The Impact of Central American Free Trade Area (CAFTA) on the United States Sugar Market

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Introduction

Sugar is an important agricultural product that has a significant share in the agricultural products international trade. Annual average production of sugar is about 120 million metric tons and the average annual consumption is about 118 million metric tons. The share of world sugar production traded on the world market has been 28 percent for the period between 1994 and 1996. Sugar is produced in more than 120 countries. Most of these producers have experienced governmental intervention in their domestic sugar market. These interventions are so extensive that they have changed some countries from net sugar importer to net sugar exporter, even though they do not have comparative advantage in sugar production. Besides this, these interventions have imposed higher prices on consumers in the protected markets and have resulted in lower prices in

countries that have comparative advantage to produce sugar, mainly developing countries (USDA, 1997).

Sugar can be obtained from two different sources: sugar cane and sugar beets. Sugar cane can be produced only in tropical areas with relatively high temperature, but sugar beet can be produced in a wide range of temperatures. Therefore, many countries can produce sugar by producing sugar beet. Most sugar production comes from developing countries but some developed countries compete in the market by using producer support programs.

World Sugar Market

Sugar is one of the most protected commodities against with respect to imports. The European Union, Japan, and the United States have the highest level of support and protection for sugar in the world. Sugar price in these countries are almost two times the world sugar price. These protection policies have a negative impact on consumers in these countries and sugar producers in other countries. This type of policy has changed the trade situation of OECD countries in the world sugar market. Because these countries have a relatively higher cost of production for sugar, in a free trade situation they do not have comparative advantage to produce sugar. Thus they would normally import sugar. By using producer support programs, many OECD countries have changed their position from net importer to net exporter (Mitchell, 2004).

Figure 1 shows the trend of world sugar production, consumption, and prices between 1990 and 2004. Production and consumption have increased by about 25 percent and 75

percent respectively, while world price has experienced a downward trend by 25 percent (USDA).

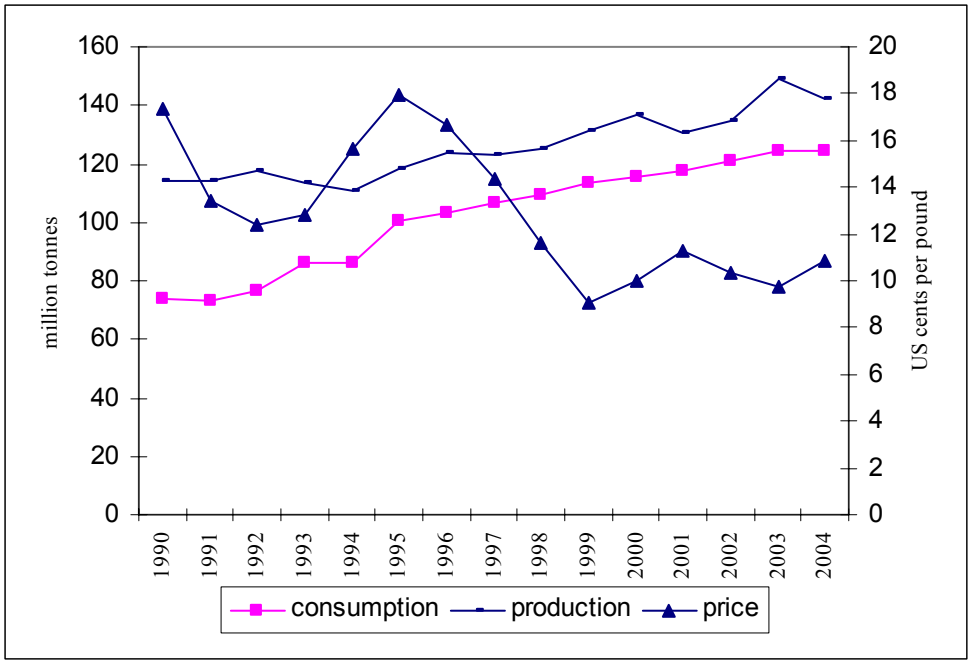

Figure 1. World Sugar Production, Consumption and Price, 1990 to 2004.
Source: USDA

The world's largest sugar producers, consumers, importers and exporters are shown in Table 1. Ten countries produced more than 72 percent of world's sugar production in 2004. The United States ranked fourth among these countries. On the export side, Brazil, the European Union, Australia, Thailand, and Cuba have had a 68 percent share of world sugar exports. Russia accounts for more than one fifth of all world sugar imports.

