
MEXICAN AGRICULTURAL TRADE UNDER NAFTA: AN ASSESSMENT AFTER FIVE YEARS OF IMPLEMENTATION

Andrés Rosenzweig Pichardo

INTRODUCTION

This paper analyses the potential of the rural sector in generating foreign exchange, identifies those sectors with higher export potential, describes the evolution of exports and imports of the main agricultural subsectors, and provides some evidence on structural changes in the composition of trade and the impact of trade liberalization in production and investment. Some highlights are provided on whether the changes in the trade pattern are due to the implementation of the NAFTA, the generation of new technologies and product innovation, population and income growth, or shifts in consumption patterns. The period considered is 1990-1998, since large-scale trade liberalization measures were adopted prior to the implementation on the NAFTA. The effects of the agreement will, of course, be emphasized.

MANAGING DATA BASES ON MEXICAN TRADE FLOWS

The analysis is based on official Mexican sources: Banco de México (BANXICO), and the Sistema de Información Comercial de México (SICM), operated by the Ministry for Foreign Trade (SECOFI). BANXICO releases trade data with a lag of less than 3 months and therefore is widely used. Regarding

the agri-food¹ sector, BANXICO provides information on imports and exports under the following headings:

- *Agriculture and Livestock*
- *Processed Food and Beverages.*

The level of disaggregation on a product basis is not large for both headings. The classification of a specific product under each heading follows international conventions, but for the specific purpose of economic analysis of the rural sector there are strong arguments to move some products from one heading to the other. For example, live animals are considered under the first category, but fresh or refrigerated meat cuts belong to the second. It seems that the value added of slaughtering an animal is not high enough to consider meat cuts and carcasses as processed food. Milk powder is considered as processed food, but in the context of the Mexican market, milk powder is a close substitute for fluid milk.

SAGAR and SECOFI are in the process of adjusting the methodology of BANXICO for their own purposes. This review also incorporates products that are treated by BANXICO as industrial products, but are included in the Agricultural Chapter of NAFTA and the WTO. The tariff lines that were classified under each heading are presented in the Appendix. All the analysis for this paper uses the adjusted methodology.

The SICM provides exports and imports for each tariff line, following the *Harmonized Nomenclature System*. The lag in release of SICM is around four months. Each user must arrange the database according to specific needs, a process that might be extremely time consuming. Based on SICM, SAGAR has developed a very simple framework that allows time series for exports, imports and the trade balance for sectors of particular interest to be generated automatically. These sectors are:

- Agriculture
- Livestock
- Processed Food, Beverages and Tobacco (divided into processed agricultural products and processed livestock products).

¹ In this paper the term agri-food includes agriculture, livestock, processed food and beverages and tobacco.

For each tariff line specific codes are allocated. One code identifies the sector to which each tariff line belongs (agriculture, livestock, processed agricultural products or processed livestock products). Each *sector* is divided in different *categories* (e.g. within agriculture, cereals, oilseeds, fruits, and vegetables, among others) and an additional code is included for each tariff line. In addition, within each category, *specific products* of interest are singled out through another code (e.g. regarding cereals, corn, wheat, rice, and oats, among others). Finally, due to the importance of specific products or group of products (e.g. for vegetable oils, sugar containing products, juices, processed meat, dairy products, alcoholic beverages, etc) another code is included.

This extremely simple program is useful to generate quickly time series for the trade balance, imports and exports at different levels: sectors, categories of products within each sector, and specific products. For example, one might be interested in generating the overall livestock sector balance. One might be further interested in disaggregating the livestock sector balance in bovine, pork and poultry. A more precise analysis of the poultry sector would require disaggregating live chickens, poultry meat, and poultry offal.

It is important to notice that this database contains annual trade information from 1990 to 1998, in volume and value. Due to changes in the Mexican Import and Export Tariff Nomenclature (Tarifa del Impuesto General de Importaciones y Exportaciones) in several tariff code levels, it was necessary to reallocate the trade figures from some derogated tariff code lines to the new codes where they belong. This database and the relevant codes for operating it will be available in the Web Site of SAGAR soon.

THE PERFORMANCE OF TRADE DURING THE NINETIES

During the period 1990-98 total agri-food exports to NAFTA partners jumped from 2.6 billion U.S. dollars to 5.6 billion U.S. dollars (an average rate of growth of 9.9 percent). On the other hand, total agri-food imports from NAFTA partners amounted 2.9 billion dollars in 1990 and 7.2 billion in 1998 (an average rate of growth of 12.0 percent). The implementation of NAFTA strengthened the increasing trend of exports. During the period 1993-98 the average rate of growth of total agri-food exports to NAFTA partners was 11.6

Table 1: Agri-food Trade Balance Mexico, United States and Canada (Million dollars).

