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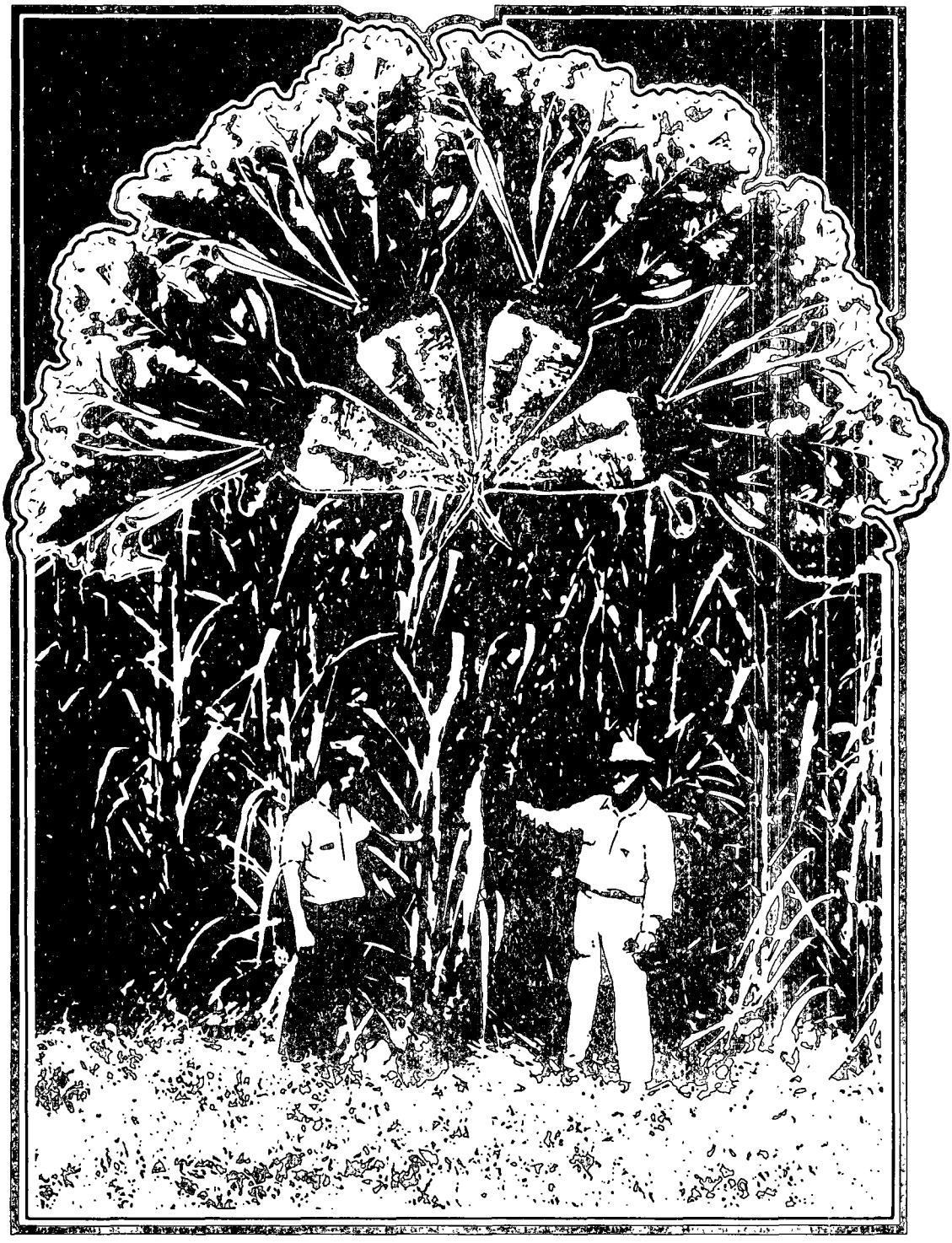
A HISTORY OF SUGAR MARKETING THROUGH 1974



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ABSTRACT

The quota system of regulating the production, importation, and marketing of sugar in the United States through 1974 was an outgrowth of Government regulation of the sugar trade dating from colonial times. Similar systems have developed in most other countries, particularly those which import sugar. The U.S. Sugar Quota System benefited domestic sugar producers by providing stable prices at favorable levels. These prices also encouraged the production and use of substitute sweeteners, particularly high fructose and glucose sirup and crystalline dextrose in various industries. But sugar is still the most widely used sweetener in the United States, although its dominant position is being increasingly threatened.

KEYWORDS: Sugar, quota, preference, tariff, refined, raw, sweeteners, corn sweeteners, world trade.

PREFACE

This report was written in 1975 by Roy A. Ballinger, formerly an agricultural economist in the Economic Research Service. It supersedes *A History of Sugar Marketing*, AER-197, also by Ballinger, issued in February 1971 and now out of print.

On January 1, 1978, three USDA agencies—the Economic Research Service, the Statistical Reporting Service, and the Farmer Cooperative Service—merged into a new organization, the Economics, Statistics, and Cooperatives Service.

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SUMMARY

It took about about 2,000 years for the production of sugar, which originated in India, to move westward across much of Asia and North Africa and become established in islands controlled by Spain and Portugal in the Atlantic Ocean off the coast of Africa. But establishing sugar production in these islands shortly before the discovery of America facilitated the speedy introduction of sugarcane to the New World. The development of sugar production in the Western Hemisphere, more than any other event, marked the beginning of present-day methods of sugar production and trade.

Except for precious metals, sugar was the first commodity shipped in commercial quantities to European countries from colonies in the New World, thus, sugar colonies became valuable possessions of European countries controlling them. Since each country attempted to control trade with its colonies to the benefit of its European nationals and not the colonists, disputes became fairly common and much smuggling developed. This was particularly notable with respect to English colonies. Those on the mainland of North America—where little or no sugar was produced—were anxious to trade surplus products for sugar and molasses produced in the Caribbean in Spanish and French as well as English colonies. Tariffs and other trade restrictions established by England were greatly resented in the mainland colonies and were a factor leading to the Revolutionary War.

Ironically, one of the first acts of the U.S. Congress, after the adoption of the Constitution, was to place an import duty on sugar as a means of raising revenue for the Government. Following the Louisiana Purchase, the tariff also had the effect of protecting the newly established sugar industry in southern Louisiana. During the 40 years or so before the Civil War, Louisiana supplied a substantial part of the relatively small quantity of sugar consumed in the United States.

The most important new feature of the sugar industry in the 19th century was the development of beet sugar in Europe, largely as a result of sugar shortages during the Napoleonic wars. The new source of sugar greatly reduced the market for cane sugar and led to economic depression in many sugarcane-producing areas throughout the world.

The structure of the U.S. sugar industry was altered greatly by events following the Spanish-American War. Sugar from the Philippines and Puerto Rico was allowed duty-free entry into the United States, and imports from Cuba were granted a 20-percent reduction from the rate applicable on sugar from other nations.

Sugar shortages during World War I led to a large increase in output in countries exporting cane sugar, particularly Cuba. England shifted from a free trade position in sugar to one of protection for its domestic industry and preference for its colonies. The United States doubled its import duty on sugar and, in 1934, followed this with a quota system. An international sugar agreement was adopted in 1937, following a series of earlier efforts to establish some international control over the sugar trade. The U.S. quota system ended in December 1974.

In most years until the end of 1974, this protection led to somewhat higher sugar prices in the United States and most other sugar-importing nations. It had also encouraged the production of nonsugar sweeteners and of attempts to produce sugar from sources other than sugarcane and sugarbeets. The most important of these competitors until about 1974 were the starch sweeteners, commonly known in this country as corn glucose sirup and dextrose. The noncaloric sweeteners—saccharin and, for a few years, cyclamate—also increased in importance; however, current and proposed restrictions are expected to restrict their use. And recently methods have been developed for producing fructose from starch in the form of a sirup containing enough fructose to make a product considerably sweeter than ordinary corn sirup. These methods appear to be of great potential economic importance.

A HISTORY OF SUGAR MARKETING THROUGH 1974

by

Roy A. Ballinger

INTRODUCTION

Cane sugar has been an important article of food in the world for several thousand years. It has been an important commodity in international trade since shortly after the discovery of America. And since the early 19th century, both cane and beet sugar have contributed importantly to the economic development of most nations of the world, including the United States.

Since colonial times, a large share of U.S. sugar needs has been supplied by imports from various countries. In addition, this country has produced a large amount of cane and beet sugar for domestic consumption. Production of nonsugar sweeteners has also achieved considerable economic importance. As a consequence, domestic and international problems connected with the marketing of sugar and other sweeteners interest producers, importers, and consumers of sugar. Sugar and other sweeteners have come to be regarded as necessary by consumers in nearly all countries, increasing the need for abundant and reliable supplies.

This report traces developments in the marketing of sugar and other sweeteners in the United States and, to some degree, in other countries. It is particularly concerned with countries from which the United States has obtained large supplies. The influence of Government policies toward sugar in the United States and other countries is described. Also, trade in sugar among nations is examined, since this trade has had a considerable indirect effect on sugar trade patterns and production in the United States.

SUGAR BEFORE THE DISCOVERY OF AMERICA

Early Sweeteners

The oldest sweet substance known to be used, except fruits and other plant materials containing sugar, is honey. The principal ingredient of honey is a mixture of two sugars, dextrose and levulose. A rock painting of the Paleolithic period found in a cave in Spain pictures a man robbing a store of wild honey (*30*).[1] Apiculture is known to have been practiced in Egypt as early as 2500 B.C. Honey was also well known as a food at an early date in many other countries. It was the most important sweetener used in Western Europe until the 16th century. Honey was also used by Indians in many parts of the Western Hemisphere when Europeans first arrived and explored the area. Although the natives in America obtained their honey from species of bees not present in Europe and Asia, early European settlers brought honey bees from Europe which have since become the common honey producers in North and South America.

Early attempts were also made to obtain sweet substances from numerous plant materials. Carrots were among the plants recommended for this purpose in England. Early Spanish explorers found Mexican Indians using cornstalks for a similar purpose. A Spanish explorer also reported that California Indians made molasses and other sweet products from certain vegetables. Since a variety of wild beet grows in California, it is possible that this beet was the source of the sweet products prepared by the Indians (*18*). The sweet ingredient of the beet is sucrose.

[1]Numbers in parentheses refer to citations listed at the end of this report.

The best-known sweetener indigenous to the New World was maple sirup or maple sugar. These materials were used by Indian tribes in the Northeastern United States and adjacent areas in Canada. Early European settlers learned of their preparation and use from the Indians (*30*).

Origin of Cane Sugar

Sugar, as a commodity, was first prepared from sugarcane. Sugarcane originated in the islands of the South Pacific. Although the natives in these islands apparently did not prepare sugar from cane, they doubtless chewed stalks as a source of food and for the sweet taste (*4*). From the South Pacific, sugarcane apparently spread first to southeastern Asia, then eastward to India, and northward to China, the Philippines, Hawaii, and other places. The manufacture of sugar from sugarcane occurred first in India. The date first produced is unknown, but Deer (*28*) states "... it may be accepted that not later than 400 B.C., and perhaps earlier, a knowledge of sugar had become general throughout India."

From India the art of growing sugarcane and recovering sugar from it gradually spread westward into Persia, Asia Minor, Egypt, and across northern Africa to the Atlantic. It also reached southern Europe, particularly Sicily, Spain, and Madeira. Much of the sugar produced for many centuries was a crude product which more nearly resembled present-day molasses than refined sugar. A similar molasses-like product is still produced in India in large quantities.

The westward migration of sugarcane and sugar was extremely slow. There was perhaps a lapse of about 2,000 years between the beginning of sugar manufacture in India and the appearance of the industry in the Atlantic islands off the coast of Africa shortly before the discovery of America. The invasion of India by Alexander the Great and the travels of early explorers brought some knowledge of sugarcane and sugar to Greece, but Europeans had no firsthand acquaintance with the product for another thousand years.

Movement Across Northern Africa

The growing of sugarcane and production of sugar did not reach the Mediterranean region until the seventh and eighth centuries. It was introduced by the Moslems after their conquest of northern Africa and Spain. The Arabs had not known of sugar in their homeland, but they became acquainted with it during their conquest of Persia.

Knowledge of sugarcane and sugar among Europeans was greatly increased during the Crusades. Sugarcane was an established crop in parts of the area occupied at times by the Christians. The cultivation of cane and the manufacture of sugar were generally continued in these areas and doubtless small quantities of sugar were shipped to Europe. The European climate was unsuitable for sugarcane in all but the most southern parts.

Sugarcane was introduced to Madeira shortly after its colonization by Portugal about 1420. The crop flourished on the island, and for a time, production of sugar was sufficiently large to influence the course of European trade. The first recorded shipment to England was in 1456. Production in 1496 reached 1,700 tons, but by 1530 it had declined to 700 tons as production in the New World was becoming established (*30*).[2]

Until after 1500, sugar in Western Europe, except in parts of Spain, Portugal, and certain Mediterranean islands, was chiefly regarded as a medicine or as an article of luxury available only to the wealthy. Even the development in Madeira was not sufficient to produce any great change in this situation. Honey continued to be the most important sweetener available to most Europeans. However, the spread of sugar production from India to the eastern shores of the Atlantic made it possible for early explorers to easily transport sugarcane across the ocean and develop the production of sugar in newly discovered America.

[2]Quantities referring to sugar produced or traded come from many sources. Exact measurement in long, short, or metric tons is given where possible.

THE COLONIAL PERIOD IN THE AMERICAS

The development of the sugar industry in America began shortly after its discovery by Columbus, who reportedly brought sugarcane from the Canary Islands on his second voyage. It was planted on some Caribbean island, probably Hispaniola, in the part that is now the Dominican Republic.

Portuguese Colony: Brazil

The first development of a sugar industry of commercial importance in the Americas was made by the Portuguese in Brazil. This followed the growth of the industry in Madeira and other islands near Africa.

Although the exact date of the introduction of sugarcane into Brazil is uncertain, there is a record of duty paid on sugar from Brazil at the Lisbon customhouse in 1526 (*30*). The first period of development of the Brazilian sugar industry ended in 1624 when the Dutch, attracted by the reported profits of the industry, attacked and captured the northern part of the country. The output of sugar was greatly reduced by the Dutch occupancy, because the Portuguese proprietors were generally dispossessed and production was disorganized. Production was not fully restored until after Portuguese control of the territory was restored in 1654.

During the century when the sugar industry was first developed in Brazil, Portugal was the largest producer of sugar in the world. And the sugar trade contributed much to the prosperity of that country. It was also a time of great prosperity for the owners and operators of sugar properties in Brazil. Sugar was the first agricultural product to be shipped from America to Europe in commercial quantities.

Spanish Colonies

The Dutch invasion of northern Brazil and the invaders' attitude toward Portuguese proprietors of sugar properties caused a decline in sugar production there. Consequently, the center of world sugar production gradually shifted to the Spanish colonies in the New World. Sugar production had become established in the Canary Islands. Although production there was never large, these islands supplied not only the first sugarcane Columbus brought to America but also most of the individuals possessing knowledge of the cultivation of sugarcane and the manufacture of sugar. The sugarcane first brought by Columbus is reported to have grown well, although the people who made the voyage with the canes became ill and died. So, the venture failed.

The Spaniards reintroduced sugarcane to Hispaniola around 1520; the exact date is uncertain. In 1530, between 1,000 and 1,500 tons of sugar were reported to have reached Spain. The sugar trade became so profitable that sugar was shipped under convoy with pearls and other treasure. However, the prosperity of the sugar industry in Hispaniola lasted a relatively short time. Shortage of labor, heavy taxes, and the requirement of the Spanish Government that all sugar produced be shipped to Sevilla contributed to the decline. Also, heavy exactions (amounting to a tax) by the church further increased costs.

The sugar industry in Cuba developed considerably more slowly than that in Hispaniola, although cane was first introduced there in 1511. Sugar production was first recorded in 1576 in western Cuba. The industry's first substantial growth in eastern Cuba (the most important producing area in the 20th century) began in 1598. By 1617, production amounted to 312 tons. Growth from this point appears to have been slow for the next century and a half; output amounted to only 490 tons in 1760. After this, the growth of the industry was more rapid, and by 1895, before revolutionary activities interfered with operations, production exceeded 1 million tons.

Sugar production also developed in other Spanish possessions in the New World. Puerto Rico, Mexico, and Peru were among the more important.

In addition, the Spanish developed a fair-sized sugar industry in the Philippines. Sugarcane, from which a low-grade sugar was being produced, was being grown extensively there when the islands were discovered by Magellan in 1521. No commercial sugar industry developed for two centuries or more after Spain took possession of the Philippines about 1565. However, shipments of sugar from the Philippines to the Pacific Coast of America are recorded from about 1800. These peaked at over 300,000 tons in 1894 (*51*).

The greatest development of the sugar industry in the Philippines was on the island of Negros. This island was placed under the control of a religious order of the Roman Catholic Church. The growth of the industry in Negros in the 19th century was extensive, but technology did not develop beyond the level reached elsewhere in the 18th century. After the Spanish-American War, the United States transferred the church lands to private entrepreneurs. Negros remains the largest source of sugar production in the Philippines.

British and French Colonies

Other European countries envied the sugar profits made by the Portuguese and Spanish. In addition to Dutch efforts in Brazil already mentioned, Britain and France were active in acquiring sugar. First, the British and French attacked Spanish shipping and settlements seeking to capture valuable merchandise including sugar. Sometimes they succeeded. Often, more permanent territorial conquests followed which made possible the establishment of sugar industries under the control of Britain and France.

The most important sugar producing colonies of Britain were the Caribbean Islands, Jamaica, Trinidad, and Barbados, plus British Guiana and British Honduras on the mainland. The principal French possessions were Haiti, Guadeloupe, and Martinique in the Caribbean. Denmark developed a comparatively small sugar industry in the Virgin Islands. The Dutch, after losing their foothold in Brazil, were largely confined to Surinam so far as sugar in the New World was concerned. However, the Dutch developed a large sugar industry on the other side of the world in Java.

Other places where sugar industries still exist, outside the Americas, were developed by European nations and include South Africa, Australia, Fiji, and the islands of Mauritius and Reunion in the Indian Ocean. In general, the development of sugar indus-

tries in these areas occurred later than in the Americas (*30*). Sugar production in Mauritius, although started much earlier, did not exceed 1,000 tons until after the end of the Napoleonic Wars in 1815.

A commercial South African sugar industry developed in Natal on the southeastern coast beginning after the area became a British colony in the mid-19th century. Sugarcane, however, had been known in this part of Africa for some centuries before it was developed commercially.

Unlike South Africa, Australia was growing no sugarcane when first visited by Europeans. Sugarcane, however, was soon introduced by the English settlers and small-scale commercial production of sugar began early in the 19th century. The industry is still confined to the coastal areas of Queensland and New South Wales where it has grown to be of great importance.

The relatively small sugar industry in Fiji was developed late in the 19th century shortly after the islands became a British colony. It has become of great economic importance to the region. The most successful developer of the industry, and the only one still operating, is a large Australian sugar company.

Trade Restrictions

The production of sugar in the Americas and its shipment, primarily to Western Europe, increased substantially toward the end of the 18th century. During this period, the "sugar islands" were regarded by European countries as their most prized colonial possessions. However, the changing fortunes of war and shifts in the attitudes of various European governments toward the sugar industry in their colonies caused unexpected and, at times, drastic shifts in the profits of colonial sugar planters. Among the more important government actions affecting the sugar industry were the Navigation Acts of England and similar laws in other countries which regulated shipping and customs duties. Tariffs on sugar became important sources of revenue for all countries whose colonies produced sugar.

All European countries regarded trade with their colonies as being properly exclusive to themselves. Spain went so far as to require, for a time, that all shipments must use the port of Sevilla. The English Navigation Acts, first passed in 1650, did not finally cease operating until 1849. Although the exact provisions of these laws were frequently changed during the two centuries of their existence, their general purpose was to confine the trade of each colony to shipments to and from English ports, or at least to provide strong financial inducements for traders to do so. That is, supplies for the colonies were to come only from England and all products from the colonies were to go to England. During most of the period, sugar and molasses were among the most important items subject to these restrictions (*54*).

England and other countries applied import duties on sugar arriving from their colonies almost from the time of their establishment. The colonies were supposed to be profitable to the government of the mother country. The rate of duty in England prior to 1651 was 5 percent ad valorem. Specific duties of so much per pound, the rate varying with the type or purity of the sugar, were substituted for the ad valorem duties that year. The law also provided that foreign sugar should pay double the rate applicable to that from English colonies. This seems to have been the beginning of imperial preference, at least for sugar.

In 1670, England took the first steps toward providing protection for its sugar-refining industry. Refining—remelting and increasing the purity of imported sugar—had become established in most European countries soon after the first shipments of sugar from the New World arrived. The first sugar mills in the Western Hemisphere were small, crude affairs, and the sugar they produced frequently was more like a thick molasses than like the sugar in use today. Better facilities and more skillful workers were available in Europe, and refineries were established there.

However, as equipment and skill improved in the colonies, some of the sugar reaching Europe was of sufficiently high quality to be marketed to consumers without further refining. Naturally, the European refiners were unhappy about this, since it reduced the volume of their business. The English Tariff Act of 1670 provided substantially higher rates of duty on the importation of the best quality sugar, described as "refined loaves" and "white candy." This discouraged refining in the colonies. Even today, this purpose is present in the laws of most countries which import sizable quantities of sugar.

British Mainland Colonies

The attempt to confine the trade in sugar to the sugar producing colonies and their mother countries in Europe gradually led to difficulties between Britain and its colonies on the mainland of North America. Sugarcane could not successfully be grown in the 13 colonies, although attempts were made as far north as Jamestown. Small quantities of molasses or sugarcane sirup were at times produced in South Carolina and Georgia.

With those exceptions, the only locally produced sweeteners available for the use of settlers were honey and maple sirup. The sweet sorghums were not introduced to the United States until the 19th century.

The importance of maple sugar in Vermont about the time of the American Revolution has been described (*21*) as follows:

> "The manufacture of maple sugar is also an article of great importance to the State (Vermont). Perhaps two-thirds of the families are engaged in this business in the

spring, and they make more sugar than is used among the people. Considerable quantities are carried to the shopkeepers; which always find a ready sale, and good pay. The business is now carried on, under the greatest disadvantages: Without proper conveniences, instruments, or works; solely by the exertions of private families, in the woods, and without any other conveniences than one or two iron kettles, the largest of which will not hold more than four or five pailfuls. Under all these disadvantages it is common for a family to make two or three hundread pounds of maple sugar in three or four weeks."

However, maple sugar and honey were inadequate for the needs, or at least the desires, of most of the colonists, although statistics showing the volume produced are not available.

Trade with the sugar islands in the Caribbean soon became important to the settlers. Some of this trade was doubtless legitimate, that is, conducted so as not to violate British law. But, particularly when the laws were most restrictive, much smuggling took place. Products sent to the sugar-producing islands included such items as fish, pork, lumber for barrel staves and other articles, tobacco, and cotton. Frequently, business with producers in French and Spanish islands was more profitable for colonial traders than trade with the British colonies, in part because products of the northern colonies were in greater demand by the French and Spanish settlers.

Sugar and the American Revolution

Opposition in the colonies to the British trading laws, particularly those concerning sugar and molasses, began to appear early in the 18th century. The New England colonies usually were the most vociferous in their complaints. The Molasses Act (also called the Sugar Act), passed by the English Parliament in 1733, levied heavy duties on molasses imported into the Thirteen Colonies from foreign countries. The colonists, especially in New England, largely ignored the law. It was reported that "In 1763, out of 15,000 hogsheads of molasses that were imported into Massachusetts, 14,500 were smuggled in" (*54*).

New provisions, intended to provide more stringent enforcement, were incorporated in the Sugar Act of 1764. Although the rates on sugar from British islands were lower than in the previous act, they were considerably higher than rates suggested to Parliament by representatives of the colonies. Britain's need for funds to help pay for the cost of the French and Indian Wars was given as one reason for retaining substantial duties on sugar and molasses. Other acts of Parliament passed at this time hampered trade in other products and were objectionable to the residents of the colonies.

As long as France possessed Canada, and British-French Wars involved the North American colonies, the people in New England and the other colonies felt the need for protection by the British army and navy. This was a strong force muting protests against restrictive British trade laws. However, when Britain acquired Canada from France in 1763, the need for restraint by the colonists largely disappeared.

Under these circumstances, the British Sugar Act of 1764 aroused increased expressions of resentment among the colonists. Smuggling of sugar and molasses from Spanish and French islands in the Caribbean continued, despite increased efforts by Britain to prevent the traffic. In 1772, a British schooner attempting to prevent smuggling ran aground on the New England shore while chasing a sloop. The sloop escaped and reported the location of the grounded British ship. An armed force was recruited which attacked the British vessel and destroyed it by fire.

This and numerous other incidents demonstrate the close connection between the sugar trade and the American Revolution. John Adams wrote (*54*), "General Washington always asserted and proved that Virginians loved molasses as well as New Englanders did. I know not why we should blush to confess that molasses was an essential ingredient in American independence. Many great events have proceeded from much smaller causes."

SUGAR FROM 1783 TO 1864

The U.S. sugar trade was immediately affected by the newly gained independence from England. The importation of sugar from British possessions in the Caribbean was almost completely eliminated and was replaced by an increase in receipts from other islands, particularly Cuba. Continued British restrictions on American shipping in the trade between the United States and British possessions in the Caribbean were an important factor in producing these results. Such restrictions were not completely removed until 1849.

U.S. Sugar Tariff

Another early development was the imposition of a tariff on sugar by the United States. The first such law, passed in 1789, provided for duties of 1 cent a

pound on brown sugar, 3 cents on loaf sugar, and 1.5 cents on all other sugar.[3] Since their original imposition, the United States has maintained import duties on all imported sugar, except for raw sugar imported from 1890 to 1894. The primary purpose of the early tariffs was to raise revenue for the Federal Government. Between 1789 and 1860, custom duties, including those on sugar, supplied from two-thirds to nine-tenths of the Federal Government's total ordinary receipts (*61*). Thus, taxes on sugar, a contributory cause of the American Revolution, were promptly imposed by the United States after independence was gained. The need for revenue was a major cause of the tax in both cases.

Prior to the Louisiana Purchase, the United States had no domestic sugar industry, except for the refining of imported sugar. Before the end of 1789, the rate of duty applicable to loaf sugars, the best quality available, was raised. This made the rate on brown (raw) sugar lower relative to the original loaf rate. These rates afforded the first tariff protection to sugar refiners granted by the Government. The purpose and effect was similar to an earlier tariff arrangement by Britain.

Production in Louisiana

The production of sugar in Louisiana began in 1794. Sugarcane had been grown in Louisiana for a number of years prior to this, but it had been used only for the production of various sorts of sirup, since the settlers lacked the skill necessary to obtain granulated sugar from the juice in sugarcane stalks. After 1794, sugar production in Louisiana increased, and by 1803, when the United States purchased the Louisiana Territory from France, it amounted to a few thousand tons a year (*42*). This was the first domestic sugarcane industry of consequence in territory controlled by the United States.

As soon as Louisiana became a part of the United States, the industry there benefited from the protection of the U.S. tariff. This had comparatively little effect on production until after the War of 1812. Not until then were conditions sufficiently stabilized to encourage capital and management to enter the Louisiana sugar industry. By 1823, production there had risen to 17,050 tons. In addition to the supply obtained from Louisiana, the United States imported 30,350 tons of sugar that year. Both imports and production gradually increased from that time to the outbreak of the Civil War, as both population and per capita consumption rose.

During the years before the Civil War, small quantities of sugar were produced in other Southern States, mainly Texas, Florida, and Georgia. Sugar is no longer produced in Georgia. It did not become important in Florida until the 20th century.

In contrast to the lack of commercial success in other States, the industry in Louisiana generally prospered. It was, and still is, confined to the delta area in southern Louisiana, where the growth of sugarcane is favored by an unusually fertile soil and a somewhat warmer climate than prevails in most of the State.

Marketing Louisiana Sugar

New Orleans, from the beginning of sugar production, was the chief center for marketing Louisiana sugar, financing the industry, and procuring supplies for plantations and mills. The consumption of sugar in New Orleans and surrounding territory, after the first few years of the industry, was never sufficient to provide a market for more than a small part of the output. Most of the sugar had to be shipped either to east coast ports to compete with imported sugar or to markets in the Mississippi Valley. Early in the 19th century, the largest proportion of shipments from New Orleans went to the Atlantic coast, but this proportion gradually declined with the growth of population and market opportunities in areas adjacent to the Mississippi River.

Most Louisiana sugar planters sent their sugar to New Orleans for sale through a commission merchant or factor, regardless of the ultimate destination of the sugar. However, some planters made direct sales to distant buyers, particularly those located in the Mississippi Valley north of the Louisiana sugar area. The sugar was placed in hogsheads that ordinarily held about 1,000 pounds. There were no set standards or grades and each hogshead commonly sold on its own merits.

Before 1820, the Exchange Coffee House in New Orleans was occasionally used as an auction market for sugar that did not find a buyer by other means. More common, at least after 1830, was the daily sale of sugar at auction on the levee. Facilities for handling this business were extensively improved and enlarged in 1830. Planters commonly consigned their sugar to a factor in New Orleans, whose commission was 2.5 percent of the sales price. Other marketing costs, such as insurance and transportation, combined to make marketing costs to the planter average 10 percent in the 1840's and 1850's.

In addition to selling sugar for their clients, factors frequently served as agents for the planters in obtaining needed credit and supplies. The isolated location of many plantations which made travel to New Orleans difficult and time consuming, together with uncertain banking facilities, combined to make the factors' services as necessary to the production of sugar as to its sale.

Most of the sugar produced in Louisiana before the Civil War was shipped from New Orleans or direct from plantations, without being refined or improved in

[3] A complete list of U.S. tariff rates on sugar appears in appendix A.

quality beyond the stage at which it left the plantation. A few refineries were established in the area. The largest one was owned by the Louisiana Sugar Refining Company of New Orleans. Comparatively little demand existed for refined sugar from Louisiana during this period, since the market, particularly to the north, used mostly raw sugar. Consumers generally were not inclined to pay the higher price necessary to obtain the refined product (*48*).

During this period, the total quantity of sugar used in the United States was small but increased rapidly. Consumption amounted to a little more than 500,000 tons in 1860, more than 10 times that of 1822, the earliest year for which figures are available. Per capita consumption increased from 9.5 pounds in 1822 to 32.6 pounds in 1860—about a third of the present-day rate of consumption.

Nonsugar Sweeteners

During this period, people were not as short of sweeteners as these figures indicate. Honey, maple sugar and sirup, cane sirup, and sorghum sirup all added to the supply. In 1840, the production of maple sugar in the United States was reported to be 34,516,000 pounds (*21*). In 1860, it amounted to 40,120,000 pounds (*56*). Also, 1,598,000 gallons of maple sirup were produced in 1860. The total, in terms of sugar, equaled 26,451 tons, adding about 5 percent to the supply of cane sugar that year. Additional supplies were probably imported from Canada.

U.S. honey production in 1860 amounted to 23.3 million pounds. Honey was a common product in rural areas and contributed considerably to the sweetening materials available to people there, as well as to consumers in towns and cities.

Considerable quantities of cane sirup were produced in Florida, Georgia, Alabama, Mississippi, Texas, and Louisiana outside the area where sugar was produced. Sugarcane grew in various parts of these States but not well enough to make sugar production profitable. However, many farmers grew small amounts of sugarcane from which sirup was produced in local mills. This provided a source of sweetening for people in the southernmost parts of the country in addition to granulated sugar.

Sweet sorghum, as distinguished from the varieties used for the production of grain, was introduced into the United States about 1850, or earlier, according to some authorities (*26*). At the time, the sweet taste of the juice in these sorghums was known to be due to sugar. Since sorghum grows in much cooler climates than sugarcane and is adaptable to a much larger area of the United States, early attempts were made to obtain granulated sugar from it. Means of doing this on a small scale on individual farms were described by William Clough in 1865 (*26*). Admittedly, the process was slow and uncertain; sometimes no sugar was obtained. Dr. Harvey W. Wiley and others in USDA conducted extensive studies on the use of sorghum as a source of sugar from 1867 to 1890. Although they did not succeed in establishing a commercial sugar industry based on sorghum, the production of sirup or sorghum molasses developed into a fair-sized home industry.

The Bureau of Census reported production of 7 million gallons of sorghum sirup in 1859. A peak output of 28 million gallons was reached in 1879. At 7.85 pounds of sugar per gallon of sirup, these amounts are equivalent to 27,000 and 108,000 tons of sugar, respectively. Production gradually declined after 1879 until the outbreak of World War I.

Starch Sweeteners

Gottlieb Sigismund Kirchhof accidently discovered that sweet substances could be prepared from starch while working at the Academy of Science, St. Petersburg, Russia, during the Napoleonic Wars. Kirchhof needed gum arabic for use in manufacturing porcelain. No gum arabic was available because of the continental blockade imposed by the British at that time. However, a Frenchman, Bouitton-Lagrange, had reported that dry starch, when heated, acquires some of the properties of the vegetable gums. Kirchhof attempted to make a substitute for gum arabic from starch by adding some water and acid before heating. As a result, instead of a gummy substance, he obtained a sweet-tasting sirup and a small amount of crystalized sugar (dextrose), a finding he reported in 1811.

Because of the extreme shortage of sugar in Europe at the time, the discovery attracted immediate notice in scientific and commercial circles. Starch, largely obtained from potatoes, was already being manufactured in a number of countries in Europe. With this supply of raw material available, numerous small factories were erected to convert starch to either sirup or sugar. Means were soon discovered by which either sirup or sugar could be obtained as desired. The fact that neither beet sugar nor any other acceptable substitute for imported cane sugar had as yet become available encouraged the development of starch sweeteners. However, the new industry, after the defeat of Napoleon and the lifting of the continental blockade, declined almost as rapidly as it had grown. Sugar became very cheap for a while as the large supplies that had accumulated in exporting countries were shipped to Europe.

But it had been discovered that all starches, regardless of the plant from which obtained, yielded the same sweet substances and that the sugar obtained from starch was identical with that contained in grapes. This last point was of some importance because brewers and winemakers had discovered that the addition of grape sugar could improve their products. However, the supply of sugar from grapes was too small to meet this demand, so

the substitution of dextrose made from starch was welcomed. This development helped to revive the starch sweeteners industry, particularly in France and Germany.

Few statistics are available concerning the early operation of the starch sweetener industry in Europe. But 11 million pounds of dextrose were reported to have been produced from potato starch in France in 1855 and about 44 million pounds in Germany in 1874. German factories had also produced 40 million pounds of sirup in 1874. Starch sweetener production developed more slowly in the United States than in Europe, since there was no sugar shortage here early in the 19th century. A small factory near Philadelphia processed potato starch in 1831-32. The next plant established in this country to make dextrose from cornstarch was in New York City in 1864. However, industry sources say that the superintendent was apparently the only person who understood the process, and the company failed soon after his unexpected death.

The Beet Sugar Industry

Developments in U.S. sugar production and marketing during the early 19th century were overshadowed for the rest of the world by the establishment and development of the beet sugar industry in Western Europe. In 1747, a German chemist, Andreas Marggraf, proved that beet sugar is identical with that in cane. Nothing much happened as a result of this knowledge for a half century. Not until 1799 was the first factory established for the production of sugar from beets (*47*).

The first large-scale impetus toward the commercial production of sugar from beets came from the efforts of Napoleon to find a substitute for imported sugar which was no longer available because of the continental blockade. The French attempted to discover new sources of supply. They first extensively investigated grapes. They also tried to obtain sugar from trees, as is done with maple trees in North America, from sweet sorghum, and from starch. None of these were commercially successful, although small amounts of sweet substances were obtained in each case.

Beet sugar production did succeed, however, and numerous small factories were established, especially in France. Production declined immediately after the Napoleonic Wars but did not disappear.

The French practice of protecting the domestic beet sugar industry from competition with overseas cane sugar was adopted soon after the end of the continental blockade, although more by accident than design at first. Import duties on sugar received from colonies and other countries were an important source of revenue to most European governments before the development of the beet sugar industry. Beet sugar produced within the country was not subject to a tariff but received the benefit of the tariff applied to imported sugar. In nearly every country where it is produced, beet sugar has continued to receive government protection, by tariff or other means, from sugar produced in other countries.

The production of beet sugar in Europe soon spread from France and Germany into other continental countries, including Italy, Holland, Austria, and Russia. An attempt was made to establish a beet sugar industry in Britain in 1830. The effort did not succeed, and the production of beet sugar did not become established there until much later. The British Government at the time was obtaining tax revenue on sugar from its Caribbean colonies, and it opposed the establishment of a domestic beet sugar industry which would reduce this revenue. Also, in the 19th century, cane sugar refiners and persons having a financial interest in sugar production in the British colonies opposed th stablishment of a beet sugar industry in England (*30*).

Early attempts to establish a U.S. beet sugar industry consisted mainly of the construction of four small factories between 1838 and 1846. By 1855, the last of these had ceased to operate. They produced only insignificant quantities of sugar. The first successful beet sugar factory in the United States was not established until after the Civil War.

DEVELOPMENTS IN THE LATTER 19TH CENTURY

The consumption of sugar in the United States declined during the Civil War from an annual average of 508,000 tons in 1857-61 to 330,000 tons in 1864. Presumably most of the decline was in the Southern States where food supplies were shortest. However, recovery in consumption after the war was rapid, reaching 505,000 tons in 1866. The increase continued, and consumption exceeded 1 million tons for the first time in 1880; by 1900 it amounted to 2,660,000 tons.

Decline and Recovery in Louisiana

The Civil War had a disastrous effect on the Louisiana sugar industry. Production, which averaged 177,000 tons per year from 1857 through 1861, amounted to only 5,400 tons in 1864. It did not recover to the pre-Civil War average until 1888. Peak production in the 19th century was 348,000 tons in 1897.

The slow recovery of the Louisiana sugar industry

was only partly due to the physical destruction of property. Probably the necessity of changing from a slave labor system to a wage system with free labor caused the greatest difficulty. Neither the employees nor the employers had any experience with a wage system in the Louisiana industry, and it was several years after the end of the war before working conditions were reasonably stabilized (*46*).

Another factor delaying recovery was the increasing capital investment necessary to establish an efficient operating unit. Improvements usually involved the purchase of more and larger machinery. The general impoverishment of the area as a result of the war made such purchases difficult and many improvements were delayed. The number of sugar mills declined as the average size of the remaining ones increased. This resulted in an increasing number of plantations which no longer had a mill as a part of the operation. This in turn led to the sale of sugarcane from many of the smaller plantations to some neighboring mill owner.

The sale of sugarcane rather than sugar involved some new and perplexing problems. Harvested sugarcane is a perishable commodity which has to be processed within a few days after it is harvested or it spoils and becomes worthless. It is bulky and cannot be transported very far without incurring excessive costs. Its value to a processor depends largely upon how much sugar can be obtained from the cane and the price at which the sugar can be sold. Both factors at the time varied widely and unpredictably. Under the circumstances, agreement on the price to be paid for sugarcane was difficult. This led, in the 1880's, to the practice of buying cane on a "scale" plan so that the price was determined by the price of sugar. Originally there were many variations in the details of the plan used by different mills, and discussions between growers and processors continued. Nevertheless, the device proved useful, and some form of it is still in use today in Louisiana and most other areas where sugarcane is grown.

By the 1890's some mills were also varying the price they paid for sugar according to the yield of sugar per ton of cane. This device, now commonly stated in terms of the percentage of sugar in cane juice, is also in use today. Thus, two of the main features of present-day grower-processor contracts for the sale of sugarcane had their origin in the last 20 years of the 19th century.

Reciprocity with Hawaii

While the Louisiana sugar industry was still striving to regain its economic health following the Civil War, the United States signed a treaty of reciprocity with the Kingdom of Hawaii which became effective in 1876. Under this treaty, sugar from Hawaii was allowed to enter the United States free of duty. The first attempt to manufacture sugar commercially in Hawaii was made in 1802, and the first surviving sugar plantation was established in 1835 (*31,61*). In 1875-76 Hawaii produced about 13,000 tons of sugar. By 1898-99 production there had increased to 283,000 tons, slightly more than the 278,000 tons produced in Louisiana that year. Except in 1886-87 when Louisiana's crop was unusally small, the 1898-99 crop was the first in which Hawaii produced more sugar than Louisiana. The rapid increase in sugar production in Hawaii continued until it exceeded 1 million tons in 1930-31. The protective effect of coming within the U.S. tariff boundary, first by treaty and then as a part of the United States, was undoubtedly a major factor inducing this rapid increase in sugar production.

Introduction of Beet Sugar in the United States

The production of beet sugar in the United States also began to develop late in the 19th century. The first successful beet factory in this country was established at Alvarado, Calif., in 1870. It operated through 1967. The early beet sugar factories erected in the United States were mostly small, and many of them operated for only a few years. By 1899, there were about 29 beet sugar factories in existence, of which all but 6 had been built in 1897, 1898 or 1899. In spite of the expansion in the production of beet sugar, sugarbeet factories in 1968 were operating on the sites of only 3 of the plants in existence in 1899. Many of the early promoters of the beet sugar industry were immigrants from Europe, particularly Germany, who brought a great deal of knowledge of the European industry with them, but frequently they did not succeed in selecting the best sites in the United States for the growth of sugarbeets over the long-term (*18*).

The average annual production of beet sugar in the United States during 1866-71 has been estimated at 448 tons. It did not exceed 2,000 tons in any year until 1888. However, production then began to increase fairly rapidly, reaching 82,000 tons in 1899. This was still well below the output in Hawaii and Louisiana and accounted for only 3.4 percent of U.S. consumption that year.

Imports and Tariffs

In spite of the recovery of production in Louisiana and the beginning of a domestic beet sugar industry, the United States relied on imports for most of its sugar supplies from 1866 through 1899. In 1897 when domestic production reached a peak of 399,000 tons, imports (smaller than in most years) amounted to 1,338,000 tons, about 78 percent of the total amount available for consumption. These imports included duty-free shipments from Hawaii, since Hawaii at that time was not part of the United States.

During the 30 years following the Civil War, the quantity of sugar available to U.S. consumers increased from 440,000 tons in 1866 to 2,800,000 tons in 1896. Domestic production, entirely confined to the mainland during this period, rose from 26,000 tons to 399,000 tons in 1897 (fig. 1). This amounted to about 6 percent of the total U.S. supply at the beginning of the period and 14 percent at the end. Imports from Cuba, 321,000 tons in 1866, reached a peak of 1,064,000 tons in 1893, yet they declined from 73 percent of the total supply in the earlier year to 43 percent in the latter one. The largest increase was in imports from countries other than Cuba. These rose from 97,000 tons in 1866 to 1,084,000 tons in 1893. After 1893 the rise in these countries was even faster as revolution in Cuba reduced production in that country.

Perhaps the most surprising thing about the trends in sources of supply of sugar for the United States is the relatively small growth in domestic production despite the continuous protection from the U.S. tariff and, from 1891 to 1894, from the bounty paid on raw sugar production.

