

Employment Changes in U.S. Food Manufacturing: The Impact of Sugar Prices



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Key Findings

- 1. Employment in sugar containing products (SCPs) industries decreased by more than 10,000 jobs between 1997 and 2002 according to the Bureau of Labor Statistics.**
- 2. For each one sugar growing and harvesting job saved through high U.S. sugar prices, nearly three confectionery manufacturing jobs are lost.**
- 3. For the confectionery industry in particular, evidence suggests that sugar costs are a major factor in relocation decisions because high U.S. sugar prices represent a larger share of total production costs than labor. In 2004, the price of U.S. refined sugar was 23.5 cents per pound compared to the world price at 10.9 cents.**
- 4. Many U.S. SCP manufacturers have closed or relocated to Canada where sugar prices are less than half of U.S. prices and to Mexico where sugar prices are about two-thirds of U.S. prices.**
- 5. Imports of SCPs have grown rapidly from \$6.7 billion in 1990, to \$10.2 billion in 1997, up to \$18.7 billion in 2004.**

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- The Bureau of Economic Analysis, U.S. Department of Commerce

Executive Summary

The Report of the House Appropriations Committee on H.R. 4754, the Commerce, Justice, and State, the Judiciary, and related agencies appropriations bill for fiscal year 2005 (H.Report 108-576) directed the Secretary of Commerce "to report on whether jobs in food manufacturing (including confectionery), cane refining and related industries have been lost as a result of the movement of manufacturing facilities offshore due, in material part, to the differential between U.S. and world sugar prices, and if applicable, the report shall include an estimate of the number of jobs lost."

Supply and Demand

The United States used approximately 17.8 billion pounds of refined sugar in 2003, down from 18.5 billion pounds in 1999. Approximately 85 percent of this sugar was produced domestically and the remaining portion was imported. The three main sugar-consuming product sectors are non-chocolate confectionery, chocolate and chocolate confectionery, and breakfast cereal.

Several factors have contributed to the declining demand for U.S. refined sugar including cost, confectionery plant closings and relocations abroad, higher refining costs for cane versus beet sugar, greater use of other sweeteners and sugar substitutes, and increased imports of sugar containing products (SCPs). Imports of SCPs have grown rapidly from \$6.7 billion in 1990, to \$10.2 billion in 1997, up to \$18.7 billion in 2004.

As U.S. sugar production continues to be protected, trade in sugar containing products has been liberalized. The trade imbalance in SCPs increased nearly five-fold over 1997 to 2002 to \$4.7 billion, while the sugar content in imported products has also risen. As a result, foreign manufacturers' access to lower-priced sugar contributes to increased imports and hinders U.S. manufacturers' abilities to compete both here and abroad.

Price

In general, the domestic price of U.S. wholesale refined sugar over the last 25 years has been two to three times the world price. These higher prices are maintained through support loans and tariff-rate quotas. In 2004, the U.S. price was 23.5 cents per pound, compared to the world price at 10.9 cents. This price differential results in a significant competitive cost disadvantage for domestic SCP manufacturers.

Plant Relocations

Many U.S. SCP manufacturers have closed or relocated to Canada where sugar prices average less than half of U.S. prices, and Mexico where sugar prices average about two-thirds of U.S. prices. Other factors such as labor and health care costs also favor Canada

and Mexico over the United States. For the confectionery industry in particular, sugar costs appear to be a major factor in relocation decisions because high domestic sugar prices represent a larger share of total production costs than labor.

Job Losses

Employment in SCP industries decreased by more than 10,000 jobs between 1997 and 2002 according to the Bureau of Labor Statistics. During the same period, non-SCP food manufacturing employment grew by 31,326.

A compilation of press reports since 2000 provides anecdotal evidence that 6,400 domestic confectionery jobs have been lost due to closures, restructuring and relocations where high sugar prices were cited as a major factor. This does not account for job losses in other SCP industries and thus may understate the full employment effects.

Approximately 987,810 people worked in sugar-using industries as of 2002. In contrast, there are 61,000 full-time equivalent jobs involved in the growing and harvesting of sugarcane and sugar beets. Studies suggest that the U.S. sugar program helps to maintain approximately 2,260 of these sugar industry jobs, many of which are growing and harvesting jobs, at an annual cost per job saved of \$826,000.¹

In addition to the cost per job saved, nearly three confectionery manufacturing jobs are lost for every job protected in the sugar growing sector due to the price gap between U.S. and world refined sugar prices. These figures are rough estimates and should be viewed as illustrative of the impacts of the sugar program rather than precise point estimates.