Table 2 shows the average monthly world sugar price between 1997 and 2002. The maximum and minimum price has been 11.92 and 5.73 cents per pound, respectively. World sugar prices increased in 2001 due to shortages after hurricane damage to the sugarcane crop in Cuba and reductions in EU beet sugar recovery rates.

Table 1. Largest World Sugar Producers, Consumers, and Importers

Producers 1999-2001		Exporters 1999-2001		Raw Sugar Importers 2002	
Brazil	19148.6	Brazil	10045.8	Russia	4441
India	19186.4	EU	5783.1	EU	1834
EU 15	17361.6	Australia	3865.9	S Korea	1516
USA	8032.6	Thailand	3711.8	Japan	1507
China	7767.9	Cuba	3200.1	Malaysia	1176
Thailand	5661.0	Others	12451.7		
Mexico	5153.1				
Australia	4899.6				
Cuba	3893.4				
Pakistan	2827.4				
World	131886.0	World	39058.4	World	21400

Source: Gudoshnicov et al., 2004

Table 2. Average Monthly World Sugar Price

ISA Monthly Prices					
	Jan - Mar	Apr - Jun	Jul - Sep	Oct - Dec	Average
1997	10.87	11.29	11.42	11.92	10.80
1998	10.70	9.01	8.12	7.87	8.11
1999	6.98	5.73	5.93	6.43	6.61
2000	5.35	7.10	10.03	10.23	8.68
2001	9.82	9.12	8.18	7.43	6.36
2002	7.01	6.24	6.34		

Source: International Sugar Organization

Sugar Producers Support Program

Sugar producer support programs have a significant impact on the world sugar market. Support programs not only have several different effects on sugar market, but they also can have a negative effect on other products and input markets in other countries. First, it decreases the consumption because it keeps the sugar price high in the protected countries. Second, it encourages farmers to produce sugar in countries that do not have a comparative advantage in this product. The negative influence on world price, production, and consumption of related products (substitute and complement products) is another disadvantages of sugar support programs.

It worth to note that world sugar trade value and the value of developing country sugar exports during 1999-2001 averaged $11.6 and $6.3 billion per year, respectively. During the same period the value of the sugar support program in OECD countries has been $6.4 billion per year in average. Comparing these numbers shows the significance and magnitude of the producer support programs (Mitchell, 2004).

Gains from Free Market

Based on the neoclassical trade theory, free trade increases the social welfare of countries that involve in trade. From this, we expect that removing barriers and moving toward free trade in the world sugar market can have some gains for importer and exporter countries.

Removing trade barriers in sugar market will have significant effects on the world sugar market. It reduces the consumer sugar price in countries that have been highly protected from imports (especially the European Union, United States, and Japan). It also increases the world sugar price up to 40 percent in favor of developing countries that

have the comparative advantage in producing sugar. By removing trade barriers, sugar production shifts from developed countries (that typically do not have comparative advantage) to developing countries. This increases employment and income in the developing countries. It has been estimated that implementation of free trade in sugar market creates a gain of as much as $4.7 billion per year for sugar exporting countries (Mitchell, 2004).

Sugar Beets and Sugar cane

Sugar can be refined from two sources: sugar beets and sugar cane. Christopher Columbus introduced sugar cane to the new world in 1493. He brought sugar cane from the Canary Islands (Gudoshnikov, 2004). Sugar cane can be produced only in tropical areas. Table 3 shows world sugar cane planted areas, production and yield.

Sugar beets are cultivated under a wide range of natural condition. Sugar beet yields depend on rainfall and temperature. Changing weather has a significant influence on production. The cost of producing sugar from beets is almost double the cost of producing sugar from cane. The fact that countries that protect their sugar market (e.g., the European Union, United States, and Japan) mainly use sugar beets to produce sugar may be part of the reason why many of these countries have difficulty competing in a free market (Mitchell, 2004).

Among countries that use beets to produce sugar, Belgium, Chile, the Netherlands, Turkey, the United Kingdom, and the United States have the lowest unit cost, ranging from 19.7 to 21.7 cents per pound. On the other hand, among countries that use cane to produce sugar, Brazil, Colombia, Guatemala, Zambia, and Zimbabwe have the lowest

unit cost, ranging from 7.4 to 8.2 cents per pound. A comparison shows that sugar production costs from beets are more than two times those from sugarcane (Gudoshnikov et al., 2004).