Prior to 1861, different classes of sugar, to which different rates of duty applied, were specified in such descriptive terms as raw, brown clayed, loaf, and refined. In 1861 the Dutch color standards of classifying sugar for assessing import duty were introduced, although usually in combination with older descriptive terminology. The color test was not entirely abandoned in the United States for purpose of tariff classification until 1913.

Because of shifts in specifications for various classes of sugar, it is difficult to make accurate comparisons of tariff rates at different times during this period. At the outbreak of the Civil War, the duty on what was termed raw sugar was 0.75 cent per pound. This was the lowest rate since the establishment of the Republic. However, the need to raise revenue for conducting the war resulted in a number of increases, and by 1864 the rate was 3 cents per pound. Also, an excise tax was imposed on refined sugar from 1862 to 1869 at rates varying from 1.5 to 3.0 percent of the sugar's value. Although some reductions were made after the war ended, the rate on raw sugar generally remained above the pre-Civil War rate until 1891.

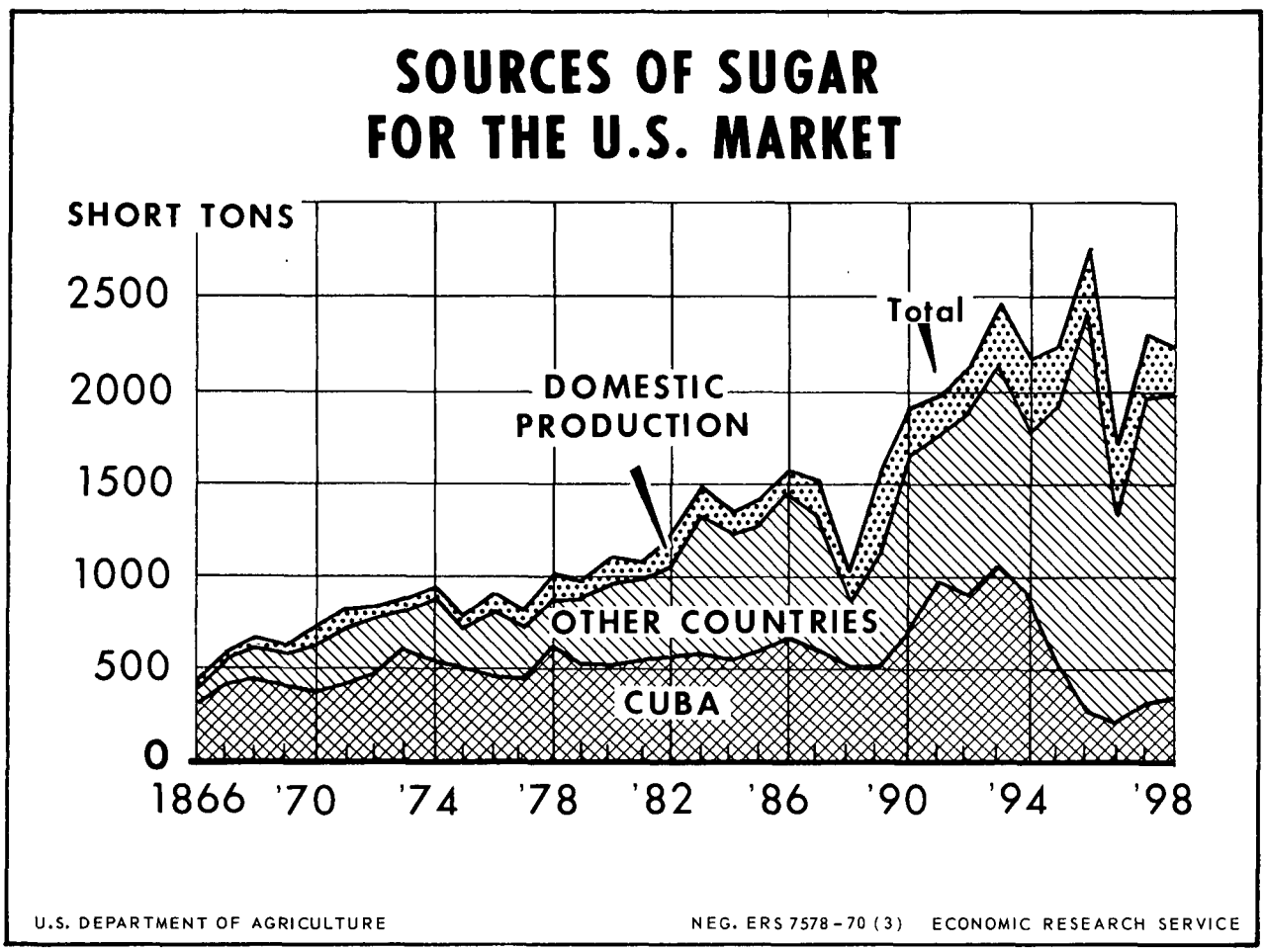

Figure 1

In 1891 raw sugar was admitted to the United States free of duty, and a subsidy was paid to domestic producers. This arrangement was in effect from July 1891 to August 1894. The rate of bounty was 2 cents per pound on domestic production for sugar testing not less than 90 degrees by the polariscopic test, and 1.75 cents for sugar between 80 and 90 degrees. During this period refined sugar remained subject to a duty of 0.5 cent per pound, thus continuing the protection for cane sugar refiners. U.S. imports of raw sugar increased about 40 percent during the period it was admitted free of duty. Imports from Cuba increased by an even larger proportion.

A surplus of funds in the U.S. Treasury was the principal reason advanced for substituting a bounty to domestic producers in place of the protection of the tariff which they had formerly enjoyed. Producers, nearly all in Louisiana, were not entirely happy with the arrangement. The subsidy was visible to everyone, whereas the benefit obtained from the tariff was less so (*53*).

Another feature of the sugar tariff introduced in 1890 was a countervailing duty of 0.1 cent per pound. In 1897 the rate of this duty was changed to make it equal to the export bounty paid in the country where the sugar was produced. The countervailing duty was established to offset the growing practice in some European countries of making payments to their producers to encourage the export of surplus quantities of beet sugar. One result of this was to encourage European exporters to seek markets where there were no special duties to offset export subsidies.

With the exception of Hawaii, countries exporting raw sugar to the United States benefited from the removal of the duty. Sugar from Hawaii had entered the United States without payment of duty since 1876. Extending duty-free status to other nations merely increased the competition to which Hawaiian sugar was subjected. Because Hawaii was independent, producers there did not receive the subsidy granted to domestic producers. As a result, the production of sugar in Hawaii, which had increased from 13,000 tons in 1876 to 140,000 tons in 1890, remained relatively static during the next 4 years, amounting to 148,000 tons in 1895. Production then resumed its rapid growth, reaching 360,000 tons in 1900. This experience appears to have been a factor encouraging Hawaii to become a part of the United States in 1898.

U.S. consumers benefited from cheaper sugar during this period. The wholesale price of refined sugar in New York City declined from 6.2 cents per pound in 1890 to 4.1 cents in 1894.

Sugar Refining

Perhaps the first sugar refinery built in what is now the United States was constructed in 1689 on Liberty Street in New York City (*62*). By the time of the Revolutionary War, several other plants apparently had been established in New York, Boston, Philadelphia, and other cities. No record of the volume of business of these plants appears to exist, but it is known that most of their sales were made to the more wealthy colonists. Other people used raw sugar or perhaps none at all.

The earliest statistics concerning sugar refining in the United States are contained in a report by Tenche Coxe, Commissioner of Revenue, which covers the year ending September 30, 1795 (*62*). According to this report, 578,939 pounds of sugar were refined that year in Massachusetts, Rhode Island, New York, Pennsylvania, and Maryland. Gross taxes collected on the business amounted to $34,527.86. However, the quantity refined in Rhode Island and Pennsylvania is not included in the report, although the tax collected in these States is included. It has been estimated that inclusion of the quantities omitted would have resulted in a total output of 1,092,000 pounds.

Reports indicate that in 1836 there were 38 refineries in the United States, 3 in New Orleans, 8 in Baltimore, 11 in Philadelphia, 11 in New York, 3 in Boston, 1 in Salem, Massachusetts, and 1 in Providence, Rhode Island. The value of the product of sugar refineries was reported to be $2 million (*62*). Four years later there were 43 refineries in the United States with an invested capital of $5,640,000; an average of $131,000 per plant. Refineries were, for the most part, small and equipped with only crude and meager machinery. It was well after the Civil War before important technological advances were made in the art of refining sugar, and refineries then began to resemble those of the present time.

By 1870 the number of sugar refineries had increased to 59 with a total capitalization of $20,545,000. Reports are fragmentary and sometimes conflicting, but it appears that the number of sugar refineries did not increase much, if at all, after 1870. The average size of the plants did increase as new and larger types of equipment became available.

From their beginning in colonial times, sugar refineries were nearly all located in port cities which were centers of population where the product could be sold. They were also convenient places for unloading raw sugar shipped to this country. By 1870 waterfront sites in these port cities began to assume greater importance than they had in earlier years. At such sites, the refinery could build its own wharf and move sugar directly from a ship into the refinery. The larger plants made the most use of these waterfront sites.

Despite the rapid increase in sugar consumption in the United States, sugar refiners complained of excess capacity and low profits. An industry representative testified at a congressional hearing that there were only 42 refineries in 1875 and that these had

diminished to 27 by 1880. This number is reported to have been reduced, through failures, to 24 in 1887.

The Sugar Trust

An indication of the profitableness of the sugar refining industry is the size of the margin between the price of raw and refined sugar. In general the wider the margin, the higher the profit, although profit is also affected by the cost of operating the refinery and selling the sugar. The margin between the price of raw (centrifugal) and refined (granulated) sugar declined from 1.437 cent per pound in 1882 to 0.712 cent in 1885, and it remained low through 1887. These reduced margins appear to have been a major factor inducing the formation of what was commonly called the Sugar Trust. This organization was established in 1887 as the Sugar Refineries Company. Attempts at forming a combination of sugar refiners had been made at least as early as 1881, but they never achieved more than temporary and local effects on the sugar market (*62*).

The formation of the sugar combination in 1887 was not an isolated phenomenon. Other trusts organized at about the same time included those concerned with milk, rubber, cottonseed oil, envelopes, elevators, oilcloth, petroleum, meat, glass, and furniture.

The Sugar Refineries Company as originally established had eight sugar refining corporations as members. These were soon joined by others and within a few months 20 refiners were included; 11 of these were in New York, 4 in Boston, and the other 5 in Portland, St. Louis, New Orleans, and San Francisco. The company reduced to 10 the number of plants that continued to operate. It is estimated that the original 20 plants had a combined daily capacity of 33,500 barrels. Yet the 10 plants which continued in operation had, as a result of better management, a capacity of 34,000 barrels. Only five refineries remained independent, which reportedly had a daily capacity of 10,400 barrels.

Each member of the Sugar Refineries Company was organized as a corporation. The stock of these corporations was exchanged for trust certificates issued by the holding company. The affairs of the Sugar Refineries Company were managed by 11 trustees. All dividends of the member companies were paid to the Sugar Refineries Company and redistributed to the members according to an agreed-upon formula. In this way the owners of plants which had been closed, because of excess capacity in the industry, could still receive an income. By closing certain plants and operating the rest at more nearly full capacity, the output of the industry could be maintained, costs reduced, and total profits increased.

The operations of the Sugar Refineries Company appear to have succeeded reasonably well for a time. Refiners' margins in 1888 and 1889 were substantially above those of 1887 and the immediately preceding years. However, the operations of the company were soon challenged on legal grounds, and the charter of the North River Sugar Refining Company, a member, was annulled. This decision was confirmed by the Supreme Court of New York in November 1889. The Sugar Refineries Company was reorganized in January 1891 as the American Sugar Refining Company, a corporation chartered under the laws of New Jersey.

Meanwhile, the capacity of the independent sugar refineries had increased, and refining margins declined in 1890 and 1891. However, sugar consumption continued to increase; the gain in 1891 over the previous year amounted to 23 percent. This gain was generally attributed to cheaper sugar resulting from a reduction in the tariff. Increased volume doubtless helped to offset the adverse effect of lower margins on refiners' profits.

The organization under its new corporate name responded to the increased competition by buying as many of the competing plants as possible. And by 1892 it controlled about 90 percent of the sugar refining capacity of the United States. The principal competition that remained was with semirefined sugar produced in Louisiana. This was made in mills which processed sugarcane and, in place of selling raw sugar to the refineries, manufactured a product intermediate in quality between raw and refined sugar. Even though accurate data are not available, most of the sugar produced in Louisiana during this period appears to have been sold as raw sugar. Another developing source of competition was beet sugar. Beet sugar mills produced refined sugar from their earliest establishment in the United States, in contrast to the situation in Europe where many of the early mills made raw sugar for sale to refiners.

The margin between the prices of raw and refined sugar widened in 1892 and 1893, following the new acquisitions of the American Sugar Refining Company, much as had happened in 1888 and 1889. However, as in the earlier period, new refineries were built and the refining margin declined in 1894.

The most serious competition encountered by the American Sugar Refining Company at this time seems to have come from Arbuckle Brothers. This firm had developed a business in roasted coffee in New York. It held a patent on a machine for packing coffee in 1-pound paper bags or cartons. These packages became very popular, and the company then began selling sugar in the same type of package. The machine worked just as well with sugar as with coffee.

Originally the sugar was purchased from the American Sugar Refining Company and put in the new packages. The business became profitable, and the sugar company attempted to buy the Arbuckle patent. Arbuckle Brothers refused to sell and, being unable to continue the purchase of refined sugar, decided to

build a sugar refinery of their own. The American Sugar Refining Company responded by entering the coffee business through the purchase of a share in another company engaged in that trade. The Arbuckle sugar refinery began operating in 1898.

The next important event in the struggle for control of the sugar market occurred in 1900 when three independent firms united to form The National Sugar Refining Company. The new organization soon appeared to be working in harmony with the American Sugar Refining Company, leaving only Arbuckle Brothers as a real independent. This ended what was apparently the most severe period of competition in sugar refining. However, the American and National sugar refining companies still did not have the power to prevent the establishment of new refineries or to stop the growth of competition from semirefined sugar produced in Louisiana and from the expanding beet sugar industry. The significance of these and other factors can best be understood after consideration of other events at the start of the 20th century which affected not only sugar refining but all other aspects of the sugar industry.

European Sugar Bounties

Developments of the sugar industry in Europe during the last half of the 19th century were in certain ways more dramatic and of greater and more lasting influence on world sugar trade than anything that happened in the United States. The most important of these events concerned the growth of the beet sugar industry on the Continent. This production of sugar from beets, as already noted, began early in the 19th century. By 1866 world beet sugar production had reached 741,000 tons, and 33 years later in 1899 it reached to 5,965,000 tons. The 1899 output was 65 percent of the world's production of cane and beet sugar.

Continental Europe accounted for about 95 percent of world beet sugar production in 1899. Russia, Germany, France, Holland, and Belgium provided 57 percent of the world total. Sugar production in these countries, and to a lesser extent in some others, exceeded their own consumption and caused producers to seek export markets. This situation developed gradually, beginning for France as early as 1860 (*28*).

In general, the governments of these countries encouraged exports by establishing export subsidies of various sorts. In France such subsidies preceded the first production of beet sugar by more than 100 years. In 1684 Colbert instituted "primes d'exportation" which granted refined sugar exports a drawback of the duty paid on raw sugar when imported. The bounty arose as a result of the method of calculating the drawback received by the exporter. This was established on the basis that 100 pounds of raw sugar would yield 44.44 pounds of refined. By 1786 it appeared that the actual recovery was 56.56 pounds of refined sugar per 100 pounds of raw sugar. But the official conversion factor was unchanged from that set 100 years earlier. Recovery rates had doubtless increased more or less gradually during this period and varied among refiners according to the quality of the raw sugar and the effectiveness of the refiners' operations. The rate of the export subsidy, therefore, cannot be calculated exactly for an individual refiner even for 1 year.

This type of export subsidy was discontinued by France in 1786 but reestablished in 1816 when the beet sugar industry was beginning to develop. The official conversion rate was established in 1816 at 100 pounds of refined sugar for 200 pounds of raw sugar. The French subsidy for the earlier period benefited only the refiners of cane sugar. However, beginning in 1816, producers of beet sugar who could sell their product in foreign countries gradually became the most important beneficiaries.

Sugar bounties developed somewhat more slowly in Germany than in France. In fact, opposition to the development of a beet sugar industry in Germany, on the grounds that it would interfere with foreign trade and increase the cost of sugar to consumers, was more or less active until about 1850.

The German bounty system started about 1885. A tax was established on sugarbeets which was refunded on all sugar exported. The refund was based on a recovery of 8.51 pounds of sugar per 100 pounds of beets. Actual recovery averaged 11.76 pounds in 1885 and 12.01 pounds in 1891. The subsidy gradually increased over time as the sugar content of the beets increased, largely a result of scientific research.

U.S. and English Imports of Beet Sugar

Most of the beet sugar exported from continental Europe in the last half of the 19th century went to England and the United States. The United States, as a measure of protection from what would now be called dumping, adopted countervailing duties starting in 1890. This did not completely stop the imports, and some shipments of beet sugar from Europe to the United States continued until the European nations took steps to abolish the export subsidies at the start of the 20th century. Most of the beet sugar going to the United States was in the form of raw sugar, primarily because the tariff was higher on refined sugar than on raw sugar. This protected U.S. refiners.

England took a different attitude toward the importation of subsidized sugar. England had imposed an import duty on sugar from 1651 to 1846. Starting in 1846, with the enactment of the corn laws, duties on sugar were generally reduced, the reductions being greater on sugar from foreign countries so that the preference to British colonies was reduced. Sugar became free of duty in England in 1874 and remained free until 1901.

The timing of England's movement to free trade in sugar corresponded rather closely with the rise of of export bounties by the continental countries. Presumably this was accidental. In any event, by 1901 most of the sugar imported into England was beet sugar, and the price of sugar in London in 1899 was less than half that prevailing in 1872.

This produced several noteworthy results. First, British sugar producing colonies in the Caribbean and elsewhere, which had been highly prosperous in the 18th and early 19th centuries, were by 1900 reduced to a very impoverished condition. The price at which they could sell their sugar had declined drastically. Substitute crops which could be grown profitably were not generally available.

Also, the cane sugar refining industry in England suffered severely, and many refineries were closed because of the large imports of refined beet sugar.

The same cheap sugar that impoverished the British sugar colonies and damaged the refining industry was highly beneficial to English consumers. It was especially beneficial to persons engaged in manufacturing such sugar-containing items as jams, marmalade, confectionery items, and sweet baked goods. These industries developed rapidly using cheap sugar. And in some cases they were able to export some of their sugar-containing products to the countries from which they had obtained subsidized sugar.

Brussels Convention

As the volume of sugar exported with the aid of bounties increased, the cost to the bounty paying countries also rose, imposing an increasingly severe financial burden on them. As early as 1851 France began looking for ways of removing or at least reducing this burden. Beginning in 1863 a number of conferences were held among the nations concerned, including England. However, it was not until 1901 that effective action to suppress the subsidies was taken at the Brussels Convention.

The avowed intention of the Brussels Convention was to equalize competition between beet and cane sugar exported from various countries and to promote the consumption of sugar. To accomplish this the signatories agreed to abolish all direct and indirect bounties on the export of sugar and to limit surtaxes from the effective date (Sept. 1, 1903) of the convention. The surtax was defined as the difference between the rate of duty or taxation to which foreign sugars were subject and that imposed on the home product. It was not to exceed 6 francs per 100 kilograms on refined sugar or 5 francs 50 centimes per 100 kilograms on other sugar.

The contracting parties also agreed to either refuse entry to sugar from countries granting bounties on the production or export of sugar or to impose special duties on such imports. The special duty was to be not less than the bounty granted in the county of origin. No preferences were to be granted to sugar produced in colonies. Each country which was party to the convention agreed to admit sugar from other member countries at the lowest rate of import duty imposed on sugar from any other country, and they agreed that cane and beet sugar would be subject to the same rates of duty.

The convention, with modification and the admittance of some new members (the United States was never a member) remained in effect until the outbreak of World War I. During the time it was in effect, sugar consumption in continental Europe increased greatly, as domestic prices were reduced. Beet sugar production remained profitable in most countries where it had developed and production began to increase in the years immediately prior to World War I.

The Brussels Convention is generally regarded as the first effective international agreement regulating trade in sugar. Numerous attempts, some of them reasonably successful, have followed the effort at Brussels.

Developments in the Corn Wet Milling Industry

The small beginnings of the production of sweeteners from starch, which had been made in the United States prior to the Civil War, were gradually expanded after the end of the conflict, first by the establishment in 1873 of a plant in Buffalo, New York. Major outlets for the dextrose produced from cornstarch in this plant were to manufacturers of vinegar and to the brewing industry. Soon other plants producing sweeteners from cornstarch were established, and by 1879 sweeteners had become a major outlet for cornstarch, although the sugar being manufactured was quite crude (70 to 80 percent dextrose) by today's standards.

However, by 1880 a process had been developed for producing relatively pure anhydrous dextrose.[4] Commercially successful methods of manufacturing dextrose hydrate were not developed until considerably later. Since this development, most of the commercial production of dextrose has been in the form of dextrose hydrate rather than anhydrous dextrose.

During the time when methods for producing dextrose were being developed, the industry was also developing improved ways of producing and marketing corn sirup. Sirup represents an intermediate state in conversion of starch into dextrose. It consists of a mixture of dextrose and other saccharides, exclusive of sucrose. The proportion of the various saccharides in the mixture can be controlled to a considerable

[4]Anhydrous dextrose contains no chemically combined water in contrast to the more commonly sold product in recent years—dextrose hydrate—which contains one molecule of water chemically combined with each molecule of dextrose.

extent by the manufacturer, so that various types of sirup have been produced and marketed for many years. Buyers' preferences vary according to the use they make of the sirup.

Most of the early plants built to produce sweeteners from starch in the United States were constructed in the Northeastern States. Since about 1880, however, production facilities have become concentrated in the Corn Belt with the largest number of plants in Illinois and Iowa. With one exception, all plants producing sweeteners from starch have used corn as their raw material since 1873. A plant in Corpus Christi, Tex., built after World War II, sometimes uses grain sorghum.

Most of these plants have always produced starch for sale as well as converting starch into corn sirup or dextrose. The industry producing these products since late in the 19th century has been called the corn wet milling industry, since the corn is softened with water before being ground.

CHANGES IN U.S. SUGAR TRADE FOLLOWING THE SPANISH-AMERICAN WAR AND DURING 1900-15

At the end of the Spanish-American War in 1899, Cuba, Puerto Rico, and the Philippines were transferred to U.S. control, although Cuba's independence was recognized in the peace treaty and the United States promised eventual independence to the Philippines. U.S. policy toward these territories encouraged the development of the sugar industry in each of them (*32*).

Changes in Tariff Duties

Following the Spanish-American War, Puerto Rico became a possession of the United States. Since 1902 sugar produced there has been admitted to the United States free of duty, and the import duty on Philippine sugar was reduced to 75 percent of the general rate in 1902. The Philippine Islands were allowed to send as much as 300,000 tons a year to the United States free of duty beginning in 1902. In 1914 the limit was removed, and all Philippine sugar was admitted duty free, until after World War II. A treaty of reciprocity with Cuba became effective in December 1903. Under the treaty, the United States established the duty on sugar from Cuba at 80 percent of the general rate, thus granting Cuba a 20-percent preferential. The most important immediate effect of this preference was to make the duty on raw sugar (96-degree polarization) from Cuba 1.348 cents a pound, as compared with 1.685 cents for other countries (*55*).

Changes in Production

Sugar producers in the three areas responded to the changes in the U.S. tariff by increasing their output. Cuban production reached a million tons in 1891-95 and then declined to less than a third of that amount during the revolutionary struggle with Spain. But Cuba recovered its former level by 1901-5 (table 1). Production continued to increase and exceeded 2.5 million tons a year during 1911-15.

Puerto Rican production also declined during 1896-1900 but much more moderately than in Cuba. The increase in production in the next 15 years, however, was sufficient to raise Puerto Rican sugar output substantially above previous levels.

Table 1—Sugar production in Cuba, Puerto Rico and the Philippines, prior to and following the Spanish-American War, 5-year averages, 1891-85 to 1911-15

5-year average	Cuba	Puerto Rico	Philippines
	------ *1,000 short tons* ------		
1881-85	626	87	189
1886-90	733	70	186
1891-95	1,061	63	287
1896-1900	313	61	135
1901-05	1,065	141	110
1906-10	1,564	282	146
1911-15	2,548	390	358

Source: Puerto Rico and the Philippines, Yearbook of Agriculture 1924, U.S. Dept. of Agr. Cuba, the Agriculture of Cuba, by P. G. Minneman, U.S. Dept. of Agr. For. Agr., Bul. No. 2, 1942.

The low point of Philippine sugar production was reached about 5 years later than in the two other areas. Political instability continued for a longer time than in Cuba or Puerto Rico. Also, the recovery of production, while substantial, proceeded at a slower rate. Duty-free entry to the United States, limited to 300,000 tons of sugar a year from 1909 through 1914, helped to keep industry expansion in the Philippines from exceeding this figure, plus the amount needed for domestic consumption in the Islands. Production in the Philippines achieved its major expansion following World War I.

U.S. production of beet sugar, which reached 92,000 tons, raw value, for the first time in 1855, continued to increase rapidly. It reached a peak of 935,000 in 1915. At that time, helped by the outbreak of war in Europe, beet sugar produced in this country first became an important source of U.S. sugar (*22*). In 1900, beet sugar provided only 3.8 percent of the total supply; by 1915, it contributed 19.8 percent. After a long period of trial and error, people interested in the commercial production of beet sugar began to learn how and where sugarbeets could be grown prof-

itably. In this they received substantial help from USDA plant scientists.

Sugar production in Hawaii also increased rapidly during this period, rising from 252,000 tons in 1900 to 640,000 in 1915. The rise continued the expansion that began in 1876 with the treaty of reciprocity between the United States and the Kingdom of Hawaii. The expansion after 1900 was further encouraged by the annexation of Hawaii as a U.S. territory.

In contrast to trends in other areas, Louisiana production, although fluctuating widely from year to year, tended somewhat downward (*23*). Annual production in 1900-4 averaged 348,000 tons; in 1911-15, only 242,000 tons. The decline appears to have been largely the result of production difficulties caused by adverse weather (mainly frost), diseases, and insect damage.

Sugar Consumption

Total U.S. sugar consumption expanded rapidly during this period. In 1911-15 it rose to more than three times the level in 1881-85 (table 2). Much of the increase resulted from the increase in population, but per capita consumption also grew substantially.

Table 2—Sources of supply for U.S. sugar consumption, 5-year averages, 1881-85 to 1911-15

5-year average	U.S. production		Net imports	Consumption[2]	
	Mainland	Insular		Total	Per capita
	1,000 tons				*Pounds*
1881-85 ...	133	---	1,172	1,305	47.6
1886-90 ...	173	---	1,457	1,630	53.3
1891-95 ...	295	---	1,899	2,194	64.9
1896-1900 .	345	83[1]	1,945	2,373	64.0
1901-05 ...	604	540	1,824	2,968	72.5
1906-10 ...	848	818	1,898	3,564	79.3
1911-15 ...	1,021	1,070	2,095	4,186	86.1

[1] Beginning in 1900 when production was 416,000 tons. [2] No allowance has been made for changes in inventory.

Most of the sugar for the increased consumption came from domestic sources, particularly after 1900, when Hawaiian and Puerto Rican output became part of the domestic supply. Although imports had increased substantially up to 1900, they declined somewhat in the following years and did not exceed their 1896-1900 average until 1911-15. The percentage of consumption supplied by imports declined throughout the period. Before 1900, imports accounted for more than 80 percent of U.S. consumption. The inclusion of supplies from Hawaii and Puerto Rico resulted in a sharp drop in the import share to about 62 percent in 1901-5. The proportion imported declined further to 50 percent in 1911-15.

Changes in Sources of Imports

Not only did the relative importance of imports as a source of supply decline following the Spanish-American War, the comparative importance of different sources of sugar imports shifted greatly. These shifts were largely the result of preferential tariff rates, which the United States granted to Puerto Rico, the Philippines, and Cuba, and the removal of export bounties on sugar by European beet sugar producing countries, as provided by the Brussels Convention. During the 15 years prior to 1896, about 45 percent of U.S. sugar imports came from Cuba, some 7 or 8 percent from the Philippines, and the rest from other countries.

Imports from Cuba declined greatly during the revolution which began in that country some years before the Spanish-American War. However, these imports recovered rapidly, and in 1901-5, about 60 percent of sugar imported into the United States came from Cuba. This percentage increased to 90 percent in 1911-15.

The trend of imports from the Philippines was similar to that of Cuba, on a much smaller scale. Imports from the Philippines, because of continuing civil disorder, reached a low point 5 years later than the low for Cuba.

Receipts of sugar from countries other than Cuba and the Philippines, which averaged about 48 percent of all U.S. imports of sugar prior to the Spanish-American War, rose to 80 percent during 1896-1900 and then declined rapidly, amounting to less than 40 percent in 1911-15. During this period, imports of beet sugar from Europe almost disappeared. Imports of cane sugar, most of which had come from other countries in the Western Hemisphere, declined more slowly but were reduced to a very low level prior to World War I.

Reciprocity with Cuba

The treaty of reciprocity with Cuba, which became effective on December 27, 1903, aroused considerable controversy among representatives of the U.S. sugar industry while under consideration by the Congress. In general, sugarbeet growers and processors were opposed to granting a preferential rate of duty on Cuban sugar. The main force of their arguments was that the proposed preferential would reduce the protection received by the domestic sugar industry, including the beet industry. The refiners, on the other hand, supported the granting of a preferential rate on sugar from Cuba. Cuba was a convenient place from which to obtain raw sugar for refining. It was relatively nearby and large supplies could, if needed, have been obtained in a short time (*55,68*). The proponents of reciprocity prevailed and Cuban sugar entered this country at a preferential rate of duty until 1960.

Economic Effects, 1904-9

The economic effects of reciprocity with Cuba appear to have differed somewhat from those anticipated by the opponents of the treaty, especially during the first years the treaty was in effect (68). During the first 5 years (1904-9) after the treaty became effective, practically all the sugar exported from Cuba came to the United States (table 3). Also, U.S. imports of sugar from countries other than Cuba and the Philippines continued in considerable volume during 1904-9. In the following period, 1910-14, the volume of Cuban sugar exports to the United States continued to increase, but total sugar exports from that country increased even faster. Consequently, about 8 percent of Cuban exports in 1910-14 went to countries other than the United States, compared with only 0.2 percent during the previous period.

When practically all Cuban sugar exports came to the United States, and the United States also imported substantial quantities of sugar from other countries at the full rate of duty, Cuban sugar producers apparently were receiving the full benefit of the U.S. tariff preferential. The price paid for Cuban sugar delivered in the United States was the same as that for sugar from other countries and the difference in rates of duty, 0.337 cent a pound on sugar polarizing at 96 degrees, accrued to producers in Cuba. With average annual exports to the United States of 1,324,000 tons during 1904-9 these benefits amounted to $8,924,000 a year.

The principal effect in the United States of the Cuban preferential during this period was to reduce U.S. Treasury receipts by the amount gained by Cuban sugar producers. U.S. sugar prices were not affected by the preferential, since the full-duty rate applied to a sizable quantity of imports and remained the effective rate so far as internal prices in this country were concerned.

The effect of the Cuban preferential on other sugar exporting countries during 1904-9 was also minor. The volume of their exports to the United States was reduced, but supplies of Cuban sugar in their other export markets were greatly reduced or disappeared. The principal result was that the relative importance of the United States and other countries as outlets for their sugar was altered. Trade patterns shifted.

Economic Effects after 1909

Beginning about 1910, Cuban sugar exports reached a level higher than could be exported to the United States at prices equal to those offered by other importing countries. When this point was reached, exports of Cuban sugar to countries other than the United States began growing in volume and U.S. imports of sugar from countries other than Cuba and the Philippines were reduced to very low levels.

With these shifts in trade, the preferential rate on Cuban sugar, rather than the full-duty rate, became the effective U.S. tariff level. If the general duty had been reduced by 0.337 cent a pound, the amount of the preference, the effect in the United States would have been similar. This reduction lowered the protection offered the domestic sugar industry and imports of duty-free sugar from the Philippines. Also, it presumably resulted in a slight increase in U.S. sugar consumption. The rise was restricted by the inelasticity of demand for sugar in this country.

When the U.S. preferential rate for Cuban sugar became the effective rate, the advantage to Cuban sugar producers largely disappeared. Cuban sugar, f.o.b. Cuba, sold for the same price whether destined for the United States or some other country. Two advantages remained for Cuban producers. One was a secure market in the United States for a large quantity of sugar in case other markets declined in importance or disappeared. The other was slightly larger exports to the United States. Lower prices here encouraged consumers to buy more sugar and presumably slowed somewhat the expansion of the domestic sugar industry, resulting in slightly larger exports. Both these advantages were too slight to be measured statistically.

Similarly, the fact that the Cuban preferential rate

Table 3—Exports of Cuban raw sugar to the United States and other countries and U.S. imports from other countries, 1900-03 to 1910-14[1]

Average[1]	Exports from Cuba			U.S. imports from countries other than Cuba and the Philippines
	Total	To United States	Share to United States, centage of total	
	1,000 tons		*Percent*	*1,000 tons*
1900-1903	877	870	99.2	939
1904-1909	1,327	1,324	99.8	574
1910-1914	2,138	1,964	91.9	150

[1] Years ending June 30.

Source: U.S. Tariff Commission Report, "The Effects of the Cuban Reciprocity of 1902," 1929. Last column from Sugar Statistics and Related Data, Vol. 1, Bul. 293, Agr. Stabil. and Conser. Serv., U.S. Dept. of Agr.

became the effective U.S. rate of duty had only slight effect on exporting countries other than Cuba and the Philippines. It became necessary for them to sell their sugar in other than U.S. markets, but they could still sell it at the same price producers in Cuba were receiving for sugar sold in the United States and other countries, so long as tariffs were the only obstacle to exports.

The chief effect of the change in trade position occurring about 1910 may be summarized as being the transfer of the advantage obtained from the Cuban preferential from Cuban sugar producers to U.S. consumers.

The treaty of reciprocity with Cuba dealt with many commodities other than sugar. A discussion confined to sugar, even though it was the most important commodity concerned, obviously cannot evaluate the entire effects of the treaty. However, consideration of these other aspects is beyond the scope of this report.

New Capital Investments in Cuba

The stabilization of political and economic conditions in Cuba and other areas where Spain relinquished control was speedily followed by a sizable flow of capital to these areas from U.S. sources and, to a lesser extent, from other countries. Prior to the Spanish-American War, U.S. citizens had made certain investments in Cuba, estimated at $50 million. The end of fighting in Cuba and the U.S. occupation for a few years resulted in the establishment of an independent government on democratic lines. And the acceptance by Cuba of the Platt Amendment as part of its constitution greatly encouraged additional investments in Cuba by U.S. citizens. The Platt Amendment, a law enacted by the U.S. Congress, was proposed to Cuba for inclusion in its constitution as a means of facilitating U.S. withdrawal from Cuba and the recognition of its new Government. The most important provision permitted the United States to intervene in Cuban affairs whenever necessary to maintain civil order in that country (*25,46,58*).

These assurances greatly encouraged further investments in Cuba, since they promised to contribute to continued political stability there (*28*). Also, the U.S. tariff preferential on Cuban sugar at first promised to increase the profitability of investments in the Cuban sugar industry. An additional attraction for firms engaged in sugar refining in the United States came from their ability to ship their own sugar to their U.S. refineries (*6*). This form of integration gave them added assurance of the availability of at least part of the supplies for their refining operations whenever needed and of greater control over the quality of the raw sugar they received.

The first rush of American investment in Cuban sugar properties occurred immediately after the end of the Spanish-American War. Large additional investments were made during and shortly after World War I.

In 1915 U.S. interests owned 43 of the 170 mills then operating in Cuba; in 1940 the proportion was 67 of 174. However, the American mills in most cases were considerably larger than other mills, and American-owned mills produced half or more of the total Cuban sugar output. American investors also owned large areas of Cuban land that were used to produce sugarcane, but in most cases, they were not large enough to supply all of the sugarcane processed by their mills. Consequently, sugarcane was also purchased from independent Cuban growers known as colonos.

Capital Investments in Puerto Rico

The movement of U.S. capital into the Puerto Rican sugar industry occurred at about the same time as that in Cuba, but on a considerably smaller scale, as the area suitable for growing sugarcane is much smaller in Puerto Rico than in Cuba. As soon as sugar from Puerto Rico was admitted duty free to the United States, sugar producers there possessed the same economic advantage over those in Cuba as producers in the continental United States and Hawaii, and later, the Philippines.

The combined production of all duty-free areas did not equal U.S. sugar consumption, and imports of Cuban sugar continued in volume. Consequently, producers in areas such as Puerto Rico with duty-free entry into the United States continued to receive protection from the tariff on sugar from Cuba.

Capital Investments in the Philippines

Extensive investments by U.S. citizens in the Philippine sugar industry developed more slowly than in Cuba and Puerto Rico and remained less important relative to the total size of the industry there. Sugar was less important in the economy of the Philippines than in that of Cuba or Puerto Rico. Also, the limit on duty-free imports may have combined with uncertainties about the islands' future political status to slow investment in the Philippines, since they were promised eventual freedom.

Distance was another factor that was especially important before the Panama Canal opened in 1914. Hawaiian cane and California beet sugar amply supplied the sugar needs of the western United States, and the route from the Philippines to northeastern U.S. ports, the primary market for imported sugar, was even longer than at present.

The Sugar Trust after 1902

The sugar trust, which developed late in the 19th century and was incorporated as The American Sugar Refining Company in 1891, continued to expand its

sugar interests until checked by Government suit brought in November 1910 (*37*). The acquisition of sizable blocks of stock (in some cases a controlling interest) in several sugarbeet processing companies was among the more important of its later expansionist moves. Beet sugar companies in which The American Sugar Refining Co. purchased stock included The American Beet Sugar Co., Spreckles Sugar Co., Michigan Sugar Co., The Great Western Sugar Co., Utah-Idaho Sugar Co., and The Amalgamated Sugar Co. (*39*). According to Vogt (*62*),

> "The best information available is that in 1905, out of a total of fifty-seven active factories, The American Sugar Refining Co. was supposed to hold one-half or a controlling interest in thirty-five factories, representing a capacity of 28,700 tons of beets daily while the independent companies had twenty-two plants with a capacity of 13,150 tons." "This placed the Trust in virtual control of 68.7 percent of the beet sugar produced in this country. For the campaign of 1906, twelve new plants were building, with a daily capacity of 9,250 tons, and of these The American Sugar Refining Co. had an interest in at least five with 3,000 tons capacity, or about 39 percent of the total. If all investments of the Trust, as such, or if the holdings in beet sugar by prominent Trust stockholders were known, the probabilities are that this percent would be greater still."

The Company also had an indirect interest in the Hawaiian sugar industry through its one-half ownership of the Spreckles Sugar Company of California. The remaining share of the ownership was controlled by interests which also owned large sugar properties in Hawaii (*37*).

The suit instituted by the Government in November 1910 was finally settled by a consent decree dated December 29, 1921. In a statement issued to its stockholders by The American Sugar Refining Co. at the time the settlement was recommended to the Court, the U.S. Attorney General was quoted as saying that—

> "It is believed that The American Sugar Refining Company is no longer a trust or monopoly. At the time the suit was commenced the American and its allied interests controlled about 75 percent of the refined sugar industry of the United States. At the present time, the control of the American has decreased to the point where it now controls about 24 percent of the industry. Under the change of management of the Company which took place about the time of the beginning of this suit the Company has since endeavored to comply with the law and the Government's requirements. It has during recent years entirely discontinued the practices which were the cause of the chief complaints against it in the suit. It is believed that the consumer of sugar can now rest assured that competitive conditions in the industry have been entirely restored and that the price he pays for his sugar in the future will be the result of natural unrestrained competition. The consequence of this decree, which finally disposes of such long pending litigation, will doubtless prove beneficial to all branches of the sugar industry in this country, including both cane and beet sugar industries in the United States, and it is hoped that it will be of some benefit to the world-wide raw sugar situation, including that of Cuba."

Corn Sweeteners

By 1900 several efforts had been made to combine large segments of what was then commonly called the glucose or starch industry in the United States into a single ownership or control for the purpose of increasing profits (*63*). These culminated in 1902 in an amalgamation called the Corn Products Company (*59*). This company obtained control of about 71 percent of the production capacity of the industry in the United States. In addition, the Corn Products Company acquired 49.7 percent of the stock of another company with 9 percent of the industry's capacity. Later, still other acquisitions were made. The 50.3 percent of the stock in the company in which the Corn Products Refining Company held a minority interest was owned by persons having financial interests in the Standard Oil Company. These persons placed their stocks in a holding company so that the Corn Products Company was unable to acquire any of it.

Meanwhile, persons connected with the Standard Oil Company, some of whom apparently also had interests in the glucose industry, had acquired large blocks of stock in The American Sugar Refining Company, providing a link in ownership between the dominant companies in the sugar and corn sweeteners industries.

In 1916 the courts held the Corn Products Refining Company an unlawful combination in restraint of trade and ordered the sale of certain properties and imposed certain other restraints designed to eliminate the company's monopoly power. The Corn Products Refining Company was allowed to continue its operations but retained only three plants, two in Illinois and one in New Jersey (*61*).

Saccharin

The commercial production of saccharin began in 1901. Saccharin is a chemical made from non-agricultural materials which is about 300 times as sweet as sugar. It has no nutritive value. In addition to tasting sweet it also tastes bitter to some, but not all, consumers.

The principal use of saccharin for many years was by people who for health reasons could not consume sugar. Consequently, it did not compete seriously with sugar in the marketplace during its early history. Later there were changes in this situation and the importance of saccharin as a sweetener increased.

Tariff Changes Before World War I

Except for the preferential reduction in the duty on sugar from Cuba in 1903, the general or full duty rate on raw sugar remained unchanged from 1897 to March 1, 1914. At that time the full duty rate on raw sugar (96-degree polarization) was reduced to 1.256 cents per pound and on sugar from Cuba to 1.0048 cents. The law as enacted provided that all sugar should be placed on the free list on May 1, 1916. This provision was repealed April 27, 1916.

The reduction in the tariff rate on sugar in 1914 was part of a movement toward freer international trade initiated by President Wilson and embodied in the Underwood-Simmons Tariff. It marked the low point in the duty on sugar since the Civil War.

SUGAR DURING WORLD WAR I

Before war broke out in Europe in August 1914, world sugar production had been increasing rapidly, rising 60 percent in crop years from 1902/3 to 1913/14. Europe was the largest producer by a substantial margin, accounting for about 42 percent of total world output in 1909-13 (table 4). Nearly all European production took place on the Continent and about 99.8 percent was beet sugar; the rest was cane sugar produced in Spain.