Study Overview

The Report of the House Appropriations Committee on H.R. 4754, the Commerce, Justice, and State, the Judiciary, and related agencies appropriations bill for fiscal year 2005 (H.Report 108-576) directed the Secretary of Commerce "to report on whether jobs in food manufacturing (including confectionery), cane refining and related industries have been lost as a result of the movement of manufacturing facilities offshore due, in material part, to the differential between U.S. and world sugar prices, and if applicable, the report shall include an estimate of the number of jobs lost. The estimate is to be for the most recent five-year period."

The Congressional request directed an examination of the employment effects of food manufacturing plant closings and relocations. However, there is no official government data that systematically tracks plant closings, and firms are not required to disclose the reasons behind such closings and relocations. Similarly, workers do not report the precise reasons behind their employment loss. As such, it becomes extremely difficult to determine the actual extent of and motivations behind plant closings.

Given these circumstances, the most appropriate approach to prepare this study was to use existing research data. This includes Bureau of Labor Statistics data on employment, a comprehensive review of press reports on plant closings and relocations, a comparison of recent trends between SCP and non-SCP industries, existing studies conducted by government and non-government agencies, and cost share data of sugar and other factors. This approach allowed us to determine the impact of U.S. sugar prices on plant closings and relocations and resulting job losses.

Further analysis would require an economic model that captures the intricate linkages between production, employment, and foreign direct investment of the sugar and sugar-using sectors.

U.S. Sugar Prices Are Nearly Twice World Levels

Sugar is an important raw material input for certain food manufacturers and is the largest raw material input for confectionery products. U.S. sugar policy, maintained through support loans, tariff-rate quotas, and domestic supply restrictions, has contributed to the large gap between the U.S. and world sugar prices. Many other sugar-producing countries' governments also intervene in sugar markets, which has contributed to overproduction and depressed world prices.²

Over the last 25 years, the U.S. price of wholesale refined sugar has on average been two to three times the world price, and in 2004, the world refined price was 10.9 cents per pound compared to the U.S. price of 23.5 cents per pound. U.S. food manufacturers pay a significantly higher price than many of their foreign competitors, currently more than double, which puts them at a competitive cost disadvantage.

Sugar Is Critical for Breakfast Cereal and Confectionery Products

One determinant of how sugar prices may affect the food manufacturing industry is the extent of sugar used as raw material in the production process. To get a sense of the products for which sugar is especially important, we calculated the cost share of sugar as a percentage of total material inputs on a value basis from 2002 Census data. The cost share is obtained by dividing the cost of sugar used as a material input by the cost of all raw material inputs used in production. Our analysis indicates that sugar represents nearly 20 to 30 percent of raw material costs for confectionery products and breakfast cereals (Table 1 lists the cost share of sugar as a raw material in 2002.) For some other products, such as breweries and flour milling, these costs are relatively small. The three main SCP sectors looked at in this study are non-chocolate confectionery, chocolate and chocolate confectionery, and breakfast cereal.

Table 1: Cost Share of Sugar as a Raw Material, 2002

| NAICS | Sugar Containing Product | Cost Share of Sugar |
|--------|--|---------------------|
| 311230 | Breakfast cereal manufacturing | 32.7% |
| 311340 | Nonchocolate confectionery manufacturing | 28.1% |
| 311330 | Confectionery from purchased chocolate | 19.1% |
| 311320 | Confectionery from cacao beans | 17.7% |
| 311930 | Flavoring syrup & concentrate mfg | 15.1% |
| 311990 | All other food manufacturing | 14.4% |
| 311813 | Frozen cakes & other pastries manuf.* | 12.4% |
| 311822 | Mixes & dough | 8.5% |
| 311821 | Cookie & cracker manufacturing ** | 8.4% |
| 31181A | Bread & bakery, except frozen, manuf. | 8.3% |
| 311941 | Mayonnaise, dressing, & sauce manuf. | 6.0% |
| 311520 | Ice cream & frozen dessert manufacturing | 4.0% |
| 311514 | Dry, condensed, & evaporated dairy | 2.2% |
| 311942 | Spice & extract manufacturing | 2.1% |
| 311420 | Canned fruits & vegetables | 1.5% |
| 311511 | Fluid milk manufacturing | 0.9% |
| 311410 | Frozen food manufacturing | 0.5% |
| 312110 | Soft drink & ice manufacturing | 0.5% |
| 311111 | Dog & cat food manufacturing | 0.5% |
| 311211 | Flour milling | 0.4% |
| 311919 | Other snack food manufacturing | 0.4% |
| 311119 | Other animal food manufacturing | 0.1% |
| 312120 | Breweries | 0.1% |