Table 3. World Sugarcane Planted Areas, Production and Yield (1998-2000)

Country	Planted area(1,000 rai)			Production(1,000 tons)			Yield per rai(kg)		
	1998	1999	2000	1998	1999	2000	1998	1999	2000
World Total	121,488	122,140	121,086	1,252,266	1275,885	1,278,093	117,547	117,376	120,875
Brazil	30,900	30,943	30,075	338,348	337,165	324,668	10,950	10,896	10,795
India	24,750	25,625	26,250	265,000	295,700	315,100	10,707	11,540	12,004
China	7,506	6,513	6,194	85,666	78,108	70,205	11,413	11,993	11,334
Thailand	5,735	5,906	5,421	50,332	53,494	49,070	8,776	9,058	9,052
Mexico	3,844	4,488	4,122	48,895	45,880	49,275	12,720	10,223	11,954
Pakistan	6,600	7,219	6,311	53,106	55,191	46,333	8,046	7,645	7,342
Australia	2,556	2,513	2,719	41,044	38,534	38,343	16,058	15,334	14,105
Colombia	2,488	2,433	2,500	32,000	36,900	37,000	12,862	15,166	14,800
Cuba	6,875	6,224	6,875	35,000	34,000	36,000	5,091	5,463	5,236
Philippines	2,456	2,346	2,341	27,000	23,778	33,732	10,993	10,136	14,409
Other	27,778	27,930	28,278	275,875	277,135	278,367	9,931	9,922	9,844

Remark * 1 rai = 0.16 Ha
Source: Thai Office of Agricultural Economics, Food and Agriculture

U.S. Sugar Market

U.S. sugar production has an important share not only in the US economy and agricultural sector but also in the world sugar market. As previously noted in Table 1, U.S. sugar production ranks fourth in the world and the United States has the third largest sugar consumption in the world (Buzzanell). Table 4 shows that U.S. sugar production

Table 4. U.S. sugar production, consumption, and import (000 metric tons)

	95/96	96/97	97/98	98/99	99/00	2000/01	01/02	02/03	03/04	04/05
Beet Sugar Production	3553	3640	3982	4012	4515	4246	3552	4048	4257	4261
Cane Sugar Production	3133	2896	3294	3585	3688	3710	3615	3596	3586	3457
Total Sugar Production	6686	6536	7276	7597	8203	7956	7167	7644	7843	7718
Total Imports	2536	2517	1962	1655	1484	1443	1393	1569	1598	1478
Dom. Human Consumption	8667	8868	8903	9079	9318	9306	8877	8814	8912	8986

Source: USDA

for fiscal year 2003/04 (October-September) was 7.84 million metric tons. Sugar beets and sugar cane in sugar production is account for 54 and 46 percent of U.S. production, respectively.

U.S. consumption has been quite stable from 1994 to 2005 while production has experienced more fluctuation. The amount of sugar imported during this period has been decreased by 40 percent. The U.S. government has influenced sugar prices and, therefore, sugar producers and consumers through intervention in the sugar market. U.S. sugar producers have an effective lobby and have been able to convince the government to constrain imports by using a tariff-rate import quota combined with a non-recourse loan program. This program has resulted in a high sugar prices in the United States relative to the world sugar price. As shown in Figure 2, raw and refined sugar prices in the United States are well above the world sugar prices.