Europe as a whole, exclusive of England, was also a large exporter of sugar, providing about 35 percent of total world exports during 1909-13. The only other countries with sizable exports were Cuba, with 27 percent of the total, and the Dutch East Indies, with 19 percent.

U.S. imports of sugar during this period amounted to about 30 percent of the world total and those of the United Kingdom, 26 percent. Most of Britain's sugar imports during this period consisted of beet sugar produced in continental Europe. More than 50 percent of Britain's imports in the immediate prewar years came from Germany and Austria-Hungary.

Shifts in Production

Much of the European beet sugar industry was destroyed during World War I. European production declined from 1909/10 to 1913/14 about 58 percent to 8,134,000 tons. The greatest decline, 95 percent, occurred in Russia, where revolution added to the destruction resulting from the war with Germany and Austria-Hungary. French production declined 78 percent, and German, 65 percent.

Sugar production in most non-European countries tended to increase during World War I, although not enough to offset declines in Europe. Thus, total world output in 1919/20 to 17,867,000 tons was about 3 percent below the prewar average. The largest increase in production was in Cuba, where output rose 82 percent to 4,184,000 tons in 1919/20. The 1919/20 Cuban crop amounted to 23 percent of

Table 4—World sugar production and trade yearly average 1909-13[1]

Area	Production	Imports	Exports
	--- 1,000 tons ---		
Europe:[2]			
Germany	2,304	3	873
Russia	1,557	4	294
Czechoslovakia	1,221	4[3]	848[3]
France	808	186	207
Poland	702	---[4]	---[4]
United Kingdom	---	1,854	33
Other	1,542	355	378
Total	8,134	2,406	2,633
Asia:			
India	2,649	716	24
Java	1,485	4	1,413
Other	563	632	257
Total	4,697	1,352	1,694
North America:			
United States	1,893	2,123	40
Cuba	2,287	1	2,010
Other	526	300	178
Total	4,706	2,424	2,228
South America	856	144	294
Africa	457	186	235
Oceania	301	140	93
Other countries	---	473	297
World	19,151	7,125	7,472

[1] Crop years for production, calendar years for trade. [2] Estimates for boundaries established after World War I. [3] Prewar Austria-Hungary. [4] Included in German, Russia, and Austria-Hungary.

Source: U.S. Dept. of Agr., Agriculture Yearbook 1924.

world output that year, compared with 12 percent during the prewar years.

U.S. production, including insular areas, increased only about 5.5 percent during World War I, while consumption rose 36 percent. Thus, U.S. imports of sugar were increasing while its European allies were experiencing great shortages.

Changes in International Trade

The decline in beet sugar production in Europe and the much greater drop in exports created an especially difficult situation in Britain, whose principal source of supply had been European beet sugar. The loss of supplies from continental Europe left only two sources from which the British could obtain significant quantities of sugar: Cuba and Java. However, the shortage of shipping and the dangerous shipping conditions which soon developed made it impossible to obtain much sugar from Java. This left Cuba as the only source from which supplies could be obtained on a large scale. Fortunately for the British, Cuban production increased rapidly.

However, Britain had to share supplies from Cuba with France, Italy, the United States, and the smaller Allied Powers. France in particular needed substantial increases in imports because much of its beet sugar industry was destroyed early in the war. French production in 1915/16 was only a fifth of the 1909/10 to 1913/14 average.

The situation with respect to sugar supplies gradually worsened as the war continued. By 1917, when the United States entered the war, the combined imports of Britain, France, and Italy were about 370,000 tons below their prewar average, and production in these countries was down about 640,000 tons. These figures indicate a deficit of about 1 million tons, compared with prewar conditions. In August 1917, the household ration of sugar was reduced to 2 pounds a month in Britain and to little more than half this in France.

U.S. Entry into the War

Soon after the United States entered the war in April 1917, President Wilson announced that the allies would be assisted in obtaining supplies of all types of goods from this country. Because sugar was among the food products urgently needed by Britain and France, a major problem of the U.S. War Food Administration, from its establishment in August 1917, was regulating the distribution of sugar shipments among the United States and its allies in some manner that would assure sufficient supplies to Western Europe (*19,20*).

In September 1917, the War Food Administration announced the formation of an International Sugar Committee, whose duties were (*19*) "to determine the most economical source, from a transportation point of view of all the allies, to arrange transport at uniform rates, to distribute the foreign sugar between the United States and allies, subject to the approval of the American, English, French and Italian governments."

The five-man Committee consisted of two members appointed by the United States, two by its allies, and the Chief of the Sugar Division of the War Food Administration. In November 1917, the Committee agreed that all purchases of sugar from Cuba, Santo Domingo (Dominican Republic), Puerto Rico, and St. Croix should be made by the International Sugar Committee. Purchases from Mauritius and the British West Indies were assigned to the Royal Commission on Sugar Supply. The United States handled supplies from Hawaii and the continental United States. Supplies from the Philippines, Java, Brazil, and Peru were to be considered available on the open market, but transactions were to be subject to consultation among the governments represented on the International Committee (*44*).

The Committee announced a maximum price of $6.90 per 100 pounds for old-crop raw sugar from Cuba arriving at destination not later than December 1, and the same price for raw sugar from other sources arriving not later than December 10.

Negotiations for 1917/18 Crop

The purchase of the 1917/18 crop of Cuban sugar (the old crop stipulation referred to 1916/17 and earlier years) was handled by the International Sugar Committee (*60*). The Cuban Government appointed two committees to handle its part of various aspects of the negotiations. In December 1917, an agreement was reached which provided for the purchase of the 1917/18 Cuban sugar crop up to a quantity of 2,500,000 long (2,800,000 short) tons by the International Sugar Committee, with options, which were exercised, to purchase an additional 750,000 long (840,000 short) tons. Purchases totaled 3,640,000 short tons.

Approximately a third of the amount purchased was to be taken by the Royal Commission on Sugar Supply for shipment to Europe. The price was 4.60 cents a pound f.o.b. for 96-degree sugar shipped from Cuban ports on the north side of the island and 4.55 cents a pound for sugar shipped from ports on the south coast. The rest of the sugar was to be purchased by U.S. refiners at 4.985 cents a pound cost and freight to New York or Philadelphia.

United States Sugar Equalization Board

In June 1918, the War Food Administrator proposed the creation of a government corporation to secure foreign sugars in cooperation with Allied Nations. The plan was approved by the President, and

the United States Sugar Equalization Board was incorporated with a capital stock of $5 million subscribed by the Government. In October 1918, the Equalization Board purchased the 1918/19 Cuban sugar crop. The price for raw sugar for shipment to the United States was 5.88 cents a pound, cost and freight, delivered at New York or Philadelphia. The prices for sugar for shipment to the United Kingdom, France, and Italy were 5.5 cents a pound f.o.b. Cuba for shipments from northern Cuban ports, and 5.45 cents from southern ports.

The price for raw sugar from Hawaii, Puerto Rico, and Louisiana was set at 7.28 cents a pound. The Equalization Board agreed to sell raw sugar from Cuba which it had purchased at 5.88 cents a pound to U.S. refiners at 7.28 cents. The purpose of this arrangement was to equalize to refiners the cost of raw sugar from different sources.

The Equalization Board retained the margin between its buying and selling prices for Cuban sugar as profit. The cane sugar refiners' margin was fixed at 1.54 cents a pound. This made the net basic price for all refined cane sugar in the United States 8.82 cents a pound. This was the same as the price for beet sugar, stated as 9.00 cents a pound, less the customary discount of 2 percent for cash, making the cash price 8.82 cents.

Armistice on November 11, 1918

Arrangements for the purchase of the 1918/19 Cuban sugar crop had been completed only about a month before the armistice was signed. Discussion soon arose concerning the advisability of immediately relinquishing all Government controls on sugar and returning to a free market. It speedily became apparent that the cane sugar refiners were not willing to assume all the obligations of the U.S. Sugar Equalization Board under the purchase contract with Cuba. Under the circumstances, all that was possible was some relaxation of controls on domestic distribution. By mid-1919, it was becoming apparent that the world shortage of sugar was not over, and some of the relinquished controls over distribution were reinstated.

There was also considerable discussion concerning the desirability of purchasing the 1919/20 Cuban sugar crop. On July 29, 1919, representatives of the Cuban Government offered to sell the 1919/20 Cuban crop to the Sugar Equalization Board. The Board presented the proposal to President Wilson and recommended that the offer be accepted. The receipt of the offer and recommendation was acknowledged, but no reply was received from the President. The Cuban representatives withdrew their offer on September 22, 1919 (*60*). The Equalization Board then notified the President that cane sugar refiners had been advised to purchase raw sugar "as per pre-war time."

Congressional inquiry concerning the sugar question began in September 1919. It resulted in the passage of the McNary Bill, which continued the U.S. Sugar Equalization Board until December 31, 1920, and authorized the purchase of the 1919/20 Cuban sugar crop. The President signed the bill on December 31, 1919, but stated that he thought it inadvisable to exercise his authority to purchase the 1919/20 Cuban crop. On January 16, 1920, the Board suggested to the President that its affairs be liquidated. The suggestion was accepted, and all Government control over sugar ended on March 1, 1920.

Domestic Sugar Controls

In addition to international controls, the Government took various actions to reduce wartime sugar consumption in this country in an equitable manner. A voluntary rationing program was instituted in 1917 (*19*). The program covered industrial users and household consumers. It was not very effective because of a lack of controls.

In 1918, a more elaborate rationing program, known as the certificate plan, was introduced (*49,50*). There had been much discussion of adopting a card system similar to the British one, which used cards for individual consumers. The card system was not adopted, partly because it was thought to be too costly.

Under the certificate plan, sugar users were divided into classes, and an attempt was made to keep track of each sales transaction. Manufacturers using sugar could make no purchases after May 14, 1918, without the surrender of authorized sugar distribution certificates issued by State Food Administrators under instructions from the War Food Administration. The available supply was to be allocated on a percentage basis, using consumption during the first 4 months of 1918 as a base. Retail sales for household use were limited to 3 pounds a month per person.

The extent to which U.S. sugar consumption was reduced by the sugar certificate plan is uncertain. The Chief of the Sugar Division, War Food Administration, estimated that savings in calendar year 1918 were between 400,000 and 600,000 tons. Domestic consumption for 1918 has been estimated at 3,801,000 tons, 337,000 tons below that of 1917. This reduction occurred during a period when U.S. sugar consumption was generally rising.

The sugar rationing programs for 1917 and 1918 were the first ever attempted by the United States. Also, the Government purchase of Cuban sugar and its distribution among several nations marked a new departure in the control of an important commodity in short supply throughout the world.

There was much disagreement concerning the desirability of an early return to free market conditions. But groups favoring such return prevailed and Government controls ended in 1920.

The United States was not the first major power to begin the decontrol of sugar. France removed all domestic controls over sugar in June 1919. This was done without any prior accumulation of stocks in France and resulted in increased prices for sugar in those parts of the world market not under some form of governmental control. Prices in Cuba and the United States were not affected by the French action because of the purchase of the 1918/19 Cuban sugar crop and controls in effect in the United States.

Price Fluctuations in 1920

The duty-paid wholesale price of raw sugar at New York had been set at 7.3 cents a pound under the Government controls operating in 1919. This price was maintained during the first 11 months of 1919 (table 5). However, when it became apparent that the Government probably would not buy the 1919/20 Cuban crop, prices began to rise. The movement started in December 1919 and reached a peak of 23.57 cents a pound on May 19, 1920. Prices then declined about as rapidly they had risen, and by November 1920 they were below the regulated price of 1919.

Table 5—Wholesale prices per pound of raw sugar, New York and index of U.S. wholesale prices of all commodities, 1919-21

Month	Raw sugar			All commodities		
	1919	1920	1921	1919	1920	1921
	- - - Cents - - -			*- - - 1910-14=100 - - -*		
January ..	7.3	13.0	5.4	199	233	170
February .	7.3	11.4	5.3	193	232	160
March	7.3	11.9	6.1	196	234	155
April	7.3	17.7	5.4	199	245	148
May	7.3	20.8	4.9	202	247	145
June	7.3	19.7	4.2	203	243	142
July	7.3	17.6	4.4	212	241	141
August ...	7.3	13.4	4.7	216	231	142
September	7.3	10.7	4.3	210	226	141
October ..	7.3	8.3	4.2	211	211	142
November .	7.3	6.8	4.1	217	196	141
December .	10.2	5.3	3.7	223	179	140
Average .	7.5	13.0	4.7	206	226	147

Source: U.S. Dept. of Agr. Agricultural Yearbooks.

After November 1919, the movement of sugar prices resembled that of the index of wholesale prices for all commodities in the United States, but the fluctuations were much wider. Both series reached monthly peaks in May 1920. The price of sugar in that month, however, was 178.5 percent above its level 1 year earlier and 325 percent higher in May 1921. Corresponding figures for all commodities were 22 percent and 70 percent higher.

The unusual price movements of 1920 do not appear to have had much long-term effect in the United States except upon certain members of the sugar trade, primarily because of the short length of time they lasted. Speculators undoubtedly made or lost considerable sums, depending on the accuracy of their predictions, and consumers suffered from high prices for a few months. The period of high prices, however, was too brief to have much effect on production plans in U.S. beet and cane areas. Any large increase in the output of cane or beet sugar would have required the construction of new processing plants or considerable expansion in the capacity of existing plants, either of which would have required from 1 to 2 years to accomplish.

The economic effects on Cuba were much more marked, primarily because sugar production was by far the largest industry in that country (2). Also, much of the sugar-producing capacity in Cuba was comparatively new, and many properties were heavily in debt. The period of high prices occurred early in the year when the mills in Cuba were grinding cane, and new crop sugar was becoming available for sale. Those who sold early in the year doubtless profited from high prices.

However, rapidly rising prices were a powerful inducement to many sugar producers to hold their sugar and wait for still higher prices, even if it was necessary to borrow money to pay current expenses in order to retain possession of the sugar. In this way, the banks became more deeply involved in price speculation. Also the price of land, particularly that thought to be suitable for cane growing, began to rise, adding to the speculative fever. In Cuba the period became known as the "dance of the millions." The "dance" ended rather more abruptly than it began, as sugar prices sank below even their 1919 level.

Somewhat similar, although less extensive, effects occurred in the Dominican Republic. Except for the lack of a U.S. tariff preferential, the position of producers in that country was similar to that in Cuba, only on a smaller scale. U.S. citizens owned several sugar mills in that country. The domestic market was insignificant compared with production, so that the economic life of the industry depended on the export market, which at the time was principally Britain rather than the United States.

The sugar industry in Java, another major exporter, was controlled by the Dutch. Normally, India provided the largest export market for Javanese sugar, but when shipping became available after World War I, sugar from Java was occasionally marketed in Europe

and the United States. The Javanese industry appears to have benefited from the high prices in 1920, because of its position as an exporter.

Cause of the 1920 Price Rise

The immediate cause of the high sugar prices of 1920 was the continuing world shortage of sugar. World sugar production, which exceeded 21 million tons in 1913/14, was below 18 million in 1919/20 (table 6). Production in Europe, despite the end of the war in November 1918, in 1919/20 reached a low point only a little above one-third the 1913/14 output. Production in Cuba had increased about 44 percent during the war. Changes in Java, the United States, and the Philippines were small, but output in other countries increased about 24 percent in total.

The removal of U.S. wartime controls, together with wartime prosperity, increased the demand for sugar in this country. U.S. imports of sugar in 1920 were 15 percent above those of 1919 and 90 percent above the 1909/13 prewar average (table 7). World imports in 1920, except those of the United States, were slightly below the 1909/13 average.

Table 6—Production of raw sugar in selected areas, crop years, 1913/14 to 1932/33

Year	Europe	Cuba	Java	United States	Philippines	Other countries	World
				1,000 tons			
1913/14	9,043	2,909	1,549	2,009	408	5,236	21,154
1914/15	7,598	2,922	1,454	1,966	421	6,514	20,875
1915/16	5,434	3,398	1,797	2,106	412	5,738	18,885
1916/17	5,194	3,422	2,009	2,279	425	5,263	18,592
1917/18	4,594	3,890	1,960	2,042	475	7,330	20,291
1918/19	3,611	4,491	1,473	2,062	453	6,514	18,604
1919/20	3,278	4,184	1,681	1,905	467	6,474	17,989
1920/21	4,104	4,406	1,853	2,339	589	6,255	19,546
1921/22	4,402	4,517	1,994	2,408	533	6,724	20,578
1922/23	4,985	4,083	1,981	1,924	475	7,412	20,860
1923/24	5,540	4,606	2,201	2,234	529	7,700	22,810
1924/25	7,678	5,812	2,535	2,684	780	7,181	26,670
1925/26	8,000	5,524	2,175	2,517	607	9,166	27,989
1926/27	7,450	5,050	2,639	2,428	767	8,290	26,624
1927/28	8,582	4,527	3,238	2,910	808	8,450	28,515
1928/29	9,148	5,775	3,198	2,762	934	8,838	30,655
1929/30	8,997	5,231	3,245	3,078	981	9,075	30,607
1930/31	11,382	3,497	3,095	3,256	958	9,343	31,530
1931/32	8,241	2,917	2,514	3,422	1,174	10,926	29,194
1932/33	7,020	2,234	1,545	3,538	1,343	11,242	26,922

Table 7—Sugar imports by principal importing countries, 1909-13 average and years, 1914-33

Year	United States	United Kingdom	Continental Europe	Other countries	World
			1,000 tons		
1909-13	2,123	1,854	560	2,588	7,125
1914	2,709	1,834	639	2,219	7,401
1915	2,643	1,787	914	1,807	7,151
1916	2,766	1,493	1,005	1,780	7,044
1917	2,472	1,207	877	1,962	6,518
1918	2,585	1,008	347	2,197	6,137
1919	3,512	1,717	2,195	1,240	8,664
1920	4,037	1,518	1,406	1,240	8,664
1921	2,984	1,432	1,017	2,516	8,191
1922	4,861	2,122	1,660	2,973	11,616
1923	3,855	1,711	1,291	2,788	9,645
1924	4,138	1,946	1,684	3,301	11,069
1925	4,460	2,366	2,050	3,546	12,422
1926	4,710	1,976	1,803	3,461	11,950
1927	4,216	1,893	1,671	3,140	10,920
1928	3,869	2,150	2,087	3,733	11,839
1929	4,888	2,351	1,917	3,823	12,979
1930	3,495	2,141	2,061	3,685	11,382
1931	3,176	2,049	1,381	2,745	9,351
1932	2,971	2,663	1,474	2,247	9,355
1933	2,874	2,282	1,306	2,004	8,466

The 1919/20 Cuban crop was about 300,000 tons smaller than that of the previous year because of adverse weather. Exports of sugar from Cuba declined about 1 million tons in 1920, partly because of the smaller crop and partly because Cuban producers tried to avoid some of the severe drop in prices late in 1920 by carrying some sugar over into 1921 (table 8). Late in 1920, Cuban producers began attempts to mitigate their financial problems; these efforts continued during the twenties and thirties.

U.S. imports of Cuban sugar in 1920 were about 13 percent below those of 1919, despite the increase of nearly 15 percent in U.S. imports from all sources (table 9). A large increase from countries other than Cuba and the Philippines accounted for the difference. Much of this came from Java at the time New York sugar prices were near their peak. Members of the sugar trade generally credited the arrival of Javanese sugar with stemming the spiral of rising sugar prices.

Once sugar prices had returned to their approximate prewar level late in 1920, they remained comparatively low throughout most of the decade and declined even further early in the thirties (table 10). The only exceptions were in 1923 and 1924 when

Table 8—Sugar exports by principal exporting countries, average, 1909-13 and years, 1914-33

Year	Cuba	Netherlands East Indies	Continental Europe	Other	World
	1,000 tons				
1909-13	2,010	1,413	2,577	1,472	7,472
1914	2,787	1,456	429	2,031	6,703
1915	2,866	1,329	379	2,190	6,764
1916	3,284	1,596	214	2,732	7,826
1917	3,221	1,305	130	2,426	7,082
1918	3,647	1,698	138	1,809	7,292
1919	4,498	2,057	331	2,532	9,418
1920	3,493	1,670	575	2,234	7,972
1921	3,145	1,849	1,004	2,490	8,488
1922	5,581	1,583	997	3,483	11,644
1923	3,861	2,014	1,545	3,338	9,758
1924	4,379	2,071	1,277	3,533	11,260
1925	5,531	2,279	2,234	3,017	13,061
1926	5,225	1,915	2,471	2,585	12,196
1927	4,645	2,202	1,874	5,761	14,482
1928	4,389	2,827	1,960	3,125	12,301
1929	5,544	2,681	2,038	3,301	13,564
1930	3,598	2,469	2,083	3,568	11,718
1931	2,998	1,739	1,840	2,436	9,013
1932	2,890	1,668	1,188	3,979	9,725
1933	2,522	1,283	916	4,127	8,848

Table 9—U.S. imports of sugar by source of supply, 1909-13 average and years, 1914-33

Year	Cuba	Philippines	Other	Total
	1,000 tons			
1909-13	1,722	113	272	2,107
1914	2,463	58	12	2,533
1915	2,392	163	155	2,710
1916	2,575	109	133	2,817
1917	2,335	134	198	2,667
1918	2,280	87	84	2,451
1919	3,343	88	69	3,500
1920	2,881	146	993	4,020
1921	2,590	165	223	2,978
1922	4,527	275	53	4,853
1923	3,426	238	189	3,853
1924	3,692	339	104	4,135
1925	3,923	493	33	4,449
1926	4,280	380	44	4,704
1927	3,650	531	29	4,210
1928	3,249	575	33	3,857
1929	4,149	711	28	4,888
1930	2,645	749	53	3,492
1931	2,482	872	28	3,382
1932	1,791	1,028	12	2,831
1933	1,573	1,249	40	2,862

Table 10—Average annual wholesale price per pound of raw sugar, New York, and index of wholesale prices of all commodities, average, 1909-13 and years, 1914-33

Year	Raw sugar	All commodities	Year	Raw sugar	All commodities
	Cents	*1910-14=100*		*Cents*	*1910-14=100*
1909-13	4.1	98	1924	6.0	143
1914	3.8	99	1925	4.3	151
1915	4.7	102	1926	4.3	146
1916	5.8	125	1927	4.7	139
1917	6.3	172	1928	4.2	141
1918	6.4	192	1929	3.8	139
1919	7.5	202	1930	3.4	126
1920	13.0	225	1931	3.3	107
1921	4.7	142	1932	2.9	95
1922	4.7	141	1933	3.2	96
1923	7.0	147			

prices were moderately higher, partly because of a temporary decline in production in the United States and smaller exports from Cuba.

The Cuban Sugar Depression in the Twenties

The decline of sugar prices, starting in the fall of 1920, brought prolonged financial difficulties to producers of Cuban sugar. Their expanded capacity to produce sugar, developed during World War I in response to increased demand for Cuban sugar, could not be abandoned or even closed down for a period of years without large financial losses affecting both Cuban and U.S. investors. Unemployment, already a problem in Cuba, became worse with any reduction in sugar output.

In fact, the processing capacity of Cuban sugar mills was further increased early in the twenties. Much of this resulted from attempts to improve efficiency and lower the unit cost of processing sugarcane. A number of mill owners in financial difficulty were able to demonstrate that, although the property at its present capacity could not be operated profitably, an increase in the size and output of the mill would reduce unit costs sufficiently to make the operation profitable. The banks, many of them in New York, were thus under pressure to make additional loans; they hoped that this would make it possible for the borrowers to ultimately pay their debts.

This reasoning, although it was valid for individual cases, resulted in a sufficient expansion of production in Cuba to force sugar prices even lower when applied over a short period of time to a considerable number of sugar properties. This offset, in large part, the benefit sugar producers could obtain from increased efficiency and, consequently, depressed conditions continued in the Cuban sugar industry (*25,43*).

Cuban sugar producers were in a peculiarly defenseless position, because Cuban sugar consumption was much too small to offset reduced exports to any meaningful extent. Government export subsidies, used by various European countries prior to the Brussels Convention, were not feasible; the sugar industry constituted such a large share of the Cuban economy that Government revenues, aside from taxes paid by the sugar industry, were insufficient to support such a program.

Protection Policies in Importing Countries

Meanwhile, the market for Cuban sugar in continental Europe declined as European beet sugar production recovered gradually from wartime damages, regaining the prewar level about 1927.

Britain reversed its policy of free trade in sugar soon after the armistice. The wartime shortage of sugar and complete loss of beet sugar imports from continental Europe were powerful factors influencing the British Government. Initiated in 1919, the new policy provided for the development of a domestic beet sugar industry and for tariff preferentials for sugar imported from British colonies and dominions.

The British duty on raw sugar was set lower than that on refined sugar, regardless of the source of the sugar, thus providing protection from imported refined sugar for British refiners. Some British beet sugar mills established under the new protective policy were equipped to manufacture raw sugar only. This raw sugar was delivered to the refining industry for conversion to refined sugar, increasing the refiners' volume of business. In addition, refiners received a drawback of customs duty on exports of refined sugar calculated so as to provide a small export subsidy.

The new British sugar policy gradually reduced the volume of Cuban sugar which could be imported, as beet sugar production increased and the output of cane sugar expanded in British colonies and dominions. The subsidy on the export of refined sugar reduced the size of the market for refined sugar exports from either Cuba or the United States where no export subsidies were paid.

Sugar producers in Java, the other principal country producing sugar for export at the time, had experiences similar to those of Cuban producers. However,

the effects generally were less severe. Javanese production capacity had not expanded so much during and immediately after World War I as it had in Cuba. The industry in Java was owned by the Dutch, and occasionally Holland provided a protected market for a part of the sugar produced in its colony. Also, sugar was relatively less dominant in the economy of Java than it was in Cuba.

Despite its advantage, the Javanese sugar industry faced increased difficulties from about 1930, primarily because of the start of worldwide depression and the decline in exports of sugar to India. For some time, Java had been the major source of large Indian imports. However, late in the twenties, India obtained from England the right to establish tariffs for itself. One result was increased protection for sugar producers in India and reduced imports. Although the initial impact of the reduction of imports of sugar into India was borne by Java, producers in Cuba met increased competition from Javanese sugar in most of its export markets except the United States.

U.S. Tariffs and Sugar Production

Although export markets for sugar in Europe and India were contracting, the United States was reversing the tariff policy adopted under President Wilson in 1913. The duty on raw sugar from Cuba had been reduced in the 1913 Act to 1.0048 cents a pound. In 1921, the Emergency Tariff Act became effective, raising the rate on Cuban raw sugar to 1.6 cents a pound. In 1922, the Fordney-McCumber Tariff Act provided for a further raise to 1.7648 cents. The rate was again raised in 1930, this time to 2 cents a pound, almost double the rate in effect prior to 1921 (*24*).

These increases in import duty not only encouraged increased production in the continental United States and Hawaii but also in Puerto Rico and the Philippines, whose shipments of sugar continued to enter the United States free of duty. As a result, production in all major areas supplying the United States with sugar, except Cuba, increased during the twenties and early thirties (table 11). Production increased most in the Philippines, where a modern sugar industry was developing at the end of World War I. Output was also increased substantially in Hawaii and Puerto Rico. Production in the mainland cane area showed little response to the first two U.S. tariff increases. Sugarcane diseases in Louisiana, the principal producing State, were unusually serious during this period and were responsible for the almost complete disappearance of cane sugar production in the mainland cane area in 1926 and 1927. The output of beet sugar did not increase materially until after 1929.

Cuba's production, most of which was exported to the United States, increased only slightly from 1920 through 1924. However, as exports, particularly to countries other than the United States, continued larger than anticipated, production in Cuba advanced to new high levels as mills were enlarged and improved to increase efficiency. Production averaged 5,395,000 tons a year from 1925 through 1930. But the danger of building up excessively large supplies was clearly recognized, as indicated by the continued efforts of industry leaders to find some effective way of regulating production and exports.

The danger to the Cuban sugar industry suddenly became very real in 1930, when the U.S. import duty on raw Cuban sugar was raised to 2 cents a pound by the Smoot-Hawley Tariff Act, at a time when commodity prices were generally declining. The increase in the U.S. tariff caused the price of raw sugar to decline more in Cuba than in the United States. The average price of raw sugar in New York during 1931-

Table 11—Sugar production in areas with duty-free access to the U.S. market, 1920-33

Year	Mainland		Hawaii	Puerto Rico[1]	Philippines	Total
	Beet	Cane				
	--- 1,000 tons, raw value ---					
1920	1,165	180	560	499	91	2,495
1921	1,091	334	546	496	203	2,670
1922	722	302	618	412	219	2,273
1923	943	168	554	381	259	2,305
1924	1,166	90	716	451	325	2,748
1925	977	142	781	672	552	3,124
1926	960	48	805	612	408	2,833
1927	1,170	72	832	637	587	3,298
1928	1,135	136	921	763	635	3,590
1929	1,089	218	925	590	769	3,591
1930	1,293	215	939	878	867	4,192
1931	1,237	184	1,018	790	871	4,100
1932	1,452	265	1,057	996	1,100	4,870
1933	1,757	250	1,191	838	1,285	5,321

[1] Includes production in the Virgin Islands, which varied from 3,000 to 14,000 tons a year.

Source: Sugar Statistics and Related Data, Vol. 1, Bul. 293, Agr. Stabil. and Conserv. Serv., U.S. Dept. of Agr.

33 was only 9 percent below the 1929 figure. In Cuba, the decline was 33 percent.

The average price of raw sugar in Cuba dropped below 1 cent a pound during 1932-36. The drop was much more than could be matched by any reduction in cost that could be made by improving efficiency. Sugar output declined more than 50 percent between 1930 and 1933, and many companies producing sugar in Cuba went bankrupt, including a number owned by U.S. citizens.

Flexible Tariffs in the United States

The Fordney-McCumber Tariff of 1922, which increased the rate of duty on raw sugar from Cuba to 1.7648 cents a pound, also permitted the President to change the rate applicable to sugar or any other product, after determining the difference in the cost of producing a commodity in the United States and in the principal competing country. The difference in production costs was supposed to indicate the rate of duty needed and to provide a "scientific" basis for determining rates.

The responsibility for determining differences in cost of production and recommending changes in rates of duty was given to the Tariff Commission. Commission investigations were undertaken at the direction of the President and the Commission's report and recommendations were made to him; only he could change any rate of duty.

Within a month after enactment of the Tariff Act of 1922, a petition was filed with the Tariff Commission asking for an investigation of the rate of duty on sugar. The investigation was undertaken and aroused considerable public interest for about 2½ years until the President announced his decision.

The Commission readily determined that Cuba was the principal competing nation and obtained permission from the Cuban Government to make the necessary studies to determine the cost of producing sugar in Cuba. A majority of the Tariff Commission, in a report dated July 31, 1924, found "that the cost of production including the result of a consideration of all advantages and disadvantages in competition (other than the 20-percent Cuban preferential) of sugar testing 96 degrees by the polariscope is 1.2307 cents per pound higher in the United States than in the Republic of Cuba." On this basis, the Commission recommended that the full duty rate on raw sugar be reduced from 2.202 cents to 1.54 cents a pound. Under the terms of the treaty of reciprocity with Cuba, the rate on sugar from Cuba would become 1.232 cents a pound (*20*).

After some delay and consultation with various agricultural organizations, the President, in a statement issued June 15, 1926, postponed action on the recommendation of the Tariff Commission. In his statement, the President cited numerous protectionist arguments similar to those frequently advanced by representatives of the domestic sugar industry. These included the need for a more diversified agriculture, the possibility of using sugarbeets as a replacement crop for some of the acres being taken out of wheat production, and the danger of monopolistic manipulation of the prices of imported sugar. The President indicated that a return to the high sugar prices complained of in 1923 might warrant reconsideration of the Tariff Commission's recommendation. No such reconsideration occurred, and the duty on sugar was not reduced in accordance with the Commission's recommendation.

The unsuccessful attempt to adjust the import duty on sugar, according to the findings of an investigation of the difference in cost of production, discouraged the use of the device in connection with possible changes in the rates of duty on other products. The sugar investigation did much to reveal the difficulties of the procedure, and cast serious doubt on its effectiveness.

Refiners' Loss of Protection in 1930

Cane sugar refiners were particularly unhappy about one feature of the Smoot-Hawley Tariff of 1930. This act established the import duty on refined sugar from Cuba at $2.12 per 100 pounds, only 12 cents above the duty on 96 degree raw sugar. It takes about 107 pounds of 96 degree sugar to produce 100 pounds of refined sugar. The import duty on 107 pounds of 96 degree raw sugar under the 1930 act amounted to $2.14, slightly above the import duty on 100 pounds of refined sugar. In the 1922 act, the import duty on 107 pounds of 96 degree raw sugar amounted to $1.882 and on 100 pounds of refined sugar to $1.912. The situation for sugar subject to the full duty changed in the same manner as that for Cuban sugar. The removal of tariff production for refiners in 1930 appears to have been accidental. There was little if any discussion of the change during the time the law was being considered by the Congress.

The export of refined Cuban sugar to the United States reached a significant volume for the first time in 1926, when it amounted to about 68,000 tons. This development occurred despite the higher duty on refined sugar at that time. By 1930, such exports had risen to 298,000 tons; in 1932, they reached a peak of 487,000 tons. In 1932, exports of refined sugar to the United States constituted about one-fourth the total shipments of Cuban sugar to this country.

The growth of sugar refining in Cuba before 1930 indicates that many Cuban producers were finding it profitable to add sugar refining to their business of growing sugarcane and producing raw sugar, despite the additional import duty assessed against such sugar. Most of this refining was done with additional equipment in the plants where raw sugar was produced. This helped reduce the required investment

and lowered costs in other ways. Also, wages were lower in Cuba than in the United States. In 1930 about 95 percent and in 1932 over 99 percent of the refined sugar exported from Cuba came to the United States.

These imports of refined sugar reduced the volume of business available to U.S. refiners. Consequently, the rapid increase in Cuban refining immediately after 1930 caused great concern among U.S. refiners and encouraged them to cooperate with other branches of the domestic sugar industry in the hope of finding some way to reduce these imports or, at least, to prevent further increases.

Cuban Attempts to Maintain Sugar Prices

Early in the twenties, Cuban sugar producers began considering ways of mitigating the effects of the depressed sugar prices (*20*). A Sugar Finance Committee was formed by industry representatives in February 1921. The Committee planned to exercise control over the export of sugar from Cuba by a permit system. The representatives hoped that the Committee could prevent prices from declining to excessively low levels. The proceeds of sales were to be prorated among producers. The membership of the Committee largely reflected the interests of U.S. investors in the Cuban sugar industry and those of the larger scale Cuban producers.

Insufficient control over supplies exported from Cuba, the opposition of U.S. refiners, and competition with sugar shipped from the Philippines and Puerto Rico combined to make the Committee's efforts ineffective. The Committee was dissolved in January 1922, but it seems to have acted as a spur to later efforts.

Sugar prices recovered somewhat during the last half of 1922, and exports of sugar from Cuba during the year rose to 5,581,000 tons, about 84 percent above those for 1921. Shipments to the United States and other countries increased substantially. These large exports were sufficient to dispose of both the 1921/22 Cuban sugar crop and the large inventory of more than a million tons on hand at the end of 1921.

Sugar prices remained relatively favorable to producers during 1923 and 1924. This provided further encouragement for the expansion of productive capacity in Cuba. The 1923/24 Cuban crop of 5,894,000 tons was the largest produced in Cuba prior to 1947. As a result of this large Cuban crop, sugar prices declined to levels generally considered unprofitable by producers. This drop led to renewed discussion of possible corrective measures.

Little agreement existed among the various groups concerned with Cuban sugar production and marketing, and nothing positive was done until the Verdeja Crop Restriction Act was passed by the Cuban Congress in May 1926. This act initiated a program of direct crop control by the Cuban Government. Production for 1926 was limited to 90 percent of the estimated crop of each mill, and authority was given to reduce production another 10 percent in 1927/28 and 1928/29. Largely as a result of these restrictions, sugar production in 1928 was about 22 percent below that of 1925.

The control was achieved by requiring each mill to stop producing sugar when its output for the year equaled its allotment for that year. No growing cane was destroyed, but some of it was allowed to remain in the field for 2 years before being harvested. This meant that the surplus of sugar was first changed into a reserve of standing cane. The supply of cane declined slowly, since several annual crops of cane are ordinarily harvested from a field before the cane roots are plowed out and the field replanted.

The initial effect of the production limitations started in 1926 was that sugar prices rose somewhat, but the effect was relatively slight and lasted only a short time. By mid-1927, prices were down again and showing signs of going lower. Production in other countries continued to increase. Output in Java, a major competitor of Cuba, increased more than a million tons between 1926 and 1928, offsetting most of the effect of the reduced output in Cuba. At the same time, beet sugar production in Europe continued to recover from its wartime low, and production within the U.S. tariff wall continued to expand.

The Sugar Defense Law enacted by the Cuban Government in October 1927 provided for the continued restriction of Cuban sugar production for a 5-year period. It also set up an agency, the Cuban Sugar Export Company, to sell all sugar exported to countries other than the United States. At the time, about three-fourths of the sugar exported from Cuba was coming to the United States, so that the agency became the single seller for only one-fourth of Cuba's crop.

The control of export sales was generally opposed by U.S. refiners who owned mills in Cuba. These refiners wished to process their raw Cuban sugar production in their U.S. refining plants. The Export Agency, however, established compulsory non-U.S. quotas for all mills, preventing U.S. refiners from using some of the sugar they had produced in Cuba. The plan had little effect on prices in the face of increasing production in other countries. Cuban labor also became dissatisfied with crop restrictions, since these reduced the amount of work available when unemployment was a serious problem.

Before the end of 1928, Cuba abandoned production and marketing controls. In 1929, the unrestricted Cuban crop increased to 5,775,000 tons—25 percent above the previous year's output. Prices declined to new lows. In July 1929, a single new selling agency, the Cooperative Sugar Sales Agency, was set up to market the entire Cuban sugar crop. Under the oper-

ations of this agency, the margin between sugar prices in New York and London widened for a few months late in 1929, but the operation was not generally regarded as successful and the agency was dissolved in April 1930.

This effort marked the end of Cuban efforts to control sugar production and prices by unilateral means. The first such effort, made by representatives of the sugar industry in 1921, had been abandoned shortly after its inauguration. The efforts of the Cuban Government were more elaborate and more persistent, but they also ended in failure. Even before their abandonment, however, efforts to establish some sort of international control were initiated.

Early International Efforts to Control Sugar

While Cuba was attempting to find some way to control, or at least influence, the international sugar market to the advantage of Cuban producers, producers in several other countries were sporadically making similar attempts. These included industry representatives in Czechoslovakia, Poland, Germany, and the Netherlands, regarding the industry in Java. None of these efforts had any long-term success (*52*).

Late in 1927, a Cuban delegation headed by Colonel Jose M. Tarafa conferred in Paris with representatives of the Polish, Czech, and German sugar industries. The European countries agreed to cooperate by encouraging increased domestic consumption of their 1927/28 crops, provided Cuba's 1927/28 crop was limited to 4 million long tons (4,480,000 short tons). In October 1928, decisions were to be made concerning the disposal of any sugar surplus that might exist at that time.

The Cubans attempted to obtain the cooperation of the Dutch in limiting sugar produced in Java. The Dutch agreed only "to continue our cooperation insofar as our mutual interests pert" (*50*). Not only did the Dutch fail to cooperate in any meaningful way, but the combined contributions of Czechoslovakia, Poland, and Germany proved inconsequential, and the reduction in the Cuban crop was, in effect, unilateral.

The failure of the Dutch to limit Javanese production seems to have been strongly influenced by the fact that sugar exports to countries in the Far East at that time had not declined as much as those to Europe and by the development of new higher yielding varieties of sugarcane in Java. This followed the discovery of a means of cross-fertilizing the seed of two varieties and thereby producing a new variety. Ordinarily, cane is reproduced vegetatively, and before the Dutch discovery in the twenties, new varieties were comparatively rare. Sugarcane seed is extremely small, and until recent centuries, it was commonly believed that the plant never produced true seed. The discovery of a practical method of cross-fertilizing sugarcane varieties was one of the most important discoveries ever made for improving cane. It lowered the cost of production of cane sugar and for a few years gave the Dutch in Java a considerable advantage over other cane-growing areas. Later, the method was adopted in most other countries where sugarcane is grown, including the United States.

In the summer of 1929, the Cubans again attempted to reach an agreement with European sugar producers on limiting production. The chance of success seemed increased by the large Cuban crop early in 1929 and by the increasing difficulty several European countries were having in finding export markets. For example, the Dutch met the problem of disposing of large quantities of Javanese sugar by selling outside their former market area. Despite these problems, no agreement was reached. World production, especially in exporting countries, continued large, although exports declined by some 2 million tons.

The Chadbourne Negotiations

The condition of the sugar industry in Cuba and Java had worsened materially by mid-1930. Large crops had again been produced in both countries, although in neither case were they quite so large as in 1929. The Smoot-Hawley Tariff of 1930 raised the U.S. import duty on raw sugar from Cuba to 2 cents a pound, effective in June. U.S. sugar consumption began to decline as the depression of the thirties worsened. Cuban sugar exports were nearly 2 million tons lower in 1930 than in 1929, and sugar prices in Cuba declined 28 percent from the already low level of the previous year.

Although events in Java were less dramatic than those in Cuba, the volume of exports turned downward, and the price declined about as severely as in Cuba. Even more ominous to the industry in Java was the prospective loss of much of the export market to India as that country moved to protect its sugar industry with import duties.

In view of these mounting difficulties, a new committee was formed to represent the Cuban sugar industry. It was led by Thomas L. Chadbourne, a New York attorney, whose clients included certain New York banks with financial interests in the Cuban sugar industry. At a meeting in New York in August 1930, the committee attempted to work out an agreement with representatives of the U.S. sugar industry to stabilize the sugar trade between the two countries. U.S. sugar producers did not altogether agree on the objectives of the conference. Hawaiian producers were not represented, and one beet sugar company was believed to oppose any agreement.

Despite the lack of unanimity, a program commonly referred to as a "gentlemen's agreement" emerged from the conference. Cuba was to limit its 1931 exports to the United States to 2,800,000 tons, but Cuba would be entitled to the full increase in U.S.

consumption in 1932 and 1933 and to half the increase in 1934 and 1935. U.S. domestic areas and the Philippines were to stabilize their output at the 1930 level, except for the share of increased consumption they were to get in 1934 and 1935. Cuba was to set aside at least 1 million tons of sugar from the 1930 and 1931 crops to be sold to non-U.S. markets over a 5-year period. Cuba also was to seek an international conference with other sugar-producing nations to try to stabilize the sugar industry worldwide. The agreement was not recorded in writing.

