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**An Overview of Cuban Agriculture and Prospects for  
Future Trade with the United States**

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## **Abstract**

For many years, the United States has blocked trade with Cuba, but the situation has recently changed. The Trade Sanctions Reform and Export Enhancement Act of 2000 loosened U.S. sanctions on agricultural exports to Cuba, allowing Cuba to buy from the United States using cash but not credit. The objectives of this study are to analyze Cuban agricultural production and trade and to estimate potential agricultural trade flows that could occur between the United States and Cuba if the embargo was completely lifted. The effects of various increases in Cuban GDP on Cuban import demand are also analyzed. Cuba could be a significant market for U.S. exports of wheat, wheat flour, rice, corn, pulses, poultry, and dairy products, while the United States would likely import sugar, citrus, and tobacco products from Cuba.

**Keywords:** Cuba, embargo, agricultural trade potential



# **An Overview of Cuban Agriculture and Prospects for Future Trade with the United States**

**Jeremy W. Mattson and Won W. Koo\***

## **INTRODUCTION**

The United States blocked trade with Cuba for many years, but the situation has recently changed. The United States imposed an embargo on Cuba in 1960 with the intent of weakening Castro's communist regime. Additional legislative acts in the 1990s further tightened the embargo (Maness). However, U.S. congressional and popular attitudes towards policies on Cuba have been changing. The Trade Sanctions Reform and Export Enhancement Act of 2000 altered the U.S. - Cuba trade relationship by allowing certain exceptions from U.S. sanctions on agricultural and medical exports. The legislation loosens U.S. sanctions on agricultural exports to Cuba, but a number of strict laws remain in place. U.S. law prohibits any U.S. person or company from providing credit to anyone in Cuba, meaning Cubans can only buy from the United States using cash up front. The legislation did not reverse the U.S. ban on imports from Cuba. There is a growing movement among U.S. businesses and politicians to further ease or end the embargo against Cuba, but the Bush administration opposes further liberalization as long as Castro is in power.

Prior to 1960, Cuba was a major trading partner for the United States. The country was one of the top two export markets in Latin America for U.S. agricultural products, and the United States was the top market for Cuban agricultural exports (Messina et al., 1997). The political circumstances between the two countries have changed dramatically since 1960, but many U.S. producers and agribusinesses are interested in the increased market opportunities that Cuba presents. Since the easing of the embargo in 2000, a number of U.S. trade delegations have traveled to Cuba, and Cuba has started to import U.S. agricultural products. A four-day exposition in Havana, held in September 2002, featured over 150 U.S. businesses displaying their products, and a number of states sent agricultural officials. U.S. agricultural producers and agribusinesses believe they can benefit from increased access to the Cuban market.

The Cuban economy declined sharply in the early 1990s with the fall of the Soviet Union. Cuba enjoyed preferential export markets in the USSR and Eastern Europe, and the state sugar and citrus industries were essentially subsidized by the Soviet Union. When this support disappeared, Cuban exports and production dropped considerably. Cuban real GDP (in 1981 terms) dropped from 19.0 billion pesos in 1990 to 12.8 billion pesos in 1993. The Cuban economy has been slowly recovering since the mid-1990s, and an increase in Cuban income would likely result in a rise in the level of agricultural imports.

The objective of this study is to analyze the agricultural situation in Cuba and the prospects for future U.S. - Cuba trade under a liberalized environment. The next sections describe Cuban agricultural production and trade, and the subsequent section analyzes possibilities for U.S. agricultural trade with Cuba under a lifted embargo and with various increases in Cuban GDP.

## **CUBAN AGRICULTURAL PRODUCTION**

Sugarcane has long been the dominant crop produced in Cuba. From 1961 to 2002, annual sugarcane production averaged 5.9 million metric tons. For comparison purposes, the United States

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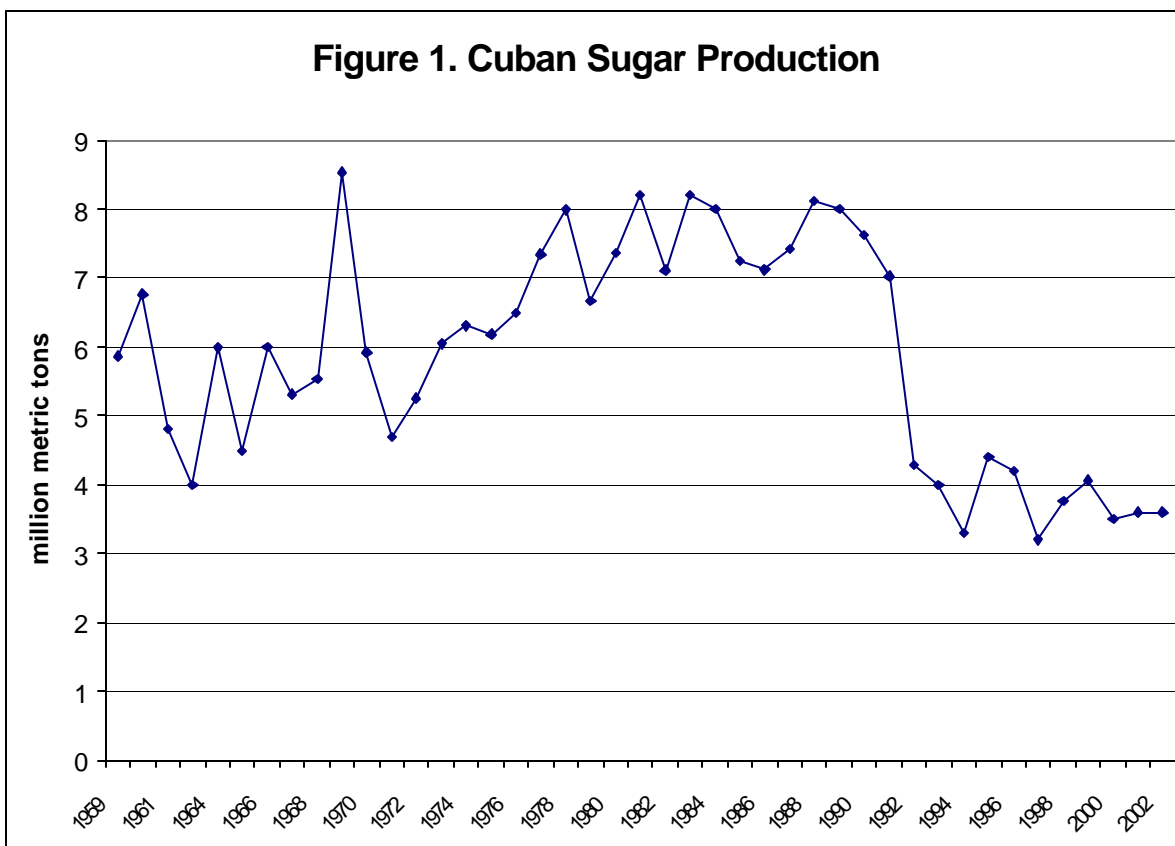
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produces about 7.5 million metric tons of sugar per year. The annual sugarcane harvest from 1961 to 2002 has averaged 1.2 million hectares in Cuba. The total amount of arable land in Cuba during this period has ranged from 1.6 million hectares in 1961 to 3.7 million hectares in the mid 1990s, indicating that a substantial portion of Cuban agriculture has been devoted to sugar.

Prior to 1960, Cuba exported significant quantities of sugar to the United States. In fact, the United States received 33 percent of its sugar needs from Cuba (ERS 1998). After the U.S. embargo was implemented, Cuba exported sugar to Eastern Europe and the Soviet Union, who bartered low-priced oil for high-priced sugar from 1960 to 1991 (ERS 1998). Cuban sugar production generally increased throughout the 1960s, 1970s, and 1980s (Figure 1). Average annual production increased from 5.7 million metric tons in the 1960s to 6.3 million metric tons in the 1970s and to 7.6 million metric tons in the 1980s. Production reached a high of 8 million metric tons in the late 1980s.