<i>ISSUE/YEAR</i>	<i>1990</i>	<i>1991</i>	<i>1992</i>	<i>1993</i>	<i>1994</i>	<i>1995</i>	<i>1996</i>	<i>1997</i>	<i>1998</i>	<i>ARG¹ 90-98</i>	<i>ARG¹ 93-98</i>
Agriculture and Livestock Trade Balance²	107	90	(613)	(250)	(1,001)	951	(1,313)	(732)	(951)	-	-
Exports	2,103	2,240	2,103	2,483	2,559	3,620	3,174	3,400	3,704	7.3	8.3
Imports	1,996	2,150	2,716	2,733	3,560	2,669	4,488	4,132	4,655	11.2	11.2
Processed Food, Beverages and Tobacco Trade Balance³	(395)	(403)	(797)	(934)	(1,135)	(423)	(317)	(465)	(672)	-	-
Exports	523	586	612	750	890	1,103	1,423	1,577	1,883	17.4	20.2
Imports	919	989	1,409	1,685	2,024	1,526	1,740	2,042	2,555	13.6	8.7
Agri-food Trade Balance⁴	(289)	(314)	(1,410)	(1,185)	(2,135)	528	(1,630)	(1,197)	(1,623)	-	-
Exports	2,626	2,826	2,715	3,233	3,449	4,723	4,597	4,977	5,587	9.9	11.6
Imports	2,915	3,140	4,125	4,418	5,584	4,195	6,228	6,173	7,210	12.0	10.3
Total Agri-food Trade in NAFTA	5,541	5,966	6,840	7,651	9,033	8,918	10,825	11,150	12,797	11.0	10.8

Source: SECOFI

¹ ARG = Average Rate of Growth.² Elaborated with chapters 1 to 10, 12 and 14, and subheadings 1801, 240110, 4101 to 4103, 5001 to 5003, 520100, 530110 and 530210. It excludes chapter 3 and the subheadings of the fishing sector, birds and sea mammals and products thereof, from the Mexican General Tariffs of Imports and Exports.³ Elaborated with chapters 11, 13 and 15 to 24, subheadings 120810, 120890, 121410, 290543, 290544, 3301, 3501 to 3505, 380910, 382460, 4301, 510130, 510310 to 510330, 5201 to 5203, 5301 and 5302. It excludes fishing products, cocoa beans, tobacco leaves, cotton, raw linen and hemp.⁴ Elaborated with chapters 1 to 24, subheadings 290543, 290544, 3301, 3501 to 3505, 380910, 382460, 4101 to 4103, 4301, 5001 to 5003, 5101 to 5103, 5201 to 5203, 5301 and 5302. It excludes chapter 3 and the subheadings of the fishing sector, birds and sea mammals and products thereof, from the Mexican General Tariffs of Imports and Exports.

percent (1.7 percentage points higher than the figure for 1990-98). The average rate of growth of total agri-food imports during 1993-98 was 10.3 percent (1.7 percentage points lower than the figure for 1990-98).

The upward trend in trade during the nineties was reinforced by NAFTA. During the period of implementation of the Agreement, Mexican exports had a greater rate of growth than imports. The real exchange rate certainly played a role in this performance, but it also seems evident that consumers in Canada and the U.S. are increasingly concerned with quality and food safety, that prices play a diminishing role in consumer choices for some food products (price elasticity of the demand for food probably has decreased), and that Mexican exporters are reliable suppliers and are creating or consolidating a reputation.

The total agri-food trade deficit between Mexico and NAFTA partners shows an increase in absolute terms. During the period 1990-92 the average deficit was 671 million dollars, and 1.5 billion for 1996-98. However, the overall trade deficit in agriculture and livestock as a percentage of the value of agriculture and livestock production has declined, from 3.1 percent in 1998 to 1.6 percent on average during 1994-98. According to FAO, a country with a ratio of less than 25 percent of agri-food imports to total exports is sound in terms of food security. This ratio was 7.8 percent on average during the period 1994-98, whereas it was 12.7 percent during the period 1989-93. The author believes that food security as a policy goal goes well beyond economic considerations since political issues seem to play a larger role.

The performance of the primary sector (agriculture and livestock) in terms of trade and production has not been as good as the processed food and beverages sector. In fact, according to INEGI, the GDP for the primary sector (agriculture, livestock, forestry and fisheries) showed an average rate of growth of 1.2 percent during the period 1993-1998; the corresponding figure for the processed food, beverages and tobacco sector was 3.2 percent. The share of agriculture and livestock deficit in the total agri-food deficit increased from 20.7 percent on average in 1990-92, to 67.3 percent in 1996-98. The share of processed food and beverages deficit in the total agri-food deficit was 79.2 percent on average in 1990-92 and dropped sharply to 32.7 percent on average in 1996-98.

The rate of growth of processed food and beverages was enhanced by foreign direct investment (FDI) in an accumulated amount of 6.4 billion dollars during 1994-1998, whereas FDI in the primary sector has been minimal (an accumulated amount of 87.4 million over the same period). The share of NAFTA countries in FDI in agri-food was 50.2 percent over the period.

Table 2 shows the trade balance for agricultural products only (excluding livestock). Surprisingly Mexico had a surplus with the NAFTA partners of 276 millions in 1998. The deficit in cereals, oilseed, forages, tubers and dried vegetables is more than compensated through a surplus in vegetables, fruits and industrial products (especially coffee and tobacco).

For the period 1996-98 an average deficit of 1.12 billion dollars is registered in the group of cereals, of which 55 percent corresponds to corn and 31 percent to wheat. Corn is the basic foodstaple for the Mexican population. Domestic production is enough to cover human demand. Nevertheless, in the period 1996-1998 the country imported an average 4.5 million tons, 64 percent higher than the NAFTA quotas negotiated for that period. This situation is due to the growth in demand for grains by the livestock sector (especially pork and poultry), and the expansion of other maize processing industries (maize-flour, starch, and fructose, among others).