The Cuban Government passed a law for the stabilization of sugar in November 1930, following the terms of the gentlemen's agreement reached earlier in New York. Protracted negotiations then ensued between representatives of the Cuban and Javanese sugar industries, the first time the Dutch had seriously negotiated regarding international control of sugar production, exports, and prices. Later, industry representatives of a number of European producers participated in the negotiations.

First International Sugar Agreement

The International Sugar Agreement was signed in May 1931 by representatives of organized sugar industries in nine countries—Cuba, Java, Germany, Poland, Hungary, Belgium, Czechoslovakia, Yugoslavia, and Peru. In most cases, the industry representatives had legislative support from their own governments. The agreement stipulated annual export quotas for 5 years for each member, exclusive of Cuban exports to the United States. The quotas in general were high enough so that no large reduction in exports was necessary. Those for Java and Germany were never filled. In the last years of the agreement, export markets had become so small that no country was tempted to exceed its export quota.

Countries adhering to the agreement accounted for nearly 50 percent of world sugar production in 1931. By 1933/34, they had only 25 percent. The countries involved in the agreement had restricted output by about 7,168,000 tons, but during the period of restriction, production in the rest of the world had risen 5,204,000 tons, thus largely offsetting the effect of the agreement (*50*). Production in areas with duty-free access to the U.S. market increased 1,587,000 tons, of which more than half was in the Philippines and about a third in Puerto Rico. India and Formosa also had major production increases. Formosa was then a part of the Japanese Empire, and production there made Japan largely self-sufficient in sugar.

Provisions for increasing the quotas of the member countries by certain percentages if the price of sugar f.o.b. Cuba should rise above 2 cents per pound never became operative, because world sugar prices remained well below 2 cents.

Despite certain adjustments in quotas which helped to keep the agreement functioning through 1932, it was becoming a dead letter by 1933. Revolution in Cuba made the continued adherence of that country somewhat doubtful. U.S. developments under the Agricultural Adjustment Administration became more important to New York sugar prices than world market conditions, and world conferences attempting to deal with a wide range of international economic questions opened opportunities for a more inclusive agreement concerning sugar.

Although the agreement cannot be considered a success, it did contain some of the devices such as export quotas used in later agreements among a larger number of nations. It failed partly because sugar importing nations were not included, leaving them free to increase production within their boundaries. Failure also resulted partly from the great severity of the worldwide depression of the thirties, which might have defeated any attempt, no matter how well planned, to cure or reduce the economic ills of a single industry such as sugar.

U.S. and Cuban Sugar Developments, 1920-33

When the rate of duty on Cuban sugar reached 2 cents a pound in 1930, mainland producers were able to increase their output substantially. Meanwhile, U.S. sugar consumption was increasing, and U.S. imports of Cuban sugar, although varying widely from year to year, averaged 3,637,000 tons a year during 1920-29. They averaged 3,862,000 tons for 1922-29. Imports from countries other than Cuba and the Philippines rose to 993,000 tons in 1920, as a result of high prices in the United States, but fell to 28,000 tons in 1929.

The change in imports following the increase in the duty on raw sugar from Cuba to 2 cents a pound in 1930 was very different than those registered after the 1921 and 1922 increases. This was partly because the import duty had reached a level where it was more effective in encouraging production in domestic areas and the Philippines and in discouraging imports from Cuba. The worldwide depression early in the thirties also affected sugar consumption and prices adversely. U.S. consumption in 1932, its low point during the depression, was 17 percent below 1929, and the New York price, duty paid, of raw sugar was down 22 percent. The world price at which Cuban raw sugar was sold declined 56 percent from 1929 to 1932.

Sugar production in Cuba declined 61 percent, and exports to the United States fell 64 percent between 1929 and 1933. The industry in Cuba suffered extensive bankruptcy. The value of Cuban imports from the United States declined 83 percent from 1929 to 1933. Thus, the situation in Cuba adversely affected the economy of the United States as well as that of Cuba.

The sugar industry in the United States also encountered serious economic difficulties during this period, primarily because of the severe depression which affected the entire country.

Developments in Corn Sweeteners

Before 1920, the corn wet-milling industry had completed the reorganization required by the courts under the decision that the largest producing company was guilty of restraint of trade and the corporate structure of the industry had assumed a form not greatly different from that prevailing until about 1970.

Production of corn sirup in 1927, the earliest date for which figures are available, amounted to 532,000 tons and that of dextrose to 448,000 tons (table 12). In terms of dry weight, these quantities amounted to 427,000 tons and 412,000 tons. The total consumption of sirup and dextrose equaled about 11 percent of U.S. consumption of sugar, corn sirup, and dextrose that year. Although the amounts and percentage reached in 1927 are below present-day figures, they are high enough to indicate that the sweetener part of the cornstarch business had become an industry of competitive significance to sugar producers (*27*).

Starch sweetener production declined irregularly between 1927 and 1933, influenced by the same economic conditions that affected sugar producers and other industries. Sugar, corn sirup, and dextrose had about the same percentage decline in output from 1927 to 1933.

Prices received for corn sirup and dextrose from 1928 to 1933 declined like that for sugar, but somewhat less than the 50-percent decline in the price of corn at Chicago. Lower prices for corn were advantageous to producers of corn sirup and dextrose, since the cost of corn was the largest single item in their cost of production. Because the corn wet-milling industry purchased only a small proportion of the corn grown in the United States, fluctuations in the price of corn were largely independent of the activities of that industry.

Table 12—Production and prices of corn sweeteners, 1927-33

Year	Production[1]		Price per pound	
	Sirup	Dextrose	Sirup	Dextrose
	--- 1,000 tons ---		*--- Cents per lb. ---*	
1927	532	448	3.26	---
1928	553	484	4.02	4.16
1929	556	447	3.98	4.16
1930	513	425	3.84	3.98
1931	465	401	3.17	3.47
1932	397	388	2.60	2.72
1933	500	421	2.80	2.98

[1] Sirup contains about 80.3 percent and dextrose 92.0 percent dry matter.

Source: Starches, Dextrines and Related Products. U.S. Tariff Commission. Report No. 138, 2nd. Series. 1939.

Saccharin

U.S. production and use of saccharin received considerable stimulus from the wartime shortage of sugar in this country in 1918 and 1919, although precise data are scarce. The U.S. Tariff Commission, however, reported the production of saccharin in certain years as:

Years	*Pounds*
1918	425,600
1919	547,988
1920	137,315
1921	188,759
1923	340,944

The end of the sugar shortage in 1920 appears to have been related to the sharp decline in the production of saccharin that year (*16*).

If saccharin is considered 300 times as sweet as sugar, a common estimate, the 1919 output of saccharin would be equivalent in sweetness to about 82,000 tons of sugar, or 1.7 percent of United States sugar consumption that year. Only some indeterminate part of the saccharin consumed that year can be considered as having replaced sugar, since much of it was used by persons unable to use sugar. However, the share used as replacement for sugar probably was larger in 1919 than in years when sugar was plentiful.

SUGAR QUOTAS PRIOR TO WORLD WAR II

U.S. sugar producers, as well as those in Cuba and the Philippines, were in acute economic distress at the time President Roosevelt initiated the New Deal. Prior to 1933, domestic sugar producers had always sought to protect and improve their economic position through the tariff. However, the effects of the approximate doubling of the import duty on raw sugar from 1921 to 1930 had been disappointing to the domestic beet and mainland cane sugar industries.

Most of the increased production in the twenties and early in the thirties had occurred in the Philippines, Puerto Rico, and Hawaii. There was no appreciable increase in the production of beet sugar until after 1930. Imports from Cuba did not decline in

volume until 1930, and even at their low point in 1933 they accounted for about 25 percent of U.S. sugar consumption.

In the midst of the depression, the Chairman of the U.S. Tariff Commission, in a letter to the President dated April 11, 1933, said, "Cuba must fix the price at which she sells sugar at a point which will enable her product to enter the American market. The result is that the price has gone down to a point which is disastrous both for American and for Cuban producers. It is evident that no increase of the American tariff can relieve the resulting situation in this country or in Cuba" (*62*).

The Chairman then recommended that the United States adopt a quota system for sugar and consider reducing the import duty on Cuban sugar. These opinions were repeated in a later report (No. 73) of the Tariff Commission. The report also pointed out that "It is also of some interest to note that the preferential advantage of 20 percent in the tariff on sugar which Cuba obtained beginning in 1903 enabled the island to forge rapidly ahead in the production of sugar as compared with other (full-duty) areas in Latin America."

The Sugar Act of 1934

Representatives of the domestic sugar industry conferred on June 27, 1933, and selected a committee to draft a sugar agreement designed to improve the balance between sugar supplies and consumption. In September 1933, the proposed agreement was signed by representatives of the various branches of the U.S. sugar industry, with certain reservations by mainland cane sugar producers. It was submitted to the Secretary of Agriculture for approval or other action (*20*).

In October 1933, the Secretary of Agriculture rejected the proposed agreement, stating that it seemed to him "to emphasize unduly the interests of processors rather than the income of farmers" and that "the Government should not under agreements of this kind undertake to relieve processors, refiners, and others of provisions of the antitrust laws unless definite protection is provided for consumers with greater assurance of benefits for farmers."

The President, in a message to Congress dated February 8, 1934, recommended the enactment of a sugar quota law which would have the threefold objective "of keeping down the price of sugar to consumers, of providing for the retention of beet and cane farming within our continental limits, and also to provide against further expansion of this necessarily expensive industry."

The Secretary of Agriculture expanded upon this statement in a press release dated March 16, 1934, which stated, "The program as outlined in the President's message and implemented by pending legislation, recognizes a duty to stabilize the price and production of sugar for the benefit of the continental producers and the industry of the insular possessions. It also takes into account the obligations of the United States toward Cuba as implied by the Monroe Doctrine and specified in the Platt Amendment."

The Sugar Act of 1934, otherwise known as the Jones-Costigan Act, was approved by the President on May 9, 1934. It provided an entirely new method, the basic parts of which were used until 1974, for regulating the domestic sugar industry and controlling the imports of sugar for the benefit of all producing areas, domestic and foreign. The act required the Secretary of Agriculture to determine the "consumption requirements for sugar for the continental United States" for 1934 and succeeding calendar years. The Secretary was given power to revise the consumption requirements for any year whenever circumstances required. The consumption requirements were to be determined from available statistics of the U.S. Department of Agriculture, so as to effect the declared policies and purposes of the act. These required the Secretary to have "due regard to the welfare of domestic consumers and to a just relation between the prices received by domestic producers and the prices paid by domestic consumerss ..."

Once consumption requirements were determined, the quantity of sugar required was divided among the domestic areas and foreign countries supplying sugar to the United States by assigning a quota to each. In doing this, the law provided that these quotas should be based on the average quantities of sugar brought into the continental United States for consumption or consumed therein, "during such three years, respectively, in the years 1925-1933, inclusive, as the Secretary of Agriculture may from time to time, determine to be the most important representative three years ..." It was also provided that the annual quota for the beet sugar area should be not less than 1,550,000 tons, raw value, and the quota for the mainland cane area not less than 260,000 tons; also that the continental areas together should receive 30 percent of consumption requirements in excess of 6,452,000 tons raw value for any year.

The most representative 3 years for the determination of quotas for offshore areas, except Hawaii, were determined by the Secretary to be 1931-33; for Hawaii they were 1930-32. Consumption requirements were set at 6,476,000 short tons, and quotas were assigned as follows:

Area	*Quota (short tons, raw value)*
U.S. beet sugar	1,556,166
Mainland cane	261,034
Hawaii	916,550
Puerto Rico	802,842
Virgin Islands	5,470

Philippines	1,015,186
Cuba	1,901,752
Full duty countries	175,000
Total	6,476,000

Since receipts of sugar from each quota area had varied substantially during 1925-33, the provisions of the law and the Secretary's regulation were important in determining the size of each quota (table 13). The Secretary of Agriculture, in an address to Colorado farm organizations on July 13, 1935, pointed out the relatively minor adjustments in production required in domestic areas and the Philippines to conform to quota limitations. He then said, "The Cuban quota, on the other hand, represents a decline of 51.3 percent from the year of peak shipments and a decline of 35.2 percent from the nine-year average" (*20*). However, the Cuban sugar quota was above the quantities Cuba exported to the United States in 1932 or 1933. Cuban sugar producers almost unanimously regarded the U.S. quota arrangement as a great improvement over the tariff of 1930.

In addition to the overall quotas, offshore areas were given quotas for refined sugar which were part of their total quotas. Continental areas could market their entire quotas in refined form. Imports of refined sugar from Cuba were limited to 22 percent of the Cuban sugar quota; Hawaii, Puerto Rico, and the Philippines were limited to the largest amount of such sugar shipped to the continental United States in any one of the years 1931, 1932, or 1933. These refined sugar quotas in 1934 were:

Area	*Short tons, raw value*
Cuba	418,385
Philippines	79,661
Puerto Rico	133,119
Hawaii	26,023

The limitations on shipments of refined sugar to the continental United States restored to cane sugar refiners in another form the protection which they had lost under the Tariff Act of 1930.

The 1934 act also provided for benefit payments to growers to be made from funds obtained from a processing tax on sugar. The processing tax was set at 50 cents per 100 pounds of sugar, raw value, equal to 53.5 cents for refined sugar. It was assessed against all sugar, domestic and foreign. Benefit payments,

Table 13—Sugar consumption in continental United States and contributions from all areas, as percentage of total consumption 1925-33 and 1934 quotas, short tons, raw value

Year	Consumption	Contributions							
		Continental United States				Hawaii		Puerto Rico	
		Beet		Cane					
	--- *Tons* ---		*Percent*	*Tons*	*Percent*	*Tons*	*Percent*	*Tons*	*Percent*
1925	6,603,000	1,063,500	16.11	149,500	2.26	763,000	11.56	603,500	9.14
1926	6,796,500	1,046,000	15.39	84,000	1.24	740,500	10.90	551,000	8.11
1927	6,348,000	935,000	14.73	46,500	.73	762,000	12.00	578,000	9.11
1928	6,642,500	1,243,000	18.71	138,500	2.08	819,000	12.33	698,500	10.51
1929	6,964,000	1,026,500	14.74	189,000	2.71	928,500	13.33	460,000	6.61
1930	6,710,500	1,140,500	17.00	197,500	2.94	808,000	12.01	780,000	11.62
1931	6,561,500	1,343,000	20.47	206,000	3.14	967,000	14.74	748,500	11.41
1932	6,248,500	1,318,500	21.10	160,000	2.56	1,024,000	16.39	910,500	14.57
1933	6,316,000	1,366,000	21.63	315,000	4.99	989,500	15.67	791,000	12.52
Quota 1934	6,476,000	1,556,166	24.03	261,034	4.03	916,550	14.15	802,842	12.40

Year	Contributions							
	Philippines		Virgin Islands		Cuba		Other countries	
	Tons	*Percent*	*Tons*	*Percent*	*Tons*	*Percent*	*Tons*	*Percent*
1925	485,000	7.35	10,000	0.15	3,486,000	52.79	40,500	0.61
1926	375,000	5.52	6,000	.09	3,944,500	58.04	47,500	.70
1927	521,000	8.21	6,500	.10	3,491,000	54.99	6,500	.10
1928	570,500	8.59	11,000	.17	3,125,000	47.05	35,000	.53
1929	724,500	10.40	4,000	.06	3,613,000	51.88	17,500	.25
1930	804,500	11.99	6,000	.09	2,945,500	43.89	30,500	.45
1931	815,000	12.42	2,000	.03	2,448,000	37.19	40,000	.61
1932	1,042,000	16.68	4,500	.07	1,762,500	28.21	26,500	.42
1933	1,241,000	19.65	4,500	.07	1,601,000	25.35	8,000	.13
Quota, 1934	1,015,186	15.68	5,470	.08	1,901,752	29.37	17,000	.26

Source: Agriculture Adjustment in 1934, A Report of Administration of the Agriculture Adjustment Act, February 15, 1934 to December 31, 1934.

however, were made only to sugarbeet and sugarcane growers in domestic areas and in the Philippines prior to its change to Commonwealth status.

At the time the processing tax was imposed, the President, by proclamation, reduced the import duty on raw sugar from Cuba from $2 to $1.50 per 100 pounds. The basic rate of payments to sugarbeet and sugarcane growers was set at 60 cents per 100 pounds of sugar recoverable from the beets or cane grown. A major purpose of the payments to sugar producers, as was true of similar payments to producers of other crops, was to provide growers with an incentive to limit their acreage in line with quotas, as determined by USDA. The Federal Government did not have the power to compel growers to adjust acreage against their will. Acreage limitations in some areas were placed in effect in 1935. In general, growers not limiting their acreage as indicated by the Secretary of Agriculture were not eligible to receive benefit payments. When the acreage of cane or beets was to be restricted by the Secretary of Agriculture, the acreage allotted to individual growers was to be largely determined as a percentage of that grown in previous years.

The 1934 Sugar Act also permitted the Secretary of Agriculture to set minimum wages for labor employed by sugarbeet and sugarcane growers, to limit the use of child labor to the grower's family, and to adjudicate disputes between growers and processors concerning the production and marketing of sugarbeets or sugarcane. These portions of the law were designed mainly for the protection of labor in somewhat the same manner as other labor legislation protected the interests of laborers.

The production adjustment and processing tax phases of the sugar program of the 1934 act were ended as a result of the Supreme Court decision on January 6, 1936, in the Hoosac-Mills case. The quota provisions remained in effect. In addition, the Soil Conservation and Domestic Allotment Act of February 26, 1936, provided for direct cash payments to agricultural products, including sugarbeet and sugarcane growers, who met certain conditions. Also, on March 1, 1937, the President recommended new sugar quota legislation.

The Sugar Act of 1937

The new Sugar Act recommended by the President became law on September 1, 1937. It was in many respects similar to the 1934 act. An excise tax, payable into the general fund of the Treasury, was substituted for the processing tax which was generally considered unconstitutional under the Supreme Court decision in the Hoosac-Mills case. Benefit payments, the most important of which were called "conditional payments" since growers had to observe certain specified conditions to receive them, were to be made to growers as before, but from funds appropriated by the Congress.

The new law provided more detailed guidelines for determining sugar consumption requirements, but they were still in general terms. Quotas for the various producing areas were specified as percentages of consumption requirements; they were:

Domestic areas	*Domestic*	*Total*
	Percent	
Beet	41.72	23.19
Mainland cane	11.31	6.29
Hawaii	25.25	14.04
Puerto Rico	21.48	11.94
Virgin Islands	.24	.13
Total	100.00	55.59
Foreign areas	*Foreign*	*Total*
	Percent	
Philippines	34.70	15.41
Cuba	64.41	28.60
Other countries	.89	.40
Total	100.00	44.41

The quota for mainland cane sugar in the 1937 act was more than 50 percent above that in the 1934 act because of the increased production potential. There were slight decreases in the percentage quotas for other areas. Other provisions of the 1937 act did not differ significantly from those of the 1934 act.

Results of the Sugar Quota Laws

The principal economic effect of the U.S. sugar quota system was to effectively separate sugar prices in this country from those in the rest of the world. When the U.S. domestic sugar industry was protected by a tariff only, the difference between the price of raw sugar in the United States and other countries tended to equal the difference between import duties plus the differences in the cost of transporting the sugar from the exporting country to the importing country. With the establishment of quotas which limited the quantity of sugar that could be imported or marketed from domestic production in any year, U.S. sugar prices became independent of those in other countries. This separation of prices could occur only when the sum of the quotas for all areas—the consumption requirements—was such that the requirements were substantially filled. If quotas were not substantially filled, the system became ineffective from the standpoint of price, and price relationships among countries were the same as when tariffs provided the only protection to the domestic industry.

The average annual difference between the price of raw sugar in New York and London, adjusted to the

New York freight basis, for 1926 through 1932 was 0.05 cent a pound; for the quota period 1934-41, it was 0.089 cent a pound (table 14). The difference in 1933 was 0.26 cent. Quotas were not in effect in 1933, but efforts of the domestic sugar industry to develop a marketing agreement which might contain quotas of some types apparently had some effect on market prices.

Table 14—Price per pound of Cuban raw sugar cost and freight New York and London, adjusted to New York freight basis, 1926 to 1941

Year	Price per pound of raw sugar		Difference
	New York	London[1]	
	- - - Cents - - -		
1926	2.59	2.62	-0.03
1927	2.96	2.91	+.05
1928	2.45	2.49	-.04
1929	2.00	1.91	+.09
1930	1.48	1.36	+.12
1931	1.34	1.25	+.09
1932	0.93	0.87	+.06
1933	1.23	0.97	+.26
1934	1.50	1.04	+.46
1935	2.33	1.00	+1.33
1936	2.69	1.01	+1.68
1937	2.54	1.32	+1.22
1938	2.04	1.14	+.90
1939	1.91	1.60	+.31
1940	1.89	1.33	+.56
1941	2.48	1.85	+.63

[1] Adjusted to New York freight basis.

Source: U.S. Tariff Commission, Statistics on Sugar, March 1940, for 1926 through 1933; Sugar Statistics and Related Data, Vol. 1, Bul. 293, Agr. Stabil. and Conserv. Serv., U.S. Dept. of Agr. Sta. Bul. 214, July 1957 for 1934-41.

These price increases were of great benefit to Cuban sugar producers. As John E. Dalton wrote in 1937, "Cuba has seen the value of her sugar crop rise from the depression low point (1932) of $40,000,000 to over $100,000,000 in 1935, the highest figure since 1929. The benefits to Cuba from our new sugar policy have been as great as those received by any other area contributing to the United States market" (*29*).

The economic improvement in the Cuban sugar industry permitted increased exports from the United States to Cuba. This further restored the volume of trade between the two countries and benefited producers in a large number of U.S. industries with sales in Cuba.

The prices in table 14 do not include the import duty and excise tax and therefore do not show the effect of these on the price of raw sugar in domestic areas. In general, U.S. sugar prices remained low during the pre-World War II quota period, compared with their level late in the twenties (table 15). In most years, prices were not much above those in 1932, the low point of the Depression. The difference between the prices of raw and refined sugar generally narrowed.

Table 15—Response of U.S. sugar prices to pre-World War II sugar quotas, 1926-41

Year	Price per pound		
	Raw sugar duty paid New York	Refined cane sugar, net cash, New York[1]	Average U.S. retail
	- - - Cents - - -		
1926	4.33	5.46	6.8
1927	4.71	5.79	7.2
1928	4.20	5.52	6.9
1929	3.76	5.03	6.4
1930	3.36	4.62	6.1
1931	3.33	4.43	5.6
1932	2.93	3.99	5.0
1933	3.22	4.32	5.3
1934	3.02	4.12	5.5
1935	3.23	4.32	5.7
1936	3.59	4.69	5.6
1937	3.44	4.55	5.6
1938	2.94	3.95	5.3
1939	2.98	4.04	5.4
1940	2.79	3.80	5.2
1941	3.38	4.39	5.7

[1] Before payment of the processing tax, which averaged 0.300 cent per pound in 1934, 0.178 cent per pound in 1937, and 0.535 cent in 1935 and 1938-41.

Source: U.S. Dept. of Agr., Sugar Statistics and Related Data, Vol. 1 Sta. Bul. 293, Agr. Stabil. and Conserv. Serv. U.S. Dept. of Agr.

Growers also received payments made under the provisions of the sugar acts. However, the processors or refiners paid the processing tax under the 1934 act and the excise tax under the 1937 act. The burden of these taxes, 50 cents a pound on raw sugar, tended to be passed back to the cane and beet growers. A farmer's incentive to grow sugarcane or sugarbeets depended on the total return received, regardless of its source. Since the quota set an upper limit on the quantity of sugar that processors could sell in any year, they did not, as a group, encourage farmers to grow more than enough beets to enable them to fill their quota. However, if they did not fill their quota, the deficit was assigned to other areas. Under these circumstances, processors could not pass the tax forward to consumers by raising prices. If the domestic areas as a whole failed to fill their quota, the deficit could be assigned to Cuba and other countries.

On April 11, 1940, the President wrote to the Chairman of the Committee on Agriculture of the House of Representatives, "In reviewing the present sugar situation I have been gratified to note the great improvement in conditions that have taken place since the adoption of the sugar program six years ago. Domestic sugar producers are fortunately receiving incomes at approximately the parity level, and are enjoying a large volume of production. The losses of sugar processors in the years preceding the program

have been converted into profits; child labor has been greatly reduced; wages and working conditions improved; and there has been brought an important and greatly needed recovery in the market for our surplus markets in the foreign countries from which sugar is imported into the United States."

Reciprocal Trade Agreements

The Reciprocal Trade Agreements Act of June 12, 1934, amended the Tariff Act of 1930 to grant the President authority to negotiate trade agreements with other countries. The purpose was to expand U.S. foreign trade by agreements which would benefit U.S. exports and provide corresponding market opportunities for foreign products in the United States. The President, in the original act, was authorized to raise or lower existing rates as much as 50 percent.

The first of these trade agreements, negotiated with Cuba, became effective on September 3, 1934. This agreement reduced the import duty on raw sugar from Cuba from 1.5 cents to 0.9 cent a pound. An equivalent reduction was made on refined sugar. These reductions in duty did not make it possible for Cuba to export more sugar to the United States because Cuba's quota was not changed; neither did the reductions affect the price of sugar in the United States, since the total quantity of sugar from all sources that could be marketed in this country remained unchanged. However, the reduction in duty did increase the price Cuban producers received for their sugar by the entire amount of the reduction. In 1935, this amounted to $22,284,264 on the 1,857,022 tons of sugar, raw value, exported from Cuba to the United States. U.S. customs receipts were reduced by the same amount. The arrangement gave Cubans additional funds with which to purchase commodities from the United States and other countries. Cuba lowered its import duties on a considerable number of commodities imported from the United States, which further increased opportunities for additional exports to Cuba.

As Dalton (*29*) pointed out in 1937, "In the two reductions of the Cuban duty from 2.00 cents to 1.50 cents and from 1.50 cents to 0.90 cent per pound, in conjunction with a fixed quota at least 300,000 tons over her previous year's shipment to the United States, Cuba was to receive liberal assistance."

The agreement provided that the U.S. duty on sugar from Cuba should revert to the previous rate if U.S. sugar quotas were suspended or repealed. Quotas were suspended between September 12 and December 27, 1939, at the outbreak of World War II in Europe. During this period, the rate of duty on raw sugar from Cuba was 1.5 cents a pound.

The trade agreement with Cuba was amended on January 5, 1942. This amendment, among other changes, provided for the further reduction of the U.S. import duty on raw sugar from Cuba to 0.75 cent a pound, with no increase of duty if quotas were suspended. Later in 1942, in a trade agreement with Peru, the U.S. full-duty rate on raw sugar was reduced by half the full-duty rate established by Presidential proclamation in June 1934. The trade agreement with Cuba, under the terms of the Trade Agreements Act, was exclusive with that country, but U.S. changes in tariff rates made in the agreement with Peru were, under the law, automatically granted to other countries. The full-duty rate reduction affected Peruvian and other sugar producers (who were subject to the rate) just as it affected Cuban producers, but the quantity of sugar affected was much smaller.

Following the trade agreement with Peru, sugar import duties remained unchanged until after World War II.

The Sugar Institute

During the years that the sugar industry was preoccupied with tariff rates, quotas, and the depression, cane sugar refiners faced chaotic marketing conditions. Secret price concessions spread the belief, whether or not correct, that competitors making such concessions were keeping the prices of refined sugar lower than the published quotations indicated. Price movements became erratic and sometimes unrelated to the economic factors which ordinarily determine price.

Refined sugar then sold largely on the basis of announced quotations, or offers, made by individual refiners. Refiners' offers were customarily uniform, since refined sugar is a highly standardized product; one refiner normally would find it impossible to sell at a higher price than his competitors at the same time and in the same market. Changes in announced price offers for refined sugar were relatively infrequent, compared with price changes in raw sugar. When prices of refined sugar increased, the increases usually did not take effect until several days after the announcement was made. During the interim, buyers could purchase enough sugar at the lower price to meet their needs for about 30 days, or in some cases longer.

In an attempt to preserve the system of selling refined sugar and improve its operation, a group of refiners began discussions of remedial measures in the summer of 1927. In September 1927, the group submitted a proposed certificate of incorporation and bylaws for a trade association, together with a number of suggestions concerning trade practices to the Department of Justice. A code of ethics was also submitted to the Department of Justice and discussed with its officials. Following this discussion, the group changed some items and adopted the code in January 1928.

The Sugar Institute, Inc., and the code of ethics were intended to establish conditions under which refined sugar would be sold at openly announced

prices without discrimination among customers. The methods adopted of reporting prices, sales, and other statistics to the Institute have been described as similar to those permitted by the National Industrial Recovery Act (NIRA).

Despite the refiners' precaution of consulting the Department of Justice, suit was filed in March 1931 against the Institute and its members alleging illegal restraint of trade. The Supreme Court on March 30, 1936, confirmed, with changes, the decision of the District Court that some of the activities of the Institute were illegal. The Supreme Court enjoined the Institute and its members from continuing certain practices, principally those related to the pricing of sugar. The decision did not require the dissolution of the Institute, but the members dissolved the organization (*20*).

The International Sugar Agreement of 1937

As early as 1927, the Cuban delegation to the League of Nations informed the World Economic Conference, which met that year (*51*), of the deteriorating world sugar situation and presented suggestions for remedial action. The Conference recommended that a study be made of sugar. A meeting in Geneva in April 1929 was attended by representatives of the League and of the sugar industries of a number of nations, not including the United States. The industry representatives generally expressed the opinion that any stabilization of production should rest on a formal agreement among producers. The representative of the League of Nations, however, took no affirmative action but declared, "All that the League of Nations can do in the sphere of industrial combinations is to study closely their development."

By 1933, worsening economic conditions throughout the world persuaded various governments of the desirability of changing their attitude toward certain types of international economic proposals and programs. The World Monetary and Economic Conference held in London in 1933 had as its major purposes the encouragement of freer trade and the development of some remedy for current monetary difficulties. However, there also was some indication that joint action by governments dealing with disorganized conditions of production and distribution might be desirable.

A Cuban draft proposal for stabilizing world sugar production was submitted to the Economic Commission of the Conference. The Cuban proposal suggested that (1) processors build no new factories, expand no old ones, and reassemble no dismantled ones for 10 years; (2) governments grant no new subsidies for production of export; (3) governments were to make no increases in tariffs that would raise duties over 70 percent ad valorem, at least until after September 1, 1935; and (4) these stipulations would become effective when signed by a comprehensive list of 26 producing and importing countries. The proposal met with a favorable reception from most exporting countries, but India, Brazil, and Great Britain opposed it. It was not adopted.

By 1937, the United States and Great Britain had stabilized their programs for their domestic sugar industries sufficiently to be willing to take more active roles in developing solutions for international sugar problems. Partly because of this an "International Agreement Regarding the Regulation of Production and Marketing of Sugar" was signed on May 6, 1937, by representatives of 21 nations, including the United States, at a conference in London. The most important feature of the agreement established the following export quotas for the free market for individual countries.

Country	*Basic quota Metric tons*	*Equivalent Short tons*
Belgium (including Belgian Congo)	20,000	22,046
Brazil	60,000	66,138
Cuba	940,000	1,036,162
Czechoslovakia	250,000	275,575
Dominican Republic	400,000	440,920
Germany	120,000	132,276
Haiti	32,500	35,825
Hungary	40,000	44,092
Netherlands (including overseas territories)	1,050,000	1,157,415
Portugal (including overseas possessions)	30,000	33,069
Peru	330,000	363,759
Poland	120,000	132,276
Union of Soviet Socialist Republics (excluding exports to Mongolia, Tannu Twa, and Sin-Kiang)	230,000	253,529
Total	3,622,500	3,993,032

In addition to its basic quota, Czechoslovakia received extra allotments of 90,000 metric tons for the year beginning September 1, 1937; 60,000 tons for 1938; and 25,000 tons for 1939. Czechoslovakia also agreed to reduce its acreage in line with these figures. Other special provisions of minor importance concerned quotas of individual countries.

An International Sugar Council was established in London to administer the agreement. Nations adhering to the agreement received voting rights on the Council approximately in proportion to the amount of their exports or imports. The agreement provided for an adjustment of export quotas whenever three-fifths of the votes cast in the Council favored such action.

Exports of sugar to the United States were not included in the free market exports for which the

agreement established quotas. U.S. participation consisted of an agreement that imports of sugar paying the full-duty tariff rate would not be reduced below the existing proportion under U.S. sugar quota law and that countries subject to its full-duty rate would be assigned any deficit in U.S. imports of sugar from the Philippines below the quota specified in the Philippine Independence Act.

The price objectives of the agreement were stated in vague terms. The agreement was to be administered so as to assure consumers an adequate supply of reasonably priced sugar at all times. There was also a provision that steps would be taken to prevent increases in the world price of sugar for export being followed by increases in domestic prices and lower consumption. The nature of these steps was not specified.

Results of the operation of the 1937 agreement were not impressive. The first quota year began September 1, 1937, but not until April 27, 1938, had enough governments ratified the agreement to permit any effective quota action. Although action was finally taken to reduce quotas by 5 percent and several exporting countries voluntarily agreed not to fill their quota, estimated market requirements exceeded exports and prices continued low.

The growing threat of war in Europe greatly affected the operations of the agreement during its second year, beginning September 1, 1938. The Council met before the start of the year and adjusted quotas to prospective market demand within the limits of its authority. England, however, had begun to stockpile supplies of essential foods, including sugar, in the summer of 1938. Sugar prices had risen considerably by May 1, 1939, and upward adjustments were made in the quotas. By the end of the quota year, these amounted to an increase of more than 16 percent over the quantity initially established. Increased demand and higher prices were due to the increasing probability of war, rather than to the International Sugar Agreement.

The start of the third year of operation of the agreement, September 1, 1939, almost coincided with the outbreak of hostilities in Europe. The British Government promptly assumed complete control of sugar in Britain and took steps to purchase all the available unsold sugar in South Africa, Australia, and Mauritius. The initial phases of the war were not so highly destructive to the European beet sugar industry as they had been in World War I. There was no great rise in prices. However, with some parties to the agreement at war with each other, the agreement became largely inoperative. About all that remained was the formal structure of the International Sugar Council, which was kept in existence in the hope that an agreement would again become effective after the war.

The Philippine Independence Act

In March 1935, the United States passed the Philippine Independence Act which provided for the complete independence of the Philippines in 1945, if its terms were accepted by the Commonwealth of the Philippines. The Philippine legislature voted on May 1, 1934, to accept the act and on March 23, 1935, President Roosevelt approved the draft of the constitution of the Commonwealth of the Philippine Islands which had been adopted by a constitutional convention called by the Philippine legislature. The commonwealth was an intermediate stage of government for the islands, preceding complete independence.

The Independence Act provided that, during the operation of the Commonwealth of the Philippines, trade relations with the United States should remain unchanged except that duty-free shipments of refined sugar from the Philippines to the United States were limited to 50,000 long (56,000 short) tons a year and shipments of unrefined sugar to 800,000 long (896,000 short) tons. These amounts did not differ greatly from the quotas for Philippine sugar under the 1934 and 1937 Sugar Quota Acts. They did, however, set a standard that was used in later acts and regulations.

SUGAR DURING WORLD WAR II

The advent of war in Europe in September 1939 found most nations somewhat better prepared than in World War I to meet the inevitable disruptions and shortages that would develop before the conflict ended. The preparations stemmed from memories of what had happened during the previous conflict and the varying degrees of success or failure that had accompanied earlier attempts to control the situation and mitigate the adverse effects. England, remembering former shortages, actively stockpiled sugar for some months before the outbreak of hostilities and promptly placed its entire sugar trade under Government control once fighting began. Before the end of World War II, Britain, the United States, and other countries used much more elaborate control devices than those of World War I.

Position at Outbreak of War, September 1939

World sugar surpluses existed during nearly all of the decade of the thirties. When the war started in

Europe, the United States had relatively large supplies. Total stocks on September 1, 1939, amounted to 1,592,000 short tons (raw value)—the largest stocks for that time of year since comparable records had become available in 1935. Sugar production in the United States and in its principal sugar supply areas also was at a comparatively high level during the crop year beginning in 1939. Consequently, the United States entered the war period in an unusually good position to withstand whatever wartime shortages might develop (*8*).

Most European countries' immediate supplies of sugar were also reasonably good. World sugar production in 1939 slightly exceeded the average for 1935-39. Production of beet sugar in Europe in 1939 amounted to 10.7 million tons (raw value), 5 percent above the 1935-39 average. An International Sugar Agreement adopted in May 1937 was in force up to the outbreak of war in Europe, but quotas were promptly suspended and the agreement became ineffective.

In every important producing and consuming country, the government more or less closely controlled the production and marketing of sugar before the outbreak of hostilities. In many countries, the system of control was more complete than in the United States. Britain and most other European countries paid production subsidies. Cuba and Java each had extensive systems of control designed to limit production and maintain prices; they also had multiple price systems in effect. Australia controlled production and operated a two-price system. In nearly every other major country, sugar producers were subject to special regulations, and they usually received direct or indirect subsidies.

This experience in regulating sugar production and marketing in peacetime doubtless made it somewhat easier for the United States and other countries to apply additional wartime controls when these became necessary. Much of the organization needed for control, together with a great deal of detailed information about the sugar industry, already existed. Despite this, considerable expansion of government agencies dealing with sugar occurred in many countries, including the United States, during the war.

Events Before Pearl Harbor

Immediately after the outbreak of war in Europe, sugar prices in the United States began to rise. The cost and freight price of Cuban raw sugar in New York averaged 1.95 cents a pound in August 1939 and 2.32 cents in September. The duty-paid cost rose from 2.85 cents to 3.7 cents. As a result, U.S. sugar quotas were suspended by Presidential proclamation on September 11, 1939. Partly because of the suspension of quotas and partly because fears of an immediate shortage of sugar subsided after the initial excitement of war, U.S. sugar prices declined after September. The cost and freight price for Cuban raw sugar in New York averaged 1.94 cents a pound in October and 1.46 in November. Quotas were reestablished on December 26, 1939.

During the period when quotas were suspended (September 11 to December 26, 1939) the duty on raw sugar imported from Cuba was automatically increased from 0.9 cent to 1.5 cents a pound. Consequently, the duty-paid price of sugar in this country did not decline so much when quotas were suspended as the cost and freight price, which does not include the duty. The average wholesale price of raw sugar in New York for November was 0.1 cent per pound above the previous August, but the cost and freight price was 0.49 cent lower.

The cost and freight price of sugar in New York increased from its low point of 1.46 cents per pound in November 1939 to 1.95 cents in January 1940. It then gradually declined to 1.74 cents in August 1940. From this point it increased slowly but consistently to 2.99 cents a pound in February 1942; this price had been established in January 1942 as the ceiling for sugar in this position. The ceiling was first established in August 1941 at 2.60 cents per pound but was raised in January 1942, and remained at 2.99 until after the Japanese surrender.

Stocks of sugar in the hands of U.S. primary distributors were at a comparatively high level in 1939; they increased still further in 1940. On January 1, 1940, they reached a peak of 2.6 million tons (raw value), 13 percent above 1939. At the seasonal low point on October 1, 1940, stocks amounted to 1.4 million tons, 46 percent above the previous year. At least part of the 1940 increase in stocks in the hands of primary distributors resulted from an abnormally large distribution of sugar in September 1939 when prices first began to rise. Sugar distribution by primary distributors in September 1939 amounted to 1.2 million tons, almost double the September average for 1935-38. Complete data regarding distribution are not available, but much of the excess distribution in September 1939 certainly served to increase invisible stocks of sugar in the hands of wholesalers, retailers, industrial users, and householders, and these stocks were not immediately consumed. Visible stocks in the hands of primary distributors averaged about 10 percent lower in 1941 than in 1940. This decline in stocks in the United States continued throughout the war. During the first 6 months of 1945, stocks averaged only 1 million tons, compared with 2.5 million tons in 1940.

Sugar Production During the War

U.S. beet sugar production in 1941 amounted to 1.6 million tons (raw value)—300,000 tons below the alltime peak of 1940. Production in 1942 increased about 8 percent from 1941, but in 1943 it dropped to 1 million tons, a decline of 42 percent in 1 year, the smallest crop since 1926. Production in 1944 was

only slightly above 1943, and it did not recover its prewar level until 1947.

The drop in production of beet sugar in 1943-46 appears to have been caused mainly by a shortage of labor needed for growing beets. Sugarbeet production at that time required much tedious hand labor which received relatively low wages. Wages in manufacturing industries were higher, and many former beet workers took factory jobs, particularly in the Western States. Substitute crops which could be produced on land formerly devoted to sugarbeets brought high prices during the war and required much less labor per acre to produce. In some cases, prices (including subsidies) for these crops were higher, compared with prewar, than they were for sugarbeets.

The production of cane sugar in the continental United States averaged somewhat higher during the war than it had in prewar years. Production in 1942 was 444,000 tons, 6.7 percent above 1941. The shortage of labor in the cane-producing areas never became so acute as in the beet areas. Also, substitute crops could not be planted in most of the cane areas so readily as in the beet areas.

Production of sugar in Hawaii declined moderately during the war. It averaged 834,000 tons for 1942-47, about 12 percent below 1941. Part of this reduction was caused by the military services taking over some cane land for war purposes. Moreover, labor and machinery became very scarce in Hawaii. The Islands were so important as a military base that many civilian laborers were employed in positions related to military activity.

Sugar production in Puerto Rico amounted to 940,000 tons in 1941, about the same as during 1942-47. Production reached a low of 729,000 tons in 1944. This decline in production was partly the result of a sharp drop in the yield of cane per acre caused by adverse weather conditions and a shortage of fertilizer.

The total production of sugar in the continental United States, Hawaii, Puerto Rico, and the Virgin Islands in the crop year 1941 amounted to 3,889,000 tons. Production for the next 6 years averaged 3,683,000 tons, a decline of 9 percent. In addition, nearly a million tons of sugar were received from the Philippine Islands in 1941, but because of the Japanese occupation none came during the next 6 years (*8*).

Sugar production in Cuba, the other important area supplying the United States, increased during the war years. It amounted to only 2,734,000 tons in 1941, compared with an average of 3,252,000 tons for 1937-40. Production amounted to 3,229,000 tons in 1943, then increased to 4,476,000 tons in 1946 and to 6,448,000 tons in 1947. Considerable quantities of invert or high-test molasses were made in Cuba in 1942 and 1944 for U.S. wartime uses. The quantity of sugar produced in those years would have been greater if part of the cane crop had not been used for making this molasses.

Goals for Sugarcane and Sugarbeets

The U.S. Department of Agriculture set production or acreage goals for all major farm products during the war. These goals were set in the fall or winter each year for the coming crop season. The goals were intended to serve as a guide to farmers and agricultural workers in planning their production programs by indicating approximately how much of each commodity was likely to be needed during the period when next year's crop would be consumed.

Separate goals were set for sugarcane and sugarbeets produced in the continental United States each year, beginning with the crop year 1943. In 1942, USDA announced that no limitations would be placed on the acreage of sugarbeets and sugarcane. Such limitations had been in effect in 1941. The acreage of sugarbeets harvested in 1942 was 26 percent greater than in 1941, and the acreage of sugarcane increased 22 percent. These were the high points reached during the war.

