DR provides reciprocal access for US products and services and will not be subject to periodic renewal. These new agreements are likely to reduce Brazil's net export gains by displacing some of Brazil's products in other hemispheric countries' markets.

Given Brazil's membership in MERCOSUL, a NAFTA-Brazil free trade agreement would open up indirect access to the NAFTA market to MERCOSUL's other members (Argentina, Uruguay, Paraguay) without any tariff liberalization on their part. Consequently, any NAFTA-Brazil free trade negotiations would need to include rules of origin to prevent such an occurrence from happening.

While market opening between Brazil and NAFTA (i.e., tariff removal) will induce some structural adjustments in production and labor markets – and over the long-run encourage export diversification and more technology-intensive industries – several constraints could hinder further long-term growth in Brazilian processed and high-value agrifood exports. Supply-side constraints include adverse macroeconomic shocks, ongoing transportation and marketing bottlenecks, financial constraints,

and a slowdown in the expansion of agricultural land. On the demand side, rising consumer demand for high-value foods plus the growth of Brazil's biofuel industry could reduce the availability of Brazil's exportable surpluses.

## CONCLUSIONS

The growth in Brazil's agrifood sector has been mostly attributed to macroeconomic stability (inflation control), accelerated currency devaluations from 1999 to 2004, and economywide trade and regulatory reforms that have encouraged investment in Brazilian agriculture as well as domestic policies (regional credit and tax exemption programs) that have provided incentives to producers and processors. Over the next decade, with continuous investments in the agrifood sector and expansion of arable land brought into production, Brazil is expected to continue to be a major player in world agrifood markets.

The growing presence of multinational firms in Brazil will enhance the competitiveness of Brazil's domestic agrifood companies, placing Brazil in an excellent position to benefit from participation in an expanded NAFTA. The capacity to produce new and more varied agrifood products, the export know-how of multinational companies and the low-cost base in Brazil will contribute to future growth in agrifood exports.

Under a hypothetical NAFTA-Brazil trade liberalization scenario, with the exception of sugar, production effects in NAFTA members are minimal and Brazil faces larger production adjustments. In addition, the simulation results do not take into account changes in SPS restrictions that would surely limit Brazil's ability to increase exports of beef and fruit and vegetables to NAFTA countries. Further, restrictions in Brazil's land expansion rate due to financial constraints and environmental concerns, and a lack of harmonization in marketing and food safety standards and regulations may diminish Brazil's export performance.

## REFERENCES

- Banco Central do Brasil. 2005. "Notas Técnicas do Banco Central do Brasil, nº 34." Março.
- Brandão Pessoa, A., G. Castro de Rezende, R. Wanderley da Costa Marques. 2005. *Crescimento Agrícola no Período 1999-2004, Explosão da Área Plantada com Soja e Meio Ambiente no Brasil*. Rio de Janeiro: Instituto de Pesquisa Econômica Aplicada (IPEA), Janeiro.
- Confederação da Agricultura e Pecuária do Brasil (CNA). 2005. "Agropecuária Brasileira." Brasília (DF), December.

- Dimaranan, B., ed. 2006. *Global Trade, Assistance, and Production: The GTAP 6 Data Base*. West Lafayette, Indiana: Center for Global Trade Analysis, Purdue University.
- Fundação Getulio Vargas. 2005. *Revista Conjuntura Econômica*. Rio de Janeiro, Agosto.
- Gasques, J. and J. Conceição. 2001. "Transformações Estruturais da Agricultura e Produtividade
- Total Dos Fatores." In *Transformações da Agricultura e Políticas Públicas*. Brasília: IPEA.
- Gibson, P., J. Wainio, D. Whitley, and M. Bohman. 2001. *Profiles of Tariffs in Global Agricultural Markets*. Washington, DC: U S Department of Agriculture, Economic Research Service (ERS), Electronic Agricultural Economic Report No. 796, January. Available at: <<http://www.ers.usda.gov/publications/aer796/AER796.PDF>>. Accessed 9 May 2006.
- Global Trade Information Services Data. Available at: <<http://www.gtis.com>>. Accessed 24 May 2006.
- Hertel, T. and M. Tsigas. 1997. "Structure of GTAP." Chapter 2 in T. Hertel, ed. *Global Trade Analysis: Modeling and Applications*. Cambridge University Press.
- ISI Emerging Markets. "Company Reports." Available at: <<http://www.securities.com>>. Accessed 24 May 2006.
- Jank, M., M. Franco Paes, A. Meloni Nassar, and P. Faveret Filho. 2001. "Concentration and Internationalization of Brazilian Agribusiness Exporters." *International Food and Agribusiness Management Review*. 2:359-374.
- Ministério Do Desenvolvimento, Secretaria de Comércio Exterior (SECEX). 2006. "Balança Comercial Brasileira." Brasília (DF), Junho.
- Organization for Economic Cooperation and Development (OECD). 2005. *Review of Agricultural Policies in Brazil*. Paris: AGR/CA(2005)3, May.
- Regmi, A. 2006. "Calculations of World Agricultural Tariff Averages by Product Groups Using Agricultural Market Access Database and WTO Member-submitted ad valorem Equivalent Estimates." Unpublished data, Washington, DC: US Department of Agriculture, ERS.
- US Department of Agriculture, Foreign Agricultural Service (FAS). *Production, Supply and Distribution (PS&D) Online Database*.
- US International Trade Commission (USITC). 2004. *The Economic Effects of Significant U.S. Import Restraints*. Washington, DC: Fourth Update 2004. Investigation No. 332-325, Publication 3701, June.