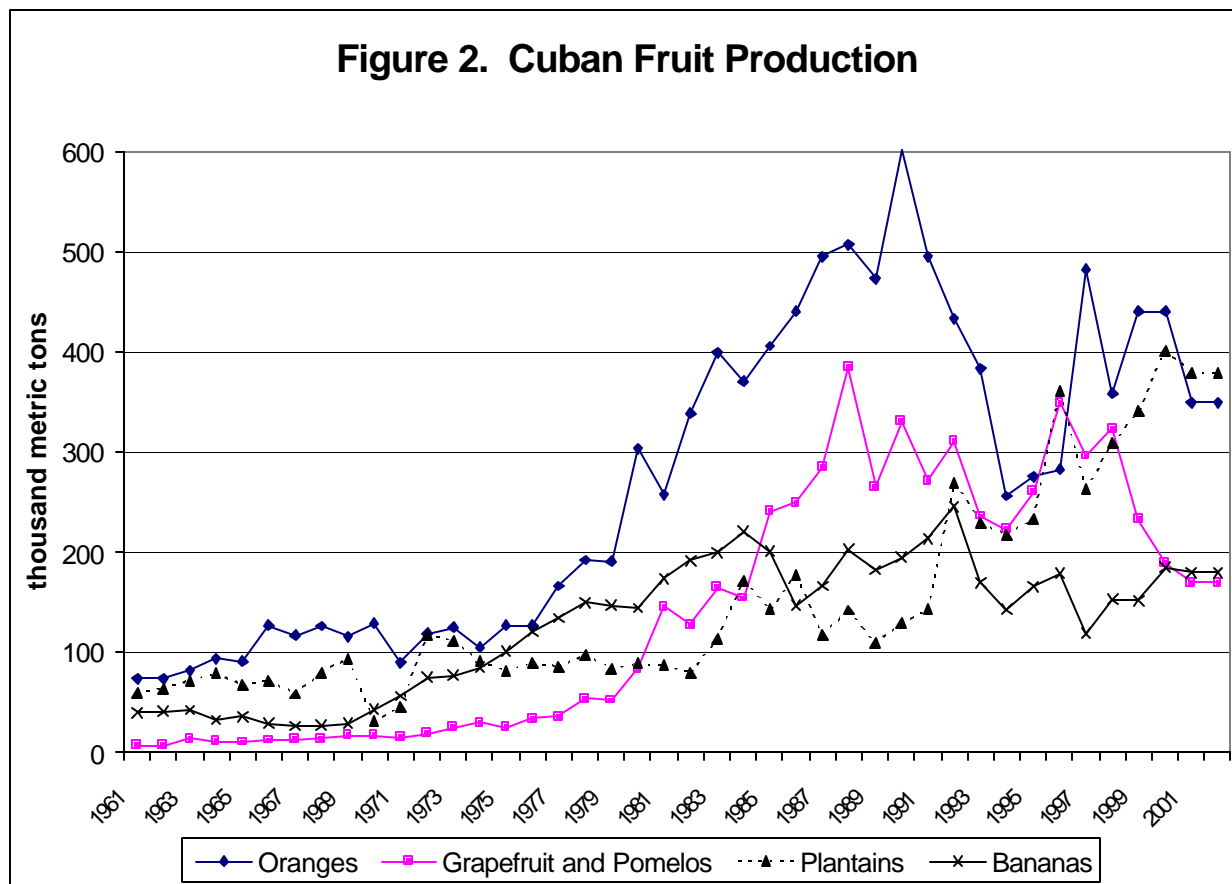
Until the Soviet Union fell in 1991, Cuba had enjoyed guaranteed markets at premium prices for its sugar. After 1991, Cuban sugar production fell dramatically. Annual production in recent years has averaged 3.6 million metric tons. Because the Cuban sugar industry was essentially being subsidized by the Soviet Union, it had little incentive to improve efficiency, resulting in a high-cost product processed by a number of small and outdated mills (ERS 1998). When the guaranteed importers disappeared, Cuba could not compete



Source: PS&D Database, FAS/USDA

in the world market, so production dropped.

Cuba currently has a plan to reorganize their sugar industry. They are closing 70 of their 154 sugar processing plants, while attempting to maintain annual production of more than 4 million metric tons of sugar. The state will trim about 100,000 of the nation's 420,000 sugar production workers (Agweek, March 10, 2003).

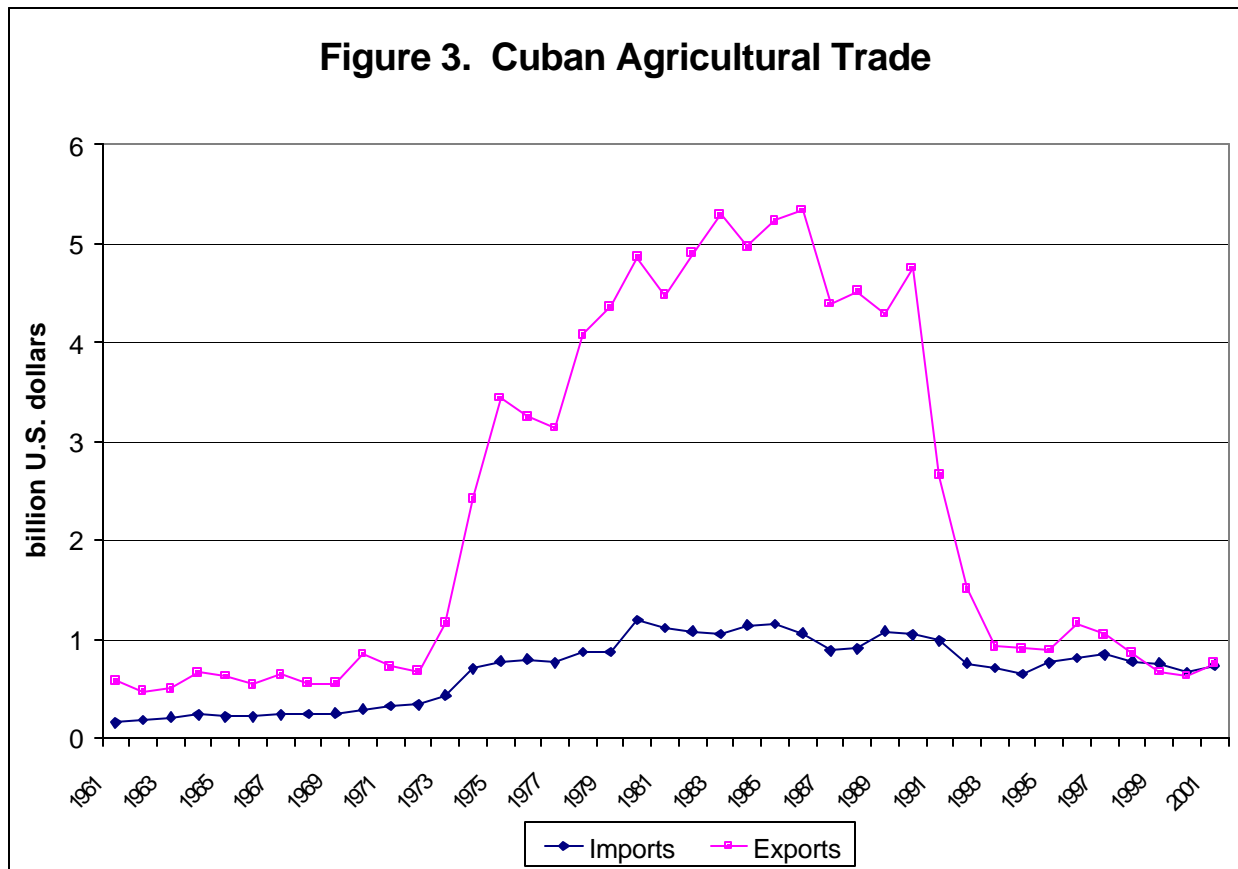


Source: FAOSTAT

Other goods produced in Cuba include oranges, plantains, potatoes, rice, casava, grapefruit, corn, bananas, and tomatoes. Figure 2 shows Cuban production of oranges, grapefruit, plantains, and bananas. Cuba is one of the world's leading grapefruit producers. Citrus production, including oranges and grapefruit, increased dramatically in the 1970s and 1980s and, like sugar production, fell in the 1990s. By contrast, plantain production has continued to increase throughout the 1990s.

### CUBAN AGRICULTURAL TRADE

Figure 3 shows Cuban agricultural exports and imports from 1961 to 2001. Until recently, Cuba has maintained an agricultural trade surplus. This surplus was particularly large from the early 1970s to the early 1990s, peaking at \$4.3 billion in 1986. The agricultural trade surplus declined dramatically in the early 1990s, from \$3.7 billion in 1990 to only \$213 million in 1993, coinciding with the decline in Cuban agricultural exports from \$4.7 billion in 1990 to \$920 million in 1993. The drop in the value of exports was due to the loss of preferential export markets in the Soviet Union and Eastern Europe. Because of a loss in purchasing



Source: FAOSTAT

power, agricultural imports also fell during this period, but not to the same extent. Cuban agricultural imports averaged over \$1 billion in the 1980s and fell to \$640 million in 1994. From 1999 to 2001, Cuban agricultural exports and imports have ranged from \$600 to \$700 million.