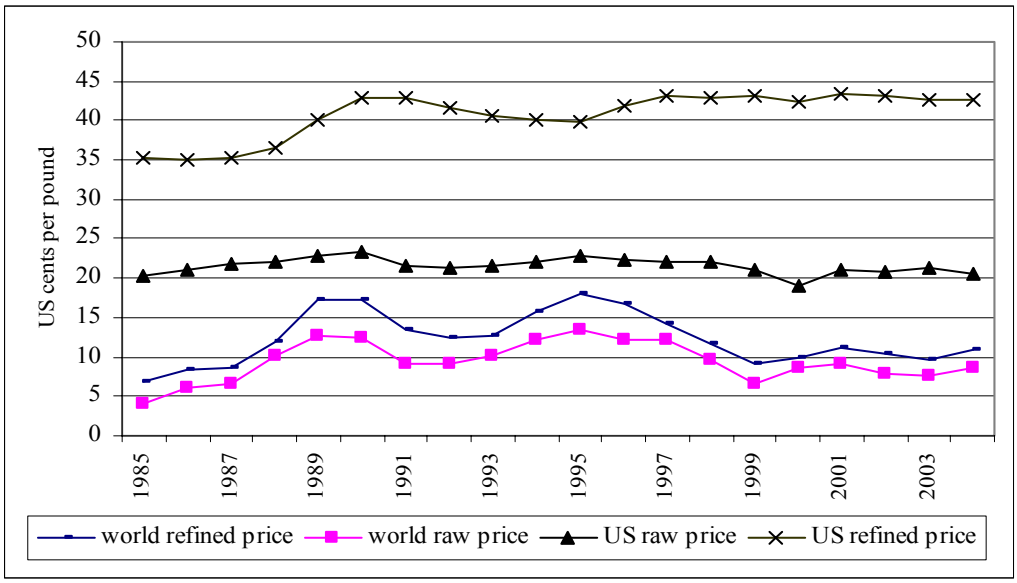

Figure 2. World and U.S. Raw and Refined Sugar Prices 1985 – 2004.

Source: International Sugar Organization

The United States is among the biggest sugar importer in the world. This country has imported about 1.5 million metric ton sugar in 2004/05 at a price of around 20 cents a pound -- more than double the price for sugar in the world market (Buzzanell). In order to reduce foreign countries access to the domestic sugar market and supporting sugar producers, import quotas are imposed on sugar import. The USDA is responsible for setting the import quota and price support loans each year. The U.S. Trade Representative allocates the import quota to countries that are eligible to export to the United States. About 40 countries had access to the U.S. sugar market through this system in 2003/04. Table 5 shows U.S. sugar import quota allotments by country. On the other hand, the national level of loan rates for raw can sugar and refined been sugar have been 18 cents and 23.9 cents per pound for the 1997 year respectively (Buzzanell).

Table 5. US Raw Sugar Tariff Quota in 2002/03 (000 metric tons raw value)

Country	Quota Share	Country	Quota Share	Country	Quota Share
Argentina	45.3	Gabon	7.3	Panama	30.5
Australia	87.4	Guatemala	50.5	Papua New Guinea	7.3
Barbados	7.4	Guyana	12.6	Paraguay	7.3
Belize	11.6	Haiti	7.3	Peru	43.2
Bolivia	8.4	Honduras	10.5	Philippines	142.2
Brazil	152.7	India	8.4	South Africa	24.2
Colombia	25.3	Jamaica	11.6	Saint Kitts & Nevis	7.3
Congo	7.3	Madagascar	7.3	Swaziland	16.8
Cote d Ivoire	7.3	Malawi	10.5	Taiwan	12.6
Costa Rico	15.8	Mauritius	12.6	Thailand	14.7
Dominican Rp	185.3	Mexico	7.3	Trinidad & Tobago	7.4
Ecuador	11.6	Mozambique	13.7	Uruguay	7.3
El Salvador	27.4	Nicaragua	30.5	Zimbabwe	12.6
				Total	**1,117.2**

Source : Gudoshnikov and et al. 2004.

Dominican Republic – Central American Free Trade Agreement

The Dominican Republic -- Central American Free Trade Area (DR-CAFTA) is a trade and investment agreement that includes the United States, the Dominican Republic, Costa Rica, El Salvador, Guatemala, Honduras, and Nicaragua. This agreement results in increased sugar import quotas from other members to the United States. As shown in Table 5, the share of the U.S. raw sugar tariff quota received by these countries in 2002/03 was about 29 percent (311,700 MT). Figure 3 shows sugar production for DR-CAFTA countries. There is a significant difference between the volume of U.S. production as compared to the other countries. Based on the DR-CAFTA agreement, new TRQs will increase DR-CAFTA country access to the U.S. sugar market. The amount of new TRQs for the first year of the agreement will be 107 thousand metric tons, which is equal to 1.2 percent of annual U.S. sugar consumption. This will increase by 2 percent