Regarding oilseeds, production fell sharply in 1995 due to disasters in the Northwest. Efforts are being made to recover production levels in areas with competitive advantage, and to diversify the structure of production of oilseeds. The vegetable oil industry is stimulating the production of soybeans, safflower in the Northeast, and palm oil plantations in the Southeast.

In 1996, Mexico reached a record harvest on basic crops production (31.2 million tons), mainly due to the increase in the production of sorghum (63.3 percent higher than the year before), and in a lesser extend, increased barley and bean production. The fruits and vegetable sector is spread over only 7 percent of agricultural land, but contributes around 15 to 20 percent of the total value of agricultural production. Production of vegetables increased 48.5 percent between 1993 and 1998, and the production of fruit grew 10.6 percent over the same period. Since the intensity of labor is 10 times higher in veg-

Table 2: Agriculture Trade Balance Mexico, United States and Canada (Thousand dollars).

<i>ISSUE/YEAR</i>	<i>1990</i>	<i>1991</i>	<i>1992</i>	<i>1993</i>	<i>1994</i>	<i>1995</i>	<i>1996</i>	<i>1997</i>	<i>1998</i>
Trade Balance	363,695	671,510	87,071	283,242	(130,311)	1,051,429	(594,043)	305,342	275,966
Cereals	(60,567)	(203,125)	(236,736)	(348,771)	(615,185)	(635,988)	(1,564,942)	(773,653)	(1,041,353)
Oilseeds	(208,306)	(344,691)	(541,582)	(595,875)	(714,458)	(687,309)	(1,098,106)	(1,172,907)	(1,034,386)
Vegetables	922,991	821,455	811,393	1,121,827	1,143,190	1,599,243	1,474,444	1,535,676	1,849,026
Fruits	226,411	389,793	314,545	267,989	218,699	418,562	424,869	390,433	501,598
Dried Vegetables	(125,391)	(2,142)	23,646	11,651	(21,432)	24,651	(47,013)	(24,142)	(93,317)
Tubers	(3,332)	(3,614)	(2,639)	(8,267)	(10,499)	(7,033)	(7,518)	(10,089)	(10,880)
Forages	(336,899)	(364,615)	(543,632)	(394,949)	(414,204)	(266,748)	(330,033)	(278,833)	(357,825)
Industrial products	382,168	414,011	292,925	281,304	335,387	650,756	614,133	700,600	538,438
Flowers	14,492	14,141	21,900	2,552	534	5,611	6,630	4,563	8,123
Other agricultural products	(47,871)	(49,701)	(52,748)	(54,217)	(52,343)	(50,316)	(66,507)	(66,307)	(83,457)

Table 3: Basic Crop Production (Thousand of tons).

<i>PRODUCT</i>	<i>1990</i>	<i>1991</i>	<i>1992</i>	<i>1993</i>	<i>1994</i>	<i>1995</i>	<i>1996</i>	<i>1997</i>	<i>1998</i>	<i>ARG 1990-98</i>	<i>ARG 1993-98</i>
Maise	14,635.4	14,251.5	16,929.3	18,125.3	18,235.8	18,352.9	18,026.0	17,656.3	18,454.7	2.9	0.4
Beans	1,287.4	1,378.5	718.6	1,287.6	1,364.2	1,270.9	1,349.1	965.1	1,260.7	-0.3	-0.4
Wheat	3,930.9	4,060.7	3,620.5	3,582.5	4,150.9	3,468.2	3,375.0	3,656.6	3,235.1	-2.4	-2.0
Rice	394.4	347.2	394.0	287.2	373.6	367.0	394.1	469.5	458.1	1.9	9.8
Soybeans	575.4	725.0	593.5	497.6	522.6	189.8	56.1	184.5	150.3	-15.4	-21.3
Sesame	59.9	37.0	22.8	22.6	8.9	21.1	47.4	21.5	31.7	-7.7	6.9
Cotton Seed	293.3	307.3	50.4	41.8	187.1	343.9	420.9	347.7	388.0	3.6	56.1
Safflower	159.4	88.2	41.0	63.9	63.9	113.3	181.6	163.4	171.2	0.9	21.8
Sorghum	5,978.2	4,307.8	5,353.2	2,581.1	3,701.1	4,169.9	6,809.5	5,711.6	6,474.8	1.0	20.2
Barley	491.9	580.2	550.0	540.5	307.3	486.6	585.8	470.7	410.8	-2.2	-5.3
Total	27,806.2	26,083.4	28,273.4	27,030.0	28,915.4	28,783.5	31,245.3	29,646.7	31,035.3	1.4	2.8

Source: Centro de Estadística Agropecuaria, SAGAR.