### Exports

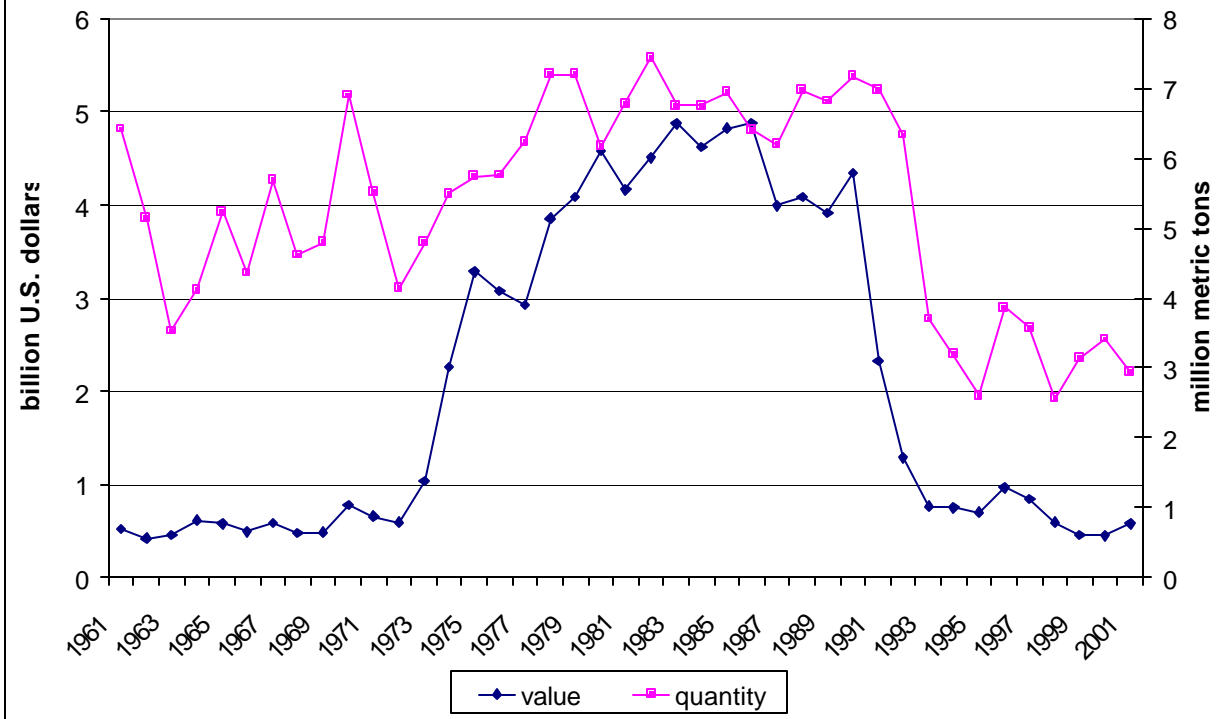
The trend in the value of Cuban sugar exports (Figure 4) looks remarkably similar to the trend in the value of total Cuban agricultural exports. Before 1991, sugar accounted for over 90 percent of the total value of Cuban agricultural exports and about 75 percent of the value of total Cuban exports. Those percentages have fallen in recent years to about 75 percent and 30 percent, respectively. Sugar exports fell from 7.2 million metric tons in 1990 to 2.9 million metric tons in 2001. The value of sugar exports dropped from \$4.3 billion in 1990 to \$580 million in 2001.

Other agricultural products exported by Cuba include oranges, grapefruit, tobacco, coffee, and molasses. Cuban citrus exports also benefitted from preferential markets in the Soviet Union and Eastern Europe and have followed a pattern similar to sugar exports, declining greatly in the 1990s (Figure 5). Exports of coffee and molasses also peaked in the 1980s and decreased in the 1990s. On the other hand, Cuban exports of cigars have avoided a decline and have actually increased (Figure 6).

## Imports

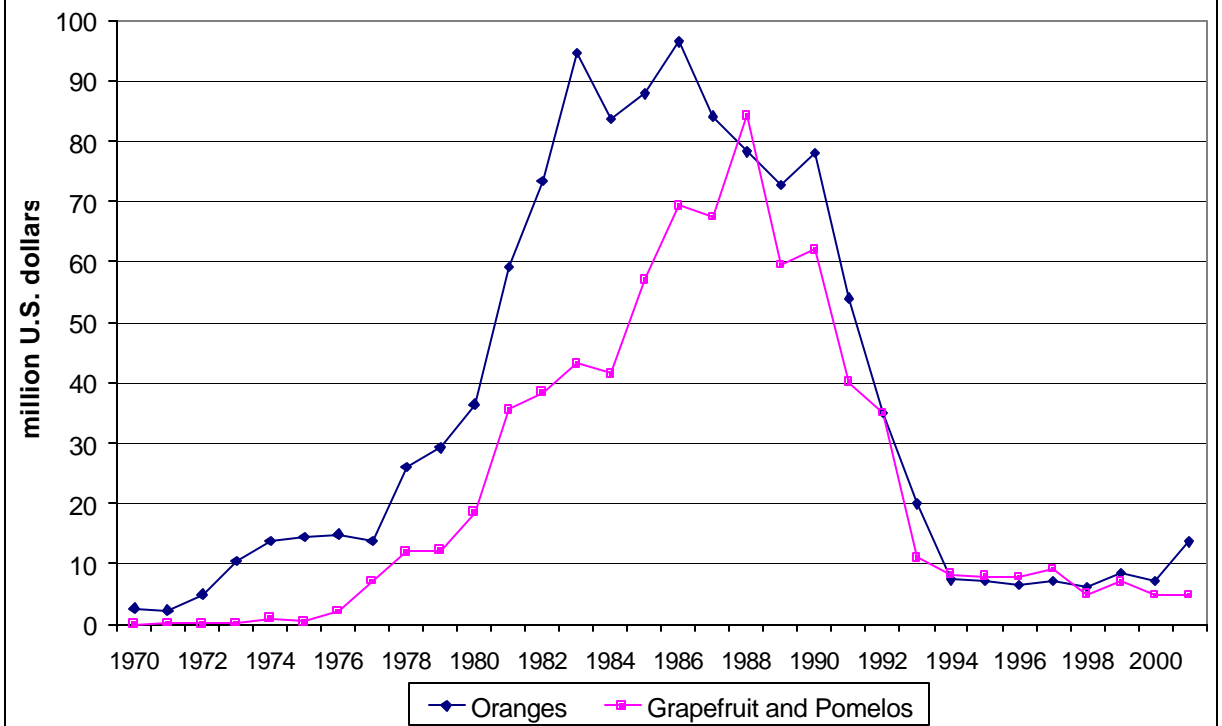
The major agricultural products imported by Cuba include rice, wheat, wheat flour, dairy, pulses, poultry, soybean meal and oil, and corn. Temperate-zone products that cannot be grown in Cuba have become staples in the Cuban diet. Therefore, Cuba must continue to import these products. Figure 7 shows Cuban imports of rice, wheat, and wheat flour; Figure 8 shows imports of dairy and meat; Figure 9 shows imports of soybeans, soybean meal, and soybean oil; and Figure 10 shows imports of corn and pulses.