The goals for 1943 called for 1,050,000 planted acres of beets and 340,000 harvested acres of cane. In 1944 the goals were reduced to 951,000 acres for beets and 337,000 acres for cane. Both the beet and cane goals for 1945 were the same as for 1944.

Government Control of Sugar Prices

U.S. sugar prices rose about 0.6 cent a pound during the first half of 1941. In an effort to half this rise, sugar consumption requirements under the Sugar Act were frequently adjusted upward, permitting the marketing of increased quantities of sugar. However, it gradually became apparent that the increased supplies would not be sufficient to stop the rise in price because of the great expansion in demand. Consequently, in mid-August the Office of Price Administration placed a ceiling on sugar prices of 3.50 cents per pound of duty-paid raw sugar, New York basis. This ceiling was maintained until January 1942 when it was raised to 3.73 cents per pound. It was raised to 3.75 cents in September 1944, and 4.205 cents in February 1946.

The first price ceilings on refined and other sugar for direct consumption, sold by primary distributors, became effective December 22, 1941. The ceiling on fine granulated cane sugar refined on the continent was set at 5.20 cents per pound, f.o.b., U.S. seaboard refineries nearest (freightwise) to point of delivery. The beet sugar basis price was set at 5.15 cents per pound at the seaboard cane refinery nearest (freightwise) to point of delivery. These ceilings were later lifted on January 9, 1942, to 5.45 and 5.40 cents, respectively. A further increase to 5.60 cents on fine granulated cane sugar processed by refineries in New

York, New Jersey, Pennsylvania, and Massachusetts was allowed on March 31, 1942. Deliveries from these refineries in 1942 were confined to 10 Northeastern States or smaller areas. On April 13, 1942, because of a shortage of sugar in the Northeast, refined granulated beet sugar and offshore refined cane sugars were moved into the area at 5.60 cents. Regulations provided that maximum prices should be reduced by any customary discount for cash or prompt payment.

The first ceiling on the wholesale price of refined sugar became effective December 22, 1941. Wholesalers were allowed to choose between the highest price charged in either the period October 6 to 11 or December 1 to 6, 1941, and they could add any increase in cost since the period chosen. On May 18, 1942, the General Maximum Price Regulation established the first ceiling on the retail price of sugar. On October 15, 1942, both wholesalers and retailers were given the option of charging either their previous maximum price or a specified percentage markup over cost which was uniform for each type of seller. The markup could be recalculated as often as costs changed. Wholesalers determined their maximum price option under Price Schedule 60 until May 10, 1943, when this schedule was terminated by Revised Maximum Price Regulation 237 which made the markup the mandatory maximum for wholesalers. Revised Maximum Price Regulation 238 terminated the option for retailers.

On May 8, 1943, authority was delegated to district Office of Price Administration offices to establish and publish community maximum retail dollar-and-cents prices of sugar. District offices calculated these by adding the wholesale and retail markups to the bulk-line price paid by wholesalers in the community. In communities where such price ceilings were not established, the other maximum-price regulations continued to apply. Later it was provided that wholesalers and large retailers who were not buying from wholesalers could not recalculate their markup after August 5, 1943. The same regulation applied to small retailers after their first purchase following August 5.

There were no significant changes in sugar price ceilings from the summer of 1943 to VJ Day, August 14, 1945.

The 1935-39 average wholesale price of refined sugar in New York was 4.67 cents per pound. From April 1942 until after VJ Day, this price was 5.49 cents, an increase of 17.6 percent. For 1944, the wholesale price index of all commodities averaged 29.1 percent above the 1935-39 average. The 1944 index for prices of foods was 32.7 percent above 1935-39; that for farm products, 62.5 percent; and that for all products other than farm products and foods, 21.2 percent.

Returns to Growers of Sugarcane and Beets

The total returns which sugarcane and beet growers received increased much more during the war than did the price of sugar. This proved necessary if production was to be maintained even as well as it was. The increased returns to growers came largely from increased subsidy payments by the Government (table 16). These payments made it possible for consumers to obtain comparatively cheap sugar while growers' returns were relatively high.

Table 16—Estimated cost of the sugar programs of the Commodity Credit Corporation, by years, December 16, 1942, to December 31, 1946

Program	1942	1943	1944	1945	1946	Total 1942-46
			--- 1,000 dollars ---			
Continental beet	244	9,195	23,351	33,606	46,475	112,871
Mainland cane—Louisiana	38	2,101	4,279	10,938	13,078	30,434
Mainland cane—Florida	---	---	204	1,925	2,008	4,137
West Coast refiners of raw cane sugar	529					529
Refiners and importers of Hawaiian sugar	1,481					1,481
West Coast refiner program			1,552			1,552
Hawaiian raw cane sugar	1		4,243	10,500	20,533	35,277
Puerto Rico raw cane sugar	578	2,846	4,362	12,402	23,050	43,238
Puerto Rican direct consumption sugar		372	260	436	433	1,501
Cuban raw cane sugar	15,876	16,116	9,956	25,961	65,129	133,038
Cuban direct consumption sugar		761	840	3,703	8,294	13,598
Dominican and Haitian raw cane sugar		300				300
Virgin Islands' raw cane sugar				52	156	208
Peruvian raw cane sugar				1,511		1,511
Miscellaneous				800	250	1,050
Total	18,747	31,691	49,047	101,834	179,406	380,725

Source: Ballinger, Roy A. Sugar During World War II. U.S. Dept. of Agr. Bur. Agr. Econ. War Records Monog. 3. June 1946.

Under the Sugar Act of 1937 and similar legislation preceding it, the Government made "conditional" payments to beet and cane producers beginning in 1934. From 1938 through 1941, the base rate of payments to producers of both beets and cane was 60 cents per 100 pounds of commercially recoverable raw sugar. These "conditional" payments were raised in 1942 and later years to 80 cents per 100 pounds of raw sugar.

Total annual payments through World War II made to cane and beet producers under the 1937 Sugar Act varied from $46 million in 1943 and 1944 to $58 million in 1942. Payments in 1947 rose to $62 million. Abandonment and deficiency payments varied from about 4 percent of the total in 1942 to nearly 11 percent in 1943. Approximately 43 percent of the total payments for 1945 were made to sugarbeet producers, 15 percent to cane growers in the continental United States, 16 percent to producers in Hawaii, and 26 percent to those in Puerto Rico.

In addition to these payments, the Commodity Credit Corporation (CCC) subsidized producers and processors of sugarbeets and sugarcane in various ways starting in 1942. These subsidies were of two main types: One consisted of the payment of "excess" costs resulting from the war; the other of "incentive" payments to encourage increased production (*67*).

Payments of excess costs were mainly for increased costs of transportation and storage during the war. For instance, in obtaining sugar from Cuba and other islands, it was sometimes impractical to ship the sugar from the customary port. Shipping from an alternate port almost always increased the expense in moving the sugar to port. Furthermore, war conditions sometimes made it necessary to store sugar longer and in more expensive locations than would otherwise be required. Ocean freight rates, including marine insurance, increased greatly during the war. The "excess" cost of handling sugar in Cuba and of shipping it to the United States varied from about $16 million in 1942 to $5 million in 1945. Similar excess costs, although smaller because of the smaller quantities of sugar involved, were incurred in shipping sugar from Puerto Rico and Hawaii. Some excess costs were incurred within the continental United States in moving sugar out of its normal consumption area into areas of temporary deficit, in moving some Louisiana raw sugar during periods of low supplies to refineries other than those normally used, and in moving sugarbeets to distant factories when the normally used nearby ones were closed because of a reduced acreage of beets.

In some cases, excess costs were met by reimbursing the growers or processors who incurred them. For sugar owned by the CCC, the excess costs were paid directly by the Corporation and were not reflected in the margin between the price paid by the Corporation and the price it received when selling the sugar.

To encourage the production of more sugar, incentive payments of 20 cents per 100 pounds of sugar produced were made in Puerto Rico and Hawaii in 1944. These were increased to 55 cents in 1945. Incentive payments of 33 cents per ton of cane were made to producers in Louisiana in 1943. These were increased to 85 cents in 1944 and $1.60 in 1945. Incentive payments at the rate of $1.50 a ton were made to sugarbeet growers in 1943; payments in 1944 and 1945 amounted to $3 a ton.

The price paid for the 1945 crop of Cuban sugar, $3.10 per 100 pounds, was 45 cents above the price paid for the three previous crops. As the CCC sold this sugar to refiners at the same price that it sold the former crops, the Corporation absorbed a loss of 45 cents per 100 pounds of sugar, in addition to other costs, mainly transportation. Thus, the effect of the program was similar to that of the incentive payments made to domestic producers.

Raw sugar imported into the United States from Cuba was entered free of duty from May 14, 1944, to the end of 1947. The CCC, the only importer of this sugar, continued to sell it to refiners at the same price as that in effect when the duty was paid. The duty equivalent which the CCC collected from the sugar refiners served to partly offset the costs of the various sugar programs undertaken by the CCC, so far as the books of the Corporation were concerned. However, the offset did not affect the final cost to the taxpayers, since the amount of the duty that would have been collected as part of the Government revenue equaled the reduction in the expenses of the Corporation.

Sugar Allocation Among the Allies

Shortly after Pearl Harbor, the United States and Great Britain established a Combined Food Board to deal with the allocation of scarce food supplies among the Allies; Canada joined in 1944. Sugar was one of the commodities controlled by this Board. From 1944 through 1947, the Board allocated available supplies of sugar among the member nations and other claimants. In 1942 and 1943, the Board made shipping recommendations and maintained a close review of the sugar situation.

The sugar under purview of the Combined Food Board constituted only about a third of world production, but it included most of the exportable surpluses produced outside of enemy-controlled territory. The United States purchased nearly all of the sugar produced in Cuba, and Britain or the United States bought the crops of Haiti, the Dominican Republic, and the British West Indies.

In allocating import supplies, the principal problem was to apportion Cuban supplies, since no single country was large enough to use all of the exportable

supply of Cuba. Each nation represented on the Board was a sizable importer of sugar, and domestic production in each nation was consumed within that country. In prewar years, Britain and Canada imported a substantial part of the sugar shipped from Haiti, the Dominican Republic, and the British West Indies. This arrangement was continued through the war years. In addition, when shipping was available, Canada obtained some sugar from Fiji and Australia, and Britain received shipments from South Africa and Mauritius. However, each nation, as well as other claimants, needed sizable quantities of Cuban sugar.

The available supply was allocated each year to various claimants according to relative need and the prospective ability of the Allies to deliver the sugar to various destinations. Shipping difficulties, particularly in 1942 and 1943, made it impracticable for any country to obtain as much sugar from Cuba as it might otherwise have acquired. Other Allies needing sugar applied to the Combined Food Board for allocations. So far as practicable, allocations were made on an annual basis, but frequent revisions were necessary.

The War Shipping Board exercised direct control of the actual movement of sugar by water throughout the war. It attempted to do this according to the allocations, but submarine warfare made this difficult and sometimes impossible. Part of the 1943 Cuban sugar crop was not harvested because of the fear that it would be impossible to move all the sugar from the island or find storage space in Cuba for the part that could not be shipped. This action resulted in the harvesting of considerable amounts of 2-year-old cane in Cuba in 1944 and contributed materially to the large crop harvested that year.

Sugar Allocations Within the United States

After the allocations of the Combined Food Board had been made, USDA, in cooperation with other agencies, allocated this country's supplies to various claimants. The largest claimants were civilians, various branches of the military services, and relief agencies. These allocations were made on a quarterly basis for a year in advance. They were revised each quarter and estimates for a new quarter were made.

The allocations were made by obtaining estimates of needs from the military services and other interested agencies of the Government. These estimates were combined into totals which were compared with estimated available supplies. The actual allocations necessarily represented some compromise, as there was almost always an estimated need for more sugar than was available. The largest adjustments were usually made in the quantities allotted to civilians, since civilians always received by far the largest share of the total. Military requests were seldom reduced.

The quantity of sugar used by a given claimant in a given period sometimes differed substantially from the allotment for that quarter. In 1944 and the first half of 1945, civilians received substantially more sugar than had been allotted to them. In 1944, this apparently amounted to about 775,000 tons or 14 percent more than the allocations. The military services actually received nearly 10 percent less sugar than was allocated to them in 1944. However, the deficit in military takings was much smaller than the surplus takings by civilians, so the total quantity of sugar distributed in 1944 was about 600,000 tons more than the total allocations.

No satisfactory method of controlling the distribution of sugar by refiners and other primary distributors was adopted until June 12, 1945, when a distribution order (WFO 131) was issued. The order specified the quantity of sugar each primary distributor could deliver to each of the four classes of users during the period April to September 1945. The four classes were: War Food Administration, Government agencies other than the War Food Administration and the War Shipping Administration, authorized purchasers, and civilians. The term "authorized purchaser" was defined as "a person who delivers sugar or any product containing sugar to a governmental agency, or who obtains sugar for export under a license issued by the Foreign Economic Administration."

The total quantity of refined sugar which distributors were permitted to deliver during April to September 1945 was 3,359,815 tons plus 30,676 tons that mainland cane direct-consumption mills had on April 1, 1945. Approximately 79 percent of the total was allotted to civilians, 7 percent to authorized users, 12 percent to Government agencies other than the War Food Administration, and 2 percent to the War Food Administration.

There was a strong demand throughout the war for invert molasses to manufacture industrial alcohol, chiefly for use in making synthetic rubber. The production of synthetic rubber increased greatly because of the loss of natural rubber supplies from Malaysia.

The principal materials used in making industrial alcohol during the war were blackstrap molasses, invert molasses, and various grains. Blackstrap molasses, a byproduct of sugar production, had been an important source of industrial alcohol for many years. Virtually all of the blackstrap molasses produced during the war was used for this purpose. Invert molasses is a product made from sugarcane which contains all the sucrose and other sugars that would otherwise be made into sugar and blackstrap molasses. Consequently, when invert molasses is produced from cane, no sugar is obtained. Invert molasses is a cheaper source of industrial alcohol than grain, and the manufacturing process is simpler.

All of the invert molasses produced during the war was made in Cuba. In 1940, Cuba produced invert molasses equivalent to about 730,000 tons of raw

sugar; in 1941, 1,360,000 tons; in 1942, 690,000 tons; and in 1944, 900,000 tons. No sugarcane was used for invert molasses in 1943 or 1945. The production program for industrial alcohol was largely determined by agreement between USDA and the War Production Board.

Sugar Rationing

Immediately following the attack on Pearl Harbor, the Government was faced with the problem of preventing maldistribution of available supplies of sugar. To stop panic buying and excessive hoarding, Order M-55 was issued. This order froze existing stocks of sugar in the hands of users and prevented deliveries exceeding 1940 levels. During the first 4 months of 1942, deliveries were limited to 80 percent of corresponding 1941 usage for all industries.

Late in April 1942, a formal rationing program was instituted by the Office of Price Administration. The first ration period for industrial and institutional users began May 1 and for individual consumers, May 5 (tables 17, 18, and 19). The purpose of rationing was to reduce demand to the indicated supply and to distribute the supply more equitably. In the original program, a basic ration of 26 pounds per year was allotted to individual consumers. This was considered to represent about half the 1941 individual use. The ration to institutions was also about 50 percent of 1941 use. Industries were allowed 70 percent of 1941 use—the lowest rate under which it was considered that industries could operate without causing undue hardship.

Immediately after the beginning of rationing, deliveries of sugar fell sharply to less than half those of the preceding month. However, actual consumption probably was greater than deliveries, because of the excess stock in the hands of jobbers, manufacturers, and consumers. June deliveries were also less than the estimated consumption. Offshore arrivals during May 1942 increased moderately so that total stocks were brought into better balance with the curtailed demand. Although arrivals, particularly from the Caribbean, declined drastically during July and August, the improved stock position, resulting from the controls over demand, permitted a slight liberalization of the rationing program. However, available supplies

Table 17—Consumer rationing of sugar in the United States during World War II

Ration period	Number of valid stamp	Weight value of valid stamp	Weight value of valid stamp per week
		- - - Pounds - - -	
May 5 - May 16, 1942	No. 1 - Book 1	1	0.583
May 17 - May 30, 1942	No. 2 - Book 1	1	.500
May 31 - June 13, 1942	No. 3 - Book 1	1	.500
June 14 - June 27, 1942	No. 4 - Book 1	1	.500
June 28 - July 9, 1942	No. 5 - Book 1	2	.500
July 10 - July 25, 1942	No. 5 and 7 Book 1	([1])	.818
July 26 - Aug. 22, 1942	No. 6 and 7 Book 1	([2])	.818
Aug. 23 - Oct. 31, 1942	No. 8 - Book 1	([3])	.500
Nov. 1 - Dec. 15, 1942	No. 9 - Book 1	3	.467
Dec. 16 1942 to Jan. 31, 1943	No. 10 - Book 1	3	.447
Feb. 1 - Mar. 15, 1943	No. 11 - Book 1	3	.488
Mar. 16 - May 31, 1943	No. 12 - Book 1	5	.455
June 1 - Aug. 15, 1943	No. 13 - Book 1	5	.461
Aug. 16 - Oct. 31, 1943	No. 14 - Book 1	5	.455
Nov. 1, 1943 to Jan. 15, 1944	No. 29 - Book 4	5	.500
Good indefinitely after Jan. 16[4]	No. 30 - Book 4	5	[5].461
Good indefinitely after Apr. 1	No. 31 - Book 4	5	[5].461
Good indefinitely after June 16	No. 32 - Book 4	5	[5].461
Good indefinitely after Sept. 1	No. 33 - Book 4	5	[5].461
Good indefinitely after Nov. 16	No. 34 - Book 4	5	[5].461
Feb. 1 - June 2, 1945	No. 35 - Book 4	5	.393
May 1 - Aug. 31, 1945	No. 36 - Book 4	5	.285
Not validated	No. 37 - Book 4	—	—
Sept. 1 - Dec. 31, 1945	No. 38 - Book 4	5	.285
Jan. 1 - Apr. 30, 1946	No. 39 - Book 4	5	.285
May 1 to Aug. 31 spare stamp 1946	No. 49 - Book 4	5	.285
Sept. 1 - Dec. 31 spare stam 1946	No. 51 - Book 4	5	[6].285
Jan. 1 to Apr. 30, 1947	No. 53 - Book 4	5	[6].285
Apr. 1 to Sept. 30 spare stamp 1947	No. 11	10	([6])
June 1 to Oct. 31 spare stamp 1947[7]	No. 12	10	([6])

[1] Stamp No. 5 had a weight value of 2 pounds and was valid from June 28 to July 25. Stamp No. 7 had a weight value of 2 pounds and was a bonus, valid from July 10 to Aug. 22. [2] Stamp No. 6 had a weight value of 2 pounds and was valid from July 26 to Aug. 22. Stamp No. 7 also was valid in this period. [3] Extended to September 30, 1946. [4] Also, sugarcane and sugarbeet growers were allowed 25 pounds of sugar produced from their crop for each person in the family, or 25 pounds per acre grown, whichever was less. [5] Weight value for period until next stamp became valid, Stamps No. 30, 31, 32, and 33 were canceled as of December 31, 1944 and No. 34 as of February 28, 1946. [6] Period overlap. [7] Rationing for household and institutional users discontinued on June 12, 1947.

Source: Sugar Rationing Division, Office of Price Administration.

Table 18—Sugar ration allowances for home canning in the United States during World War II

Year	Maximum quantity per person			Principal regulations applying
	Stamps	Application	Total	
	- - - Pounds - - -			
1942	0	[1]6	[1]6	5 lb. for canning and 1 for jams and preserves. After May 20, 1 lb. per 4 qt. of fruit and 1 lb. per person for jams and preserves, with no limit on total amount per person.
1943	10	15	25	Stamps No. 15 and 16 were valid from May 24 to Oct. 31. Applications for the remainder were accepted until Feb. 28, 1945.
1944	5	20	25	Stamp No. 40, book 4, was valid from Feb. 1, 1944 to Feb. 28, 1945. Applications for the remainder were accepted until Feb. 28, 1945.
1945[2]	0	15	15	Applications accepted until Oct. 31, 1945, the total not to exceed 120 lb. per family. Only 5 lb. per person allowed for canning vegetables and making jams, jellies, relishes, catsup, etc.[2]. [3]
1946	10	0	10	Spare stamp No. 9 valid, March 11 to Oct. 31, 1946. Spare stamp No. 10, valid July 1, to Oct. 31, 1946.

[1] The limit was entirely removed after May 20, 1942. [2] The maximum was 20 lb. per person from February 23 to May 1, 1945. This was reduced to 15 lb. on May 1. [3] No local board could issue more than 70 percent as much sugar for home canning as it issued between February 29, 1944, and December 9, 1944, except by permission of the regional office. The total for any region was limited to 70 percent of the previous year. Regional administrators could reallocate quotas between districts and boards.

Source: Sugar Rationing Division, Office of Price Administration.

Table 19—Monthly allotments of sugar for industrial users in the United States during World War II[1]

Ration period	Bakery and cereal products	Pharmaceuticals	Others	Jams, jellies, preserves, and fruit butters	Baked beans, catsup, and chili sauce	Canned soups
	Percent of base					
1942:						
May-June	70	70	70	70	70	70
July-Oct.	80	80	80	80	80	80
Nov.-Dec.	70	70	70	70	70	70
1943:						
Jan.-July [4]	70[3]	70	70	70	70	70
Aug.-Oct.[4]	80[3]	100	80	120	80	80
Nov.-Dec.	90[3]	110	90	120	90	90
1944:						
Jan.-Mar.	80	100[4]	80	Provisional[5]	Provisional[5]	80
Apr.-June[6]	80	100[7]	70[8]	Provisional[5]	Provisional[5]	70[8]
July-Sept.[9]	80	125	80	Provisional[5]	Provisional[5]	Provisional[5]
Oct.-Dec.	80	125	80	Provisional[5]	Provisional[5]	Provisional[5]
1945:						
Jan.-Mar.	80	125	70	70[10]	Provisional[5]	Provisional[5]
Apr.-June	75	120	65[11]	70[10]	Provisional[5]	Provisional[5]
July-Dec.	60	110	50	50[10]	Provisional[5]	Provisional[5]
1946:						
Jan.-Mar.	60	110	50	45[12]	Provisional[5]	Provisional[5]
Apr.-June	70	120	60	55[12]	Provisional[5]	Provisional[5]
July-Dec.	60	120	60	55[12]	Provisional[5]	Provisional[5]
1947:						
Jan.-Mar.	60	120	60	55[12]	Provisional[5]	Provisional[5]
Apr.-June	75	120	75	75[12]	Provisional[5]	Provisional[5]
July-Sept. 19	85	135	85	85[12]	Provisional[5]	Provisional[5]

July 28, 1947 rationing of industrial users continued.

[1] Not including special allotments. Nonprovisional allowance depended upon the total amount of sugar used in the base period, while provisional allowance depended upon the amount of specified perishable commodity processed. [2] Special allowance was made for corn sugar and sirup replacement. [3] Additional 20 percent allowed on estimated use of sugar for bread and rolls only. [4] Manufactures of pharamaceuticals (internal use) were permitted to apply for an increase not to exceed 25 percent. [5] Provisional use for canned, bottled, frozen, pickled, or otherwise preserved processed foods was dependent upon the amount of perishable commodities processed. The use of sugar per unit of product was limited. [6] Special allotment granted for production of frozen sugared egg yolks, May 29 to July 31. [7] Manufactures of pharamaceuticals (internal and external uses) were permitted to apply for an increase not to exceed 25 percent. [8] Application for an additional 10 percent permitted. [9] Application for increased allotment permitted to users who customarily used fresh, frozen, or dried eggs. [10] Allotment for jams, jellies, preserves, fruit butters, and marmalades based on sugar used in 1944 for production for civilians. [11] Manufactures of ice cream, ices, sherberts, frozen custards, and mixes used for these purposes received 70 percent base use. [12] Allotment for jams, jellies, preserves, fruit butters, and marmalades based on 100 percent of sugar used in 1944 for production for civilians plus 50 percent of sugar used in 1944 for Government production or the amount of sugar used in 1941, whichever was higher.

soon declined and rations were reduced. At the end of 1942, actual stocks were not far below the goal set up under the rationing program.

Arrivals of sugar from the Caribbean gradually improved during the first part of 1943. This favorable situation was brought about by the diversion of shipping from other areas, by the operation of a shuttle service between Cuba and Florida, by increased efficiency in the utilization of shipping facilities, and by a reduction in the submarine menace.

However, the improvement in shipping early in 1943 was partly offset by a prospective sharp reduction in domestic beet crop prospects, and rations were increased only moderately. A home canning program was adopted under the terms of which consumers could obtain some additional sugar.

The improved situation in shipping and inland transportation brought a continued increase in receipts in 1943, and receipts during July reached the highest level since mid-1941. The allocation to industrial users was increased, and additional special allotments were authorized. A shortage of deliveries of corn for processing led to a shortage of corn sugar and sirup which was partly relieved on July 10, 1943, by the authorization of a special allotment of sugar to manufacturers for July and August 1943.

In January 1944, consumers' ration stamps were made valid for an indefinite period, rather than expiring on a certain date. This was done to avoid the rush of consumers spending their ration stamps before expiration, regardless of immediate need.

The allotment of sugar to industrial users was continued on the more liberal basis established in August 1943. In general, the 1944 industrial users' ration was 80 percent of the base period. Also, supplemental allotments above 80 percent were given to certain industrial users in 1944. The list of such industries varied from time to time, but it usually included the manufacturers of breakfast cereals and bakery products, fruit preserves, and drugs and chemicals with low sugar content. Concerns that were located in areas that had had substantial increases in population during the war also were permitted additional sugar.

Sugar supplies were much smaller in 1945 than at any previous time during the war. Sugar stamps which had been made valid for an indefinite period when they were issued at various times during 1944 were canceled at the end of December 1944 to avoid having them used in 1945 with a consequent further reduction in supplies available to some consumers.

On February 1, 1945, the consumer ration was reduced to 0.393 pound a week per person. A further reduction was made on May 1 to 0.285 pound. These reductions were made by lengthening the period between the validation of sugar stamps.

The home canning program for 1945 was set at a level of 60 percent of the previous year. Sugar for home canning programs was intended to encourage as much home canning as possible so that total food supplies might be increased. This program suffered greatly from lack of effective controls. In 1943 and 1944, some sugar for home canning could be obtained by anyone in exchange for a special ration stamp. No evidence that the sugar so obtained was to be used for home canning was required, and no record was kept to show who used such stamps. Additional sugar for home canning could be obtained by presenting a written application to the local ration board. Persons who got sugar through these applications were required to declare their intention of using the sugar for home canning, but no attempt was made to learn if the sugar was actually so used.

The greatest difficulty with the home canning program occurred in 1944. Sugar was somewhat more plentiful that year than in either of the 2 previous years, and much more so than in 1945. In contrast, supplies of fruits and vegetables were comparatively short. Under the circumstances, allocations of sugar for home canning were comparatively liberal and people were able to obtain practically all of the sugar called for by their special ration stamps and approved applications. Local ration boards were apparently very liberal in approving applications. As a result, the issuance of sugar for home canning in 1944 totaled about 50 percent more than the quantity originally allocated for that purpose. There is no way of learning accurately how much sugar was actually used for home canning, but estimates of the extent of home canning actually done would indicate that a large proportion of the sugar issued for home canning that year was used for other purposes. Basic allotments to industrial users were further reduced to 50 percent of their base during the third quarter of 1945. Manufacturers of bread, bakery products, and cereals were allotted 60 percent of their base use and pharmaceuticals, 110 percent for this period. These were the lowest ration levels yet established. Third-quarter ration levels for industrial users, individual consumers, and institutional users were continued nearly unchanged for the fourth quarter of 1945 and the first quarter of 1946.

Individual sugar rations during 1946 and early in 1947 continued at the rate established in mid-1945. Two stamps for home canning sugar were issued in 1946. Each was for 10 pounds of sugar, a slight increase over 1945. Sugar allocations to industrial producers of bakery and cereal products were at 60 percent of the base amount, except during the second quarter when allocations were raised to 70 percent. The 60-percent amount was the lowest at any time during the rationing period. In general, allocations to other industrial users followed the same pattern, although at different levels.

One reason for the severe shortage of sugar in 1946 was the need to provide some sugar for the inhabitants of the recently liberated areas in Western Europe. These areas were not yet able to produce beet sugar in anything like the prewar quantity, and mil-

itary success for a time increased the demand on the sugar prorated by the Combined Food Board.

Sugar continued in very short supply early in 1947. However, it soon became apparent that the 1947 Cuban sugar crop, harvested during the first half of the year, would be much larger than the preceding crops; and the supply situation eased rather rapidly. The 1947 Cuban crop established a new record of 6,448,000 tons. This was 44 percent or 2 million tons above the 1946 output. This large increase in sugar supplies enabled rationing allowances for all types of users to be raised at the start of the second quarter of 1947 and then discontinued by steps. Rationing for consumers and institutional users ceased on June 12, 1947, and for industrial users, on July 28. Inventory controls were continued until August 30, 1947.

The passage of the Sugar Control Extension Act in March 1947 transferred the Sugar Control Program from the Office of Price Administration to USDA. This act provided for the extension of rationing and price control to October 31, 1947, if the Secretary of Agriculture thought this desirable. Controls were ended before that date.

Government Purchases of Sugar and Molasses

The necessary central control of shipment of sugar and molasses from offshore areas was obtained by Government purchase of substantially all the production in Cuba and Puerto Rico and by control of shipments from Hawaii during the war years (*65*). The Government took title to the sugar and molasses in Cuba and Puerto Rico, shipped them to this country, and resold them to refiners and dealers. Until 1945, the purchase and sale prices were so arranged that the Government obtained the customary peacetime margin. The price paid for Cuban sugar in 1945 was raised 0.55 cent per pound. But prices to U.S. dealers were not changed, and the Government absorbed the resulting loss. The 1946 and 1947 crops were also purchased with some additional price increase.

The Government did not purchase the sugar shipped from Hawaii to the continental United States. Practically all of this sugar was delivered to two refineries located in the San Francisco area. This and other factors simplified the problem of moving Hawaiian sugar compared with that from other offshore areas. However, the shipping of sugar from Hawaii was under the control of the War Shipping Administration and the physical handling of the sugar was arranged in much the same way as for Cuban and Puerto Rican sugar.

Purchases from Cuba

The U.S. Government purchased the entire crops of sugar and molasses produced in Cuba from 1942 through 1947. The first Government contract for the purchase of Cuban sugar, between the Defense Supplies Corporation and the Cuban Sugar Stabilization Institute, became effective January 28, 1942. This contract covered the sale of invert molasses, blackstrap molasses, and sugar produced from the 1942 crop.

That crop was purchased for 2.65 cents a pound, 96 degree polarization, delivered f.o.b., Cuba, at normal shipping ports. Excess costs caused by shipping from abnormal ports because of wartime shipping conditions were borne by the U.S. Government. The contract provided that one-third of the crop was to be delivered in the form of invert molasses, but this was later reduced to the quantity equivalent to approximately 700,000 short tons of raw sugar. The invert molasses, plus the blackstrap molasses obtained as a byproduct in manufacturing sugar, was bought for 2.5 cents a pound of sugar content.

The 1943 Cuban crop of raw sugar was purchased by the CCC. The price was the same as for the previous year's crop. Price stabilization agreements for products imported by Cuba from the United States were reached at the same time. The CCC also bought the 1944 crop of Cuban sugar (except 200,000 tons for local consumption) at 2.65 cents per pound.

The CCC purchased the 1945 crop of Cuban sugar from the Cuban Sugar Stabilization Institute at a minimum price of 3.10 cents per pound but with an escalator clause. It provided that the minimum price was to be increased by the amount of any increase in the ceiling price of raw sugar in the United States, c.i.f., New York City, duty paid, above the sum of 4.20 cents per pound and any ocean freight charge absorbed by CCC above the basic rate of 0.34 cent per pound. The minimum price was also to be increased if, in any quarter of 1945, the U.S. cost-of-living index was more than 4 percent above the index for the last quarter of 1944. The percentage increase in price for each quarter for which there was an increase was to equal the percentage increase in the cost of living for one-fourth of the raw sugar purchased; in no event was the price to exceed 2.65 cents a pound plus the amount paid as price support by the CCC to U.S. Caribbean possesions. The increase in the total amount of money paid as a result of an increase in the cost of living was not to be more than the excess of such increase over any increase resulting from a rise in the ceiling price or ocean freight rates.

The last wartime purchase of Cuban sugar crops by the CCC covered the crop years 1946 and 1947. Negotiations for the purchase were protracted, and the contract was not signed until July 16, 1946. A considerable amount of the 1946 crop of Cuban sugar was shipped to the United States before the contract was signed, and as agreed, was later paid for in accordance with the terms of the final contract.

One problem encountered in negotiating the 1946-47 crops contract, which had not been an important

element in earlier contracts, was the Cubans' desire to obtain some guarantee with respect to future treatment of Cuban sugar by the United States, particularly with reference to quotas. The Cubans feared that new U.S. sugar quota legislation might reduce the share of Cuban sugar in the U.S. market in favor of either the domestic areas or the Philippines. The individuals negotiating for the United States had no authority to make any commitment with respect to future U.S. sugar quotas. Finally, a clause was included in the contract giving Cuba the right to cancel the contract, with respect to sugar not yet delivered, if the United States should take any action regarding its future quotas which Cuba might regard as detrimental to its interests.

Decisions concerning price also delayed completion of the negotiations. The 1942, 1943, and 1944 Cuban crops had each been purchased for $2.65 per 100 pounds, raw value, free alongside ship at Cuban ports. The price for the 1945 crop was raised to $3.10 per 100 pounds. The Cubans desired a further price increase for the 1946 and 1947 crops. The basic minimum price finally agreed upon was $3.675 per 100 pounds. However, this price was to be increased under certain circumstances. The most important of these provided for increases from the base price by (1) the amount of any increase in the U.S. ceiling price of raw sugar above 4.775 cents per pound, (2) any amount by which the ocean freight from one port northside of Cuba to New York should exceed 0.34 cent per pound, (3) increases in living costs, and (4) any increase in the price of raw sugar purchased from Puerto Rico.

With these escalator clauses, the average price the United States paid for 1946 crop Cuban sugar was $4.816 per 100 pounds. The 1947 crop cost $4.9625. By the time 1947 crop deliveries were completed, the United States had terminated its sugar rationing and price control programs.

The molasses purchased from Cuba during these years was used in the United States to produce alcohol. The Cubans retained enough molasses to keep the alcohol plants in their country in operation and then sold the alcohol to the United States.

The Defense Supplies Corporation purchased the exportable blackstrap molasses produced from the 1942, 1943, and 1944 Cuban sugar crops. It also bought invert molasses made from the 1944 crop, equivalent to 900,000 short tons of raw sugar. The price paid for both invert and blackstrap molasses delivered at Cuban port terminals in 1943 and 1944 was 2.50 cents a pound of sugar content. However, the price of blackstrap was subject to a deduction of 2 cents a gallon for molasses containing 52 percent sugar, with a scale of premiums and discounts for sugar content greater or less than 52 percent.

The Defense Supplies Corporation bought alcohol produced in Cuba from the 1944 and 1945 sugar crops. The price paid was 65 cents per gallon for 190-proof alcohol delivered at Cuban ports. The purchase of alcohol from Cuba was arranged to permit the use of alcohol plants in Cuba rather than importing the entire supply of molasses into this country for manufacture into alcohol.

The CCC purchased the available molasses and alcohol from the 1946 and 1947 Cuban sugar crops. The basic price was 2.50 cents per pound of sugar content at Cuban port terminals. The Corporation also purchased the industrial alcohol produced in Cuba from the 1946 and 1947 sugar crops. Because of the larger than expected size of the 1947 sugar crop in Cuba, the quantity of molasses obtained from Cuba was larger than expected. Also, the end of hostilities reduced the need for alcohol for war purposes, and molasses supplies in the United States became relatively abundant.

Purchases from Puerto Rico, Dominican Republic, and Haiti

The CCC purchased the 1943-47 sugar crops of Puerto Rico from individual sugar producers. The prices paid were comparable to those paid for Cuban sugar but higher by the amount of the U.S. tariff on sugar from Cuba. In addition, cane growers in Puerto Rico received certain additional payments; these amounted to 20 cents per 100 pounds of sugar in 1944. The purchases generally covered the entire crop, except sugar used for local consumption and sugar sold before the effective date of the first contract.

The minimum price for the 1945 Puerto Rican crop was 3.46 cents per pound for raw sugar delivered at shipside, the same as in the 2 previous years; in addition to the purchase price, each seller received a support payment of 0.55 cent per pound of raw sugar. Cane growers received 0.45 cent of this amount, and mills, 0.10 cent. The price of the sugar was to be increased by 35 percent of any increase in the ceiling price for raw sugar, c.i.f., New York, over 4.11 cents per pound up to 4.51 cents per pound, and 100 percent of any increase above 4.51 cents. The processors were to share in any increase in market proceeds only if the price rise was sufficient to eliminate the CCC support payment to the mills.

The 1943 and 1944 sugar crops of the Dominican Republic and Haiti were purchased by the CCC. The basic price paid in both countries was 2.65 cents per pound for sugar polarizing 96 degrees. However, sugar shipped to the United States was priced at 2.425 cents per pound, because of the tariff differential. Ordinarily, only small quantities of sugar from these countries are shipped to the United States, and very little of the 1943 or 1944 crops was sent here. Purchases of Dominican and Haitian sugar for 1945 and 1946 were made by Britain.

Effects of the Sugar Program

No attempt has been made to measure statistically the various effects of the Government's sugar program. Accurate measurements would be difficult or impossible for many parts of the program, but it is possible to determine the general nature and direction of the effects of many of the Government's actions.

During most of the war period, price ceilings on sugar kept the prices paid by consumers much lower than they would have been without price control. This was particularly true in 1946 when the quantity of sugar available to civilians reached its lowest level.

Market prices of sugarcane and sugarbeets, based on the ceiling price of sugar, were insufficient to maintain production of these crops by farmers. As a result, sizable payments were made to producers to encourage production. This method of increasing returns to growers left the margins between raw material costs and sugar prices at comparatively low levels for both cane and beet sugar mills. Sugar mills buy their cane or beets on contract at prices that vary with the price of sugar but that provide a widening margin for the mills as prices for sugar advance. Ceiling prices prevented these margins from widening as much as mill costs increased; therefore, it became necessary for the Government to make subsidy payments to processors.

The net effect of low sugar prices and high subsidies, compared with what might have happened with higher prices and lower subsidies, is difficult to ascertain. Consumers with low incomes surely benefited from the policy, but those with higher incomes doubtless paid more in higher taxes (to provide for the subsidy payments) than they saved from low prices for sugar.

Price ceilings kept consumer prices for sugar substantially lower than could otherwise have been expected and made rationing necessary so that supplies could be distributed fairly. In fact, sugar was the first food to be rationed during the war and the only food still rationed during 1946.

The primary problem in rationing was to obtain reasonable equity between consumers without making the rationing system unduly complicated. Any system of rationing necessarily involves some compromise between equity and administrative feasibility. The sugar and related rationing programs were necessarily complicated. They involved first the division of supplies between the United States and other countries, then the division among the military services, the United Nations Relief and Rehabilitation Administration, and other special claimants, and finally among civilian consumers in this country.

No exact method of determining equitable allotments of sugar between even the major groups of claimants was developed. During most of the war, requests from the military services and many of the other special claimants were largely met. Thus, civilian claimants had, in effect, the lowest priority, and the quantity left for them was mainly a residual. Therefore, civilian supplies varied more widely from time to time than would otherwise have been the case.

The division of supplies among civilians involved programs for households, industrial uses, institutional uses, and home canning. Rations for households always provided uniform quantities per person, the quantity varying from time to time with the available supplies of sugar. A uniform ration for each individual was doubtless necessary for administrative reasons, but equality in this case did not result in equity. For instance, families accustomed to doing most or all of their own baking were more severely limited by the ration than were those who bought their baked goods. Persons who ate some of their meals at restaurants obtained more sugar than others, because individual rations were not reduced unless more than one-third of their meals were taken away from home.

Industrial users were rationed on the basis of the quantity of sugar each company had used in the base period, but the percentage of base use allotted to different industries varied considerably according to the apparent need for the products of each industry. Such an arrangement was obviously in the public interest, since the products of some industries were more essential than those of others. However, the procedure resulted in more severe restrictions on the volume of business and possible profits in some industries than in others.

The purchase of sugar by the U.S. Government from Cuba and Puerto Rico involved protracted negotiations each year, particularly with Cuba. Price was the most important issue. Dissatisfaction with price and subsidy payments for Puerto Rican sugar led to a strike in the mills early in 1945.

Difficulties such as these appear to have been more or less inevitable because of conflicting desires (1) of the Government to provide cheap sugar for consumers and (2) of growers to obtain increased returns. Except for the strike in Puerto Rico, there is no reason to think that these difficulties caused any decrease in the production of sugar. There is no way of measuring accurately the effect of the strike on Puerto Rican production, but it is generally believed to have been small. If producers in Cuba and other areas had received larger returns per pound of sugar, they might have produced more, but this is uncertain, in view of abnormal wartime conditions.

Despite the difficulties involved, it seems certain that the benefit from the various Government sugar programs greatly outweighed any harm they caused. These programs were, of course, merely a small part of the Government's attempt to control prices and distribute goods equitably.

Nonsugar Sweeteners During World War II

The shortage of sugar during World War II presented producers of other sweeteners with an opportunity to increase their sales whenever they could produce the additional quantities needed. Producers of corn sweeteners (dextrose and corn sirup) were more successful in taking advantage of the situation than were those producing other caloric sweeteners (table 20). A marked increase in the consumption of corn sweeteners occurred despite the shortage of corn at various times during the war.

The consumption of maple sirup declined about as much as that of sugar during the war. The production of maple sirup required considerable labor, which was scarce. Yields of maple sap also vary widely from season to season, largely because of the influence of the weather. This caused a sharp reduction in supplies in 1944 and 1945.

Sales of sorgo sirup and honey increased only modestly during the war. And those for sorgo sirup declined considerably as soon as sugar was again in abundant supply.

The sharp rise and later decline in the consumption of "other" sirup was caused by the nature of the regulations covering the marketing of sugar and the ability of operators of raw sugar mills to change part or all their output to cane sirup and edible molasses. Government price controls during much of the war were such that the sugar in cane sirup and edible molasses could be sold for higher prices in these products than if it were manufactured into raw or refined sugar. Rationing did not apply to cane sirup or edible molasses. Consequently, the owner of a cane sugar mill, instead of trying to obtain the maximum quantity of raw sugar from the cane ground, preferred to produce increased quantities of sirup and molasses.

The situation became one of concern to the Government, but no effective action to correct it, except in certain extreme cases, had been taken when rationing and price controls were terminated. The output of these products in the United States dropped rapidly when the shortage of sugar ended. Molasses produced from sugarbeets is not edible, and there was no increase in the production of beet molasses during the war.