Table 4: Fruit and Vegetable Production (Thousand of tons)

<i>Product</i>	<i>1990</i>	<i>1991</i>	<i>1992</i>	<i>1993</i>	<i>1994</i>	<i>1995</i>	<i>1996</i>	<i>1997</i>	<i>1998</i>	<i>ARG 90-98</i>	<i>ARG 93-98</i>
Oranges	2,220.3	2,369.5	2,541.5	2,913.7	3,191.1	3,571.5	3,984.6	3,943.9	3,329.2	5.2	2.7
Bananas	1,986.4	1,889.3	2,095.4	2,206.9	2,295.5	2,032.7	2,209.6	1,714.5	1,556.6	-3.0	-6.7
Mangoes	1,074.4	1,117.9	1,075.9	1,151.2	1,117.9	1,342.1	1,190.0	1,501.4	1,504.2	4.3	5.5
Limes	685.4	716.5	777.5	725.2	813.3	947.5	1,089.2	1,095.6	1,211.5	7.4	10.8
Apples	456.5	527.4	598.2	537.8	487.7	413.2	426.7	629.3	374.3	-2.5	-7.0
Melons	523.2	645.3	495.7	394.2	446.7	424.0	472.0	590.2	572.7	1.1	7.8
Watermelons	404.1	392.7	499.0	387.6	428.0	484.8	533.6	709.6	649.9	6.1	10.9
Avocados	686.3	780.4	724.5	709.3	799.9	790.1	837.8	762.3	813.9	2.2	2.8
Grapes	428.9	529.6	522.0	466.6	536.9	475.9	408.3	473.3	482.0	1.5	0.7
Tomatoes	1,885.3	1,860.4	1,413.3	1,692.7	1,368.3	1,935.5	1,993.7	1,919.3	2,236.9	2.2	5.7
Green peppers	850.9	921.1	1,275.7	1,219.3	987.5	1,187.4	1,206.1	1,832.1	1,660.3	8.7	6.4
Onions	770.6	810.0	674.4	662.1	667.7	662.2	702.5	814.5	892.0	1.8	6.1
Potatoes	1,285.8	1,211.1	1,212.9	1,133.7	1,167.2	1,269.1	1,282.4	1,316.5	1,272.2	-0.1	2.3
Carrots	198.5	213.3	239.6	264.7	191.8	199.6	219.5	306.8	287.6	4.7	1.7
TOTAL	13,456.6	13,984.4	14,145.7	14,464.7	14,499.4	15,735.5	16,556.0	17,609.3	16,843.2	2.8	3.1

Source: Centro de Estadística Agropecuaria, SAGAR

Table 5: Main Agricultural Exports to the United States (Thousand of dollars).

<i>Products</i>	<i>1993</i>	<i>1994</i>	<i>1995</i>	<i>1996</i>	<i>1997</i>	<i>1998</i>	<i>Growth % 93-98</i>	<i>No. Supplier 1993 1998</i>	
Asparagus	41	39	69	80	11	143	249	1	1
Garlic	15	8	18	32	25	48	220	2	1
Peppers	163	161	221	176	254	299	83	1	1
Cucumbers	85	137	150	129	108	149	75	1	1
Fresh tomatoes	394	394	583	538	521	636	61	1	1
Limes	32	33	32	36	39	41	28	1	1
Vegetables	115	128	129	133	144	139	21	1	1
Mangoes	106	100	99	127	120	124	17	1	1
Onions	119	138	147	151	134	139	17	1	1
Grapes	36	36	65	52	69	94	161	2	2
Avocados	0	0	0	0	13	23	—	0	2
Dried Vegetables	8	6	7	9	13	13	63	5	3

Source: SECOFI with figures of USDOC

etables than in grains, the sector plays a key role in generating agricultural employment.

The average rate of growth of exports of vegetables to NAFTA countries was 10.2 percent during 1993-98, while exports of fruit increased at an annual rate of 10.5 percent over the same period. Main export products are tomatoes, bell peppers, onions, broccoli, cucumbers, squashes, limes, melons, watermelon, avocados, grapes, bananas, mangoes, grapefruits, etc. It is worth recalling that the United States has increased its exports of vegetables to Mexico during the summer. U.S. exports of apples have performed also dynamically. As a result, the domestic level of production of apples has actually decreased over the period. In fruits and vegetables, Mexico has become or maintained its position as the main supplier for the U.S. market for several relevant products.

NAFTA has opened new markets for Mexican products that didn't have an important market share in the United States. For example, for the period 1993-98 the exports to the United States of asparagus grew 249 percent, grapes 161 percent and strawberries 123 percent, among others.

Table 6 shows a deficit with NAFTA partners in livestock products. More than half of this deficit is explained by cattle and beef products. The

poultry sector ranks second in the contribution to this deficit, followed by pork and milk products.

The bovine sector has suffered from competition of NAFTA partners, and from severe droughts in 1995 and 1996. Nevertheless, meat production has grown on average at a rate of 1.9 percent (carcass weight equivalent) during 1993-98. Modernization of production units is occurring through the improvement of genetics and better practices for management of grasslands. Still, many units have been unable to survive, especially in the grain-fed sector. Before 1995, Mexico exported an average of 1.2 million live animals, but that declined to 458 thousand head in 1996. Since then, Mexican exports have recovered to 714 thousand heads in 1988. This recovery was helped by special programs to recover the herd level that existed before the droughts.

The poultry sector shows a completely different performance. Production has grown on average at a rate of 8.9 percent during 1993-98, even though the trade deficit (in carcass weight equivalents) has increased. Large investments, both domestically and foreign sourced, with state-of-the-art technologies have been made during the period. Sanitary campaigns during the last years eradicated diseases in many areas of the country. In the context of NAFTA rules and disciplines, it is foreseeable in the short run that disease free areas will be recognized by the United States and Canada. The integration of the poultry sector among NAFTA partners will be enhanced by different consumption patterns, since price differentials for chicken, legs, breasts, quads, wings and offal are large. Mexico is currently exporting poultry meat to markets with high quality and safety standards, such as Hong Kong and Japan.