**Figure 4. Cuban Sugar Exports**



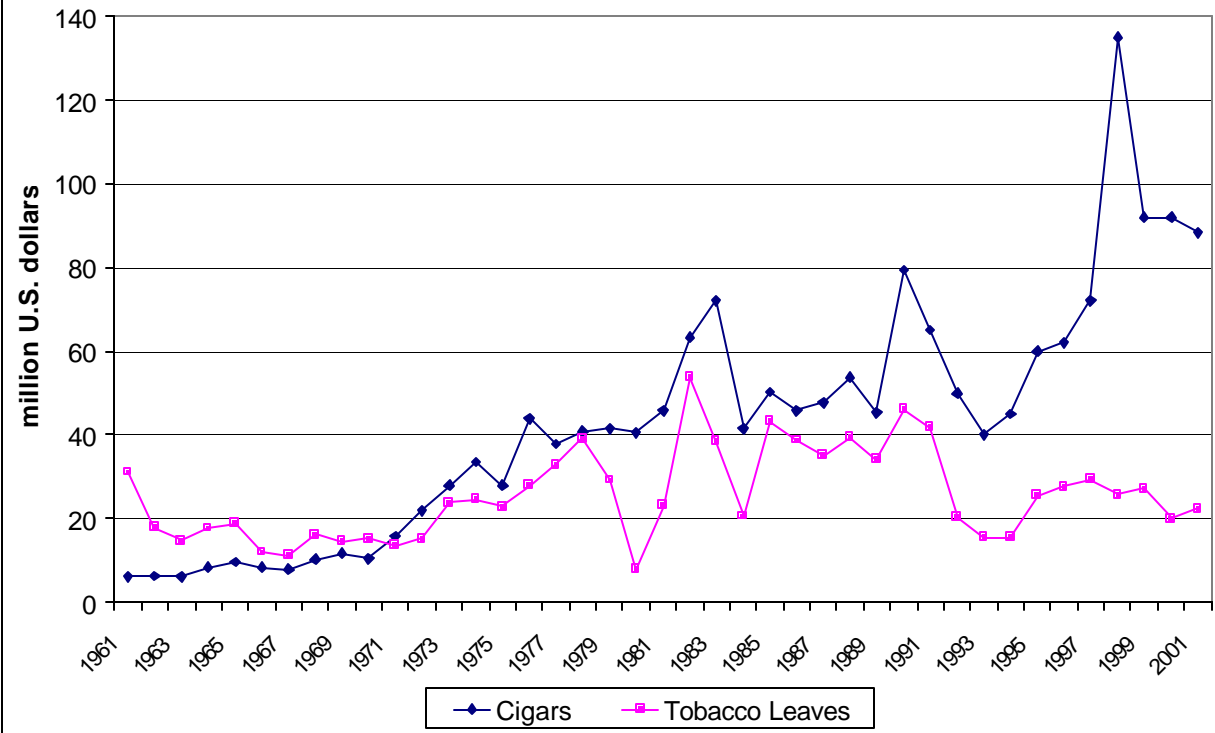
Source: FAOSTAT

**Figure 5. Cuban Citrus Exports**



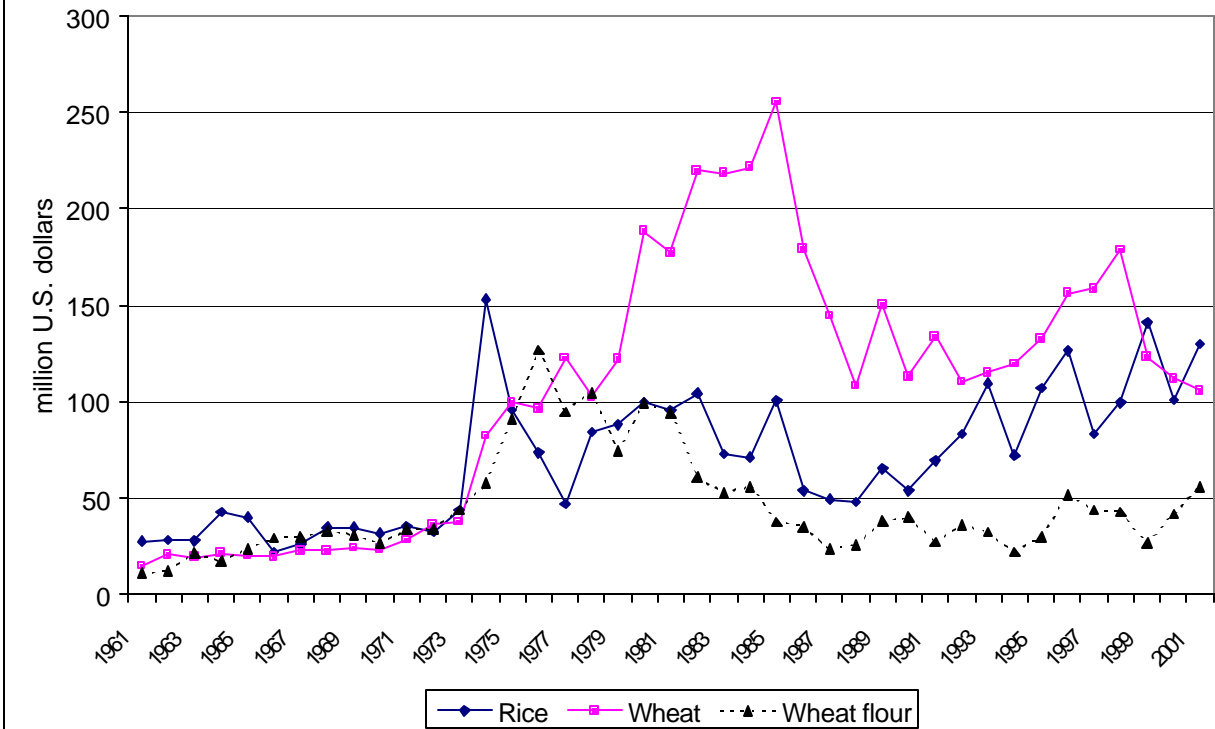
Source: FAOSTAT

**Figure 6. Cuban Tobacco Exports**



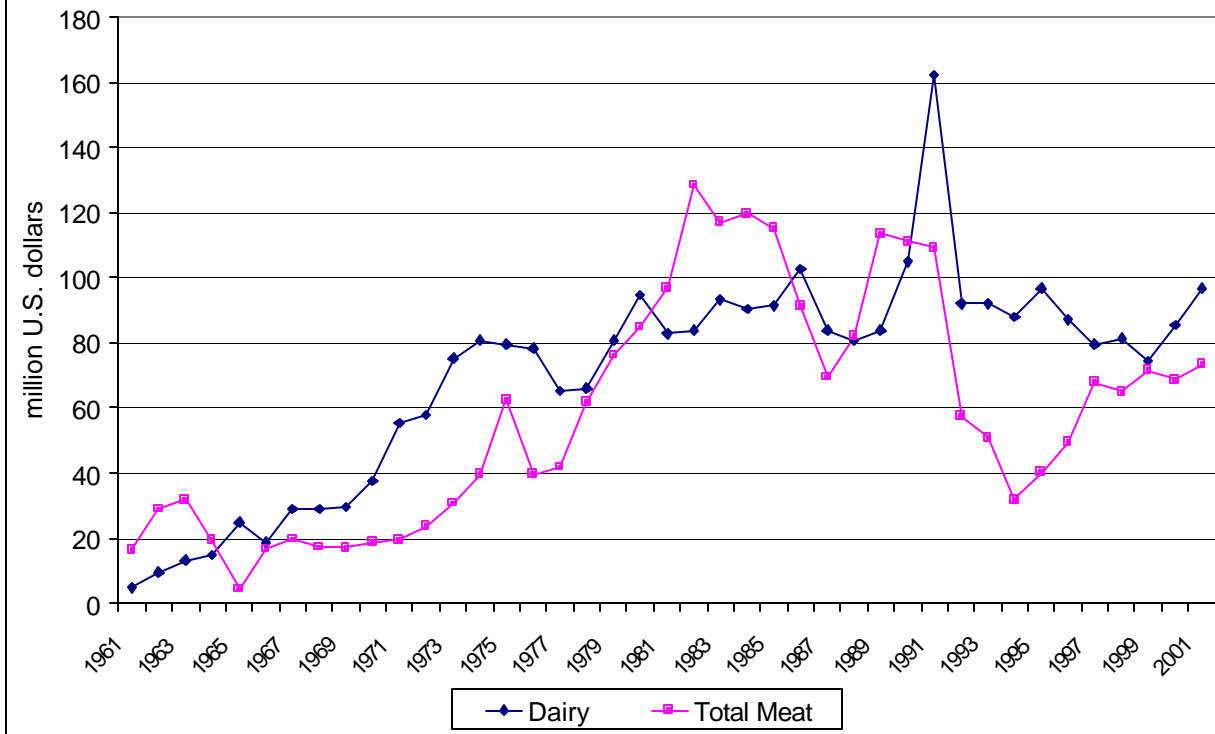
Source: FAOSTAT

**Figure 7. Cuban Rice, Wheat, and Wheat Flour Imports**



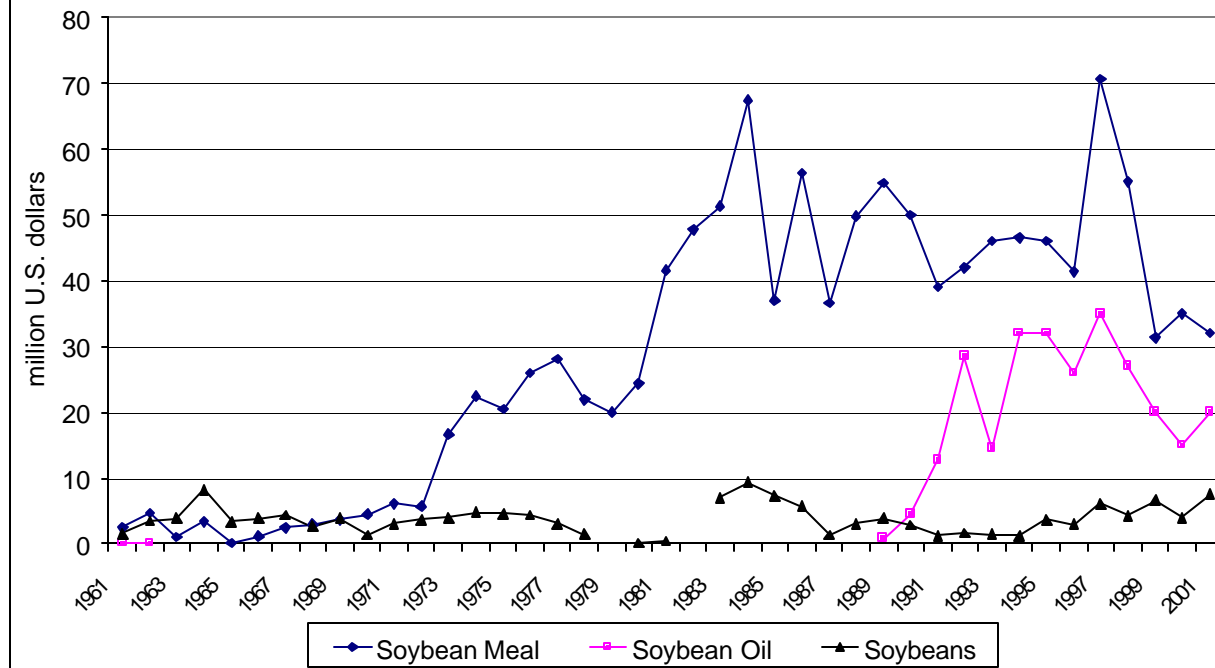
Source: FAOSTAT

**Figure 8. Cuban Imports of Dairy and Meat**

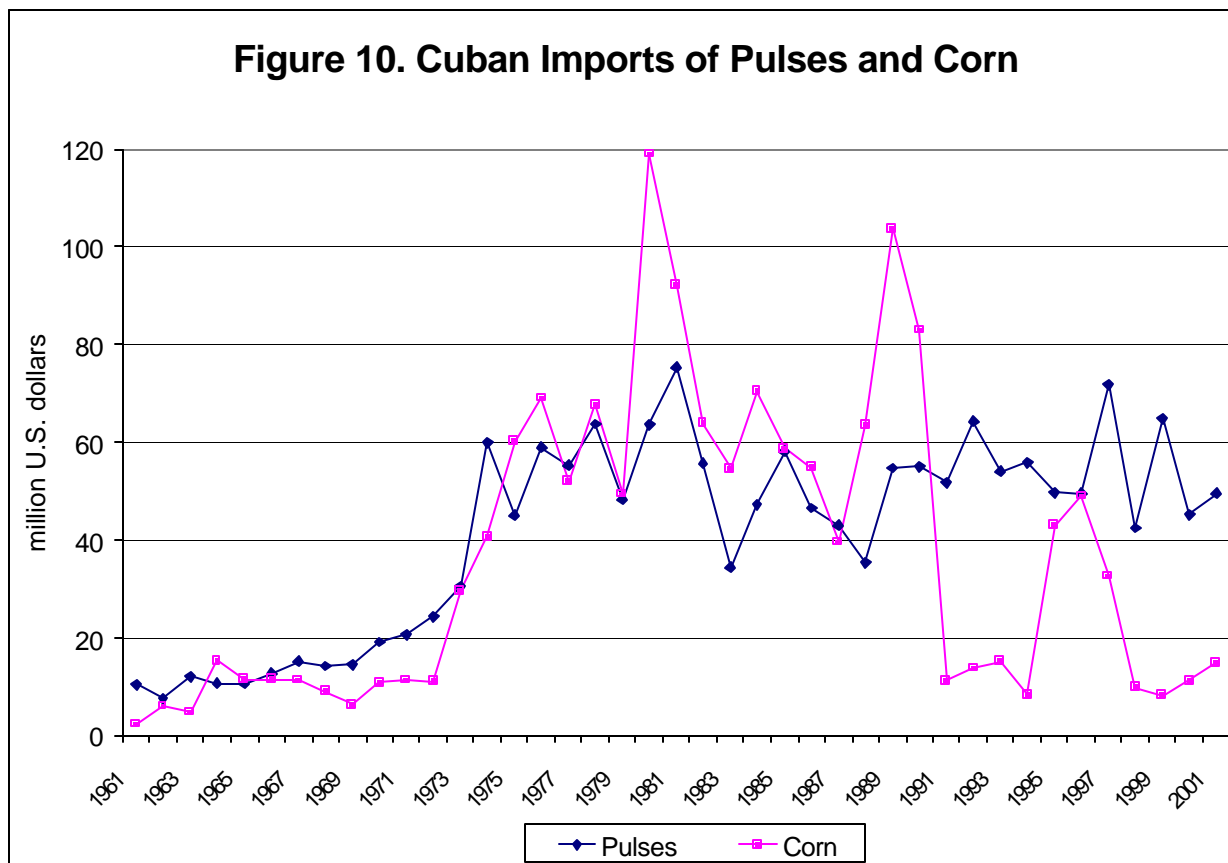


Source: FAOSTAT

**Figure 9. Cuban Imports of Soybeans, Soybean Meal, and Soybean Oil**



Source: FAOSTAT



Source: FAOSTAT

## PROSPECTS FOR U.S. AGRICULTURAL TRADE WITH CUBA UNDER LIBERALIZED TRADE ENVIRONMENT

### *Previous Studies on Expected Exports to Cuba*

Since Cuba needs to import agricultural products to meet its food requirements, and since most of their agricultural imports are products produced in the United States, increased access to Cuba would likely have a positive effect on U.S. agriculture. A report by the Economic Research Service (ERS) of the USDA (1998) remarks that the general consensus is that U.S. agricultural exports to Cuba could be about \$1 billion. Calculations of potential benefits vary, though.

Estimates of trade potential from the U.S. International Trade Commission (ITC) (2001) are smaller. They estimate that total U.S. exports to Cuba, in the absence of sanctions, would have been approximately \$658 million to \$1.2 billion per year during the 1996-98 period. Messina et al. (1997), in contrast, find that U.S. agricultural exports could easily total \$1 billion per year.<sup>1</sup> However, they note that it could take 5 to 10 years to build this market once the embargo is lifted.

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<sup>1</sup>The study by Messina et al. was published in the Papers and Proceedings of the Seventh Annual Meeting of the Association for the Study of the Cuban Economy (ASCE). ASCE is a non-profit and non-political professional organization whose objective is the study of the Cuban economy and society.