Source: Economic Census, 2002

Sugar Containing Product Industries Experience Employment Losses

Employment in the SCP industries decreased by more than 10,000 jobs between 1997 and 2002 and stood at approximately 987,810 total jobs as of 2002.³ This is in contrast to the non-SCP food manufacturing industries in which employment expanded by more than 31,000 jobs. Non-chocolate confectionery, chocolate and chocolate confectionery, and breakfast cereal account for more than half of these job losses. (Table 2 highlights changes in SCP and non-SCP employment between 1997 and 2002.)

The SCP job losses have occurred despite increased domestic production. More specifically, SCP production, which accounts for more than 70 percent of all food manufacturing, grew by 10.5 percent between 1997 to 2002 while those sectors lost 10,000 jobs. Non-SCP production, in contrast, increased by 5.2 percent and added more than 31,000 jobs over this same period.

Table 2: SCP and Non-SCP Employment, 1997 and 2002

| | Employment (actual) | |
|-----------------|---------------------|---------|
| | 1997 | 2002 |
| Non-SCPs | 452,655 | 483,981 |
| SCPs | 997,989 | 987,810 |

Source: Bureau of Labor Statistics

Most of the increases in non-SCP employment were in poultry processing (18,517), meat processing (8,589), and wineries. Non-SCP employment fell in most other categories, especially dry pasta manufacturing (2,361), coffee and tea manufacturing (1,581), and oilseed processing (1,112). The overall employment growth in non-SCP food manufacturing can be attributed to expanding export markets and increases in the size and diversity of the American population. These demographic changes have driven consumer demand for an increased variety of highly processed and ethnic foods. But, like all of manufacturing, the employment growth has been muted by automation and increasing productivity.

Sugar Prices Cited as Significant Factor in Plant Closings and Relocations

In spite of increased demand and production, many domestic SCP firms are closing down and relocating operations abroad. Others are expanding offshore rather than expanding domestically. A comprehensive review of press reports over the past five years, where actual job loss numbers are reported, suggests that plant closings and relocations abroad alone have accounted for 6,400 or nearly two-thirds of the 10,000 job losses in SCP industries. This is a rough approximation and likely understates the extent to which plant closings and relocations account for job losses. This does not account for jobs that are created abroad instead of domestically. Also, many of the companies reporting domestic plant closings and relocations do not offer information on the actual number of jobs that would be affected and thus are not counted.

For example, Ferrara Pan Candy reported closing several domestic facilities while opening one plant in Mexico and two in Canada, resulting in a domestic employment loss of 500 jobs.⁴ In addition, more than 1,000 Brach's candy employees lost their jobs when the company closed its Chicago plant and started outsourcing abroad.⁵ Hershey Foods also closed plants in Pennsylvania, Colorado, and California, relocating them to Canada, resulting in more than 1,000 job losses.⁶ Access to lower-priced sugar was cited as a significant contributing factor in all of these relocation decisions.

One large candy company recently stated that labor represents only 3 to 6 percent of the total costs to make a piece of candy, while sugar represents 30 to 70 percent.⁷ Another candy company noted that it was hard to compare wages between its U.S. and Mexican plants, but the company expected to save \$2 million a year by purchasing sugar in Mexico.⁸ A third company noted that it uses 100,000 pounds of sugar every day and at a price differential of 12 to 16 cents a pound – that is, an added cost of \$12,000 to \$16,000

per day.⁹ This company also noted there are no alternatives to sugar in producing lollipops, candy canes, and other hard candies.¹⁰

Confectionery Plant Closings Hit Chicago Region Especially Hard

There are certain areas of the country that have been affected significantly by SCP plant closings and relocations. Chicago, one of the largest U.S. cities for confectionery manufacturing, has lost nearly one-third of its SCP manufacturing jobs over the last 13 years. These losses are attributed, in part, to high U.S. sugar prices. The metro Chicago confectionery industry maintained 8,500 jobs in 2001, down 3,642 jobs since 1991 representing a 30 percent employment decline. (Table 3 illustrates that Illinois SCP manufacturers experienced a sharper employment decline than overall manufacturing in that state.)