The pork sector has increased production at an average rate of growth of 3.2 percent (carcass weight equivalent) during the period 1993-98. It is foreseeable that domestic demand will remain as the most important factor of dynamism in this sector, since NAFTA countries are net exporters. The United States has already recognized the State of Sonora as a free disease area, and other States are in the process of gaining that status under the rules of the SPS Agreement of NAFTA. Mexico is currently exporting pork to markets with high quality and safety standards, such as the United States and Japan. For the period 1996-98 Mexico's total average pork exports reached 102.7 million

dollars (73.9 percent to the United States, 16 percent to Japan, and 10.1 percent other countries).

The production of fresh milk grew at an average rate of growth of 3.8 percent during 1990-1998 (2.2 percent for 1993-1998). On a macroeconomic level, the performance of this sector was triggered by a gradual process of elimination of controls on consumer prices for fluid milk that ended in 1996. Since 1995, support to producers was used to enhance productivity through technological transfer, genetic improvement, mechanization, development of prairies, and the reinforcement of sanitary and inspection services. Most milk producers operate under cooperative schemes that allow vertical integration with the pasteurization plants. Under the provisions of the Mexican Law on Standards (*Ley de Metrología y Normalización*), producer organizations have been active in assuring the enforcement of standard and labeling regulations to improve consumer information.

The United States is the third largest supplier of milk powder to the Mexican market, after the EU and New Zealand. Since 1998 imports of skimmed milk powder from the United States have increased market share, reflecting the recovery of surpluses of milk after the droughts in 1995 and 1996, and a higher degree of integration between the dairy sector in both countries.

Table 8 summarizes processed agricultural products. Animal feeding preparations, vegetable oils, and canned food show a deficit which is largely compensated by a surplus in alcoholic beverages (mainly beer and tequila), and to a lesser extent, by a surplus in juices and sugar containing products. Exports of beer are concentrated in only two firms, while exports of juices come from about eight firms. In preparations of fruits and vegetables, the figures show basically a balanced trade.

Table 9 presents data on the main processed livestock products. As is the case in primary livestock products, Mexico also shows a deficit with its NAFTA partners in these products. Almost one fourth of the deficit is due to processed dairy products, and 45 percent is generated by imports of animal oils and fats (products with low consumer acceptance in the United States but widely used in Mexico). The dairy processing industry showed an average rate of growth

Table 6: Livestock Trade Balance Mexico, United States and Canada (Thousands dollars).

	1990	1991	1992	1993	1994	1995	1996	1997	1998
Trade Balance	(257,175)	(581,939)	(700,055)	(533,502)	(870,423)	(100,289)	(719,422)	(1,037,306)	(1,227,184)
Bovine	70,342	(227,199)	(314,168)	45,653	(238,690)	322,777	(303,290)	(542,527)	(633,724)
Pig	(134,134)	(184,809)	(182,512)	(162,899)	(205,151)	(70,782)	(75,118)	(97,190)	(136,930)
Poultry	(7,687)	(11,736)	(11,010)	(180,797)	(221,463)	(186,378)	(221,789)	(256,647)	(249,734)
Ovine	(23,713)	(33,662)	(35,322)	(28,514)	(26,657)	(10,111)	(9,359)	(10,458)	(10,464)
Goat	(5,300)	(3,063)	(2,309)	(1,743)	(1,971)	(711)	(2,104)	(1,848)	(2,300)
Dairy (milk)	(116,119)	(77,393)	(109,029)	(161,182)	(127,760)	(129,957)	(74,881)	(70,836)	(115,336)
Eggs	(6,679)	(7,920)	(10,669)	(12,705)	(15,303)	(11,766)	(16,140)	(24,966)	(36,742)
Honey	6,153	3,279	2,085	2,330	2,392	2,815	11,100	11,334	4,686
Other livestock products	(40,039)	(39,435)	(37,120)	(33,645)	(35,820)	(16,174)	(27,842)	(44,167)	(46,641)

Source: SECOFI

Table 7: Livestock Production (Thousand of tons).

<i>Product</i>	1990	1991	1992	1993	1994	1995	1996	1997	1998	ARG 90-98	ARG 93-98
Carcass Meat	2,704.4	2,945.1	3,059.6	3,206.3	3,451.0	3,704.9	3,589.5	3,805.7	4,028.7	5.1	4.7
Bovine	1,113.9	1,188.7	1,247.2	1,256.5	1,364.7	1,412.3	1,329.9	1,340.1	1,379.8	2.7	1.9
Swine	757.4	811.9	819.8	821.6	872.9	921.6	910.3	939.2	960.7	3.0	3.2
Poultry	772.3	878.9	921.8	1,058.0	1,144.4	1,303.4	1,284.0	1,460.9	1,619.5	9.7	8.9
Ovine	24.7	26.3	27.9	28.7	30.3	29.9	29.4	30.2	30.5	2.7	1.2
Goat ¹	36.1	39.3	42.9	41.5	38.7	37.7	35.9	35.3	38.2	0.7	-1.6
Milk	6,265.9	6,847.8	7,114.1	7,555.2	7,461.5	7,537.6	7,709.3	7,968.6	8,442.0	3.8	2.2
Eggs	1,009.8	1,141.4	1,161.3	1,233.6	1,246.2	1,242.0	1,235.9	1,328.9	1,461.2	4.7	3.4
Honey	66.5	69.5	63.9	62.0	56.4	49.2	49.2	53.7	56.1	-2.1	-2.0

Source: Centro de Estadística Agropecuaria, SAGAR.