While statistics are not available, there is some indirect evidence that the consumption of saccharin also increased during World War II. Saccharin appeared much more frequently than before on tables in restaurants and other eating places, sometimes when no sugar was offered to customers, and reports of its increased use by industrial food processors were fairly common.

Postwar Recovery

When World War II ended, world supplies of sugar were at their lowest level since the outbreak of the

Table 20—U.S. consumption of sugar and other caloric sweeteners, 1939-49

Year	Sugar	Dextrose	Sirups				Honey
			Corn	Maple	Sorgo	Other[1]	
	--- 1,000 tons ---		*--- 1,000 gallons ---*				
1939	6,860	223	93,022	2,756	11,407	27,641	15,362
1940	7,029	229	92,283	3,021	10,199	32,537	17,456
1941	8,055	321	103,537	2,209	10,684	23,816	19,283
1942	4,459	381	170,925	3,351	10,568	37,219	16,896
1943	6,332	358	152,580	2,663	13,728	39,119	19,409
1944	7,186	338	153,647	2,731	11,868	49,212	18,175
1945	6,138	331	155,350	1,103	11,649	50,114	21,624
1946	5,660	321	152,584	1,530	9,850	58,539	19,874
1947	7,466	383	164,577	2,506	11,934	47,218	21,079
1948	7,295	352	110,398	1,890	9,845	30,198	17,366
1949	7,493	362	116,757	1,989	7,665	28,752	20,037
	Percent of 1939-49 average						
1939	93.8	86.4	96.6	103.5	106.0	98.7	88.5
1940	96.1	88.8	95.8	113.5	94.8	116.2	100.5
1941	110.1	124.4	107.5	83.0	99.3	85.1	111.1
1942	74.6	147.7	177.5	125.9	98.2	132.9	97.3
1943	86.6	138.8	158.5	100.0	127.5	139.7	111.8
1944	98.2	131.0	159.6	102.6	110.3	175.8	104.7
1945	83.9	128.3	161.4	41.4	108.2	179.0	124.5
1946	77.4	124.4	158.5	57.5	91.5	209.1	114.4
1947	102.1	148.4	170.9	94.1	110.9	168.6	121.4
1948	99.7	136.4	114.7	71.0	91.5	107.9	100.0
1949	102.4	140.3	121.3	74.7	71.2	102.7	115.4

[1] Includes can sugar sirups, refiners' sirup, and edible molasses.

Source: The World Sugar Situation, 1951, U.S. Dept. of Agr.

war. Sugar rations in the United States were the smallest since the start of rationing. The shortage was largely the result of the loss of production from the Philippines and Java, and the reduced production of sugarbeets in the United States and Europe. Moreover, the Cuban sugar crop in 1944 was unusually small.

Not until 1948 did world sugar production return to the level of 1939, although there were increases in 1946 and 1947. The restoration of cane and beet fields in war-devastated areas and the repairs of damaged milling equipment were somewhat slow becuase of disorganized conditions in many parts of the world. World production had to exceed world consumption for several years before stocks of sugar increased to a point where normal trade conditions prevailed.

U.S. SUGAR QUOTAS AFTER 1947

The abundant supplies of sugar, mostly from Cuba, which became available to U.S. consumers by mid-1947 made possible the abandonment of sugar controls, of which the last to disappear was that on the purchase and delivery of the 1947 Cuban sugar crop. The approach of the end of wartime controls created great interest, particularly among domestic sugar producers, in amending and extending the sugar quota law. The 1937 act, still in effect, although its quota provisions had been suspended since April 1942, would terminate December 31, 1947, unless amended.

The Sugar Act of 1948

In the summer of 1947, Congress passed new sugar quota legislation, to become effective January 1, 1948 (*5*). This took the form of a new law, rather than an amendment to the existing act and was called the Sugar Act of 1948. Its basic features remained the same as those of the 1934 and 1937 acts, although changes in details were more extensive and of greater economic effect than those contained in the various amendments to the 1937 act.

When the bill was before the Congress, the Secretary of Agriculture testified that great consideration had been given the situation in Cuba and its contribution in supplying sugar to the United States and its Allies during World War II. He pointed out certain new provisions which would substantially benefit producers of sugar in Cuba. The extent of the benefits will be examined after discussing the general features of the act.

Under the new law, the Secretary was still directed to determine U.S. sugar consumption requirements for each calendar year and to revise his determination whenever necessary. However, the guidelines for determining consumption requirements were changed by requiring that:

> "...the Secretary in making any such determination...shall take into consideration the relationship between the prices at wholesale for refined sugar that would result from such determination and the general cost of living in the United States as compared with the relationship between prices at wholesale for refined sugar and the general cost of living in the United States obtaining during 1947 prior to the termination of price control of sugar as indicated by the Consumer Price Index as published by the Bureau of Labor Statistics of the Department of Labor."

The Consumer Price Index (CPI) for January-October 1947, the period referred to in the law, was 157.84 (1935-39 = 100). The average wholesale price of refined sugar during the period was 8.267 cents per pound. Dividing the wholesale price of refined sugar by the CPI for the base period yielded the factor 0.052376. This factor multiplied by the wholesale price of refined sugar for any given period indicated the price necessary to produce the same ratio between the price of sugar and the Index as it existed during the base period.

These calculated prices, compared with the actual prices of sugar, show that the price of sugar in the base period was higher relative to the Index than it had been since before 1935-39 (table 21). The price of sugar during the base period also proved to be higher than in any of the following years through 1955. The failure of sugar prices after 1947 to rise as high as the price calculated by the formula does not indicate lack of any consideration of the price formula by the Secretary of Agriculture, since he was required to consider other factors in determining sugar consumption requirements.

The quotas for domestic areas established by the Sugar Act of 1948 were stated in terms of tons per year, instead of percentages of consumption requirements which were used in the previous act. The tonnages specified in the Sugar Act of 1948 were:

Area	*Short tons raw value*
Domestic beet sugar	1,800,000
Mainland cane sugar	500,000
Hawaii	1,052,000
Puerto Rico	910,000
Virgin Islands	6,000
Total	4,268,000

Table 21—Wholesale prices of refined sugar, actual and calculated from the formula in the Sugar Act of 1948

Average	Actual price[1]	Calculated price[2]	Consumer price index
	- - - Cents per lb. - - -		*1935-39=100*
1935-39	4.76	5.24	100.0
1940	4.42	5.25	100.2
1941	5.02	5.51	105.2
1942	5.56	6.10	116.5
1943	5.60	6.47	123.6
1944	5.58	6.57	125.5
1945	5.50	6.72	128.4
1946	6.47	7.30	139.3
Base period[3] ..	8.27	8.27	157.8
Nov. & Dec.			
1947	8.40	8.69	166.0
1948	7.76	8.97	172.0
1949	7.97	8.90	170.0
1950	8.00	8.97	172.0
1951	8.38	9.74	186.0
1952	8.62	9.53	181.9
1953	8.72	9.74	186.0
1954	8.72	9.79	187.5
1955	8.59	9.85	188.1

[1] Wholesale New York. [2] Calculated using formula in the Sugar Act of 1948. [3] January through October, 1947.

In addition, the Philippines received a quota of 952,000 tons of sugar as specified in the Philippine Trade Act of 1946. This quantity referred to the actual weight of Philippine sugar as it arrived in the United States and not to any particular polarization, such as that specified by the term "raw value." During the first years this quota was in effect for the Philippines, USDA considered it equal to 982,000 short tons, raw value. This, plus the fixed tonnage quotas for domestic areas, amounted to 5,250,000 tons.

The remainder, after domestic and Philippine quotas, was divided between Cuba and other foreign countries. Cuba received 98.64 percent and the other countries, 1.36 percent, of this residual.

The quotas for domestic areas were about 11 percent above their annual average marketings during 1935-39 (table 22). However, U.S. sugar consumption during 1948-52, when the original act was in effect, was nearly 14 percent above marketings during 1935-39.

Two features of the 1948 act were highly beneficial to Cuba; one of these also benefited other foreign countries. U.S. sugar consumption continued to increase while these quotas were in effect, and the entire increase accrued to foreign countries other than the Philippines. Consumption requirements for 1952 were 7,900,000 tons, making the basic quota for Cuban sugar 2,621,851 tons and that for other foreign countries, 36,149 tons. These were increases of 36 percent over 1948 for both Cuba and other foreign countries.

Also, the provisions for distributing deficits—the amounts by which one or more areas failed to fill its quota in any year—to areas able to fill them were changed in the 1948 act. The 1937 act provided that the entire amount of any deficit in the quota for the Philippines should be prorated to foreign countries other than Cuba. This provision was changed in the 1948 act so that Cuba received 95 percent and other countries 5 percent of any deficit in sugar supplies from the Philippines. Because of wartime destruction, deficits in sugar supplies from the Philippines were large for several years. The amounts for the first 5 years were:

Years	*1,000 tons, raw value*
1948	742
1949	425
1950	450
1951	200
1952	200

Table 22—Marketings of sugar in the continental United States, 1935-47

Year	Domestic areas					Philip-pines	Cuba	Other foreign countries	Total
	Beet	Mainland	Hawaii	Puerto Rico	Virgin Island				
	- - - 1,000 short tons, raw value - - -								
1935	1,478	319	927	793	2	917	1,830	11	6,277
1936	1,364	409	1,033	907	4	983	2,102	29	6,833
1937	1,245	491	985	896	8	991	2,155	89	6,860
1938	1,448	449	906	815	4	981	1,941	75	6,619
1939	1,809	587	966	1,126	6	980	1,930	62	7,466
1940	1,550	406	941	798	0	981	1,750	17	6,443
1941	1,952	411	903	993	5	855	2,700	190	8,009
1942	1,703	407	751	836	0	23	1,796	39	5,555
1943	1,524	460	866	642	3	0	2,857	114	6,466
1944	1,155	515	802	743	3	0	3,618	106	6,942
1945	1,043	417	740	903	4	0	2,803	87	5,997
1946	1,379	445	633	867	5	0	2,283	46	5,657
1947	1,574	383	842	969	3	0	3,943	45	7,759

Source: Sugar Statistics and Related Data, Vol. 1, Bul. 293, Agr. Stabil. and Conserv. Serv. U.S. Dept. of Agr.

Cuba's share of these deficits over the 5 years amounted to 1,916,150 tons and that for other countries to 100,850 tons. The amounts assigned to other foreign countries were greater than they could reasonably have expected under the conditions of 1937 when they were entitled to the entire Philippine deficit. The quota provisions for sugar from Cuba in the 1948 act proved substantially more favorable to Cuban producers than those of the 1937 act, although perhaps not so much as the Cubans had hoped for and requested during the negotiations for the purchase of the 1946 and 1947 Cuban sugar crops.

In addition to deficits in supplies from the Philippines, there were also deficits in all domestic areas except Puerto Rico and the Virgin Islands in 1 or more years during 1948-52. Part of these were assigned to Cuba. The amount of domestic area deficits generally decreased from 1948 through 1952.

In 1948, the United States purchased sugar from Cuba, Peru, and the Netherlands Indies, primarily to meet food needs in areas occupied after the end of World War II. The purchase from Cuba amounted to 1 million short tons of raw sugar, and that from Peru to 37,000 tons. The Netherlands Indies supplies 15,000 long tons of semirefined sugar. In 1949, the United States and Britain jointly purchased 850,000 short tons of raw sugar. The U.S. share of the purchases, slightly more than one-half, was again utilized for relief feeding in occupied areas. The 1948 and 1949 purchases helped to provide Cuban sugar producers with sufficient market outlets to justify the continued production of large crops. A sugar surplus did not appear until 1952.

Production of sugar in Puerto Rico in 1950, 1951, and 1952 was larger than the quota for such sugar in the continental United States plus the local quota for consumption in Puerto Rico. Part of the excessive stocks of sugar which appeared in Puerto Rico as a result of this situation was disposed of by sales to the Commodity Credit Corporation for distribution under various Government programs, and part was sold on the world market. Sales on the world market were made at prices considerably lower than those prevailing in the United States.

The 1951 Amendments

The Sugar Act of 1948 was amended in 1951, although the amendments did not become effective until January 1953, immediately after the terminal date of the original act (*8*). The 1951 amendments were relatively minor. The quota for Puerto Rico was increased 170,000 tons to 1,080,000 tons, and that for the Virgin Islands, from 6,000 to 12,000 tons. Also, the share of foreign countries other than Cuba and the Philippines in excess of the fixed tonnage quotas for domestic areas and the Philippines, now 5,418,000 tons, was raised to 4 percent, and that for Cuba was reduced to 96 percent. The term for which the law was to be effective was extended to December 31, 1956.

The effect of the changes in quotas made in the 1951 amendments with consumption requirements of 8,100,000 tons, the final figure for 1953, was to reduce the quota for Cuban sugar by 236,520 tons, or about 8.5 percent below the original 1948 act. The 1953 quota was, however, 11 percent larger than it would have been under the 1937 act. The quota for foreign countries other than Cuba and the Philippines was increased by 68,520 tons, about 77 percent. The 170,000-ton increase for Puerto Rico raised its former quota by 19 percent, and the small quota for the Virgin Islands was doubled.

The 1956 Amendments

Although the terminal date for the 1951 amendments to the Sugar Act of 1948 was December 31, 1956, most of the amendments enacted in 1956 took effect on January 1, 1956. The new date for termination of the law was December 31, 1960.

Changes in quotas for both domestic and foreign areas were extensive. Quotas for domestic areas remained unchanged whenever consumption requirements were 8,350,000 tons or below. The domestic areas, however, beginning in 1956 received 55 percent of any increase in consumption requirements above 8,350,000 tons in place of none as formerly. This restored the right of the domestic areas to participate in the growth of the U.S. sugar market at approximately the level provided by the 1937 act. The first 165,000 tons of increased quota for domestic areas were assigned at 51.5 percent to the sugarbeet area and 48.5 percent to mainland cane. The next 20,000 and 3,000 tons were assigned to Puerto Rico and the Virgin Islands, respectively. Any further increases above the first 188,000 tons were apportioned among all domestic areas on the basis of the quotas then in effect for each domestic area.

Obviously, this arrangement specified in the act caused a slight change in the relative size of quotas for domestic areas. The proportions were:

	Consumption requirements of	
	8,350,000 tons or below	*8,358,000 tons or above*
Beet sugar	40.5	40.7
Mainland cane	11.2	12.5
Hawaii	23.7	22.7
Puerto Rico	24.3	22.7
Virgin Islands	.3	.3

Mainland producers of cane sugar also benefited from the purchase of 100,000 tons of sugar by the Commodity Credit Corporation (CCC) for distribution to

underdeveloped nations. Most of this sugar was purchased from producers in the mainland sugarcane area, and the remainder from producers of beet sugar. Aside from benefiting consumers in less developed nations, this purchase reduced the inventories of sugar in mainland areas to more nearly normal levels than those of 1953 and 1954 when sugar production in continental areas exceeded quotas.

The quota for the Philippines was not changed by the 1956 amendments. Those for foreign countries other than Cuba and the Philippines were increased, beginning in 1957, and the shares received by various countries were rearranged. Since the changes for these countries did not become effective until 1957, the 1956 increases for domestic areas had the effect of reducing their quotas that year. Starting in 1957, foreign countries other than Cuba and the Philippines received 4 percent of that part of sugar consumption requirements between the quotas assigned to the domestic areas and the Philippines (5,424,000 tons) and the first 8,350,000 tons of consumption requirements plus 15.41 percent of that part of consumption requirements in excess of 8,350,000 tons. Cuba was assigned 29.59 percent and the domestic areas 55 percent of consumption requirements in excess of 8,350,000 tons. As a result of these changes, the quotas for countries other than Cuba and the Philippines began increasing at a much more rapid rate than at any time since the quota system was established in 1934.

The quota for Cuban sugar, although reduced by the 1956 amendments, compared to what it would have been under the previous law, was still larger than it would have been under the 1937 act.

During 1955-59, U.S. sugar consumption requirements increased 1 million tons (table 23). Domestic sugar producing areas received nearly 58 percent of this increase, foreign countries other than Cuba and the Philippines, 16 percent, and Cuba, 26 percent. Most of the increase in quotas for countries other than Cuba and the Philippines was assigned to Mexico, the Dominican Republic, and Peru.

Changes in Sugar Quotas, 1960-61

The Sugar Act was amended in July 1960 following the Castro Revolution in Cuba in 1959. The effective term of the law was extended from December 31, 1960, to March 31, 1961. The President was empowered to determine the size of the Cuban quota for the balance of 1960 and the first 3 months of 1961. The President, by proclamation on the same day he signed the law, reduced the Cuban quota for the remainder of 1960 to zero, exclusive of Cuban sugar certified for entry into the United States but not yet entered and a very small quantity needed to cover possible revisions in the amounts entered.

The amendments also authorized the purchase of sugar from foreign countries other than Cuba in amounts sufficient to replace the sugar previously assigned to Cuba. In 1960, the United States authorized the purchase of 1,200,000 tons of sugar for this purpose. All but about 12,000 tons of this were purchased. The largest amounts were acquired from the Dominican Republic, Mexico, the Philippines, Peru, Brazil, the British West Indies, and British Guiana.

The Sugar Act was again amended on March 31, 1961. This time the terminal date of the law was extended to June 30, 1962. The principal changes were the substitution of the phrase "any country with which the United States is not in diplomatic relations" for the word "Cuba," and a clause directing the Secretary of Agriculture, in purchasing sugar to replace supplies formerly obtained from Cuba, to give special consideration "to countries of the Western Hemisphere and to those countries purchasing United States agricultural commodities."

In 1961, 3,117,195 tons of sugar were allotted for purchase in addition to the quota supplies received from various areas. The number of countries from

Table 23—Effect of the 1956 amendments to the Sugar Act on quotas for domestic and foreign areas

Year	Quotas for area supplying sugar				
	Domestic	Philippines	Cuba	Other[1]	Total[2]
	- - - 1,000 tons - - -				
1955	4,444	977	2,860	119	8,400
1956	4,801	980	3,090	129	9,000
1957	4,788	980	2,994	213	8,975
1958	4,912	980	3,060	248	9,200
1959	5,021	980	3,120	279	9,400

[1] Foreign countries other than Cuba and the Philippines. [2] Consumption requirements.

Source: Sugar Statistics and Related Data, Vol. 1, Bul. 293, Agr. Stabil. and Conserv. Serv., U.S. Dept. of Agr.

which supplies were purchased was considerably larger than in 1961. But the largest share of the purchased sugar was still obtained from the countries which provided the largest amounts in 1960.

Sugar Act Amendments of 1962

Technically, there were 2 amendments in 1962, but the effect was the same as that of a single amendment. One became effective on July 13, 1962, and the other, on July 19, 1962. Since the previous law terminated on June 30, 1962, there was a period of 13 days during which no sugar act was in effect, and sugar could have been imported into the United States without regard to quota limitations. However, there were no imports inconsistent with sugar quotas as established in the 1962 amendments, and the hiatus in the law caused no economic problems.

In 1962, for the first time since the Sugar Act of 1948 became law, a significant change was made in the method of comparing sugar prices with the general price level as one of the factors to be considered by the Secretary of Agriculture in determining sugar consumption requirements. The new formula called for a comparison of the relation of the price of raw sugar to the index of prices paid by farmers during 1957-59 to the relationship likely to be established by any determination or revision of sugar consumption requirements.

In the years following the 1962 change, actual prices of sugar were much closer to those suggested by the price formula than was the case with respect to the earlier price formula in the Sugar Act (table 24). The year 1963 was an exception; world sugar prices rose to unusual heights; and part of this rise was reflected in the New York price of raw sugar, making it considerably above the price indicated by the Sugar Act formula.

Quotas for the various areas supplying the United States with sugar were rearranged in 1962, increasing the quota for the continental beet and cane sugar areas, for the Philippines, and for certain other countries. Under the new arrangement, domestic areas, whenever consumption requirements were 9,700,000 tons or below, received quotas aggregating 5,810,000 tons. When consumption requirements were above 9,700,000 tons, they received in addition 65 percent of that part above 9,700,000 tons. Under the immediately preceding arrangement, quotas for the domestic areas with consumption requirements of 9,700,000 tons would have totaled 5,186,500 tons. Also, the participation of the domestic areas was increased from 55 percent to 65 percent.

The assignment of quotas to the various domestic areas was also changed in 1962. The entire increase for domestic areas was allotted, approximately three-fourths to the beet area and one-fourth to mainland cane. The quota for Hawaii was fixed at 1,110,000 tons, that for Puerto Rico at 1,140,000, and that for the Virgin Islands at 15,000 tons. The law, however, provided that the quota for any offshore domestic area should be increased if production, less local consumption in the area, should exceed the quota. Small upward adjustments were made in the quota for Hawaii under these provisions in certain years, but none were necessary for Puerto Rico or the Virgin Islands.

The quota for the Philippines was increased to 1,050,000 tons, the first increase for that country under the Sugar Act of 1948. The quotas for other foreign countries were rearranged. Cuba was assigned a quota equal to 57.77 percent of the total assigned to countries other than the Philippines. However, the law provided that whenever the United States did not maintain diplomatic relations with any country, the assigned quota would not be prorated to that country, and a quantity of sugar equal to that assigned such a country would be imported from other foreign countries. Since the United States had not maintained diplomatic relations with Cuba since mid-1960, no Cuban sugar was imported while the 1962 act was in effect. The distribution of quotas and nonquota purchases of the quota for Cuban sugar did not differ greatly from those under the previous Sugar Act.

A new feature in the 1962 act provided that an import fee should be paid to the United States as a condition for importing sugar into this country. Beginning with the Sugar Act of 1934, all imported sugar had been purchased at prices equivalent to those paid for sugar produced in domestic areas. Since U.S. sugar prices had, with certain exceptions including the World War II, been higher than those at which exporting countries could sell sugar elsewhere, foreign countries endeavored to obtain the largest possible quota for U.S. sugar. In 1959 and the first half of 1960, producers of sugar in Cuba received a quota premium for sugar sold in the United States which

Table 24—Raw sugar prices: Actual and calculated from formula in 1962 amendments to the Sugar Act of 1948, average 1957-59 and years 1960-67

Year	Raw sugar price, duty-paid, N.Y.	Calculated price of raw sugar, duty-paid, N.Y.	Index of prices paid by farmers[1]
	- - - Cents per lb. - - -		*1910-14=100*
1957-59	6.21	6.21	292
1960	6.24	6.36	299
1961	6.30	6.40	301
1962	6.45	6.53	307
1963	8.18	6.64	312
1964	6.90	6.66	313
1965	6.75	6.83	321
1966	6.99	7.10	334
1967	7.28	7.27	342

[1] Including interest, taxes, and wage rates. Also called the parity index.

averaged about 2.29 cents per pound. This amounted to about $258 million on the 5,638,000 tons of Cuban sugar sold to the United States during the 18-month period.

This quota premium for Cuban sugar was paid during a period when the policies of the revolutionary Cuban Government were becoming more and more objectionable to the United States, culminating in a break in diplomatic relations and the cessation of imports of sugar from Cuba. This situation with respect to Cuba was one of the reasons advanced in support of some arrangement that would reduce or remove the quota premium received by producers in foreign countries for U.S. sugar imports.

The 1962 act imposed an import fee on sugar imported from any country other than the Philippines during the last half of 1962, 1963, and 1964. The fee for quota sugar for 1962 was 10 percent of the excess of the price for raw sugar produced in domestic areas over the prevailing price for raw sugar of foreign countries, adjusted for freight to New York and the tariff rate accorded the most favored nation. In 1963, the fee was 20 percent of this excess, and in 1964, 30 percent. The fee for global quota sugar, that is, the quota withheld from Cuba and assigned for purchase from other countries, was 100 percent in all years. No provision was made for quotas from foreign countries or an import fee on sugar imported from such countries in 1965 and 1966, although other provisions of the law terminated on December 31, 1966.

The fee provisions had less economic effect than seemed probable when the law was enacted because of high world sugar prices during much of 1963 and 1964. U.S. sugar prices were below those in the world market, and consequently the import fee was zero. This condition continued from January 1963 through May 1964. Producers in foreign countries, of course, would have preferred to pay no fee, since their receipts were reduced by the amount paid.

Another new feature of the 1962 ammendments to the Sugar Act was the provision for sugarbeet acreage reserves for new producing localities. The acreage required to yield 65,000 tons of sugar, raw value, was to be reserved each year from the total acreage allocated to sugarbeet growers for the use of growers in new factory areas or to growers in areas served by the expansion of existing factories. These acreage reserves remained effective for 3 years, beginning with the first year each reserve was established. That is, acreage limitations established for the entire sugarbeet area did not affect the acreage in any reserved area during the 3-year period.

USDA established nine acreage reserve areas under this provision of the 1962 law as follows:

Localities served by new facilities:	*Acreage*	*Effective year*
Mendota, Calif.	19,000	1963
Hereford, Texas	24,730	1964
Drayton, N. Dak.	31,000	1965
Auburn, N. Y.	29,500	1965
Presque Isle, Maine	33,000	1966
Phoenix, Ariz.	20,000	1966
Localities served by expanded facilities:		
Ottowa, Ohio	2,415	1964
Idaho Falls, Idaho	8,140	1964
Carrollton and Croswell, Mich.	4,030	1964

Only the acreage reserves in Texas, New York, Maine, and Arizona were in strictly new producing areas. The new plants in California and North Dakota were in areas where some beets had previously been grown. The total reserved area in all States amounted to 171,815 acres, almost 14 percent of the total area planted to sugarbeets in 1966.

The provisions in the 1962 act for sugar quotas for foreign countries other than the Philippines and for the application of an import fee on such sugar applied only to the 3 years, 1962-64, although other provisions of the act did not terminate until the end of 1966. Thus, some amendment to the 1962 act prior to January 1965 would have seemed desirable if sugar quota legislation were to continue in effect. However, the law was not amended until November 1965.

In view of the unusual circumstances, the Secretary of Agriculture in alloting quotas for 1965 to foreign countries other than the Philippines, acting "under general authority included in the Sugar Act," based the proration on the quantity of imports from such countries in 1963 and 1964. Imports in 1963 were given a weight of 1 and those for 1964 a weight of 2. In view of legal limitations, no import fee was applied to any 1965 imports.

Sugar Act Amendments of 1965

The 1965 amendments to the Sugar Act became effective in November 1965 and extended the terminal date of the law to December 31, 1971. The quotas established earlier by the Secretary of Agriculture for foreign countries other than the Philippines were retained for 1965, but a different arrangement was established for the following years. No provision was made for a fee on imported sugar. The basic quota for the Philippines was continued at 1,050,000 tons. In addition, however, the Philippines were assigned 10.86 percent of the first 700,000 tons of any increase in consumption requirements above 9,700,000 tons.

The quota for Cuba was set at 50 percent of the total amount assigned to foreign countries other than the Philippines. However, the quota was withheld

from Cuba whenever the United States did not maintain diplomatic relations with Cuba. The withheld quantity was prorated pursuant to the statutes among other foreign countries, except the Philippines.

Quotas for domestic areas when consumption requirements were between 9,700,000 tons and 10,400,000 tons were:

Area	*Short tons raw value*
Domestic beet sugar	3,025,000
Mainland cane sugar	1,100,000
Hawaii	1,110,000
Puerto Rico	1,140,000
Virgin Islands	15,000
Total	6,390,000

Domestic areas received 65 percent of any amount by which consumption requirements for any year exceeded 10,400,000 tons, and their quotas were reduced by 65 percent of any amount by which requirements were below 9,700,000 tons. The increases or decreases in quotas for domestic areas were all assigned to the beet and mainland cane areas in the proportion of their tonnage quotas for consumption requirements between 9,700,000 and 10,400,000 tons.

The quotas for domestic areas established by the 1965 amendments with consumption requirements of 10,400,000 tons were about 2 percent above what they would have been at this level of requirements under the terms of the 1962 amendments. The relationship among the quotas for individual domestic areas remained substantially unchanged.

Sugar Act Amendments of 1971

The sugar quota law was again amended in 1971 to cover the period January 1, 1972, through December 31, 1974. Domestic areas were given quotas totaling 6,910,000 tons per year when consumption requirements amounted to 11,200,000 tons. These quotas were increased or decreased by 65 percent of the amount actual consumption requirements were above or below 11,200,000 tons. The entire increase or decrease was given to the mainland cane and domestic beet areas.

Only minor changes were made in the way quotas were distributed to foreign countries. The quota for Cuba was again withheld so long as the United States and Cuba did not maintain diplomatic relations, and the amount of the quota distributed to other foreign countries.

The major change in the 1971 amendments concerned the method of estimating annual consumption requirements. The Secretaty of Agriculture, under the new provisions, was required to determine and revise consumption requirements so as to attain the price objective set forth in the act. This objective was to maintain the same ratio between the current price of sugar and the average of the current parity and wholesale price indexes as existed for the period September 1, 1970, through August 31, 1971.

In order to achieve the annual price objective, the Secretary of Agriculture was required to adjust consumption requirements whenever actual sugar prices for 7 consecutive market days were 4 percent or more above or below the objective. From October 31 to March 1 of the following year, the maximum allowed variation was 3 percent. Consumption requirements could not be reduced after November 30 of any year.

These rigid price provisions proved workable in 1972 and 1973 but not in 1974. World sugar prices rose to unusual heights in 1974. Prices in the United States followed at somewhat lower levels. U.S. consumption requirements were increased from 12.0 to 12.5 million tons on January 11, 1974. However, supplies did not reach the United States in sufficient quantity to prevent further domestic price rises. Prices also rose in the world market. Efforts to hold down prices by further increases in the estimate of consumption requirements were abandoned.

In 1974 new sugar legislation was introduced in the Congress. The Committee on Agriculture of the House of Representatives reported a sugar quota bill to the House, but the bill was rejected by the House. Since the existing law had a terminating date of December 31, 1974, quotas regulating the U.S. sugar industry and the importation of sugar ended on that date. Sugar quotas in the United States had been in effect for 41 years, except for a brief hiatus (about 2 weeks) in 1962 and the suspension of the quota provisions of the law during the World War II period.

Late in 1974 the President proclaimed a sugar import quota for 1975 of 7 million tons, to cover imports from all countries. This was substantially above prospective imports. Its only economic effect was to prevent the import duty on sugar from rising about 6.25 cents per 100 pounds for sugar polarizing 96 degrees.

GOVERNMENT REGULATION OF THE SUGAR INDUSTRY BY COUNTRIES OTHER THAN THE UNITED STATES

Nearly all countries that produce, import, or export sugar in large quantities have adopted more or less complex regulatory systems for the industry. For convenience, the nations with extensive sugar regulatory systems may be divided into two groups. One consists of countries that import sizable quantities of sugar or apparently would make such importations if their domestic sugar industries were unprotected or protected at lower levels. The other group regularly exports a sizable proportion of its sugar crops. With negligible exceptions, nations in the first group are large producers of beet sugar. Countries in the second group produce mainly cane sugar. A few countries produce sizable quantities of sugar from both beets and cane; the most important of these is the United States, which greatly altered its protective system when it ceased operating a quota system in 1974.

In general, countries which have sizable domestic sugar industries and which also import sugar developed the most comprehensive systems of control over production, prices, imports, and exports. Most of the control systems of exporting countries appear to have been designed largely to take advantage of, or to mitigate, the adverse effects of import controls established by importing nations. The following summaries of the sugar regulatory systems of the more important sugar producing and trading countries illustrate some of the complexities and diversities of the systems (*53*).

Many other countries maintain regulatory systems over sugar production and trade similar to those which have been summarized, although with considerable variation in detail. However, the countries whose control systems have been summarized accounted for about 40 percent of world sugar production, exports and imports, and the United States, another 20 percent.

Britain

Britain has been a major importer of sugar since the 16th century when sugar production in the Caribbean and elsewhere in the New World developed. During this period, British policy toward sugar varied widely from one of protection to one of free trade. Following World War I, Britain reinstated a protective system. After World War II, the system was revised to extend greater protection to British Dominions and colonies which produced sugar for export.

Between the two wars, British regulation of trade in sugar consisted largely of tariff protection for the domestic beet sugar industry, for cane sugar refiners, and for producers of raw sugar in various dominions and colonies. During World War II, the British Government purchased the exportable surplus in all Commonwealth countries at fixed prices. After the war, negotiations for a sugar agreeement were started, and the Commonwealth Sugar Agreement (CSA) was signed in December 1951. The Agreement was intended to assure a reliable supply of sugar for Britain, to develop the production of sugar in Commonwealth countries, and to provide for the orderly marketing of sugar.

The CSA as originally signed was between Britain and Australia, South Africa, the British West Indies, Mauritius, and Fiji. Later, St. Vincent, British Honduras, and what was then known as East Africa joined. South Africa ceased to be a member on December 31, 1961. A basic feature of the CSA was the assignment of price quotas to each country's quota at a price negotiated each year, which was to be considered reasonably remunerative to efficient producers. In addition, each Commonwealth country was given an overall quota larger than the negotiated price quota. Sugar equal to the difference between the two quotas could also be exported to Britain and receive the benefit of a tariff preferential. These quantities could also be exported to countries granting a tariff preferential to Commonwealth countries. These were: Canada, New Zealand, and originally, Rhodesia. Also, Commonwealth countries were free to export sugar to nonpreferential markets, although these could have had some limitations in certain years under the terms of the International Sugar Agreement (*53*).

The distribution of sugar exports from Commonwealth countries in 1962 after South Africa had ceased to be a member of the CSA was:

Destination	*1,000 short tons tel quel*
Britain:	
Negotiated price	1,632
Preferential	94
Canada	641
New Zealand	143
United States	401
Other countries	374
Total	3,284

The general method used in determining the annual negotiated price was specified in the CSA. This, in summary, provided that the price for shipments of sugar in 1950 of 30 pounds/10 shillings/0 pence for sugar polarizing 96 degrees was to be considered the "basic price." A percentage distribution of costs for the 1950 crop, representing all costs of producing and shipping sugar for export was determined and accepted as the "basic weighting of costs." Indi-

ces reflecting changes in wage levels and prices of supplies and services were reported annually by each exporting area and weighted according to estimated quantities from each area and then combined in an overall index. The negotiated price each year was then determined by varying the basic price proportionately to the movement of the price index.

Since 1957, the Sugar Board was the agency which purchased all sugar in the negotiated price quotas of the Commonwealth countries. The Sugar Board then sold the sugar for the best free market price obtainable. When the negotiated price was higher than the free market price, the deficit incurred by the Board was met by a surcharge levied on all sugar domestically produced or imported into the country, including sugar in sugar containing products. If the free market price was above the negotiated price for any considerable period, the surplus accruing to the Sugar Board was disposed of by a "distribution payment" whenever a surcharge would otherwise have been payable.

A substantial quantity of beet sugar was produced in Britain in addition to supplies obtained from Commonwealth and other sources. The British Government annually established both the total area in England to be planted with sugarbeets and the basic price to be paid for beets, which was subject to variation for such factors as sucrose content and time of delivery. The beets were processed in plants owned and operated by the British Sugar Corporation. This Corporation was allowed to make a profit equivalent to a reasonable rate of interest on capital and authorized reserves. Any losses incurred by the British Sugar Corporation were made up by the Sugar Board out of funds received from the surcharge applicable to all sugar sold in Britain, and any profit in excess of the permitted amounts was to be paid to the Sugar Board.

Britain joined the European Economic Community by a gradual process early in the seventies, and the Commonwealth Sugar Agreement expired at the end of 1974. The economic effects of these moves are still in the process of development. Under the terms agreed to when joining, Britain is allowed to continue preferential treatment of certain sugar imports from former British territories. The amounts are somewhat smaller than formerly, and imports from South Africa and Australia are not included.

France

France is a major producer of beet sugar; the output ordinarily equals or exceeds consumption. The French Government controls the quantity of beet sugar produced and the price growers receive for beets. The Government also establishes prices for all grades of sugar. These prices apply to beet sugar produced in France and to cane sugar shipped to a French port from the overseas departments of Reunion, Martinique, and Guadeloupe. An equalizing duty is assessed on sugar imported from the world market so that its price becomes the same as that for domestically produced sugar. Most of the cane sugar shipped to France is exported to former French possessions.

West Germany

The West German Government establishes quotas annually for sugar deliveries by individual sugarbeet processors, refiners, and importers. Sugarbeet processors, on the basis of the quotas they receive, contract with growers for the production of sugarbeets. The processors undertake to purchase all beets grown in agreed-upon areas. In this manner, the Government indirectly controls the production of beet sugar. The Government also determines the prices of sugarbeets and of sugar.

Sugar is imported only through the device of public tenders. Anyone wishing to import sugar after a tender offer has been announced must offer to sell the sugar to the Sugar Import Agency at the world price of sugar. If the agency declines to buy the sugar, the project is abandoned. If the agency buys the sugar, the importer is required to repurchase it at the domestic price for sugar. As a result, the importer obtains sugar at the domestic price, regardless of whether the world price is above or below the price in West Germany.

Italy

Sugar prices in Italy are set by the Interministerial Committee on Prices. These determinations are based on verified production costs of typical factories. The price factories pay growers for sugarbeets has also been regulated by the Government in recent years, although it was formerly determined by negotiation between growers and processors.

To prevent sugar production in excess of domestic consumption needs, attempts were made to limit the area planted to sugarbeets by agreement between growers and processors. These efforts were not successful, and the Government assumed the regulatory function.

Sugar imports are licensed by the Government, which grants licenses only in exceptional cases, except for sugar imported in bond for reexport in sugar containing products. In most years, exports of sugar are negligible, except when world sugar prices have been above prices in Italy.

Belgium and Luxembourg

With the exception of a few acres of beets grown in Luxembourg, the region's entire sugar industry is in Belgium. Trade in sugar between Belgium and Luxembourg is free of customs duties.

Contrary to the situation in most European countries, sugarbeet and sugar production is not subject to Government control in Belgium. However, a production quota based on domestic sugar requirements is established each year by agreement between the beet processors and beet growers. The total quota is then divided among factories and the growers producing beets for each factory. Sugarbeet prices are also determined by negotiation between growers and processors.

Sugar imports and exports are controlled by Government license, except for shipments from Belgium to Luxembourg and the exemption from import duty of the importation of 6,000 tons of sugar a year from the Congo (Kinshasa).

The Netherlands

The Government does not directly control the production of sugarbeets and beet sugar, but it exerts a strong indirect influence through its price policy. Both a guaranteed and an actual ex-factory price is either paid into or made up from a Government equalization fund. Under this system, prices for beets and sugar in the Netherlands have remained relatively stable.

Sugar imports are licensed by the Government. Licenses for the import of raw sugar for reexport as refined sugar or in sugar containing products are granted freely. Imports for domestic consumption are subject to import duty. Any difference between the import price plus duty calculated on the price of white sugar and the domestic ex-factory price is equalized by a levy or a subsidy.

European Economic Community

Since 1957, the European Economic Community (EEC) countries of France, West Germany, Italy, Belgium-Luxembourg, and the Netherlands have been in the process of establishing common economic policies for all industries, including sugar. Great Britain joined the Community in 1971.

The common policy, based on a variable levy program of protection for various commodities, includes the establishment of target prices, intervention or support prices, threshold prices, and variable import levies (*32*). The target price for sugar is the price for refined sugar which the EEC considers desirable or in its best interests. This has been determined to be prices in eight departments in the north of France, the area with the largest surplus in the EEC. The arrangement for sugar is unusual, since target prices for most other commodities are fixed for the area with the largest deficit, rather than the largest surplus. The intervention or support price represents the price level, somewhat below the target price, at which the authorities would purchase sugar to prevent further price declines. The threshold price is the target price less the cost of transportation of sugar from the port of importation to the principal deficit supply area where the target price applies. The variable import levy is used to raise the price of imported sugar to the target price or, in the form of a subsidy, to lower it when the world price is above the target price.

At one time, the plan called for a single target and other prices for sugar for the entire EEC area. Beet and sugar production would be subject to uniform regulation throughout the area. However, this plan was changed, and a much more complex scheme that provides quotas for individual EEC countries together with appropriate price variations among member countries was adopted. It is expected that the Common Market regulations concerning sugar will supersede the regulations of individual member countries whenever they conflict.

Soviet Union

Sugar policies in the USSR appear to have undergone considerable modification shortly after the death of Stalin in 1953. During Stalin's regime, some progress was made in restoring the war-damaged sugar industry. However, recovery was relatively slow, and per capita sugar consumption increased only slightly. Since 1954, production has increased much more rapidly. During 1950/51 through 1954/55 production of sugar in the USSR averaged 3,217,000 metric (3,546,000 short) tons. In crop years 1955/56 through 1959/60, output averaged 5,090,000 metric (5,611,000 short) tons, an increase of over 50 percent. Since that time, USSR production has continued to increase, reaching 11,500,000 short tons in 1967-68.

In addition to greatly increasing domestic production, the USSR imported substantial quantities of sugar, particularly from Cuba in 1955, 1956, and 1957. In these years, USSR imports of sugar were considerably larger than exports and apparently were largely consumed domestically.

Following the Castro revolution in Cuba, USSR purchases of Cuban sugar increased substantially, primarily for political reasons and as part of the development of new economic relations between the two countries. Exports of sugar from the USSR have also increased since 1960, indicating that a large part of their increased imports of sugar are, in effect, reexported. The Government controls sugar prices, production, and marketing within the USSR as well as imports and exports.

Japan

Before World War II, Japan was nearly self-sufficient in sugar, largely because of production in Formosa, which was then a part of the Japanese Empire. With changed boundaries since World War II, Japan has become a major sugar importing nation. In addition to importing large quantities of sugar, Japan has

encouraged the development of a beet sugar industry in the northern part of the country and of cane sugar in some of the southern islands. In 1967, domestic production equaled about 19 percent of consumption.

Japan has also encouraged the production of non-sugar sweeteners, both those derived from starch and also the noncaloric sweeteners, saccharin and cyclamate. The starch sweeteners, principally in the form of dextrose, have been manufactured largely from sweetpotatoes. Data regarding the relative importance of the starch and noncaloric sweeteners in total sweetener consumption in Japan are not available.

India

In 1954, the Indian Government began encouraging the increased production of centrifugal sugar (the ordinary commercial type). There was also some increase in the output of a noncentrifugal sugar called gur, a low-grade sugar used largely in the producing areas. The chief emphasis, however, was on the development of the centrifugal sugar industry (*35*).

The Government controls the prices paid growers for sugarcane. The distribution of sugar by mills, for domestic use and export, is controlled by a "release permit" system. Sugar for export is subsidized by exemption from certain taxes. Exports are arranged by a Government agency which has power to obtain sufficient sugar from mill owners to fill export commitments.

Cuba

Prior to 1960, about half of the sugar exported from Cuba was shipped to the United States, and Cuban sugar controls were designed mainly to synchronize with the import controls imposed by the United States. Since 1960, when all sugar properties in Cuba were nationalized and Cuba definitely joined the Soviet bloc of nations, the former administrative organizations have been abolished, and all phases of the industry have been operated under rigid Government control.