A study by Rosson and Adcock, prepared under contract for the Cuba Policy Foundation<sup>2</sup> (2001), found that the U.S. economy has the opportunity to gain \$1.24 billion annually in agricultural exports and \$3.6 billion more in related economic output without the embargo. They calculated the effect the embargo has on the agricultural sector in individual states and found that Arkansas, with an annual potential of \$167 million in agricultural exports is affected most by the embargo. Other affected states (in order) include California, Iowa, Louisiana, and Texas. North Dakota was ranked twelfth in economic impact.

Rosson and Adcock also estimated a less optimistic scenario where U.S. sanctions on Cuba are lifted, but the basic economic conditions in Cuba do not change, resulting in limited growth in production and trade potential. Under this scenario, U.S. agricultural exports to Cuba reach \$411 million, and an additional \$919 million in economic activity is stimulated in the U.S. economy.

According to Messina et al., Cuba needs to import cereals, animal feeds, beans, dairy, and livestock products, and their import needs could become more diverse in the future if tourism and domestic demand increase. ERS (1998) notes that most U.S. food exports to Cuba would consist of rice, coarse grains, beans, wheat flour, and animal products. The United States could also export agricultural inputs to Cuba such as fertilizer, herbicides, pesticides, machinery, and technology. Rosson and Adcock (2001) found that the major products exported to Cuba (in order) would be rice, the soybean complex, chicken meat, wheat and wheat flour, corn, beef, pork, and fertilizer. The USITC (2001) estimated that without sanctions, annual U.S. exports to Cuba from 1996 to 1998 would have been about \$62 to \$76 million for beef, pork, and poultry, \$34 to \$54 million for wheat, \$40 to \$59 million for rice, \$9 to \$10 million for feed grains, \$42 to \$48 million for animal feeds, \$29 to \$33 million for fats and oils, \$13 to \$26 million for dry beans, and \$6 to \$8 million for cotton.