¹ Millions of liters. Includes bovine and goat milk.

Table 8: Agricultural Processed Products Trade Balance (Thousands dollars).

	1990	1991	1992	1993	1994	1995	1996	1997	1998
Trade Balance	(226,933)	(178,080)	(474,347)	(538,537)	(679,996)	(66,864)	(9,985)	(110,234)	(260,031)
Animal feeding preparations	(112,162)	(152,016)	(221,524)	(184,045)	(249,108)	(166,805)	(179,194)	(165,699)	(213,954)
Vegetable oils	(139,884)	(46,811)	(58,352)	(87,403)	(95,819)	(186,558)	(128,918)	(170,015)	(252,709)
Alcoholic beverages	189,562	184,782	202,771	233,560	273,917	348,584	424,203	554,948	730,157
Preparations of fruit, vegetables or other parts of plants	41,816	72,672	38,295	43,972	24,251	82,898	26,173	17,312	(15,734)
Sugar containing products	(37,735)	(60,595)	(79,520)	(88,180)	(81,829)	16,556	44,647	73,124	71,907
Juices	103,253	58,912	19,834	25,723	47,182	86,793	89,639	80,609	112,165
Other agricultural preparations	(271,784)	(235,025)	(375,852)	(482,164)	(598,590)	(248,331)	(286,535)	(500,513)	(691,863)

Source: SECOFI

Table 9: Livestock Processed Products Trade Balance by Cluster (Thousands dollars).

	1990	1991	1992	1993	1994	1995	1996	1997	1998
Trade Balance	(168,317)	(225,185)	(322,311)	(395,909)	(454,527)	(356,075)	(307,828)	(354,314)	(411,502)
Preparations of livestock products	(2,645)	2,381	(9,138)	(14,091)	(14,669)	(6,041)	(3,172)	(6,389)	(4,603)
Dairy products	(60,049)	(85,677)	(138,956)	(157,969)	(178,062)	(124,872)	(72,992)	(88,970)	(102,484)
Preparations of animal meat	(23,018)	(44,423)	(70,918)	(92,067)	(106,038)	(48,932)	(39,849)	(52,046)	(56,733)
Oils and fats	(65,633)	(79,168)	(78,710)	(106,454)	(126,684)	(148,286)	(149,557)	(155,326)	(185,611)
Other livestock preparations	(16,972)	(18,298)	(24,590)	(25,329)	(29,075)	(27,945)	(42,259)	(51,583)	(62,071)

Source: SECOFI

of 4.9 percent in the period 1994-98. Multinationals play a key role in this market, and are developing new products targeted for different strata of consumers. On the other hand, technological change poses a challenge, since new formulas for the manufacturing of several dairy products have been developed in order to reduce costs. These formulas include whey concentrates, proteins and fats of vegetable origin, mixers and blenders, among other ingredients. These technologies have allowed development of products targeted to low income consumers and are substituting fresh milk and milk powder. Therefore it will be necessary for milk producers and processors in Mexico to develop new strategies to be able to compete in a fast changing business environment.

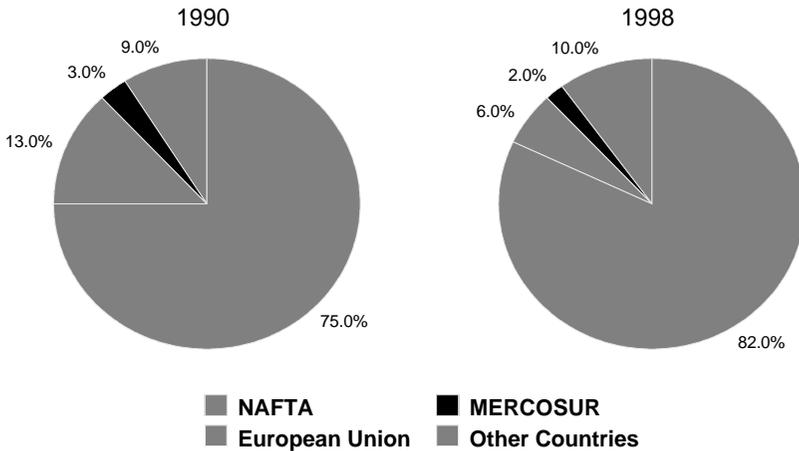
CONCENTRATION OF MEXICAN AGRICULTURAL TRADE WITH NAFTA PARTNERS

Mexican trade in agriculture, livestock, and processed food and beverages, is heavily concentrated in the NAFTA area. The share of total trade in agri-food with NAFTA partners amounted to 75 percent in 1990 and increased to 82 percent in 1998. The share of the European Union dropped from 13 percent to 6 percent during the same period. Given the terms of the negotiation in agricultural products between Mexico and the EU, it might be expected that the great bulk of imports from NAFTA countries will not be displaced, and that Mexican exports to the EU might increase significantly.

CONCLUDING REMARKS

The underlying hypothesis during the NAFTA negotiations in agriculture was that Mexico, the United States and Canada are complementary at a large extent in overall agricultural production. The evidence after five years of implementation seems to confirm that.