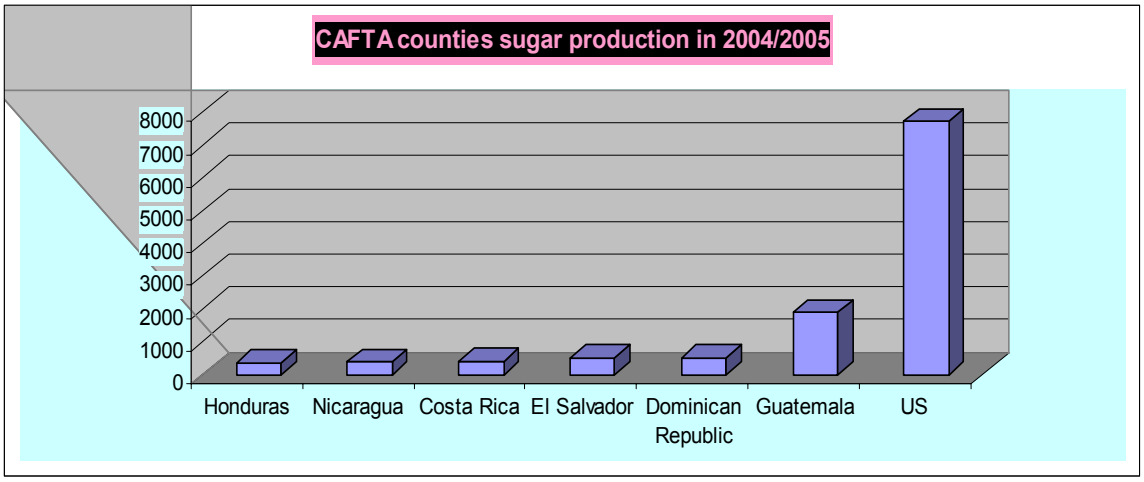

Figure 3. DR-CAFTA Countries Sugar Production in 2005/05
Source: USDA

each year. After 15 years, the amount of the increase in U.S. imports from DR-CAFTA countries under the DR-CAFTA agreement will be 151 thousand metric tons, or 1.7 percent of U.S. consumption (USDA).

Sugar production, consumption, and imports for DR-CAFTA countries are shown in Table 6. These countries have exported 2.31 million tons of sugar, almost a million

Table 6. DR-CAFTA Sugar Production, Consumption, and Export (excluding the U.S.).

	Costa Rica	Dominican Republic	El. Salvador	Guatemala	Honduras	Nicaragua	Total
TOTAL Sugar Production (1000 MT)	400	508	505	1900	350	370	4033
TOTAL Sugar Production (1000 MT)	400	508	505	1900	350	370	4033
Raw Exports (1000 MT)	175	187	280	1225	40	200	2107
Refined Exp.(Raw Val) (1000 MT)	0	2	0	210	0	0	212
TOTAL EXPORTS (1000 MT)	175	189	280	1435	40	200	2319
Human Dom. Consumption (1000 MT)	236	320	226	537	280	200	1799

Source: USDA

tons more than total U.S. sugar imports. The U.S sugar import quota limits the ability of these countries to export their product to the United States.

Effect of DR-CAFTA on U.S. Sugar Market

Increase in amount of import of a commodity can shift supply for that commodity to the right in the importer country, due to downward pressure on the domestic price for that commodity. Suppose we have the U.S. sugar market situation as depicted in Figure 4. To draw this picture we have used information from the previous sections. As we mentioned before, the world and U.S. sugar prices in 2004 were 8.6 and 20.5 cents per pound, respectively (based on Figure 2). Based on Table 4, U.S. total sugar consumption and import in 2004 have been 8986 and 1478 metric tons respectively. So we can show the world sugar market and U.S. sugar market situation in Figure 4. The total sugar supply in the U.S. is equal to the domestic production plus import. P_w is the world sugar price and sugar price in the U.S. sugar market (after import) is equal to P_{us}. As a result of import,

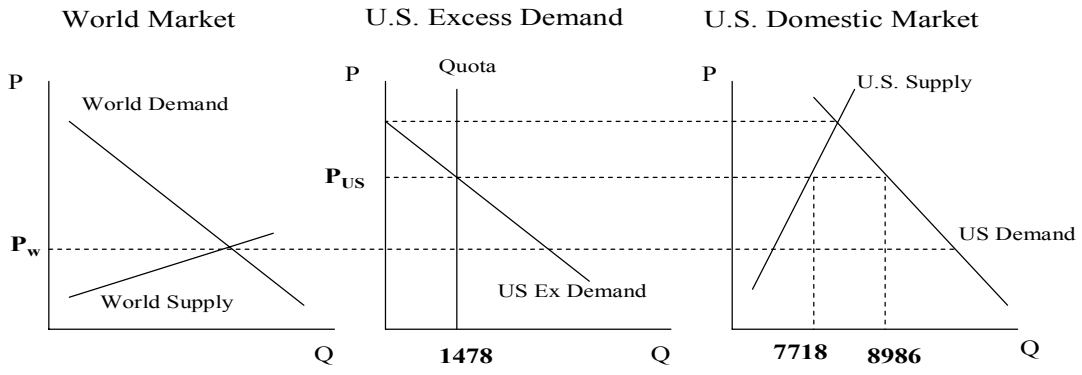

Figure 4. U.S. Sugar Market Relative to World Sugar Market

the sugar price in the U.S. goes down but because the amount of import is not too big, the sugar price in U.S. after import is still far above the world sugar price.