### *Recent Exports to Cuba*

Since the Trade Sanctions Reform and Export Enhancement Act of 2000, the United States has started to export agricultural goods to Cuba. According to USDA data, U.S. agricultural exports to Cuba equaled \$138 million in 2002. These exports included \$23 million of wheat, \$23 million of coarse grains, \$21 million of soybeans, \$21 million of soybean oil, \$19 million of soybean meal, and \$21 million of poultry. In the first five months of 2003, the United States exported \$89 million of agricultural products to Cuba. Cuba is likely to continue importing agricultural products from the United States at these levels, with a possible ceiling of \$200 - \$250 million in trade per year. It is unlikely that Cuba will increase imports from the United States beyond these levels unless laws change allowing Cuba to purchase goods on credit or the ban on travel is lifted (Hagstrom 2003).

### *Predicted U.S. Exports to Cuba*

If the embargo is lifted, exports of wheat and wheat flour could increase. Table 1 shows Cuban wheat imports from 1981/82 to 2000/01. This table includes all wheat and wheat flour in wheat equivalents. Cuban wheat and wheat flour imports in recent years have been about 500 thousand metric tons less than levels of imports in the 1980s. Along with the decline in imports, the source of imports changed. In the 1980s, Canada was the major supplier of wheat to Cuba, followed by Europe and Argentina. Starting in the late 1980s, exports from Canada decreased while exports from Europe rose. The European Union (EU) is

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<sup>2</sup>The Cuba Policy Foundation is a non-partisan, anti-embargo organization.

now the major supplier of wheat to Cuba, with over 80 percent market share, and most of the remainder is supplied by Canada. The shift to the EU suggests the use of lower quality wheat. Of Cuba's total wheat imports, about 20 thousand metric tons consist of durum wheat, and 150 to 300 thousand metric tons consist of wheat flour.

Table 1. Cuban Imports of All Wheat<sup>1</sup>

	Total	Source			
	Imports	Argentina	Canada	EU	others
	----- thousand tons-----				
1981/82	1437	0	1135	301	0
1982/83	1395	0	1081	314	0
1983/84	1741	274	1313	149	4
1984/85	1319	262	797	260	0
1985/86	1444	213	1094	126	0
1986/87	1391	50	1263	74	4
1987/88	1515	91	1001	373	50
1988/89	1339	50	602	631	57
1989/90	1233	128	500	529	76
1990/91	1453	219	453	605	172
1991/92	1090	53	219	818	0
1992/93	892	78	208	607	0
1993/94	1066	0	77	987	0
1994/95	1059	10	3	977	0
1995/96	711	0	71	617	23
1996/97	969	200	36	729	4
1997/98	982	9	110	812	52
1998/99	986	0	62	874	51
1999/00	1155	0	54	1031	70
2000/01	947	0	137	810	0

<sup>1</sup>Includes wheat and wheat flour in wheat equivalent.

Source: *World Grains Statistics*, International Grains Council, various years

With greater access, the United States could be able to capture market share from the EU. Furthermore, with an increase in trade, investment, and tourism, Cuban income and food expenditures could increase and wheat imports could return to 1980s levels. If the United States could achieve 50 percent market share in Cuba, wheat and wheat exports would total 500 thousand metric tons or more, making Cuba one of the top 15 markets for U.S. wheat and the biggest market in Latin America after Mexico, Colombia, and Venezuela.

To estimate potential U.S. markets shares in Cuba for wheat, corn, rice, and poultry meat, U.S. market shares in other Caribbean countries were calculated (Table 2). U.S. wheat exports (not including wheat flour) to 10 Caribbean countries totaled 429 thousand metric tons in 2000. Total wheat imports by these countries equaled 435 thousand metric tons, giving the United States 99 percent market share. The United States also had 99 percent market share for corn, with exports totaling 1.3 million metric tons. U.S. market share for rice was 33 percent, though it has been higher in previous years since Trinidad & Tobago imported a higher than normal quantity of rice from Guyana in 2000. The United States had 92 percent market share for poultry meat, with exports totaling 105 thousand metric tons. If trade were to be liberalized

Table 2. U.S. Market Shares in the Caribbean for Wheat, Corn, Rice, and Poultry in 2000

Country	Wheat			Corn			Rice			Poultry Meat		
	Imports from United States	Total Imports	U.S. Market Share	Imports from United States	Total Imports	U.S. Market Share	Imports from United States	Total Imports	U.S. Market Share	Imports from United States	Total Imports	U.S. Market Share
	----metric tons----			----metric tons----			----metric tons----			----metric tons----		
Bahamas	1	3	33%	746	968	77%	37,416	37,508	100%	37,340	37,417	100%
Barbados	19,440	19,440	100%	31	43	72%	5,341	7,071	76%	1,586	2,724	58%
Dominica	0	0	-	5	7	71%	2	1,241	0%	3,048	3,305	92%
Dominican Republic	273,067	278,924	98%	985,742	1,002,789	98%	52,866	54,783	97%	6,270	6,322	99%
Grenada	8,881	8,881	100%	1,043	1,063	98%	115	2,031	6%	3,580	4,683	76%
Jamaica	109,152	109,152	100%	235,165	235,166	100%	17,042	69,061	25%	33,436	36,942	91%
St. Kitts & Nevis	0	0	-	16	25	64%	749	898	83%	2,257	2,635	86%
St. Lucia	1	1	100%	30	46	65%	73	3,259	2%	6,269	7,885	80%
St. Vincent & the Grenadines	18,523	18,752	99%	3,308	3,317	100%	5,494	9,247	59%	8,520	9,798	87%
Trinidad & Tobago	201	283	71%	48,348	48,436	100%	7	178,748	0%	2,693	2,795	96%
Total	429,266	435,436	99%	1,274,434	1,291,860	99%	119,105	363,847	33%	104,999	114,506	92%

Source: Hemispheric Trade and Tariff Database for Market Access, Inter-American Development Bank. [http://alca-ftaa.iadb.org/eng/NGMADB\\_E.HTM](http://alca-ftaa.iadb.org/eng/NGMADB_E.HTM)

with Cuba, it would be reasonable to expect that U.S. market shares in Cuba would be similar to U.S. market shares in other Caribbean countries, although it would take a few years to reach those market shares, and 99 percent market share may be too optimistic. The proximity of the United States to Cuba, though, makes it likely that the United States could achieve significant market shares for these commodities. The bulk of Cuba's imported wheat is from the EU, while the remainder is from Canada; Argentina and Canada are the two suppliers of corn to Cuba. The United States should have an advantage over these countries in exporting to Cuba due to lower transportation costs. This advantage depends, though, on Cuban quality demands. If they are not demanding high quality wheat, they may import low quality wheat from the EU and the former Soviet Union. If Cuban income rises, they could likely demand higher quality wheat from the United States.

Table 3 shows the quantity of U.S. wheat, wheat flour, corn, rice, and poultry exports to Cuba that would result if the United States did achieve the maximum market shares. Two levels of exports are calculated. One assumes Cuban imports are maintained at the current level, and the other assumes that imports return to 1980s levels. Cuban imports of wheat and corn were considerably greater in the 1980s. Cuban rice and poultry imports, on the other hand, were lower in the 1980s. Cuban poultry imports have actually increased greatly since the mid 1990s. Wheat flour imports have increased in recent years but were at their height in the 1970s. If Cuban imports remain at current levels and the United States achieves the maximum potential market shares, U.S. exports to Cuba would total 743 thousand metric tons of wheat, 257 thousand metric tons of wheat flour, 135 thousand metric tons of corn, 159 thousand metric tons of rice, and 48 thousand metric tons of poultry. If the Cuban economy improves and imports return to 1980s levels, the United States could export 1.1 million metric tons of wheat and 508 thousand metric tons of corn to Cuba.