For most sectors in which the trade deficit has increased, domestic production has also increased. In this context, domestic support programs implemented by the Mexican government should not be neglected. Upon implementation of NAFTA, the instruments to support agriculture changed drastically. Guaranteed prices were substituted for direct payments. This

Figure 1: Share of Main Trading Partners in Mexican Agri-Food Trade.

occurred mainly through PROCAMPO, and since 1995, a program known as Alianza para el Campo has fostered competitiveness through the adoption of modern technologies, an efficient use of resources, training in production practices and marketing, and phytosanitary campaigns, among other instruments. Interested readers in recent developments in agricultural policies may consult The Monitoring Outlook of the OECD.

Upon full implementation of the NAFTA, the Trade Agreement with the EU and other preferential trade agreements with several Latin American countries, the real constraint for the expansion of exports of Mexican agri-food will be the country's capacity to overcome structural problems such as infrastructure, technology, the degree of producer organization, lack of knowledge of foreign markets, excessive land fragmentation, and last but not least, the rather low degree of vertical integration between the producer of primary products and food processors.

APPENDIX

AGRICULTURAL SUBSECTOR CLASSIFICATION

Subsector	Chapter	Subchapter	Description
	Cereals		
A	1	1	Maize "corn"
A	1	2	Rice
A	1	3	Wheat
A	1	4	Other cereals
	Oilseeds		
A	2	1	Soya beans
A	2	2	Safflower seeds
A	2	3	Sesame seeds
A	2	4	Chestnuts (peanuts)
A	2	5	Other seeds and oilseed fruits, whether or not crushed
	Vegetables		
A	3	1	Onions
A	3	2	Peas
A	3	3	Cauliflower and broccoli cut, fresh or chilled
A	3	4	Cucumbers and gherkins, fresh or chilled
A	3	5	Tomatoes
A	3	6	Asparagus
A	3	7	Carrots and swedes, fresh or chilled
A	3	8	Peppers
A	3	9	Other vegetables; mixtures of vegetables, dried, cut in pieces or in slices, crushed or powdered
	Fruits		
A	4	1	Fresh avocados
A	4	2	Peaches, including nectarines
A	4	3	Fresh Strawberries
A	4	4	Fresh guavas, mangoes and mangosteens
A	4	5	Lemons and limes
A	4	6	Mandarins (including tangerines and satsumas); clementines, wilkings and similar citrus hybrids
A	4	7	Apples
A	4	8	Pears and quinces
A	4	9	Watermelons, melons and papaws
A	4	10	Fresh or dried oranges
A	4	11	Nuts and other shelled fruits, fresh or dried, whether or not shelled or peeled
A	4	12	Fresh pineapples
A	4	13	Fresh or dried bananas
A	4	14	Fresh grapes
A	4	15	Other fresh fruits

Subsector	Chapter	Subchapter	Description
			<i>Dried Vegetables</i>
A	5	1	Beans (<i>Vigna</i> spp., <i>Phaseolus</i> spp)
A	5	2	Dried, shelled chickpeas, whether or not skinned or split
A	5	3	Broad beans (<i>Vicia faba</i> var. Major), horse beans (<i>Vicia faba</i> var. Equine and <i>Vicia faba</i> var. Minor)
A	5	4	Dried, shelled lentils, whether or not skinned or split
A	5	5	Other beans, dried, shelled, whether or not skinned or split
			<i>Tubers</i>
A	6	1	Seeds potatoes
A	6	2	Yams
A	6	3	Other roots and tubers with high starch or inulin content, fresh or dried, whether or not sliced or in the form of "pellets"; sago pith
			<i>Forages</i>
A	7	1	Sorghum
A	7	2	Other forages (swedes, mangolds, fodder roots, hay, alfalfa, clover, sainfoin, forage kale, altramuces, vetches and similar forage products, whether or not in the form of "pellets")
			<i>Industrial products</i>
A	8	5	Barley
A	8	1	Coffee
A	8	2	Sugar
A	8	3	Tobacco
A	8	4	Cocoa
A	8	6	Other industrial crops
			<i>Flowers</i>
A	9	1	Bulbs, corms, tubers, tuberous roots, crowns and rhizomes, in growth or in flower
A	9	2	Unrooted vine cuttings and slips and other parts of plants for growth, unrooted, and grafted cacti
A	9	3	Cut flowers and buds, for bouquets or for ornamental purposes, dyed, bleached, impregnated or otherwise prepared
A	9	4	Foliage, branches and other parts of plants, without flowers or flower buds, grasses, fresh, for bouquets or ornamental purposes, dyed, bleached, impregnated or otherwise prepared
			<i>Other Crops</i>
A	99	1	Other crops

LIVESTOCK SUBSECTOR CLASSIFICATION

Subsector	Chapter	Subchapter	Description
	Bovine		
P	1	1	Live bovines
P	1	2	Carcasses or half-carcasses of bovine animals
P	1	3	Bovine meat
P	1	4	Bovine offal
	Swine		
P	2	1	Live swine
P	2	2	Carcasses or half-carcasses of swine animals
P	2	3	Swine meat
P	2	4	Swine offal
	Poultry		
P	3	1	Live fowls
P	3	2	Edible meat or meat offal of fowls, not cut in pieces
P	3	3	Pieces and meat offal of fowls
P	3	4	Other pieces and meat offal of fowls
	Ovine		
P	4	1	Live ovines
P	4	2	Carcasses or half-carcasses of ovine animals
P	4	3	Ovine meat
	Goat		
P	5	1	Live goats
P	5	2	Goat meat
	Dairy		
P	6	1	Milk and cream not concentrated, unsweetened, nor otherwise sweetened
P	6	2	Milk and cream concentrated, sweetened, or otherwise sweetened
P	6	3	Other milks and creams
	Egg		
P	7	1	Birds eggs, in shell, fresh, preserved or cooked
P	7	2	Birds eggs not in shell y egg yolks, fresh, dried, cooked by steaming or boiling in water, moulded, frozen or otherwise preserved, whether or not sweetened
	Honey		
P	8	1	Natural honey
	Other livestock		
P	99	1	Other live animals
P	99	2	Other (fresh, chilled or frozen animal meat)
P	99	3	Other animal meat offal