Table 3: SCP Employment Losses in Illinois, 1991 to 2001

| | 1991 | 2001 | Absolute Change | Percent Change |
|---|----------------|----------------|-----------------|----------------|
| Chicago sugar-user manufacturing employment* | 15,068 | 11,000 | -4,068 | -27 |
| Illinois sugar-user manufacturing employment | 30,952 | 26,000 | -4,952 | -16 |
| Illinois manufacturing employment | 875,700 | 815,400 | -60,300 | -7 |

Source: Sources: “Federal Sugar Support Program Brief,” World Business Chicago, February 9, 2004, and Bureau of Labor Statistics

* Sugar-user manufacturers include confectionery, cereals, gum, and bakery.

Industry Studies at Odds

In addition to press reports, there have been two studies commissioned by industry. The Sweetener Users Association commissioned Promar International to conduct a study on the employment effects of the U.S. sugar program. Promar calculated that between 7,500 and 10,000 jobs have been lost since 1997 because of artificially high sugar prices. This estimate only counts jobs directly impacted by the price of sugar. Promar acknowledges that labor costs and other factors play a role in companies’ decisions to relocate operations outside the United States, but maintains that the cost of sugar is a major factor.¹¹

The American Sugar Alliance commissioned Buzzanell and Associates to conduct a similar study on the confectionery industry. Buzzanell argues that the overriding reasons behind U.S. confectionery plant relocations from the U.S. to Mexico and Canada has

been labor and related costs rather than lower sugar prices.¹² Buzzanell presents data obtained largely from private interviews with confectionery companies in Mexico, Canada, and the United States (Chicago, Illinois and Holland, Michigan) and compares the costs of wages, health care insurance, taxes, electricity, land, and refined sugar in each operation.

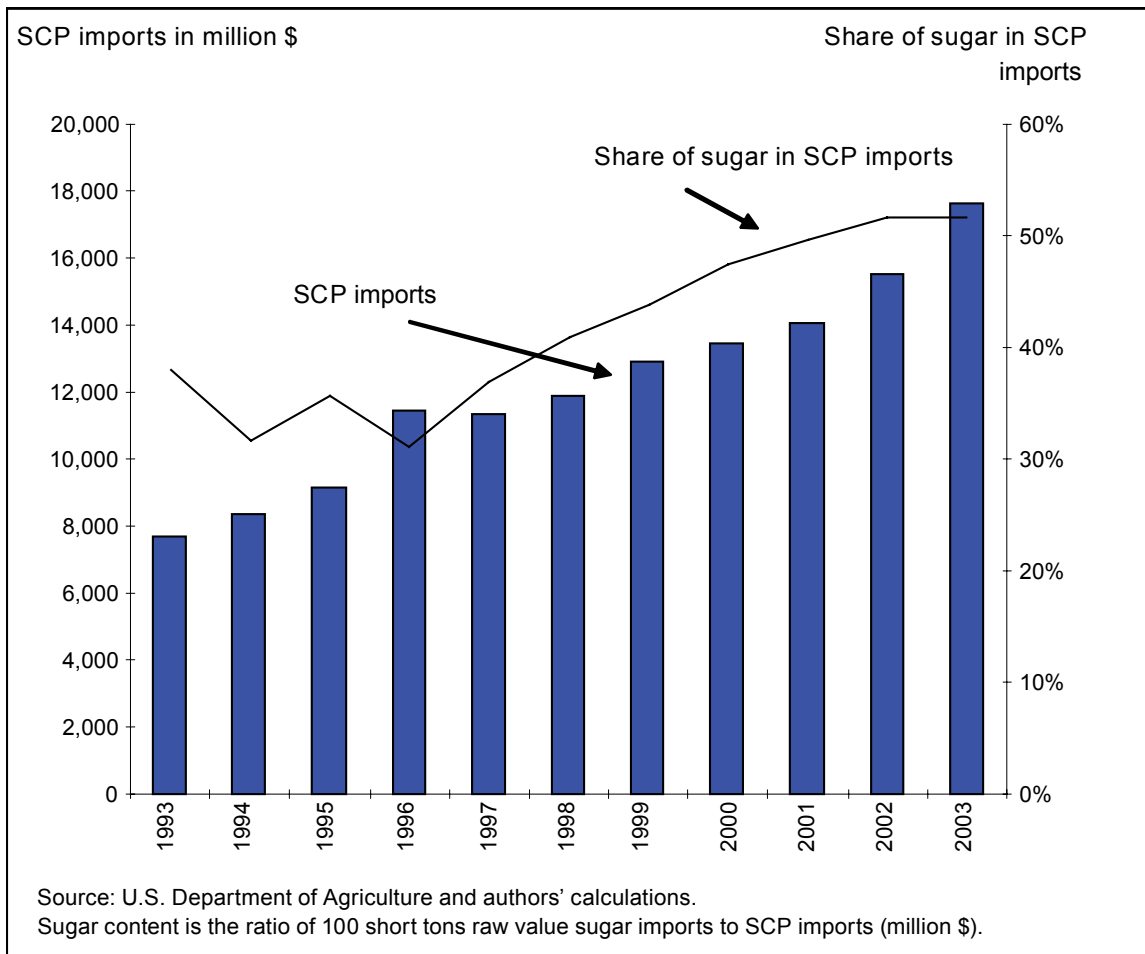
Cost comparison data are useful on a factor-by-factor basis, but say little about the importance of one cost factor relative to other factors. For example, according to the 2002 Economic Census, sugar accounts for 18 to 33 percent of raw material costs, compared to a 16 percent share of total costs for labor. There is no substitute for sugar for many confectionery products such as hard candies, which explains the relatively high cost share of sugar for these products. The lack of comparable data across all SCPs for both sugar and labor costs makes it difficult to systematically examine the relative importance of sugar and labor, thus preventing any broad SCP industry-wide conclusions.