Table 3. Potential for U.S. Exports of Wheat, Corn, Rice, and Poultry to Cuba

Commodity	2001 Cuban Imports	1980s Cuban Imports	Potential Market Share	Potential U.S. Exports	
				(with 2001 Cuban import level)	(with 1980s Cuban import level)
	-----metric tons-----			-----metric tons-----	
Wheat	750,000	1,130,000	99%	742,500	1,118,700
Wheat Flour	260,000	197,221	99%	257,400	195,248
Corn	136,000	513,000	99%	134,640	507,870
Rice	483,000	212,000	33%	159,390	69,960
Poultry Meat	52,700	23,028	92%	48,484	21,186

**Per capita imports:** The idea that Cuban imports of wheat and corn could return to 1980s levels is based on the assumption that increased trade and investment in Cuban would increase Cuban income, which could lead to increased imports. Cuba's real GDP dropped significantly in the early 1990s (Figure 11). From 1990 to 1993, Cuban real GDP, in 1981 terms, declined by 33 percent, but has gradually been recovering since 1993. To estimate the effect that income has on Cuban imports, a simple econometric model was estimated. Per capita imports of individual commodities were estimated as a function of real per capita

GDP, a trend variable, and, in the case of rice and corn, Cuban per capita domestic production. The equation was estimated as follows:

$$M_{it} = \alpha_0 + \alpha_1 \text{PCRGDP}_t + \alpha_2 \text{PROD}_{it} + \alpha_3 \text{Trend}_t + \varepsilon, \quad (1)$$

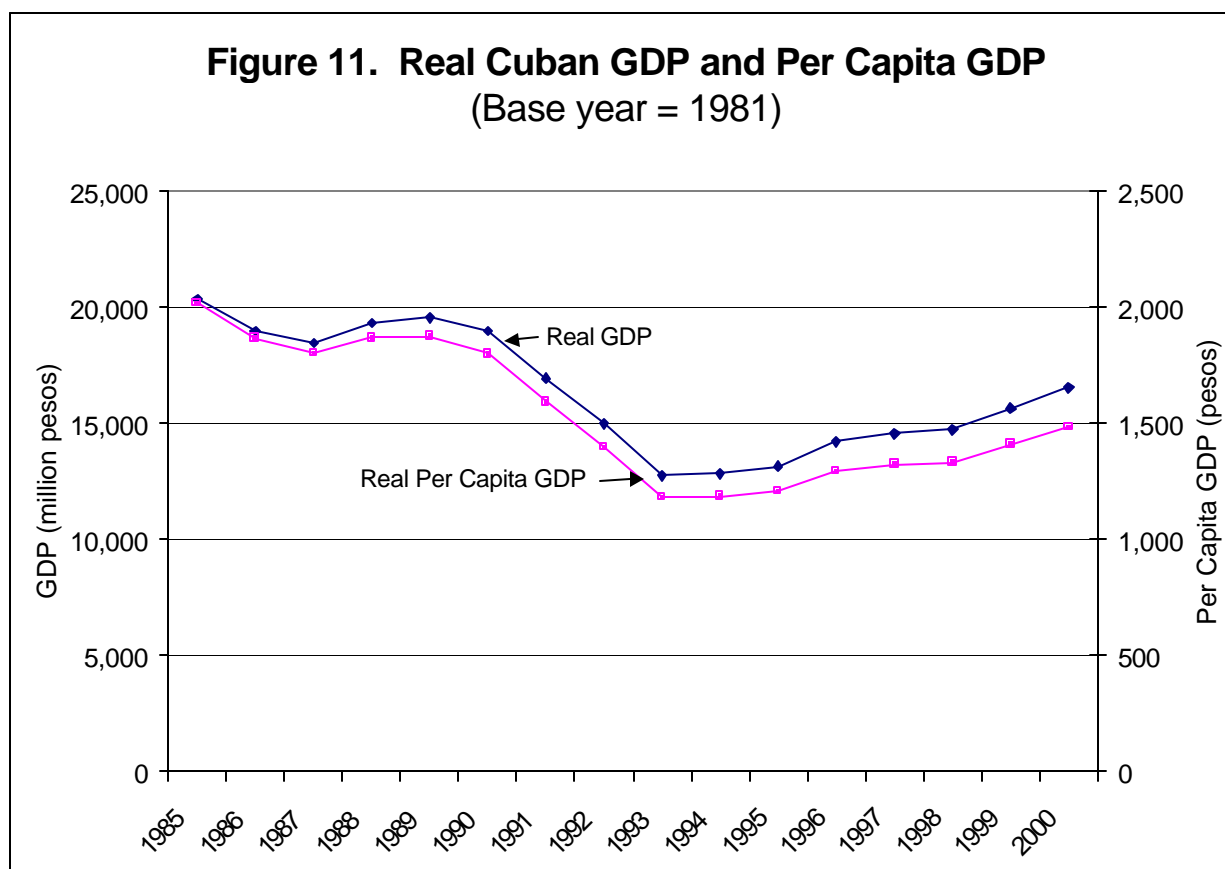
where  $M_{it}$  = per capita imports of commodity  $i$  in time period  $t$ ,

$\text{PCRGDP}_t$  = per capita real GDP in Cuba in time period  $t$ ,

$\text{PROD}_{it}$  = Cuban per capita domestic production of commodity  $i$  in time period  $t$ , and

$\text{Trend}_t$  = trend variable.

Per capita imports and domestic production are measured in kilograms, and real per capita GDP is measured in pesos, with a base year of 1981. This equation was estimated for wheat, wheat flour, rice, corn, soybeans, soybean meal, and poultry. The domestic production variable is used only in the rice and corn models since Cuba either does not produce the other commodities, or data were not available. Annual data were used, and since available GDP data were limited, the period covered was from 1985 to 2000.



Source: Mesa-Lago 1998, updated with Anuario Estadístico de Cuba 2000.

**Estimated exports to Cuba:** Table 4 shows Cuban per capita production, imports, and consumption of wheat, corn, and rice from 1981/82 to 2002/03. These data are from the USDA and were converted to per capita data using population data from the U.S. Bureau of the Census, International Database. As the data show, Cuban per capita imports and consumption of wheat and corn dropped considerably in the early 1990s. Cuba does not produce wheat, and its corn production is small. Corn production has increased over the last 10 years but not nearly enough to make up for the significant drop in imports. Unlike wheat and corn, Cuban rice imports have increased in recent years. This increase in imports has corresponded with a decline in domestic production, leaving consumption relatively stable. According to FAO data, per capita poultry imports fell from 5.8 kg in 1991 to 1.1 kg in 1994 and then increased to 4.7 kg in 2001. Since FAOSTAT has Cuban import data for a greater number of commodities than does the USDA, FAO data were used in estimating Equation 1. During this period, the Cuban population has been increasing at a slow rate, from 10.1 million in 1985 to 11.2 million in 2002.

Table 4. Cuban Per Capita Production, Imports, and Consumption of Wheat, Corn, Rice (kg per capita)

	<i>Wheat</i> <sup>1</sup>			<i>Corn</i>			<i>Milled Rice</i>		
	Production	Imports	Consumption	Production	Imports	Consumption	Production	Imports	Consumption
1981/82	0	148	148	2	39	41	31	18	49
1982/83	0	143	143	2	38	40	35	18	53
1983/84	0	176	176	3	32	35	34	5	39
1984/85	0	132	132	3	40	43	36	13	49
1985/86	0	142	142	3	40	43	34	10	44
1986/87	0	137	137	3	41	45	37	17	53
1987/88	0	138	138	4	57	61	30	16	45
1988/89	0	130	130	3	69	73	31	18	49
1989/90	0	118	118	5	59	64	33	23	56
1990/91	0	133	133	4	9	13	29	25	54
1991/92	0	103	103	4	3	7	26	19	45
1992/93	0	84	84	5	11	16	22	37	59
1993/94	0	101	101	4	4	7	11	23	34
1994/95	0	99	99	5	17	21	14	29	43
1995/96	0	71	71	4	25	29	13	36	49
1996/97	0	87	87	5	21	26	22	24	46
1997/98	0	86	86	6	3	10	25	31	55
1998/99	0	88	88	6	6	12	16	39	55
1999/00	0	101	101	6	9	15	22	37	59
2000/01	0	86	86	6	11	17	15	43	58
2001/02	0	98	98	6	22	29	15	41	56
2002/03	0	98	98	6	9	15	15	42	57

<sup>1</sup>Includes wheat flour in wheat equivalent.