Shortly after achieving power in 1959, Castro and his associates announced their intention of diversifying the agricultural economy of Cuba and reducing the country's dependence on sugar. Since then, the policy appears to have been reversed, and plans were announced for increasing sugar production in Cuba to 10 million tons by 1970. This was not achieved. The largest amount of sugar produced in Cuba since 1960/61 was 6,600,000 tons in 1964/65.

Since 1960, the Soviet Union has replaced the United States as the largest importer of Cuban sugar. The Soviet Union appears to have paid somewhat above the world price for most of this sugar, although complicated systems of payment, including barter, make any exact comparison impossible.

Philippines

Practically all the sugar produced in the Philippines until 1975 was either consumed in that country or exported to the United States. When the United States operated under a quota system, an agency of the Philippine Government called the "Sugar Quota Administration" annually determined quotas for sugar destined for the United States and other users.

The national quotas were distributed among the sugar mills, and the allotments for each mill assigned among the sugarcane growers supplying cane to the mill. Sugar mills pay growers for their cane on the basis of a sharing system established by the Government. Sugar prices are not controlled, except in emergencies, by the Philippine Government. The export of sugar is handled by the mills, either individually or in voluntary groups.

Australia

Most of the sugar produced in Australia is exported; the largest quantities go to Britain, Canada, and Japan. The production and marketing of Australian sugar is closely regulated by the Government of the State of Queensland, where most of the sugar is produced. Outstanding features of the control system are the assignment of cane production to certain lands and the establishment of production peaks for individual mills and farms. A similar system is in effect in New South Wales where the rest of Australian sugar production is situated.

All raw sugar produced in Queensland becomes the property of the Government of Queensland. Sugar produced in New South Wales is sold to Queensland and marketed in the same manner as Queensland sugar. Refined sugar for consumption in Australia is handled by two refining companies which act as agents for the Queensland Government. All exports of Australian sugar are arranged by the Colonial Sugar Refining Company on behalf of the Government of Queensland.

Sugar mills receive average prices based on the net receipts from the sale of sugar in domestic and foreign markets. These prices apply for all sugar within the established production peaks for each mill and farm. Sugar in excess of the assigned peaks is paid for at lower prices, discouraging the production of such excess sugar. The Government also regulates the division of the net receipts between the mills and growers. The division varies according to the sucrose content of the cane.

Brazil

Sugar production, marketing, and prices in Brazil are regulated by the Sugar and Alcohol Institute, a Federal agency. To provide the Institute with funds to carry out its various functions, all sugar produced in

Brazil is subject to certain taxes. The Institute fixes the total quota or size of the crop each year, taking into account domestic consumption requirements, probable exports, and desirable inventory levels. The total quota is divided among individual factories. A mill is not allowed to grow more than one-half the cane it processes, and the mill operators contract with growers for specific quantities of cane for delivery to the mill.

The distribution of sugar for domestic consumption is regulated by monthly delivery quotas assigned to refineries supplying the main consumption areas. All exports of sugar from Brazil are handled through the Sugar and Alcohol Institute. The institute guarantees a uniform price for all sugar exported within the authorized production quota. When the export price is lower than the guaranteed price, the deficit is made up from the Price Equalization Fund provided for the Institute. When the export price is higher, the excess is paid into the fund.

INTERNATIONAL SUGAR AGREEMENTS AFTER WORLD WAR II

As previously noted, the export quotas established under the International Sugar Agreement of 1937 became inoperative with the outbreak of war in 1939. Only the administrative structure established by the Agreement remained in force.

Shortly after the end of World War II, discussion began concerning a new International Agreement. Such an Agreement was reached in 1953 and became effective January 1, 1954. It was to remain in effect for 5 years, but the quota provisions were to be reviewed at the end of the first 3 years. This review resulted in the establishment of revised export quotas for 1957 and 1958. The 1953 Agreement ended December 31, 1958, and was replaced by the International Sugar Agreement of 1958. This Agreement also covered a 5-year period with provision for review in the third year of its operation. The Agreement actually operated in 1959, 1960, and 1961, but the quota provisions were suspended at the end of 1961 because of a failure to agree on quotas for 1962 and 1963. During 1962-68, only the administrative structure established by the Agreement remained in existence. In 1969, a new agreement became effective, which remained in force until the end of 1973, and was then extended by protocol.

Principal Features of the 1953 Agreement

The general form of the 1953 Agreement was similar to that of the 1937 Agreement which it superseded. Exporting countries were assigned basic quotas for sugar to be exported to the free market. Exports to the free market were defined as total net exports to all countries except for specific exemptions. The exempted trade consisted of all imports into the United States; USSR imports from Czechoslavakia, Hungary, and Poland; trade between member exporting countries and their overseas departments, territories, or associated States; and certain movements between adjoining territories or islands covered by the Commonwealth Sugar Agreement of 1951 (*53*).

The net exports of the member nations in 1954 amounted to 84 percent of total free market exports that year. The basic export quotas for member nations for 1954, 1955, and 1956, exclusive of countries which were members of the Commonwealth Sugar Agreement and certain other special cases, totaled 4,440,000 metric (4,894,000 short) tons. This was 22 percent more than the basic quotas in the 1937 Agreement. The largest single change consisted of the increase in Cuba's quota by 140 percent to 2,480,000 short tons. The quota for the Netherlands, including the Netherlands Indies, was reduced 1,157,000 tons to 44,000 short tons. The change in the Netherlands quota reflected the newly acquired independence of Indonesia and the fact that Indonesia was not originally a member of the 1953 Agreement. The increase for Cuba recognized its increased importance as an exporter during and immediately after World War II. The next largest change resulted from China (Taiwan) becoming a member with a quota of 661,000 short tons. Peru did not become a member of the 1953 Agreement until 1958. This had the effect of reducing the total basic quotas by 540,000 short tons, compared with later years. Other changes in basic quotas were relatively minor.

The free market demand for imported sugar in 1954 and 1955 was such that the International Sugar Council reduced actual quotas to 80 percent of the basic quotas specified in the Agreement. In mid-1956, the figure was raised to 100 percent. These changes were made primarily to keep world or free market sugar prices within a range of 3.25 to 4.35 cents per pound. The Council had authority to adjust quotas within these price limits.

The 1956 Protocol

The review of quotas in the third year of the 1953 Agreement resulted in the adoption of a protocol revising the quotas and the price provisions of the Agreement for 1957 and 1958. Basic quotas were raised about 9 percent for 1957 to 5,324,000 short tons. Cuba, China (Taiwan), the Dominican Republic, and the Philippines each received small increases in their quotas. The total basic quotas for 1958 were further increased, chiefly because Peru and Indonesia

became members with quotas of 504,000 and 386,000 short tons, respectively.

The price objective was redefined as 3.15 to 4 cents a pound. The Council's authority to adjust quotas was limited by certain provisions for automatic quota adjustments between these levels. Quotas were suspended whenever the price exceeded 4 cents per pound. Under this provision, quotas were automatically suspended in January 1957 and were reimposed in November when prices declined to below 4 cents. In 1958, the International Sugar Council established marketings at 100 percent of basic export tonnages.

The 1958 Agreement

The principal new feature in the 1958 Agreement was that the total basic export quotas were again adjusted upward, chiefly because Brazil became a member with a basic quota of 606,000 short tons. The price provisions of the Agreement were not changed significantly.

Declining sugar prices in 1959 caused the Council to reduce permitted marketings to 80 percent of basic quotas. In 1960, marketings were set at 85 percent of basic quotas. Prices in 1960 averaged somewhat above their 1959 level, but they were only slightly above the minimum price range specified in the Agreement. Prices remained relatively stable, despite the termination of U.S. imports from Cuba in mid-year and the purchase of a large quantity of Cuban sugar by the USSR.

Quotas for 1961 were provisionally set at 85 percent. Cuba was authorized, in addition to its 1961 quota, to export the quantity of sugar normally sold to the United States which might not be marketable there in 1961. This was estimated at approximately 3 million metric (3,307,000 short) tons. World sugar prices declined during most of 1961, partly because the European crop of sugarbeets harvested in the fall of 1960 was unusually large. A more important reason, however, was that Cuba exported to the free market a quantity of sugar greatly exceeding that permitted under the International Sugar Agreement.

This action of the Cuban Government (under the Castro regime all of Cuba's foreign trade is controlled by the Government), plus its insistence on a much larger quota for future years, were major factors causing the suspension of the quota provisions at the end of 1961.

The 1968 Agreement

The International Sugar Agreement was revised and reactivated on January 1, 1969, for a 5-year period. The price objectives specified in the Agreement range from 3.25 to 5.25 cents per pound, compared with 3.25 to 4.35 cents in previous postwar Agreements. Neither the United States nor the European Economic Community became members of the new agreement.

In the 1968 Agreement, the annual quota for sugar from Cuba was 2,150,000 metric (2,370,000 short) tons, nearly twice that of any other country. Exports from Cuba to Communist countries were exempt from the Cuban quota. The USSR, which imported large quantities of sugar from Cuba, did not have an export quota but was permitted to export up to 1,100,000 metric (1,212,530 short) tons to the free market in 1969, with certain possible upward adjustments in 1970 and 1971. These exports were regarded as a "pass through" (reexport) of Cuban sugar. Similar export restrictions were placed on sugar exported from certain other Communist countries. These arrangements provided only an uncertain basis for limiting the quantity of Cuban sugar finally appearing in the free market in any year.

The failure of the EEC countries to join the Agreement left them free to export as much sugar as they wished. Such exports have largely been confined to years when beet yields were above average. Both the quota arrangements with Cuba and the Communist countries and the lack of membership of EEC countries and the United States appear to be weak points in the 1968 Agreement.

The original Agreement continued through 1973. It was extended by protocol for the years 1974 and 1975. During much of the time the 1968 Agreement was in effect, the world price of sugar was unusually high, making the price provisions relatively unimportant except for certain export commitments at prearranged prices. These prices, however, were raised somewhat during the period the Agreement blanketed.

The International Sugar Organization arranged a conference which met late in 1975 to consider further extension of the International Sugar Agreement. The United States had an observer at this conference, and a Committee was established to draft an Agreement for consideration by the conference.

Achievements of International Sugar Agreements Through 1973

The basic purpose of the International Sugar Agreements of 1937, 1953, 1958, and 1968 was to maintain prices for sugar exports to the free market at what was considered a reasonable level. This was to be done by controlling the volume of exports to the market and, if necessary, persuading exporting nations to keep production in their territories in line with reasonable export possibilities. Although price objectives were stated in cents per pound of sugar, the figures used were pragmatic, based entirely on what the negotiating parties thought could be achieved rather than on any underlying principle. Obviously the most desirable price for an importing

country was not necessarily the same as that for an exporter. However, exporting countries always had to weigh the danger of being undersold by exporters who were not members of the Agreement and thereby losing part of their market.

The size of the quota to be assigned individual exporting countries has been the most difficult item on which exporting countries needed to agree. Some compromise was always necessary if the aggregate of the quotas was to be small enough to permit meaningful market controls. Willingness to compromise to achieve Agreement was, of course, related to the benefits a country thought it might gain from an Agreement. In general, countries whose sugar industry was of major importance in their domestic economy and whose exports to the free market constituted a major outlet for their sugar appeared to have the most to gain from the International Sugar Agreement.

Throughout 1954-61, Cuba had by far the largest export quota of any country. Its exports to the free market during this period ranged from about 36 percent to 51 percent of all free market exports, exclusive of those under article 16, which were largely controlled by the Commonwealth Sugar Agreement and which were only loosely a part of the International Sugar Agreement (table 25). The figures cited also exclude 1961 when Cuba's exports greatly exceeded its quota.

Cuba also had, until mid-1960, a large market in the United States which considerably lessened its dependence on the free market. However, sugar production was by far the largest industry in Cuba, and between one-third and one-half of the Cuban sugar crop was exported to the free market each year. Under these circumstances, a stable and remunerative price was highly important to the Cubans. Apparently these circumstances were major factors persuading the Cubans to accept a basic annual quota for the years 1954, 1955, and 1956 of 2,480,000 short tons, although their average exports to the free market during the 3 previous years had been 2,793,000 tons.

The situation and outcome for Mexico were very different. Prior to 1954, nearly all the sugar produced in Mexico was domestically consumed. Exports to the free market during 1951, 1952, and 1953 averaged only 20,000 short tons per year, less than 2.5 percent of production. There was no incentive for Mexico to join the International Sugar Agreement, unless its quota was large enough to insure its right to export as much sugar as it wished in any year. The basic quota

Table 25—Net exports of sugar to the free market under the 1953 and 1958 International Sugar Agreements

Exporting country	1953 Agreement			1956 Protocol		1958 Agreement		
	1954	1955	1956	1957	1958	1959	1960	1961
	--- 1,000 short tons, raw value ---							
Under Article 14								
Cuba	2,002	2,282	2,845	2,779	2,635	2,221	4,063	7,070
China (Taiwan)	582	646	808	942	865	730	998	545
Dominican Republic	552	628	742	802	663	635	743	495
Poland	213	170	45	77	248	247	59	344
Czechoslovakia	268	164	107	110	305	293	212	329
Belgium	37	62	83	15	57	46	0	115
Other	240	258	92	111	668[1]	1,536[2]	1,412[3]	1,433[4]
Total	3,894	4,210	4,722	4,836	5,441	5,708	7,487	10,331
Under Article 16								
Australia	718	690	755	860	729	714	869	836
Fiji	158	166	143	197	202	202	241	164
Mauritius	538	537	583	638	573	559	353	565
South Africa	225	264	203	183	276	270	314	327
Caribbean Area[5]	1,055	1,043	1,089	1,100	1,056	1,084	1,129	1,009
Total	2,694	2,700	2,773	2,978	2,836	2,829	2,906	2,901
Total participants	6,588	6,910	7,495	7,814	8,277	8,537	10,393	13,232
Nonparticipants	1,305	1,580	841	2,077	1,278	526	570	893
Total free market	7,893	8,490	8,336	9,891	9,555	9,555	10,963	14,215

[1] Of which Peru shipped 368,000 tons. [2] Of which Brazil shipped 657,000 tons, Peru 451,000 tons, and Hungary 64,000 tons. [3] Of which, Brazil shipped 828,000 tons, Peru 252,000 tons, and Hungary 117,000 tons. [4] Of which France shipped 620,000 tons, Brazil 498,000 tons, India 144,000 tons, and Hungary 131,000 tons. [5] Includes British West Indies, British Guiana, and British Honduras.

Source: The World Sugar Economy: Structure and Policy. International Sugar Council, 1963. Metric tons have been converted to short tons.

for Mexico was 83,000 short tons, more than 4 times its average exports to the free market in 1951, 1952, and 1953.

Most member countries received quota treatment between that of Cuba and Mexico. In each case, however, the quota treatment resulted from bargaining and compromise.

Few problems were encountered by the member countries importing sugar, either in the negotiation of the Agreements or in their administration. The obligations they assumed were relatively minor. They undertook to limit their sugar imports from nonmember countries, generally to the proportions of previous years. Member countries' subsidies that might nullify the purpose of the Agreement were subject to discussion and recommendation by member nations. The Agreement also provided for studies designed to assist in the promotion of sugar consumption.

However, importing nations were under no obligation to reduce or control sugar production within their borders, and no such actions were taken by importing countries as a result of the International Sugar Agreement. Importing countries were free to buy sugar at the lowest price offered by sellers so long as they did not overimport from nonmember countries.

In general, it appears that the International Sugar Agreements through 1973 achieved limited success in reaching their goals except when the Government of Cuba, the largest exporter of sugar, was favorably inclined toward the Agreement and cooperated fully in helping it to function as intended. When the attitude of the Cuban Government changed, as it obviously had by 1961, and Cuba disregarded its obligations, the Agreement quickly became ineffective. However, achievements under the Agreement, even in the years when Cuba was cooperative, were relatively modest. It is doubtful that world sugar prices, except those of a temporary and seasonal nature, were increased much. Greater stability of prices does seem to have been maintained in certain years, particularly in 1954, 1955, 1972, and 1973.

WORLD SUGAR PRODUCTION AND TRADE

Sugar production appears to have continually increased in the world since the earliest available information. But the increase became much more rapid, particularly for supplies available to European countries, after the discovery of America. Comprehensive statistics on world sugar production, however, did not become available much before the 20th century. Production in 1900-1901 is estimated to have been about 13 million tons. By 1939, at the outbreak of World War II, it was about 35 million tons. Output declined to 28 million tons in 1947/48, the last year of wartime sugar controls by the United States.

During the 27-year period, 1948/49 through 1974/75, world sugar production increased more than 175 percent to a peak of 88 million tons in 1973/74 (table 26). The increase in output during this period was 3 to 4 times as great as the increase in the world's population, and per capita supplies for the world increased by 75 percent. This is in marked contrast to the per capita rise in world production of all foods: 3 percent in underdeveloped countries, and 10 percent or less in other countries.

World Sugar Production Since 1948

Since the end of World War II, sugar production has increased in every continent but at quite different rates (table 27). The rate for the world of 2,125,000 tons per year is equal to 3.47 percent of average world production during the 27-year period. In contrast, the annual rate of increase in North America was only 1.58 percent, and that for Asia was 5.74 percent. The increase in the USSR was much more rapid after 1954/55, apparently because of a change in Government policy. Trends in production in other areas doubtless have been influenced by changes in government policy, but in all such cases more than one government was involved, and shifts in policy did not occur at the same time or have the same effect (*57*).

North America

To understand production trends in North America, it is helpful to divide the area into importing and exporting countries and to separate the principal exporting regions (table 28). Although Cuba was the largest sugar producer in North America during most of 1948/49 through 1974/75, Cuban production showed no tendency to increase but varied erratically throughout the period. Prior to 1960, the fluctuations of output were largely the result of Cuban efforts to regulate supplies in accord with the world demand for Cuban sugar. Early in the period, production was rising in response to continuing world shortages following World War II and the Korean emergency. The record 1951/52 crop of nearly 8 million tons, one-fifth of the world's total output, was followed by a sharp drop in world prices. In an effort to halt the price decline, the Cuban Government segregated part of the supply for sale over a 5-year period, and it imposed limitations on output that were well below production in the immediately preceding years.

After the Castro revolution in 1959, the policy of the Cuban Government with respect to sugar production appears to have been reversed one or more

Table 26—Production of sugar by continents, 1948/49 through 1974/75

Year	North America	South America	Western Europe	Eastern Europe	U.S.S.R.	Africa	Asia	Oceania	World total[1]
	- - - 1,000 tons, raw value - - -								
1948/49	12,152	3,319	4,683	2,881	2,183	1,603	3,373	1,171	31,375
1949/50	12,821	3,151	4,737	2,737	2,205	1,610	3,528	1,155	31,944
1950/51	13,744	3,587	6,412	3,260	2,400	1,821	3,634	1,131	35,989
1951/52	15,038	3,777	6,227	3,456	2,700	1,709	4,754	943	38,604
1952/53	13,052	4,181	5,956	2,503	3,400	1,930	5,279	1,198	37,499
1953/54	13,307	4,593	7,637	3,876	3,525	2,063	4,953	1,571	41,525
1954/55	13,301	4,993	7,109	3,431	3,025	2,238	5,851	1,592	41,540
1955/56	12,941	4,894	7,599	3,521	4,200	2,482	6,379	1,448	43,464
1956/57	14,451	5,243	7,118	3,025	5,000	2,448	6,894	1,452	45,631
1957/58	14,576	5,605	7,514	4,060	5,700	2,710	7,390	1,609	49,164
1958/59	15,596	6,829	8,852	4,199	6,800	2,794	7,710	1,762	54,542
1959/60	15,805	6,640	7,753	4,096	6,300	2,922	8,700	1,706	53,923
1960/61	17,280	6,894	10,607	5,073	6,600	2,520	9,497	1,669	60,050
1961/62	15,230	6,922	8,432	5,288	7,170	3,124	9,128	1,695	56,989
1962/63	14,603	6,826	7,805	4,626	6,600	3,365	8,791	2,279	54,895
1963/64	16,010	7,120	9,105	4,995	6,475	3,820	10,015	2,242	59,782
1964/65	18,621	7,871	10,635	5,696	11,270	3,917	11,520	2,462	71,992
1965/66	16,194	9,431	9,552	5,072	10,700	3,754	12,054	2,526	69,283
1966/67	18,059	8,789	9,786	5,594	10,304	4,824	10,863	2,956	71,175
1967/68	17,002	8,647	10,704	5,609	11,531	4,937	11,450	3,127	73,007
1968/69	17,482	8,789	11,005	5,065	10,922	4,860	13,047	3,500	74,671
1969/70	21,476	9,274	11,684	4,846	9,570	5,000	14,611	2,787	79,250
1970/71	18,872	10,044	11,382	4,439	9,904	4,868	15,108	3,123	77,739
1971/72	17,270	10,860	13,222	4,786	8,813	5,677	13,800	3,391	77,818
1972/73	18,976	11,735	12,579	5,413	8,984	6,002	16,129	3,428	83,247
1973/74	19,132	13,275	12,964	5,629	10,549	6,123	17,723	3,309	88,704
1974/75	18,981	13,844	11,712	5,295	8,521	6,296	18,340	3,649	86,637

[1] May not add due to rounding.

Source: Foreign Agriculture Circular, For. Agr. Serv., U.S. Dept. of Agr.

Table 27—Increases in sugar production by continents, annual average, 1948/49 through 1974/75

Continents	Average annual increase in production	
	1,000 tons	*Percent*[1]
North America	263	1.58
South America	405	5.34
West Europe	270	2.89
East Europe	93	2.04
USSR	244	3.42
Africa	181	4.93
Asia	576	5.75
Oceania	95	4.19
World	2,125	3.47

[1] Percentage of the arithmetic mean.

Source: Derived from Table 26.

Table 28—Sugar production in North America, 1948/49 through 1974/75

Year	Importing countries[1]	Exporting Countries				North America
		Cuba	Mexico	British and French West Indies[2]	Other	
	1,000 tons, raw value					
1948/49	4,184	5,763	754	748	703	12,152
1949/50	4,469	6,127	692	836	697	12,821
1950/51	4,967	6,349	778	869	781	13,744
1951/52	4,493	7,964	807	892	882	15,038
1952/53	4,559	5,687	911	981	914	13,052
1953/54	4,868	5,472	960	1,066	941	13,307
1954/55	5,097	5,066	1,041	1,149	948	13,301
1955/56	4,720	5,229	870	1,097	1,025	12,941
1956/57	4,751	6,252	1,190	1,134	1,124	14,451
1957/58	4,572	6,447	1,311	1,074	1,172	14,576
1958/59	5,040	6,574	1,460	1,192	1,330	15,596
1959/60	5,069	6,462	1,731	1,247	1,296	15,805
1960/61	5,461	7,459	1,603	1,328	1,429	17,280
1961/62	5,543	5,308	1,647	1,273	1,459	15,230
1962/63	5,706	4,211	1,870	1,405	1,411	14,603
1963/64	6,620	4,400	2,097	1,321	1,572	16,010
1964/65	6,728	6,600	2,280	1,445	1,568	18,621
1965/66	6,191	4,950	2,320	1,336	1,397	16,194
1966/67	6,247	6,200	2,679	1,275	1,658	18,059
1967/68	6,177	5,500	2,575	1,251	1,499	17,002
1968/69	6,516	5,207	2,826	1,162	1,771	17,482
1969/70	6,312	9,406	2,648	1,164	1,946	21,476
1970/71	6,288	6,530	2,729	1,125	2,200	18,872
1971/72	6,299	4,837	2,778	1,023	2,333	17,270
1972/73	6,828	5,787	3,053	964	2,344	18,976
1973/74	6,055	6,393	3,125	1,000	2,559	19,132
1974/75	6,068	6,063	3,197	953	2,700	18,981

[1] United States and Canada. [2] Includes British Honduras.

Source: Foreign Agriculture Circular, For. Agr. Serv., U.S. Dept. of Agr.

times. The large crop produced in 1960/61 seems to have been the result of a determination to harvest all available cane in Cuba. At the same time, new plantings of cane were neglected, and some mills were dismantled. Some time before 1964, the Cuban Government changed its policy and announced plans for expanding sugar production in Cuba. Later, it announced a production goal of 10 million tons a year by 1970. This was not achieved.

Production in the French West Indies and in former British territories in the islands increased in mid-1967 and 1968. After 1967/68, it showed some tendency to decline irregularly. Production in Mexico multiplied about four times between 1948/49 and 1974/75. Production in other exporting countries in North America has risen almost as fast as in Mexico.

The other sugar exporting areas of North America consist of the Dominican Republic, Haiti, and the Central American countries, including Panama. Of these, the Dominican Republic is the largest producer, but overall production has been increasing most rapidly in Central America.

The importing areas in North America consist of Canada and the United States. Production increases, mostly in the United States from 1948/49 through 1972/73 averaged about 110,000 tons per year, about 2.5 percent of the average output during the period. Much of this increase was in beet sugar. But in the exporting countries, it has all been in cane sugar.

South America

In recent years, Brazil has accounted for more than half the sugar produced in South America. In 1967/68, only three countries in the world, the United States, Cuba, and the USSR, produced more sugar than Brazil's crop of 5 million tons. Brazilian sugar production has been increasing since 1948/49 at a rate considerably more rapid than the average for South America, but it has been less than the growth rate in Columbia, Venezuela, Ecuador, and Bolivia.

The production of beet sugar in Chile, which began in 1953/54, reached 178,000 tons in 1967/68. Chile and Uruguay are the only countries in South America that produce beet sugar.

Europe

Since 1953, more sugar has been produced in Europe, including the USSR, than on any other continent. All of this production is beet sugar, except for a small quantity of cane sugar produced in Spain. Most

of the USSR sugar crop is produced in Europe. In most years, Europe has supplied 80 percent or more of the world's beet sugar.

The most rapid increase in European production until 1975 was in the USSR, followed by the EEC countries. Production in EEC countries increased about 180 percent from 1948/49 to 1971/72. Production trends in Britain have been similar to those in the original EEC countries, except that the rate of increase has been considerably slower.

The largest sugar producer in Eastern Europe is Poland, followed by Czechoslovakia and East Germany. Sugar output throughout Eastern Europe has been increasing, although more slowly in Czechoslovakia than in other countries in the region. In most countries in Eastern Europe, production has continued to increase since 1960, in contrast to output in Western Europe where growth has been negligible since 1960.

Asia

India, where sugar production originated, is the largest producer of both centrifugal and noncentrifugal sugar in Asia. From 1948/49 to 1960/61, production of centrifugal sugar in India tripled, a slightly more rapid rate of increase than that for the rest of the continent. There have been further increases in output in India since 1968. India produces more than half the world's supply of noncentrifugal sugar. Production of this sugar, called gur, increased about 50 percent in the 20 years following World War II, but this is only about one-fourth the rate for centrifugal sugar.

Production of sugar in the Philippines, the second largest producer in Asia, was reduced to zero during World War II. Since the war, production has recovered rapidly and reached a peak of 2,914,000 tons in 1973/74. This is nearly 1 million tons above the 1966/67-1970/71 average.

Other Asian countries where sugar production has increased rapidly since 1948/49 include Pakistan, Japan, Turkey, Iran, and Thailand. All of the sugar produced in Asia is cane sugar, except in Turkey where only beet sugar is produced and in Iran and Japan where both cane and beets are grown. Changes in political boundaries appear to have been a major factor inducing increased production in Pakistan and Japan.

Production in Taiwan increased immediately following World War II, but there has been no upward trend since 1952/53. Somewhat the same situation has prevailed in Indonesia where production reached a peak in 1955/56.

Africa

Sugar producing countries in Africa may be divided into two groups. One consists of the older producing countries which had sizable sugar industries prior to World War II: South Africa, the United Arab Republic (Egypt), Mauritius, and Reunion. South Africa is the largest producer in this group, and Reunion is the smallest. These four countries provided more than four-fifths of the sugar produced in Africa in 1948/49 and more than half in 1975/76. South Africa alone has provided about one-third of the sugar produced in Africa since 1948/49.

Sugar output in the newer producing countries in Africa has increased annually at about 10.5 percent of average output during the 27-year period, compared with 4.0 percent for the four older producing countries. Most of this increase has taken place in former colonial territories which have achieved independence since World War II. In recent years, the largest producers in the group have included Mozambique, Uganda, Rhodesia, Swaziland, Malagasy Republic, Tanzania, and Kenya. Changes in political status and boundaries make it difficult to determine accurately the production of individual countries since 1948/49. But countries where production has increased the most rapidly in recent years include Tanzania, Uganda, Malagasy Republic, Rhodesia, and Swaziland.

Oceania

Australia and Fiji are the only sugar producers in Oceania. About 87 percent of the total is produced in Australia. In both areas, the increase in production has been considerably more rapid since 1958/59 than in preceding years.

International Trade in Sugar

Sugar has been an important article of international trade ever since the earliest establishment of the cane sugar industry in the the Americas. So long as sugarcane was the only important source of sugar in the world, trade, at least between colonies and their mother countries, was inescapable. Sugarcane grows only in tropical and subtropical regions, and the principal commercial demand for sugar was in Europe where sugarcane, except to a slight extent in the extreme southern part, does not grow.

The development of the beet sugar industry in Europe in the 19th century considerably altered the directions of trade in sugar. The share of cane sugar in the total world exports was reduced from 100 percent to about two-thirds. Cane sugar production declined even more in relative importance from 1880 to 1910 and was generally less than one-half the world's total output of sugar.

World sugar exports during 1909-13, prior to the outbreak of World War I, amounted to about 7.5 million tons per year, approximately 40 percent of world production. During 1935-39, world exports averaged about 12.5 millilion tons per year, or only 36 percent of world production.

Sugar exports were slightly below the 1935-39 level during the first few years following World War II, but they maintained about the same prewar proportion of world production. Exports more than doubled from 1948 through 1974 (table 29), or nearly 3 percent per year. Exports of sugar from Eastern Hemisphere countries (table 30) increased at a considerably more rapid rate than those from Western Hemisphere countries, rising from 38 percent of the world total during 1948 to 49 percent in 1974.

Exports from Western Hemisphere countries, except Cuba, increased 5.0 percent a year in 1948-74, compared with 3.7 percent for Eastern Hemisphere countries. Nearly all Cuban sugar is exported. The failure of Cuban exports to increase during this period is attributable to Government price and production policies.

Neither Brazil nor Mexico was an important exporter of sugar before World War II. Since then, both countries have expanded production faster than their domestic consumption has risen, making increased exports possible. Much of this increase has come since 1960, when the United States ceased to import sugar from Cuba and increased its imports of Mexican and Brazilian sugar.

All major sugar exporting countries in the Eastern Hemisphere increased their exports from 1948 through 1974, although in the Philippines, Taiwan, and Mauritius the increases were largely confined to the beginning of the period when these areas were recovering from wartime difficulties. Increased exports in certain years from the USSR have been largely reexports of sugar imported from Cuba since 1960. The largest increase in exports has occurred in Australia where the volume has grown far beyond the quantity formerly taken by Britain on a price preferential basis. Sugar exports from South Africa, although on a considerably smaller scale than for Australia, have undergone a similar development.

The United States has been the largest importer of sugar since World War II, but its proportion of total world imports has declined (table 31). Import trends in Britain, the second largest importer in most years, have been somewhat similar to those in the United States. In 1948-52, these two countries took 51 percent of the world's sugar imports; in 1969-73 they accounted for only 33 percent.

Prior to World War II, Japan imported very little sugar. The loss of Taiwan, where the Japanese had developed a sizable sugar industry, made imports necessary after the war. However, in recent years Japanese imports of sugar have grown well beyond the supplies formerly obtained from Taiwan or their imports from that country in recent years.

The largest growth in imports for any country has been that for the USSR, beginning in 1960. Most of these have come from Cuba and reflect the changed political status of that country, together with the cessation of U.S. imports from Cuba. Also a considerable proportion of these imports have been reexported.

Table 29—Trends in sugar exports from principal exporting countries in the Western Hemisphere, 1948-74

Year	Cuba	Mexico	Dominican Republic	Brazil	Peru	Other	Total	World
	1,000 tons, raw value							
1948	6,521	52	482	398	387	107	7,923	12,192
1949	5,391	33	487	43	314	280	6,548	11,266
1950	5,636	25	484	28	273	1,254	7,700	12,386
1951	5,981	0	532	23	393	1,136	8,065	12,298
1952	5,514	9	604	52	317	1,255	7,751	12,740
1953	5,978	65	610	285	454	1,278	8,670	14,890
1954	4,613	78	561	166	470	1,299	7,187	13,730
1955	5,133	89	639	642	538	1,441	8,482	15,491
1956	5,998	35	767	21	476	1,569	8,866	15,342
1957	5,999	109	848	472	551	1,586	9,565	16,978
1958	6,120	195	738	844	456	1,346	9,699	17,067
1959	5,458	169	731	688	530	1,436	9,012	16,293
1960	6,211	520	1,208	852	583	1,643	11,017	19,103
1961	7,064	631	825	863	661	1,968	12,012	21,754
1962	5,656	394	890	491	528	1,854	9,813	20,129
1963	3,881	438	719	581	547	2,344	8,510	19,138
1964	4,603	578	717	279	468	1,853	8,498	19,304
1965	5,859	581	591	841	403	2,082	10,357	21,167
1966	4,889	524	604	1,108	467	2,034	9,626	20,968
1967	6,264	606	713	1,103	524	2,126	11,336	22,314
1968	5,085	707	672	1,131	515	2,506	10,516	22,610
1969	5,290	666	681	1,211	295	1,994	10,137	21,408
1970	7,613	637	874	1,241	480	2,042	12,887	24,321
1971	6,075	602	1,114	1,313	476	2,013	11,593	23,650
1972	4,564	636	1,211	2,264	530	2,346	11,551	23,936
1973	5,288	669	1,136	2,595	449	2,228	12,365	24,305
1974	6,053	547	1,103	2,539	509	2,619	13,370	25,416

Source: Foreign Agriculture Circular, For. Agr. Serv., U.S. Dept. of Agr.

Table 30—Trends in sugar exports from principal exporting countries in the Eastern Hemisphere, 1948-74

Year	Australia	Philippines	USSR	Taiwan	South Africa	Mauritius	Other	Total
	1,000 tons, raw value							
1948	466	237	---	220	8	425	2,913	4,269
1949	535	457	---	340	82	479	2,825	4,718
1950	421	484	---	711	75	396	2,599	4,686
1951	326	679	100	327	73	557	2,171	4,233
1952	271	944	85	518	11	518	2,642	4,989
1953	817	926	135	1,020	109	531	2,682	6,220
1954	718	1,018	254	583	244	553	3,173	6,543
1955	700	977	255	649	271	539	3,618	7,009
1956	828	1,014	214	707	201	585	2,927	6,476
1957	884	942	233	881	164	639	3,670	7,413
1958	770	1,011	245	931	265	574	3,572	7,368
1959	717	1,124	242	815	273	560	3,550	7,281
1960	869	1,164	291	1,012	288	353	4,109	8,086
1961	906	1,153	1,048	720	326	565	5,024	9,742
1962	1,287	1,226	986	673	475	567	5,102	10,316
1963	1,263	1,195	1,014	762	646	633	5,115	10,628
1964	1,384	1,279	477	984	644	635	5,403	10,806
1965	1,317	1,195	805	920	413	638	5,528	10,810
1966	1,896	1,232	1,282	939	582	629	4,782	11,342
1967	1,836	1,220	1,324	628	899	569	4,502	10,978
1968	1,790	1,086	1,610	739	1,401	657	4,811	12,094
1969	2,275	1,124	1,530	585	786	657	4,314	11,271
1970	1,531	1,364	1,672	452	871	634	4,910	11,434
1971	1,942	1,567	1,544	577	913	539	4,975	12,057
1972	2,216	1,367	71	539	1,287	739	6,166	12,385
1973	2,272	1,625	51	537	983	815	5,657	11,940
1974	1,970	1,700	129	610	912	800	5,925	12,046

Source: Foreign Agriculture Circular, For. Agr. Serv., U.S. Dept. of Agr.

Table 31—Trends in sugar imports by principal importing countries, 1948-74

Year	United States[1]	United Kingdom	USSR	Japan	Canada	France	Morocco	Other	World
	1,000 tons, raw value								
1948	3,225	2,095	---	621	623	351	151	3,761	10,827
1949	3,753	2,449	---	285	623	325	190	3,406	11,031
1950	3,707	2,351	---	447	640	376	228	4,638	12,387
1951	3,666	2,552	---	559	547	139	247	4,188	11,898
1952	3,872	2,288	---	809	611	397	284	4,284	12,543
1953	3,828	3,393	11	1,168	582	449	309	4,728	14,468
1954	3,795	2,710	196	1,038	657	368	325	4,674	13,763
1955	4,011	2,504	718	1,130	680	361	396	5,406	15,206
1956	4,173	2,614	386	1,326	719	379	375	5,247	15,219
1957	4,166	3,218	747	1,281	692	607	386	5,456	16,553
1958	4,765	2,987	440	1,348	735	504	367	5,760	16,960
1959	4,571	2,851	390	1,341	762	594	377	5,289	16,175
1960	4,717	2,560	1,893	1,379	680	860	305	5,908	18,302
1961	4,226	2,582	3,965	1,508	760	432	281	7,525	21,279
1962	4,671	2,414	2,740	1,651	832	474	454	7,535	20,771
1963	4,486	2,817	1,255	1,628	830	425	411	7,261	19,113
1964	3,596	2,547	2,082	1,701	845	566	447	6,993	18,777
1965	3,856	2,398	2,528	1,902	924	480	411	7,676	10,175
1966	4,239	2,455	2,032	1,917	862	561	375	8,506	20,947
1967	4,687	2,357	2,737	2,003	984	539	332	8,341	21,980
1968	5,130	2,286	1,935	2,264	951	416	310	8,323	21,615
1969	4,885	2,369	1,472	2,456	1,043	117	279	7,848	20,469
1970	5,193	2,027	3,312	2,866	1,046	66	301	8,748	23,559
1971	5,314	2,352	1,693	2,675	991	119	271	9,412	22,827
1972	5,201	2,384	2,121	3,061	1,001	141	245	8,974	23,128
1973	5,270	2,260	2,900	2,615	1,062	110	306	9,298	23,821
1974	5,774	2,087	2,046	3,055	941	171	308	8,889	23,271

[1] These figures differ from the quota charges for imported sugar reported by USDA. They are used in order to have data which, when added to the imports of other countries, equal the world total.

Source: Foreign Agriculture Circular, For. Agr. Serv., U.S. Dept. of Agr.

For many years, the reexport of part of the country's sugar imports has been a common practice, particularly by certain European countries. Mostly, it has involved importing raw cane sugar and exporting all or part of it in refined form. The practice started soon after the development of sugar colonies in North and South America in the 16th century. Trade controls channeled the raw sugar exports of these colonies to the mother country, except for smuggling. European countries with no sugar producing colonies provided a market for sugar refined in such countries as Spain, Portugal, France, and Britain.

The reexport of sugar has increased considerably in volume since World War II. During 1948-60, the largest volume of reexports came from Britain and France. Since 1960, however, the USSR has reexported more sugar than any other nation. The volume of reexports of sugar from Mainland China, East Germany, and Czechoslovakia also increased during this period. All these increases, as well as those of the USSR, are related to the change in Cuba's political status.

The trend of imports by the United States and Britain, both of which have been large-scale importers for many years, illustrates some of the effects of protective systems on international trade. U.S. sugar imports during 1948-52 equaled 10.4 percent of world sugar production; in 1963-67, only 5.7 percent; in 1974, 6 percent. Net imports of Britain declined from 4.4 percent of world production in 1948-52 to 2.9 percent in 1963-67.

Brazil's production has increased rapidly enough to provide for increased domestic consumption and increased exports. Average annual production during 1963-67 was 2,821,000 tons above that for 1948-52, although exports rose only 633,000 tons. There have been similar trends, although on smaller scales, in Colombia, Venezuela, Mexico, and some Central American countries. Countries in Asia where sugar production has increased more rapidly than exports include Pakistan, Iran, Turkey, and Thailand. In Africa, several newer nations have increased their production substantially without any significant increase in exports. These include Kenya, the Malagasy Republic, Mozambique, Uganda, and others, although reliable statistics are frequently not available because of recent changes in boundaries and political status.

World Sugar Trade Pattern

Nearly all of the more important sugar-importing nations grant price preferentials of some sort to sugar imported from certain countries. Usually the preference is limited to certain quantities of sugar imported each year. Exporting countries naturally ship as much sugar as they can to markets where they obtain the highest price. Arrangements of this sort are a major factor determining the pattern of world trade in sugar. They are often more political than economic in nature (table 32).

The United States accounted for about a fifth of world sugar trade in 1967; four-fifths of this trade was with the Philippines and countries in the Western Hemisphere, exclusive of British and French prossessions or former possessions in America. The United States received almost four-fifths of all the sugar exported by these countries.

Somewhat the same arrangement applies to other major importing countries. For instance, about 78 percent of the sugar imported into Britain came from its former territories, most of it from Australia, Mauritius, and the British Caribbean. The next largest source was South Africa, which until recently was considered a part of the British Commonwealth. Canadian sugar imports were distributed in much the same manner as those of Britain. Together, Britain and Canada took about 57 percent of the exports from British sources and 42 percent of those from South Africa.

The other principal purchaser of sugar from British sources was Japan, which imported almost as much Australian sugar as Britain and Canada together. Cuba and South Africa were the other important sources of Japanese imports. The three countries supplied more than four-fifths of Japanese sugar imports in 1967.

Imports of EEC countries came mostly from French possessions and from countries in Eastern Europe. They were based either on political connections with France or proximity to EEC countries.

Nearly all imports by the USSR and Mainland China came from Cuba, and the imports appear to have been intended as a means of assisting Cuba economically. A large part of these imports were offset by exports.

Although the group of importing countries discussed in detail earlier accounted for nearly two-thirds of world imports in 1967, there were 7,600,000 tons taken by many other countries. None of them imported as much as 400,000 tons. In some cases, the sources of supply are largely determined by political connections; New Zealand imports sugar primarily from Australia, and the former French possessions in North Africa continue to obtain their sugar from France. In other cases, an importer merely buys sugar wherever it can be obtained for the least cost that year.