Increased SCP Imports Reflect Displaced Domestic Production

Plant closings and relocations have been accompanied by increasing SCP imports. While NAFTA and other free trade agreements have liberalized trade in manufactured foods, sugar continues to be protected. The relatively high U.S. sugar price results in cheaper SCP imports and a cost competitive disadvantage for domestic SCP producers. This is mirrored by sharp increases in SCP imports as well as increased sugar content in those SCP imports.

Imports of SCPs have grown rapidly from \$6.7 billion in 1990, to \$10.2 billion in 1997, and up to \$18.7 billion in 2004. Import growth in SCPs has clearly outpaced that of non-SCPs. Not only has the trade imbalance in SCPs increased—the trade deficit in SCPs has increased nearly five-fold since 1997 to \$4.7 billion in 2002, but the actual sugar content in these SCP imports has continued to rise. (Figure 1 shows that SCP imports and the amount of sugar in SCP imports are on the rise.) Sugar in imported SCPs grew 111,000 short tons (raw value) from FY 2003 to FY 2004 for a growth rate of 11.6 percent. According to USDA, sugar in imported products has continued its growth and has displaced domestic sugar deliveries. Further, the volume of sugar imported through SCPs is increasing at a much higher rate than that of SCPs alone. This is illustrated through a 200 percent increase in the volume of raw sugar coming into the United States in these SCPs compared to a 100 percent increase in the actual value of sugar containing product imports between 1993 and 2003.¹³

Figure 1: SCP Imports and the Amount of Sugar in SCP Imports on the Rise



In particular, USDA's Economic Research Service reports that imports of confectionery and cocoa preparations have seen the most growth in sugar content. In contrast, the sugar content of domestically-produced SCPs has been declining. These trends reflect the displacement of domestically-produced SCPs.

Cane Refiners Also Faced with Employment Losses

The cane refining sector has also experienced employment losses as well as a decline in the number of refineries. In 2003, there were 2,845 cane refining jobs, according to Promar International, compared to 3,891 jobs in 1997, according to Census, representing a loss of 1,046 jobs. The Sugar Alliance reports that there were seven remaining refineries in operation as of 2005, down from 11 in 1996.

Job loss in cane refineries is tied to the declining demand for refined sugar for food and beverage usage, and an increase in production costs of refined cane sugar over refined

beet sugar in the United States. This is largely due to the price of raw sugar in the United States that is kept high as a result of the sugar price support program. This results in decreased profitability for cane refiners. As U.S. food processing companies relocate operations outside the United States, in order to maintain global cost competitiveness, they demand less U.S. refined sugar. The increased usage of sugar substitutes—both consumer and producer driven—further reduces the dependence on refined sugar. As a result, the producers and growers are consolidating with the refiners to preserve profitability. Grower-owned shares of U.S. cane refined sugar sales more than quadrupled in the last five years from 14 percent of production capacity in 1999 to 57 percent of production capacity in 2004.¹⁴

High U.S. Sugar Prices Have Economy-Wide Implications

The economic effects of the differential between U.S. and world sugar prices are not confined to employment in the SCP industries. The existing literature on the economic effects of liberalization of U.S. sugar prices suggests that eliminating sugar quotas and tariff rate quotas and allowing sugar to enter the United States duty free would result in economic gains in the form of increased domestic food manufacturing production and U.S. exports, gains for consumers, taxpayer savings, and a net positive effect on U.S. employment.