Source: PS&D Database, FAS/USDA

Results from the estimation of Equation 1 are shown in Table 5. For wheat, wheat flour, corn, and poultry, real per capita GDP is shown to have a positive and statistically significant effect on imports, as expected. The effect on rice and soybean imports is positive but insignificant, and the effect on soybean meal imports is also insignificant. The last column in Table 5 shows the estimated import demand elasticity with

respect to income for each commodity. Results show that a 1 percent increase in real per capita GDP in Cuba causes per capita imports to increase 0.91 percent for wheat, 1.46 percent for wheat flour, 2.95 percent for corn, and 2.49 percent for poultry. Low  $R^2$ s and low t-values in the soybean and soybean meal models indicate that changes in GDP do not adequately explain the variability in imports of soybeans and soybean meal in these two models. The low number of observations could be a problem. There are also some questions about the accuracy of Cuba's official GDP data, which could create a problem in the analysis (Mesa-Lago 1998).

Table 5. Estimated Models for Per Capita Import Demand

	estimate	p-value	elasticity
<u>Wheat</u>			
Intercept	20.3	0.4202	
PCRGDP	0.0535	0.0009	0.911
Trend	-1.432	0.0806	
$R^2 = .8391$			
<u>Wheat Flour</u>			
Intercept	-9.236	0.0388	
PCRGDP	0.0136	0.0001	1.457
Trend	0.313	0.0261	
$R^2 = .7603$			
<u>Rice</u>			
Intercept	21.36	0.0197	
PCRGDP	0.009087	0.2304	0.512
Rice Prod	-0.6021	0.0371	
Trend	0.713	0.0076	
$R^2 = .7921$			
<u>Corn</u>			
Intercept	-33.12	0.4939	
PCRGDP	0.0506	0.0933	2.945
Corn Prod	-2.8716	0.6938	
Trend	-0.567	0.827	
$R^2 = .7886$			
<u>Soybeans</u>			
Intercept	-0.7581	0.5507	
PCRGDP	0.000957	0.1502	1.585
Trend	0.0251	0.5197	
$R^2 = .2142$			
<u>Soybean Meal</u>			
Intercept	29.2509	0.0029	
PCRGDP	-0.004929	0.2365	-0.400
Trend	-0.3143	0.2145	
$R^2 = .2444$			
<u>Poultry</u>			
Intercept	-6.2896	0.0977	
PCRGDP	0.004424	0.0277	2.492
Trend	0.2585	0.0326	
$R^2 = .4269$			

The estimated elasticities are used to project the level of imports that could result if Cuba's real GDP increased. Table 6 shows current and possible future Cuban imports of wheat, wheat flour, rice, corn, and poultry. This table also shows potential U.S. exports to Cuba under each scenario. Potential U.S. exports are based on the potential market shares shown in Table 3. The first row for each commodity shows the current level of imports, measured both in kilograms per capita and total metric tons. The next three rows show the projected imports that could result if Cuban real per capita GDP increased by 10 percent, 30 percent, and 50 percent. A 30 percent increase would return real per capita GDP to late-1980s levels. These results show that if real per capita GDP increased by 30 percent, Cuban imports of wheat, wheat flour, rice, corn, and poultry could increase by 27 percent, 44 percent, 15 percent, 88 percent, and 75 percent, respectively. If the embargo is lifted and the United States achieved the maximum potential market shares, U.S. exports to Cuba could be 945 thousand metric tons of wheat, 370 thousand metric tons of wheat flour, 184 thousand metric tons of rice, 254 thousand metric tons of corn, and 85 thousand metric tons of poultry.

Table 6. Projected Imports by Cuba Resulting from Increased Income, and Potential Imports from the United States

Income	% increase	Cuban Imports		Potential Imports from United States
		Per Capita --kilograms--	Total -----metric tons-----	
<i>Wheat</i>				
2001 levels	0%	67	750,000	742,500
10% increase	9%	73	818,311	810,128
30% increase	27%	85	954,934	945,384
50% increase	46%	98	1,091,556	1,080,640
<i>Wheat Flour</i>				
2001 levels	0%	23	260,000	257,400
10% increase	15%	27	297,874	294,895
30% increase	44%	33	373,621	369,885
50% increase	73%	40	449,369	444,875
<i>Rice</i>				
2001 levels	0%	43	483,000	159,390
10% increase	5%	45	507,753	167,559
30% increase	15%	50	557,260	183,896
50% increase	26%	54	606,767	200,233
<i>Corn</i>				
2001 levels	0%	12	136,000	134,640
10% increase	29%	16	176,053	174,292
30% increase	88%	23	256,158	253,597
50% increase	147%	30	336,264	332,901
<i>Poultry</i>				
2001 levels	0%	5	52,700	48,484
10% increase	25%	6	65,832	60,566
30% increase	75%	8	92,097	84,730
50% increase	125%	11	118,362	108,893



According to these results, a 30 percent increase in income would increase Cuban imports of wheat and corn, but not to 1980s levels. The results in Table 5 indicate that Cuban imports of wheat and corn have been in a downward trend and factors other than the decline in income have contributed to the drop in imports. On the other hand, imports of wheat flour, rice, and poultry are in an upward trend and exceed 1980s levels.

An increase in population or tourism in Cuba could result in a further increase in demand for agricultural imports. Cuba's population is very stable, however, with a current growth rate of about 0.4 percent, and the U.S. Census Bureau projects that population growth will decline. Tourism, on the other hand, could increase considerably in Cuba if the U.S. ban on travel to the country is lifted.

### Imports from Cuba

Trade liberalization with Cuba could also lead to increased U.S. imports from the country. The ERS (1998) notes that the most likely candidates for Cuban exports to the United States would be sugar, citrus, vegetables, tropical fruit, seafood, and tobacco. Exports to the United States would also provide Cuba with the foreign exchange to purchase agricultural products and inputs from the United States.

Although Cuba has been an inefficient, high-cost sugar producer and production and exports have fallen dramatically, economic incentives and increased investment could cause Cuban sugar production and exports to rebound. If Cuba exports sugar to the United States, they would simply be allocated a share of the U.S. import quota, and total U.S. sugar imports would not increase as long as the quota is in place.

Cuba exports both fresh and processed citrus. The ERS (2002) notes that processed citrus would be the most likely export opportunity if Cuba was allowed to export to the United States. They remark that Cuba might be able to compete with Brazil in the U.S. orange juice import market, and they might become a major grapefruit juice supplier. Cuba could also export fresh grapefruit to the United States. Florida supplies the U.S. fresh grapefruit market, but the grapefruit harvest begins one month earlier in Cuba. Therefore, Cuba may be able to export fresh grapefruit to the United States when supplies are low, just before the Florida harvest begins. Cuba is not likely to export fresh oranges to the United States since the type of oranges grown in Cuba are not desirable in the U.S. market (ERS 2002). Cuba also has the potential to be a major supplier of limes in the United States.

## CONCLUSION

With the recent easing of the embargo, the United States has started to export agricultural products to Cuba. U.S. agricultural producers and agribusinesses believe they can benefit from increased access to the Cuban market. Currently, Cuba can purchase goods from the United States using only cash. U.S. exports to Cuba will likely continue at current levels until the sanctions are lifted. There is growing support among business interests and some politicians to further ease or end the embargo. However, there still remains political support for continuing the embargo. This study examines Cuba's agricultural trade and analyzes the potential for trade with the United States that could result if the embargo were to be lifted. It does not deal with the domestic or international political costs or benefits of lifting the embargo.

Cuba could be a significant market for U.S. exports of wheat, wheat flour, rice, corn, pulses, poultry, and dairy products. The United States could also export agricultural inputs that are needed in Cuba. The

products that Cuba would most likely export to the United States include sugar, grapefruit, grapefruit juice, orange juice, and tobacco. Much of the increased trade with Cuba would depend on much-needed investment in the country. Current production constraints in Cuba limit their ability to export, and without increased exports, foreign exchange constraints limit their ability to import. Political considerations in the United States and Cuba could also influence trade between the two countries, even with the sanctions lifted. Increased trade between the two countries after the lifting of the embargo may take a few years to develop.

The United States would have to compete with the EU and Canada in supplying wheat to Cuba and with Argentina in supplying corn to Cuba, since they are currently the major suppliers of wheat and corn to Cuba. Due to its proximity to Cuba, the United States should have an advantage over these countries in exporting to the country. Nearly all wheat and corn imports from other Caribbean countries are supplied by the United States, while the United States held about one-third of the market for rice exports to these countries in 2000. If the United States is able to achieve market shares in Cuba similar to its market shares in other Caribbean countries, and if the Cuban economy eventually recovers and per capita GDP returns to levels from before the fall of the Soviet Union, then U.S. exports to Cuba could total close to 1 million metric tons of wheat, 370 thousand metric tons of wheat flour, and 250 thousand metric tons of corn. At these import levels, Cuba would become an especially important market for U.S. wheat or wheat flour.

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