PROCESSED AGRICULTURAL SUBSECTOR CLASSIFICATION

Subsector	Chapter	Subchapter	Description
			<i>Cereal derivatives</i>
A1	1	1	Of maize "corn"
A1	1	2	Of rice
A1	1	3	Of wheat
A1	1	4	Of other cereals
			<i>Oilseed derivatives</i>
A1	2	1	Of soya beans
A1	2	2	Of safflower seeds
A1	2	3	Of sesame seeds
A1	2	4	Of chestnuts (peanuts)
A1	2	5	Of other seeds and oilseed fruits, whether or not crushed
			<i>Vegetable derivatives</i>
A1	3	1	Of onions
A1	3	2	Of peas
A1	3	3	Of cauliflower and broccoli cut, fresh or chilled
A1	3	4	Of cucumbers and gherkins, fresh or chilled
A1	3	5	Of tomatoes
A1	3	6	Of asparagus
A1	3	7	Of carrots and swedes, fresh or chilled
A1	3	8	Of peppers
A1	3	9	Of other vegetables; mixtures of vegetables, dried, cut in pieces or in slices, crushed or powdered
			<i>Fruit derivatives</i>
A1	4	1	Of fresh avocados
A1	4	2	Of peaches, including nectarines
A1	4	3	Of fresh Strawberries
A1	4	4	Of fresh guavas, mangoes and mangosteens
A1	4	5	Of lemons and limes
A1	4	6	Of mandarins (including tangerines and satsumas); clementines, wilkings and similar citrus hybrids
A1	4	7	Of apples
A1	4	8	Of pears and quinces
A1	4	9	Of watermelons, melons and papaws
A1	4	10	Of fresh or dried oranges
A1	4	11	Of nuts and other shelled fruits, fresh or dried, whether or not shelled or peeled
A1	4	12	Of fresh pineapples
A1	4	13	Of fresh or dried bananas
A1	4	14	Of fresh grapes
A1	4	15	Of other fresh fruits

Subsector	Chapter	Subchapter	Description
			<i>Dried vegetables derivatives</i>
A1	5	1	Of beans (<i>Vigna</i> spp., <i>Phaseolus</i> spp)
A1	5	2	Of dried, shelled chickpeas, whether or not skinned or split
A1	5	3	Of broad beans (<i>Vicia faba</i> var. Major), horse beans (<i>Vicia faba</i> var. Equine and <i>Vicia faba</i> var. Minor)
A1	5	4	Of dried, shelled lentils, whether or not skinned or split
A1	5	5	Of other beans, dried, shelled, whether or not skinned or split
			<i>Tubers preparations</i>
A1	6	1	Of seeds potatoes
A1	6	2	Of yams
A1	6	3	Of other roots and tubers with high starch or inulin content, fresh or dried, whether or not sliced or in the form of "pellets"; sago pith
			<i>Feed and Animal food</i>
A1	7	1	Of sorghum
A1	7	2	Of other forages
			<i>Industrial crops derivatives</i>
A1	8	1	Of Coffee
A1	8	2	Of sugar
A1	8	3	Of tobacco
A1	8	4	Of cocoa
A1	8	5	Of barley
A1	8	5	Of other industrial crops
			<i>Wines, spirituous and alcoholic beverages</i>
A1	9	1	Of wines
A1	9	2	Of other alcoholic beverages
			<i>Other preparations based on agricultural raw materials</i>
A1	99	1	Of other preparations

PROCESSED LIVESTOCK SUBSECTOR CLASSIFICATION

Subsector	Chapter	Subchapter	Description
			<i>Bovine derivatives</i>
P1	1	1	Of live bovines
P1	1	2	Of carcasses or half-carcasses of bovine animals
P1	1	3	Of bovine meat
P1	1	4	Of bovine offal
			<i>Swine derivatives</i>
P1	2	1	Of live swine
P1	2	2	Of carcasses or half-carcasses of swine animals
P1	2	3	Of swine meat
P1	2	4	Of swine offal
			<i>Poultry derivatives</i>
P1	3	1	Of live fowls
P1	3	2	Of edible meat or meat offal of fowls, not cut in pieces
P1	3	3	Of pieces and meat offal of fowls
P1	3	4	Of other pieces and meat offal of fowls
			<i>Ovine derivatives</i>
P1	4	1	Of live ovines
P1	4	2	Of carcasses or half-carcasses of ovine animals
P1	4	3	Of ovine meat
			<i>Poultry derivatives</i>
P1	5	1	Of live goats
P1	5	2	Of goat meat
			<i>Dairy derivatives</i>
P1	6	1	Cheeses, yogurt, and other milkfat
			<i>Other industrial preparations based on livestock products</i>
P1	99	1	Other preparations