Now suppose the U.S. increases the import quota for DR-CAFTA countries based on the DR-CAFTA agreement. This increase will shift the quota vertical line to the right and therefore the sugar price in U.S. will decrease from P_{us} To P'_{us} and the amount of sugar consumption will increase. The magnitude of price reduction depends on the magnitude of increase in import quota and the elasticity of demand for sugar in the United States.

As mentioned before, based on the DR-CAFTA agreement, the amount of increase in the import quota for the first year will be 107,000 metric tons, about 1.2 percent of annual U.S. sugar consumption. This increase in quota will changed the Figure 4 as follow:

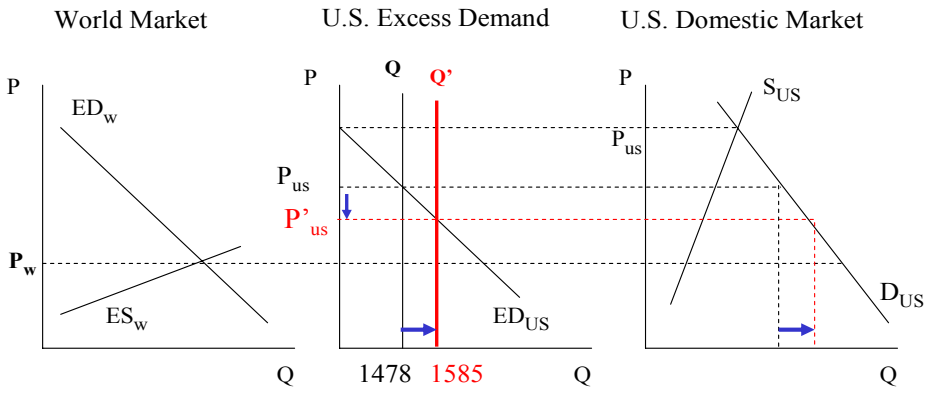

Figure 5. U.S. Sugar Market After Increase in Import Quota

Kennedy and Petrolia (2003) show a U.S. sugar demand elasticity of -0.14. This indicates that a 1 percent increase in price will result in a 0.14 percent decrease in the quantity

demanded. Based on Figure 5 and using the demand elasticity of -0.14, we can calculate the amount of decrease in price as follows. Since the elasticity of demand is (dq/q) / (dp/p) = -0.14, and we know that (dq/q) = 0.012 and p = 20 cents, then substituting into the original demand elasticity equation yields (0.012) / (dP/20) = -0.14. Rearranging yields (dp/20) = (0.012) / (-0.14), which in turn can be rearranged to yield dp = 20 * (- 0.0857). Solving for dp we can then show dp = -1.71 cents.

If we assume there is not any shift in consumption, the change in price will be a reduction of around 1.7 cents per pound. Therefore, the establishment of DR-CAFTA will result in an 8.57 percent decrease in the U.S. domestic sugar price.

Conclusion

Total annual sugar exports of the DR-CAFTA countries are approximately 2.3 million tons, almost two times U.S. sugar imports. The U.S. sugar import quota program constrains the access of these countries to the U.S. sugar market so that in the first year of DR-CAFTA, exports increase by 107 thousand tons.

There has been much debate as to the impact of these increased imports. According to the U.S. government "Americans consume somewhere between 10 and 20 teaspoons of added sugar per day. By comparison, increased sugar market access for Central America and the Dominican Republic under the DR-CAFTA amounts to only about one and half teaspoons per week per American. Increased sugar market access through DR-CAFTA amounts to only a small portion of United States sugar production. The increased access in the first year of the agreement is equal to a little more than one day's production in the United States" (USTR).

Despite these claims, this study shows that these increased imports will result in a decrease in the U.S. domestic sugar price of about 1.7 cents, or approximately 8.6 percent. Although it amounts to only pennies per pound, this decrease in the domestic price could result in the incursion of significant U.S. government expenditures given the current structure of the U.S. non-recourse loan program. Continued expansion of the import quota may necessitate structural changes in U.S. domestic sugar policy.

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