The United States Department of Agriculture cites the high price of domestic sugar as a main factor hindering competitiveness of the U.S. confectionery industry, and notes that sales in this industry have shown little growth over the past couple of years.¹⁵

The Government Accountability Office estimates that economic losses to domestic sweetener users, including sugarcane refiners, food manufacturers, and consumers, resulting from the sugar program in 1998 were \$1.9 billion due to production and consumption inefficiencies.¹⁶ The U.S. International Trade Commission examined the economic effects of the U.S. sugar program and found a net annual welfare gain of \$1 billion to the U.S. economy of eliminating the U.S. sugar program.¹⁷ Commission estimates reflect the total net effect for both sugar users and the sugar industry.¹⁸

Studies estimate that the U.S. sugar program maintains approximately 2,260 sugar harvesting and growing jobs, many of which are filled by seasonal workers. The estimated annual cost per job saved is \$826,000. Meanwhile, SCP industries have lost more than 10,000 jobs. Approximately 6,400 of these job losses can be attributed to confectionery plant closings and relocations abroad, where high U.S. sugar prices were cited as a significant contributing factor. Together, this suggests that for each one sugar growing and harvesting job saved, nearly three confectionery manufacturing jobs are lost due to plant closing and relocations associated with the differential between U.S. and world sugar prices. These figures do not account for job losses in other SCP industries and thus may understate the job costs. However, these figures are rough estimates and should be viewed as illustrative of the impacts of the sugar program rather than precise point estimates.

Looking Ahead

This report relies on cost share data along with comparative and trends analysis in order to assess the employment effects of food manufacturing plant closings and relocations. Press reports are also used to support the analysis. While this approach provides us with some answers for factors that might affect plant closing and relocations, it does not necessarily address the wide-ranging factors that might be involved. Further analysis would require a wider set of business information that firms typically take into account in making such decisions, and economic models that capture the intricate linkages between production, employment, and foreign direct investment of the sugar and sugar-using sectors.

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- ¹ Gary Clyde Hufbauer and Kimberly Ann Elliott, “Measuring the Costs of Protection in the United States,” Institute for International Economics, Washington, DC, January 1994; and “Fruits of Free Trade,” Annual Report 2002, Federal Reserve Bank of Dallas. These estimates are based on data from the early 1990s when the differential between U.S. and world sugar prices was between 60 and 105 percent. In 2004, the price differential was 116 percent. Thus, these studies likely underestimate the cost per job saved of the sugar program today.
- ² For a discussion on the global sugar market and government policies, see “World Sugar Policy Review,” U.S. Department of Agriculture, 2003.
- ³ For an explanation of how the term “sugar containing products” is defined, see Box 1.
- ⁴ Alexei Barrionuevo and Elizabeth Becker, “Fewer Friends in High Places for This Lobby,” *New York Times*, June 2, 2005.
- ⁵ John Schmeltzer, “Candymaker Exits a Bitter Old Trend,” *Chicago Tribune*, January 1, 2004; Laurent Belsie, “Bitter Reality: Candy Less Likely to be ‘Made in US,’” *Christian Science Monitor*, April 8, 2002.
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- ¹⁶ “Sugar Program, Supporting Sugar Prices Has Increased Users Costs While Benefiting Producers,” United States General Accounting Office, Report to Congressional Requesters, June 2000.
- ¹⁷ “The Economic Effects of Significant U.S. Import Restraints,” Fourth Update 2004, Investigation No. 332-325, Publication 3701, United States International Trade Commission, June 2004.
- ¹⁸ In addition, the Federal Reserve reported that the annual cost per sugar job (growing and harvesting) that is saved is \$826,104. At 2,261 sugar jobs saved, the total economic cost to the U.S. economy is \$1.9 billion per year. A small number of sugar growers benefit from this and receive an estimated \$400 million annually.