The countries shown in table 32 provided over four-fifths of world exports in 1967. Most of the remaining 3,743,000 tons came from the principal reexporting countries of the world, the most important of which are listed in the table as importing countries. The USSR was the largest of these with exports of 1,324,000 tons, followed by Mainland China with 551,000 tons, France with 519,000 tons, and Britain with 391,000 tons. Most of the exports from the USSR and Mainland China represent either sugar imported from Cuba or domestically produced sugar exported in place of supplies imported from Cuba. Cuba also exported more than 2 million tons of sugar to other countries. Much of the sugar exported from

Table 32—International trade in sugar, 1967

Exporting countries	United States	United Kingdom	Importing countries: Canada	Japan	Common Market	USSR	Mainland China	Other	Total
	1,000 short tons								
U.S. sources:									
Philippines	1,122	---	---	---	---	---	---	98	1,220
Mexico	520	---	5	---	---	---	---	100	625
Central America	174	---	---	13	15	---	---	23	225
Dominican Republic	629	11	---	---	---	---	---	4	644
Brazil	651	20	---	14	47	---	---	370	1,102
Peru	372	---	---	---	15	---	---	87	474
Other W. Hemisphere	245	13	8	25	29	---	---	112	432
Total	3,713	44	13	52	106	---	---	794	4,722
British sources:									
Australia	195	486	173	658	---	---	---	324	1,836
Fiji	43	162	85	45	---	---	---	16	351
Mauritius	19	414	55	---	12	---	---	118	618
India	76	86	---	---	---	---	---	34	196
British Caribbean[1]	199	727	215	---	---	---	---	91	1,232
Total	532	1,875	528	703	12	---	---	583	4,233
Common Market sources:									
French Caribbean	58	---	---	---	111	---	---	12	181
Reunion	---	---	---	---	216	---	---	4	220
Malagasy Republic	9	---	---	---	2	---	---	77	88
Total	67	---	---	---	329	---	---	93	489
Japanese sources:									
Taiwan	80	---	---	87	---	---	---	461	628
South Africa	66	133	238	375	24	---	---	44	880
Total	146	133	238	462	24	---	---	505	1,508
Sino-Soviet sources:									
Cuba	---	89	77	597	82	2,734	613	2,072	6,264
Eastern Europe[2]	8	68	---	---	249	3	---	841	1,169
Total	8	157	77	597	331	2,737	613	2,913	7,433
All other countries	112	208	128	187	378	---	---	2,730	3,743
World	4,578	2,417	984	2,001	1,180	2,737	613	7,618	22,128

[1] Guyana, British Honduras, and British West Indies. [2] Bulgaria, Czechoslovakia, East Germany, Hungary, Poland, Romania, and Yugoslavia.

Source: Reports of the For. Agr. Serv., U.S. Dept. of Agr., and International Sugar Council Sugar Yearbook, 1967.

France and Britain went to their former possessions.

Most of the world's international trade in sugar is conducted under various special arrangements, and the direction of the trade is determined by these arrangements. Reasonably free competition among buyers and sellers of different nations is restricted by these arrangements to only a fraction of the sugar moving in international trade. The complicated nature of the preferentials offered or received by various nations and the widely varying amount of the preference makes it impracticable to determine the exact extent of nonpreferential trade in sugar. The termination of the sugar quota system by the United States at the end of 1974 and Britain's entry into the Common Market at about the same time may result in considerable changes in the volume and direction of world trade movements, but the extent of these changes is not yet known.

POSTWAR TRENDS IN THE U.S. SUGAR INDUSTRY

The World War II period of U.S. Government sugar controls ended in 1947 with the purchase of the 1946 and 1947 crops of Cuban sugar and the removal of internal wartime price and distribution controls over sugar during 1947. Also, Congress passed a new sugar quota law in 1947, known as the Sugar Act of 1948, which became effective on January 1, 1948. Thus, the United States in 1948 returned to its prewar system, although somewhat modified, of regulating the production, importation, and marketing of sugar.

Trends in U.S. Sugar Supply by Sources Since 1948

The large 1947 Cuban sugar crop made possible increased shipments of sugar to the United States and provided this country with relatively large stocks beginning in 1948. As a result, sugar marketings in 1948 were smaller than in 1947, although larger than in years of wartime controls. After 1948, sugar marketings in the United States increased at a fairly regular rate, and in 1968 they were about 55 percent larger than in 1948 (table 33).

The quantity of sugar marketed in the United States coming from most of its major supplying areas has increased since 1948. The major exceptions are Puerto Rico, where production has declined, and Cuba, from which the United States has not imported any sugar since 1960. Also, the small sugar industry in the Virgin Islands has ceased operations. About 58 percent of the average annual increase in sugar marketings since 1948 has come from domestic areas, and 42 percent has come from imports (table 34). The largest increase in tonnage has been supplied by the domestic beet sugar industry, but the largest percentage increase has come from the mainland sugarcane area.

Most of the increase in the mainland cane area has been in Florida. The size of the increase in supplies from the Philippines is partly the result of wartime destruction in that country. As a result, U.S. receipts of sugar from the Philippines were comparatively low during the first few years of the postwar period.

The volume of U.S. imports from countries other than the Philippines, although fluctuating considerably from year to year, has shown an average annual increase of 17,000 tons. During 1948-68, the net effect of numerous amendments to the sugar quota laws was to assign most of the increase in U.S. sugar consumption to domestic areas. The decline in Puerto Rican sugar production produced rather large deficits in quota supplies from that area, especially since

Table 33—Sources of sugar for the United States, 1948-74

Year	Beet	Cane	Hawaii	Puerto Rico	Virgin Islands	Philippines	Cuba	Other foreign countries	Total
	1,000 tons, raw value								
1948	1,656	456	714	1,013	4	252	2,927	62	7,084
1949	1,487	557	769	1,091	4	525	3,103	52	7,588
1950	1,749	522	1,145	1,053	11	474	3,264	61	8,279
1951	1,730	457	941	959	6	706	2,946	13	7,758
1952	1,560	579	972	983	6	860	2,980	51	7,991
1953	1,749	513	1,087	1,118	12	932	2,760	111	8,282
1954	1,802	501	1,040	1,082	10	974	2,718	113	8,240
1955	1,797	500	1,052	1,080	10	977	2,862	118	8,396
1956	1,955	601	1,091	1,135	13	982	3,089	126	8,992
1957	2,066	636	1,037	912	15	906	3,127	217	8,916
1958	2,240	680	630	823	6	980	3,438	279	9,076
1959	2,241	578	977	958	12	980	3,215	279	9,240
1960	2,165	619	845	896	7	1,155	2,390	1,445	9,522
1961	2,607	784	1,045	980	16	1,355	0	2,945	9,732
1962	2,415	787	1,084	904	11	1,256	0	3,340	9,797
1963	2,965	1,072	1,033	875	15	1,195	0	3,360	10,515
1964	2,699	905	1,110	793	16	1,217	0	2,369	9,109
1965	3,025	1,099	1,137	830	4	1,178	0	2,647	9,920
1966	3,024	1,100	1,200	711	5	1,186	0	3,129	10,355
1967	2,824	1,169	1,253	705	0	1,123	0	3,310	10,384
1968	3,085	1,204	1,192	504	0	1,124	0	3,842	10,951
1969	3,216	1,169	1,160	341	0	1,124	0	3,725	10,735
1970	3,569	1,308	1,145	352	0	1,298	0	3,879	11,551
1971	3,438	1,255	1,087	143	0	1,592	0	3,779	11,294
1972	3,511	1,630	1,113	148	0	1,432	0	4,006	11,840
1973	3,512	1,614	1,142	79	0	1,454	0	3,875	11,676
1974	3,024	1,272	993	157	0	1,472	0	4,298	11,216

Source: Sugar Statistics and Related Data, Vol. 1, Bul. 293, Agr. Stabil. and Conserv. Serv., and various issues of Sugar Reports since 1974, U.S. Dept. of Agr.

Table 34—Postwar average annual changes in quantity of sugar marketed in the United States, by sources of supply, 1948-75

Source of supply	Amount of increase	Average annual increase[1]
	1,000 tons	*Percent*
Domestic beet	83	3.0
Mainland cane	43	4.2
Hawaii	10	0.8
Puerto Rico[2]	-38	-4.2
All domestic	98	1.6
Philippines	35	2.8
Other imports[3]	35	1.7
All imports	70	1.9
Total	168	1.5

[1] Percentage of arithmetic mean. [2] Includes Virgin Islands. [3] Includes receipts from Cuba.

Source: Reports of Agr. Stabil. and Conserv. Serv., U.S. Dept. of Agr.

1962. Since 1962, all of these deficits have been assigned to foreign countries, including the Philippines. Except for the assignment of these deficits, the growth in U.S. sugar imports might have been smaller than the amount recorded.

The production of sugar involves the growing of sugarbeets or sugarcane, the processing of these plant materials into raw or refined sugar, and the further processing of raw sugar in separate plants into refined sugar (*15*). These functions may all be combined in a single company or entrepreneur, but they are frequently divided in various ways among three separate individuals or organizations. The characteristic arrangements vary considerably among the sugar producing areas, and gradual changes have occurred in each area.

Beet Sugar

Nearly all sugarbeets produced in the United States are grown by farmers for sale to a processor. Sugarbeet processors grow an insignificant acreage of beets, usually for experimental purposes. Until the seventies, farmers did not collectively own any processing plants. Since 1948, the number of farms growing sugarbeets has declined. But the average acreage of beets per farm has increased more rapidly. Thus, production has risen substantially (table 35).

The mechanization of sugarbeet growing, the development of varieties producing monogerm seed, and the increasing use of chemicals to control weeds and diseases have been major factors which have helped decrease by 45 percent the number of man-hours of labor required to produce enough beets to yield 1 ton of sugar. The increased use of machinery has contributed greatly to the lower unit costs of producing beets. The most economical use of the machines requires a larger acreage than most farmers could manage before the newer machines became available (*40*).

The U.S. sugarbeet industry has grown at very different rates in various parts of the country since 1948, as shown by trends in acreage planted to sugarbeets in various areas (table 36). Although U.S. acreage in 1968 was about 57 percent above the 1948-52 average, it increased 155 percent in the Red River Valley and 132 percent in the Pacific Northwest. In California, acreage increased rapidly through 1964, when it was 110 percent above the 1948-52 average; then, acreage declined for 3 years and has since fluctuated irregularly. Acreage also reached a peak in 1964 in the Rocky Mountain States, but the peak was

Table 35—Trends in the U.S. beet sugar industry, averages for 1948-52, 1953-57, 1958-62, and years, 1963-74

Period or year	Farms growing sugar beets	Average harvested area per farm	Average yield of beets	Total sugar produced raw value	Grower receipts per farm	Share of receipts from Government	Man-hours per ton of sugar produced
	Number	*Acres*	*Tons*	*1,000 tons*	*Dollars*	*Percent*	*Number*
1948-52	30,239	24.2	14.7	1,559	4,892	18.1	34.1[1]
1953-57	25,412	31.8	16.6	1,957	7,258	17.3	30.6
1958-62	24,397	40.6	17.2	2,404	9,794	16.7	21.6
1963	22,807	54.7	18.7	3,086	14,712	15.6	19.5
1964	23,968	58.1	17.0	3,332	13,848	16.2	20.1
1965	22,608	54.9	16.5	2,816	12,869	16.1	19.9
1966	19,542	59.4	17.6	2,853	15,816	14.7	18.7
1967	17,775	63.9	17.3	2,694	17,508	14.1	18.6
1968	18,452	78.1	17.8	3,490	22,135	13.9	16.7
1969	18,431	84.8	18.4	3,472	23,321	14.0	18.1
1970	16,442	83.1	18.5	3,322	26,270	12.5	16.5
1971	15,044	88.1	20.3	3,512	31,199	12.0	15.3
1972	14,542	91.8	21.3	3,632	35,634	11.2	15.0
1973	12,438	97.7	20.2	3,200	66,588	6.1	15.0
1974	11,964	102.5	18.2	2,916	90,515	4.4	N.A.

[1] 1950-52 only.

N.A. Not available.

Source: Sugar Statistics and Related Data, Vol. II, Bul. 244, Agr. Stabil. and Conserv. Serv., U.S. Dept. of Agr.

Table 36--Trends in acreage planted to sugar beets, by areas in the United States, averages, 1948-52, 1953-57, 1958-62, and years, 1963-74

Period	California	Pacific Northwest[1]	Red River Valley[2]	Rocky Mountain[3]	Michigan-Ohio	Other	United States
	1,000 acres						
1948-52	172	117	83	307	101	31	811
1953-57	192	137	107	312	87	28	863
1958-62	229	172	133	373	100	31	1,038
1963	320	229	172	421	114	44	1,300
1964	362	268	175	452	125	74	1,456
1965	313	236	191	379	112	77	1,308
1966	279	216	192	363	112	78	1,240
1967	230	228	209	344	106	93	1,210
1968	289	280	252	418	128	142	1,509
1969	344	299	262	470	132	163	1,670
1970	291	264	250	395	134	97	1,431
1971	338	273	191	377	133	77	1,389
1972	341	301	190	370	138	84	1,424
1973	280	271	212	323	120	74	1,280
1974	234	170	333	328	116	71	1,252

[1] Idaho, Oregon, and Washington. [2] Minnesota and North Dakota. [3] Colorado, Montana, Utah, Whoming, and Nebraska.

Source: Prospective Plantings, Stat. Rpt. Serv., U.S. Dept. of Agr.

only 47 percent above the base period. The 1973 acreage, although above those for the 2 previous years, was 29 percent below 1964. Beet acreage in Michigan and Ohio has shown no consistent trend since 1948, although fluctuating considerably from year to year.

The sharp increase in acreage in the "other" States through 1969 was largely the result of the construction of new beet sugar mills and the consequent increase in acreage in Texas, Arizona, Kansas, New York, and Maine. In 1948, no beets were produced in some of these States, and the acreage was very small in the others. No beets have been grown in Wisconsin since 1961, although one-third of the acreage in "other" States during 1948-52 was recorded by Wisconsin.

Sugarbeets were processed by a maximum of 72 factories in 1950 to a low minimum of 52 factories in 1973. During that period, a number of new factories, mostly of much larger than average size, were built, and the capacity of a number of existing factories was increased. With rare exception (Empire State and Maine Sugar plants were new) nearly all of the factories which closed were old and small plants. As a result, total factory capacity increased considerably. In 1974, factories operated in 16 States. However, more than one-third of the total factory capacity was located in California and Colorado, and only about 9 percent was in States east of the Mississippi River.

The 54 or more plants processing sugarbeets in 1974 were operated by 13 companies. Some of them were subsidiaries of larger companies engaged in businesses other than the processing of sugarbeets. Since 1970, four new beet cooperations have started operations.

The six largest processing companies generally produce nearly nine-tenths of the total output of U.S. beet sugar. In some respects, the degree of concentration is even greater than that indicated by the overall figure. For instance, two companies own all the mills in Utah, Idaho, Oregon, and Washington; and one company owns the mills in northeastern Colorado plus all the mills in adjacent areas in Nebraska and Kansas. One effect of this is that few sugarbeet growers have more than one buyer or potential buyer for their beets. However, this lack of competition for their product is offset to a large extent by the beet growers' associations that bargain with processors concerning prices and other terms of sale.

U.S. sugarbeets are all produced under annual contracts between growers and processors. Although varying in detail, these contracts possess certain common characteristics. They are signed before the beets are planted; the acreage to be grown by each farmer is specified; the growers are required to use seed supplied by the processor; various cultural practices relating to such items as rotation practices, the use of fertilizer, and times of harvest are specified; and the prices to be received by the growers are stated in terms of a formula related to the price the processor receives for sugar.

Because of this method of determining the price of beets, the grower-processor contracts are commonly referred to as participation contracts. These contracts commonly provide for the determinination of grower prices from the net returns (price minus marketing costs) received by the processor from the sale of sugar and the sucrose content of the beets. In a few cases, the returns processors receive for byproducts are also included in the formula. The price variations

usually are specified in a table showing prices per ton of beets for various net returns from the sale of sugar and for various percentages of sucrose in the beets.

No two processors use exactly the same form of contract, and some of the larger companies use somewhat different contracts for different areas where they have mills. The contract terms from 1934 through 1974 were reviewed by Government officials responsible for the administration of the Sugar Act. This law gave the Secretary of Agriculture power to specify minimum prices to be paid growers for their beets. The Secretary usually approved existing or proposed contracts as meeting minimum requirements, although frequently this was preceded by consultation with the parties concerned.

Mainland Sugarcane

Louisiana and Florida were the only mainland States where sugarcane was grown for the commercial production of sugar until 1973 when a mill in Texas began operating, although small quantities of cane are grown for the production of sirup in a few other Southern States. As in the sugarbeet area, the number of farms on which sugarcane is grown has decreased since 1948, and the average acreage per farm has increased substantially (table 37). Much of the increased acreage per farm is the result of expanding production in Florida, especially since 1960. In 1966, the 169 farms growing sugarcane in Florida produced 16 percent more sugar than the 2,080 farms in Louisiana. Some of the increase in average yield of cane per acre is also due to the increasingly large proportion of the total crop which is now grown in Florida where yields are higher than in Louisisana.

Much of the U.S. sugarcane is produced by companies which also own and operate processing mills. About half of the cane in Florida and Louisiana is grown in this manner. Independent growers with no ownership relation to a sugar mill sell their cane to one or more sugar mills on annual contracts. These are likely to be less formal than those used for sugarbeets. Many of them are oral and relate mainly to the price to be paid for cane. Certain specifications regarding the size of daily deliveries to the mill may be included, but generally nothing is included that relates to varieties, fertilization, or cultural practice.

Until 1975, the price commonly paid was a formula price, with a minimum price determined annually by the Secretary of Agriculture. This minimum price was specified in a formula which took into account the quality of the cane—sucrose content and purity—and the price of raw sugar in New York City over a specified period of time. The formulas for Louisiana and Florida sugarcane differed in details but were generally the same.

Hawaii

The sugar industry in Hawaii is considerably more integrated than are those in other areas in the United States. Most sugarcane is grown by companies which operate sugar mills, and the number of farms growing sugarcane is comparatively small (table 38). Total sugar production has remained relatively stable since 1948, compared with output in mainland areas.

Most of the raw sugar produced in Hawaii is shipped to a mainland refinery owned by Hawaiian sugar producers and operated as a cooperative. Thus, the principal product sold by producers of sugarcane

Table 37—Trends in the U.S. mainland cane sugar industry, averages, 1948-52, 1953-57, 1958-62, and years, 1963-74

Period	Farms growing sugarcane	Average harvested area per farm	Average yield of cane	Total sugar produced raw value	Grower receipts per farm Government	Share of receipts from produced	Man-hours per ton of sugar
	Number	*Acres*	*Tons*	*1,000 tons*	*Dollars*	*Percent*	*Number*
1948-52	5,192	64.7	20.5	516	9,541	14.7	70.1[1]
1953-57	3,785	77.3	24.4	580	14,556	14.0	47.5
1958-62	2,854	126.6	24.7	707	25,842	13.3	37.7
1963	2,419	192.3	29.9	1,182	61,574	10.2	29.3
1964	2,483	228.7	25.3	1,142	43,990	13.5	32.2
1965	2,396	209.9	25.3	1,102	44,956	12.7	28.6
1966	2,249	226.6	26.2	1,212	55,440	11.4	23.4
1967	2,062	247.7	30.2	1,457	75,187	11.0	19.0
1968	1,937	251.4	27.4	1,209	69,045	11.1	20.8
1969	1,821	228.7	27.9	1,071	66,588	10.6	19.6
1970	1,724	269.1	28.9	1,252	85,151	10.1	17.8
1971	1,648	319.1	25.3	1,204	92,883	9.6	19.2
1972	1,578	370.1	31.0	1,616	141,598	8.1	17.7
1973	1,426	425.5	25.4	1,372	230,203	5.0	19.8
1974	1,315	459.6	24.8	1,379	533,382	2.3	N.A.

[1] 1950-52 only.

Source: Sugar Statistics and Related Data, Vol. II, Bul. 244, Agr. Stabil. and Conserv. Serv., U.S. Dept. of Agr.

Table 38—Trends in the Hawaiian cane sugar industry, averages 1948-52, 1953-57, 1958-62, and years, 1963-74

Period	Farms harvesting sugarcane	Average harvested area per farm	Average yield of cane	Total sugar produced, raw value	Man-hours per ton of sugar produced
	Number	*Acres*	*Tons*	*1,000 tons*	*Number*
1948-52	362	296.1	76.4	954	24.3[1]
1953-57	846	120.6	89.0	1,100	19.1
1958-62	871	153.5	87.5	978	15.8
1963	612	175.5	93.4	1,101	13.6
1964	535	207.1	94.7	1,179	11.8
1965	578	189.6	98.0	1,218	10.8
1966	529	209.8	98.8	1,234	10.5
1967	569	196.5	98.8	1,191	10.6
1968	518	219.1	99.4	1,232	10.0
1969	528	214.4	95.7	1,182	9.4
1970	504	225.8	91.9	1,162	9.5
1971	511	226.6	92.3	1,230	9.0
1972	410	264.6	91.5	1,119	9.2
1973	393	275.3	89.2	1,129	9.2
1974	339	282.7	95.8	1,043	N.A.

[1] 1950-52 only.

N.A. - Not available.

Source: Sugar Statistics and Related Data, Vol. II Bul.244, Agr. Stabil and Conserv. Serv., U.S. Dept. of Agr.

and sugar in Hawaii is refined sugar sold in the continental United States.

The production of sugarcane in Hawaii is highly mechanized as is indicated by the smaller number of man-hours of labor used to produce a ton of sugar compared with other regions of the United States. Also, the productivity of labor in Hawaii has increased greatly since 1948. Higher yields of cane than those obtained in other areas is an important factor accounting for the higher productivity of labor in the Hawaiian sugar industry.

Puerto Rico

The Puerto Rican sugar industry is characterized by a large, although declining, number of independent growers who sell their sugarcane to a processor operating one or more sugar mills (table 39). The average number of acres of sugarcane harvested per farm each year is much smaller than in other sugarcane areas and somewhat below the average for sugarbeet growers. However, the average harvested acreage per farm in Puerto Rico has doubled since 1953-57.

Table 39—Trends in the Puerto Rican cane sugar industry, averages 1948-52, 1953-57, 1958-62, and years, 1963-74

Period	Farms growing sugarcane	Average harvested area per farm	Average yield of cane	Total sugar produced 96 basis	Grower receipts per farm	Share of receipts from Government	Man-hours per ton of sugar produced
	Number	*Acres*	*Tons*	*1,000 tons*	*Dollars*	*Percent*	*Number*
1948-52	17,021	23.6	29.4	1,276	6,356	16.4	109.9[1]
1953-57	18,268	21.2	27.0	1,089	5,133	16.4	98.7
1958-62	14,131	25.6	31.5	1,043	6,997	14.3	88.4
1963	12,317	24.6	33.4	978	9,473	11.2	89.9
1964	11,608	26.1	32.3	978	8,484	13.3	88.0
1965	10,770	26.7	30.6	887	7,929	14.4	80.5
1966	9,826	27.8	34.7	808	8,829	13.7	78.1
1967	8,795	29.9	31.0	637	9,683	13.0	70.1
1968	7,753	30.6	27.8	478	8,922	13.8	71.1
1969	6,531	27.6	32.7	455	7,956	13.1	59.8
1970	5,565	33.9	31.2	321	9,365	12.2	63.1
1971	4,202	36.5	29.9	295	9,062	11.9	60.1
1972	3,535	43.1	28.8	252	10,477	10.9	63.0
1973	2,954	44.7	27.4	287	13,191	9.0	62.1
1974	2,551	47.7	29.5	N.A.	44,307	3.0	N.A.

[1] 1950-52 only.

N.A. - Not available.

Source: Sugar Statistics and Related Data, Vol. II Bul. 244, Agr. Stabil and Conserv. Serv., U.S. Dept. of Agr.

The number of man-hours required to produce a ton of sugar in Puerto Rico also is much higher than in any other domestic area. Although man-hour requirements in Puerto Rico have been reduced nearly one-half, this is smaller than the reductions which have occurred in other domestic sugar producing areas. Sugarcane production in Puerto Rico is less mechanized than in other regions. More machinery is used than at the end of World War II, but the introduction of labor-saving devices in the Puerto Rican sugar industry has been slower than in other areas.

The production of sugar in Puerto Rico in 1973 was only about one-fourth the 1948-52 average. Puerto Rico is the only major domestic sugar producing area in which production has declined since World War II. Production in the Virgin Islands, which usually ranged from 5,000 to 15,000 tons per year, ceased in 1966.

The prices Puerto Rican growers receive are determined in about the same way as in Florida and Louisiana, although the details vary from mainland practices. For instance, the period of time used in determining the average price to be used in the sugarcane price formula differs from that for either Florida or Louisiana, because the marketing period for Puerto Rican raw sugar differs from those for the mainland States. Also, because of the cost of shipping raw sugar to the mainland, the ratio of the price of cane to the price of sugar is somewhat lower than for the mainland States.

Raw Sugar Prices in the U.S. and World Sugar Markets

Under the U.S. sugar quota system, sugar prices in the United States and in the world market have remained effectively separated. Prices have frequently moved in opposite directions. Since 1948, the trend in U.S. sugar prices has been generally upward, and in the world market it has been downward (table 40). As a result, the margin between U.S. prices and those in the world market widened substantially. If the figures are disregarded for 1951, 1957, 1963, and 1964 when the sugar markets generally were disrupted, first by the outbreak of war in Korea, second by the Suez Crisis, and finally by a worldwide shortage of sugar early in the sixties, then the average yearly margin between U.S. and world sugar prices has increased since 1948 at an average rate of about 0.24 cent per year. Approximately a third of this has been accounted for by the increase in U.S. prices and two-thirds by price declines in the world market.

These price trends are largely the result of U.S. policies which have restricited domestic supplies sufficiently to cause sugar prices to rise about as much as the increase in average prices for other U.S. farm products. These sugar prices have been highly profitable to most foreign exporters, as is shown by their willingness to supply the U.S. market in much of 1963 and 1964 when world prices were even higher than those in the United States (*1*). It is also obvious from their prompt actions increasing production whenever there appeared to be an opportunity to export more sugar, even at less than the prevailing U.S. price.

Since all sugar exported to the United States was sold at U.S. prices, adjusted for transportation costs and import duty, quotas in the U.S. market were highly prized. Many exporting countries, however, produced much more sugar for export than they were permitted to sell in the United States or other preferential markets, such as Britain, France, and the USSR. Most of these countries were, in effect, selling their sugar at a blended price consisting of the weighted average of the prices obtained for sugar sold to the United States, to some other preferential market if available, and to the world market. The United States imports more sugar than any other nation, almost all of it until 1975 on a preferential basis. Prior to 1975 the only markets available to some exporting countries were the U.S. and world markets.

Table 40—Trends in raw sugar prices in the United States and "world" sugar markets, 1948-75

Year	Price per pound in New York[1]	Adjusted price per pound in "world" market[2]	Difference
	- - - Cents - - -		
1948	5.54	5.13	+0.41
1949	5.81	5.03	+0.78
1950	5.93	5.82	+0.11
1951	6.06	6.66	-0.60
1952	6.26	5.08	+1.18
1953	6.29	4.27	+2.02
1954	6.09	4.14	+1.95
1955	5.95	4.19	+1.76
1956	6.09	4.47	+1.62
1957	6.24	6.10	+0.14
1958	6.27	4.36	+1.91
1959	6.24	3.86	+2.38
1960	6.30	4.09	+2.21
1961	6.30	3.85	+2.45
1962	6.45	3.87	+2.58
1963	8.18	9.41	-1.23
1964	6.90	6.79	+0.11
1965	6.75	3.07	+3.68
1966	6.99	2.82	+4.17
1967	7.28	2.95	+4.33
1968	7.52	2.96	+4.56
1969	7.75	4.37	+3.38
1970	8.07	4.88	+3.19
1971	8.52	5.65	+2.87
1972	9.09	8.54	+.55
1973	10.29	10.99	-.70
1974	29.50	31.62	-2.12
1975	22.47	21.92	+.55

[1] Spot prices in New York. [2] Spot prices in Cuba or, since 1961, greater Caribbean ports adjusted to New York delivery basis.

Source: Sugar Statistics and Related Data Vol. I Bul. 293, Agr. Stabil. and Conserv. Serv., U.S. Dept. of Agr. through 1973; Sugar Reports, Agr. Stabil. and Conserv. Serv., U.S. Dept. of Agr. 1/75 through 7/75; Sugar Market News, Agr. Mkt. Serv., U.S. Dept. of Agr. 8/75 through 1/76; Sugar & Sweetner Reports, Agr. Mkt. Serv., U.S. Dept. of Agr. beginning 2/76.

Some countries, such as the Philippines, sent nearly all of their sugar exports to the United States. Under the quota system others, Taiwan for example, had only small U.S. quotas and sold most of their sugar on the world market. Both countries export most of the sugar they produce, but the average prices they received for exports prior to 1975 were very different.

Australian production and export of sugar has increased rapidly since World War II. Much of the increase in exports went to the world market, and more than half the quantity of sugar produced was exported. All exports of sugar are in effect, pooled, so that all producers receive the same price each year, which is a blend of prices received in all foreign and domestic markets. The ability of producers in Australia to supply sugar to the world market was greatly increased by the size of its preferential markets, particularly in Britain. Significant quantities of Australian sugar were also sold in Canada and the United States.

Prices and Distribution of Refined Sugar in the United States

Sugar intended for consumption without further refining is distributed to users by four classes of producers or dealers (*40*). In 1974, the quantities handled by each were:

	1,000 tons	*Percent*
Cane sugar refiners	6,671	66.2
Beet sugar processors	3,254	32.2
Importers of direct-consumption sugar	89	.9
Mainland cane sugar mills	67	.7
Total	10,081	100.0

The sugar distributed by cane sugar refiners nearly all originated in plants located in or near five Atlantic coast cities, two on the Gulf coast, and one on the Pacific coast. Small amounts came from plants located in Hawaii, Puerto Rico, and at interior points. Imported refined sugar comes from a number of foreign countries and arrives mostly at various east coast ports. The mainland cane mills distributing refined sugar are located mostly in Louisiana. Refined beet sugar is produced at all plants that process sugarbeets. Except for five comparatively small mills in Michigan and three in Ohio, all are located west of the Mississippi; the greatest concentration is in California, Colorado, Idaho, and the Red River Valley in Minnesota and North Dakota.

The plants refining cane sugar are all located in or near large metropolitan areas where a portion of their output is consumed. The remainder is distributed in whatever territory is most advantageous competitively. In this manner, some refined cane sugar is distributed in each of the mainland States, as well as in Hawaii and Puerto Rico.

Plants processing sugarbeets are all located where sugarbeets are grown, since beets are perishable and bulky and cannot be transported economically for long distances. Since most beets are grown west of the Mississippi in areas having very low population densities, local or nearby sales of sugar are not important for most mills. Consequently, transportation costs generally are more important for U.S. beet sugar than for refined cane sugar.

Refined sugar is commonly sold on a basing-point price system. The quoted prices, or offers by sellers, do not necessarily represent the cost of the sugar delivered to the buyer. The delivered cost may be equal to, greater than, or less than the quotations. Under the basing-point system, the sellers pay the cost of moving sugar to the point of delivery, but they add a charge, called a prepay, to the price. The prepay, when initiated, was supposed to equal the lowest cost of shipping sugar from a point of origin to a particular destination. For example, the prepay charged by sellers on sugar shipped from Colorado to Chicago was set so as to make the cost to buyers in Chicago equal to that of sugar from other origins.

In this example, the prepay for Colorado sugar shipped to Chicago ordinarily would be less than the transportation cost, and the sellers' net returns would be less than the quoted price. However, for nearby destinations, such as Denver, the prepay would exceed transportation charges, and the seller would realize what is termed a freight gain rather than a freight loss. In other instances, such as deliveries in major port cities where cane sugar refineries are located, no freight gain or loss ordinarily accrues to the seller. Minor producing areas, such as those in Michigan and Ohio, sell their beet sugar locally and are not involved in the calculation of prepays to such areas as Chicago.

In practice, basing-point prices do not work so neatly as described. Competitive conditions frequently cause one or another group of sellers to offer concessions which result in lower prices than indicated by the current quotation. Prices in Chicago are often cited as an example of this type of market. The probable cause is that Chicago is the largest market for sugar in the interior of the country and uses large quantities of both cane and beet sugar. The proportions available from various points of origin vary considerably from year to year, although the share of the market supplied by beet sugar has tended to increase. In part, this increase has been achieved by the beet sugar industry through offering various sorts of price concessions, especially in years when beet sugar supplies have been large.

The relative quantities of sugar delivered in various areas of the country since the close of World War II have varied considerably, largely because of popu-

lation shifts and the increasing use of sugar by food processors, who have also been affected by population changes. There has been no increase in sugar deliveries in the New England States and only a minor one in the Mid-Atlantic States, compared with major increases in the North-Central, Southern, and Western States (table 41).

Deliveries of beet sugar have been heavily concentrated in the north-central and western regions since 1948, although since 1962 there have been small increases in such deliveries in the Mid-Atlantic and Southern States. The increase in the North-Central States from 1948-52 to 1963-67 amounted to an average of 681,000 tons, 57 percent of the total increase in beet deliveries; 33 percent of the increase was in the Western States.

The increase in beet sugar deliveries in the North-Central States is especially significant for competition with cane sugar coming from the Atlantic and Gulf coasts. Since World War II, north-central beet sugar deliveries increased from 42 to 52 percent of total sugar deliveries in the region. During the same period, the price of refined sugar in Chicago declined appreciably relative to cane sugar prices in New York (table 42). The price quotations for beet sugar in the Chicago Chicago area, relative to cane sugar prices in New York, declined 1 cent a pound between 1949-52 and 1963-67. The declines in other areas were substantial, although not so large as in Chicago. Cane sugar prices outside the Northeast also declined, relative to New York prices, but generally not so much as beet sugar prices. Price declines for cane sugar were considerably lower in the Gulf and Southeastern States than in other areas. Price declines compared with New York prices were somewhat smaller in 1968 when the proportion of beet sugar in all sugar deliveries was smaller than in preceding years.

Price Movements of Sugarbeets and Sugarcane

These shifts in the geographic pattern of sugar prices affected prices farmers received for sugarbeets and sugarcane. For instance, the average price per ton of beets received by growers increased by only about 30 percent from 1948-52 to 1968-72 (table 43). The price basis (sales receipts less marketing expenses), which was a major factor determining the price processors paid for beets, increased 26 percent.

Producers of mainland cane fared better in terms of price increases than sugarbeet growers or producers of sugarcane in Puerto Rico. Average sugarcane prices received by growers in Louisiana and Florida during 1968-72 were 37 percent above those for 1948-52. Grower prices for mainland sugarcane were essentially a function of the New York price of raw

Table 41—Deliveries of refined sugar by major geographic divisions, averages for 1948/52, 1953/57, 1958-62, 1963-67, 1968-72, 1973-74

Type of sugar and period	New England	Mid-Atlantic	North Central	Southern	Western	United States
	1,000 short tons, refined sugar					
Cane sugar:						
1948-52	412	1,745	1,254	1,930	424	5,765
1953-57	407	1,832	1,379	2,173	473	6,264
1958-59	422	1,882	1,417	2,404	477	6,602
1963-67	402	1,883	1,435	2,493	499	6,712
1968-72	412	1,969	1,626	2,777	518	7,302
1973	427	1,944	1,687	2,921	512	7,491
1974	403	1,886	2,042	2,865	519	7,715
Beet sugar:						
1948-52	0	2	907	74	545	1,528
1953-57	0	10	1,000	75	666	1,751
1958-62	0	32	1,267	89	789	2,177
1963-67	4	57	1,588	128	941	2,718
1968-72	8	48	1,863	139	1,089	3,147
1973	([1])	55	1,974	144	1,109	3,282
1974	N.A.	21	1,562	103	1,142	2,828
Cane and beet sugar:						
1948-52	412	1,747	2,161	2,004	969	7,293
1953-57	407	1,842	2,379	2,248	1,139	8,015
1958-62	422	1,914	2,684	2,493	1,266	8,779
1963-67	406	1,940	3,023	2,621	1,440	9,430
1968-72	420	2,017	3,489	2,916	1,607	10,449
1973	427	1,999	3,661	3,065	1,621	10,773
1974	403	1,907	3,604	2,968	1,661	10,543

[1] Less than .5.

N.A. - Not available.

Source: Sugar Statistics and Related Data, Vol. 1, Bul. 293, Agr. Stabil and Conserv. Serv., U.S. Dept. of Agr.

Table 42—Comparative trends in quoted wholesale prices of refined sugar in various areas of the United States

Period	New York price of refined sugar	Difference from New York price[2]						
		Cane sugar				Beet sugar		
		Chicago	Pacific Coast	Gulf	Southeast	Chicago	Pacific Coast	Eastern
	Cents per pound							
1949-52[1]	8.24	+.01	+.07	-.01	-.01	-.16	-.03	-.18
1953-57	8.79	-.18	-.07	-.15	-.11	-.38	-.17	-.27
1958-62	9.41	-.48	-.37	-.23	-.18	-.67	-.39	-.70
1963-67	10.76	-.91	-.91	-.63	-.55	-1.16	-.87	-1.11
1968-72	11.96	-1.03	-1.00	-.88	-.64	-1.03	-1.10	-1.03
1973	14.07	-1.59	-1.69	-.93	-.29	-1.69	-1.69	-1.71
1974	34.35	-.08	-2.23	-.19	-.01	-2.28	-2.45	-2.16

[1] Data for 1948 are not available. [2] Approximate boundaries for these areas are shown in "sugar reports," No. 81, p. 6, U.S. Dept. of Agr., Agr. Commodity Stabil. Serv., January 1959.

Table 43—Prices of sugarbeets, sugarcane, and sugar in the United States

Crop years (Oct.-Sept.)	Processor payments per ton[1]			Price per pound			
	Beets	Mainland cane	Puerto Rico cane	Raw sugar, New York	Refined sugar, wholesale, New York	Refined sugar, retail, U.S. average	Basis of payment for beets
	Dollars			*Cents*			
1948-52	11.20	6.62	7.94	6.04	8.29	10.0	7.00
1953-57	11.33	7.13	8.03	6.12	9.07	10.7	7.20
1958-62	11.71	7.63	7.60	6.53	9.76	11.9	7.47
1963-67	12.45	8.62	8.29	7.16	10.64	12.29	7.99
1968-72	14.61	10.55	7.32	8.57	12.40	13.39	9.42
1973/74	31.66	21.26	8.26	20.39	34.41	23.82	19.95
1974/75	N.A.	49.07	28.90	30.61	39.93	42.78	N.A.

[1] Processor payments only. [2] Preliminary.

N.A. Not available.

Source: Sugar Statistics and Related Data, Vol. 1, Bul. 293, and Vol. II, Bul. 244, Agr. Stabil. and Conserv. Serv., U.S. Dept. of Agr.

sugar at certain times of the year and the quality (sucrose content and juice purity) of the cane. Average raw sugar prices during this period rose only 30 percent. However, the quality of mainland sugarcane improved substantially. A part of this improvement resulted from the increasing proportion of mainland cane grown in Florida where the sucrose content is higher. The average sucrose content of cane grown in Louisiana also increased but not to the Florida level.

The average price of sugarcane received by Puerto Rican growers increased only 4 percent from 1948-52 to 1968-72, much less than the increase in the New York raw sugar price. A decline in the quality of Puerto Rican sugarcane was partly responsible.

Because the Hawaiian sugar industry is much more integrated than those in other areas, statistics showing the price of sugarcane are not available. However, most of the sugar produced in Hawaii is refined in California, and the sugar is sold in much the same area as beet sugar. Consequently, returns to the Hawaiian sugar industry likely are similar to those for the beet industry.

NONSUGAR SWEETENERS: RECENT DEVELOPMENTS

The use of certain nonsugar sweeteners, used partly as substitutes for sugar, increased rapidly after World War II. Sugar has two principal economic characteristics; it is sweet, and it is nutritive. All sugar substitutes are sweet in some degree; some are nutritive, others are not. The nutritive sweeteners which compete with sugar (sucrose) are largely those manufactured from starch and known in the United States as corn sirup and dextrose, although honey, maple, and other sirups also belong in this category. The

principal nonnutritive substitutes for sugar, saccharin and cyclamate are manufactured from nonagricultural materials.

Trends in the Use of Starch Sweeteners

The use of corn sirup and dextrose increased considerably during World War II when sugar was in short supply. After the war, when the supply of sugar increased, the use of corn sweeteners declined to about the prewar share of the sweetener market and remained there for several years (*38*). Beginning in 1957, the consumption of starch sweeteners, particularly corn sirup, started increasing more rapidly than that of sugar (table 44). During 1957-67, the growth in consumption of caloric sweeteners (sugar, dextrose, and corn sirup) by all users averaged 231,000 tons per year; of this increase, 66 percent was sugar, 8 percent dextrose, and 26 percent corn sirup (*9,10,11,12,13,14*). But the average quantity of sugar consumed was much larger than that of dextrose or corn sirup. And the rate of increase, based on the average annual consumption of each sweetener, was lowest for sugar (1.7 percent), slightly more for dextrose (4.6 percent), and highest for corn sirup (6.0 percent).

Most of the starch sweeteners are used by industrial processors of food and other products (*61*), although a sizable but declining proportion of sugar is consumed in households and other nonindustrial establishments. Nonindustrial use of sugar in the United States has remained comparatively stable in quantity, although declining somewhat since 1963. The use of each of the caloric sweeteners by industry has increased substantially since 1957 and at about the same rate for the first 6 years of the period. But since 1962, the growth rate for sugar has been somewhat slower than that for corn sirup (tables 45, 46, and 47).

Although the proportions of the various sweeteners used by all industrial processors has not changed greatly since 1957, this stability represents an average of quite diverse trends in individual industries. For instance, in the baking, canning, and dairy industries, purchases of sugar increased after 1957, but the rate was slower than those for other caloric sweeteners so that sugar has constituted a declining proportion of the total caloric sweeteners purchased. The beverage industry is the largest industrial purchaser of sugar, and in this case sugar maintained its share of the caloric sweetener market at around 95 percent. Sugar also maintained its share of the sweetener purchases in the confectionery industry and in the category labeled "other foods."

About half the dextrose used in the United States during this period was delivered to the baking industry, where it was used primarily in products manufactured with yeast to assist the process of fermentation. The proportion of dextrose in the baking industry's total purchases of caloric sweeteners declined slightly since 1957, largely because of the increased use of corn sirup. More dextrose was used in nonfood industries than in any of the food industries except baking. Moreover, the use of dextrose for

Table 44—Distribution of principal caloric sweeteners to all U.S. users, 1957-74

Year	Quantity consumed				Percentage of total consumed			
	Sugar	Dextrose[1]	Corn sirup[1]	Total	Sugar	Dextrose	Corn sirup	Total
	--- 1,000 tons ---				*--- Percent ---*			
1957	7,950	307	737	8,994	88.4	3.4	8.2	100.0
1958	8,210	354	781	9,345	87.8	3.8	8.4	100.0
1959	8,336	376	832	9,544	87.4	3.9	8.7	100.0
1960	8,423	373	865	9,661	87.1	3.9	9.0	100.0
1961	8,775	384	889	10,048	87.3	3.8	8.9	100.0
1962	8,881	410	987	10,278	86.4	4.0	9.6	100.0
1963	9,137	464	1,055	10,656	85.7	4.4	9.9	100.0
1964	8,839	463	1,170	10,472	84.4	4.4	11.2	100.0
1965	9,183	465	1,189	10,837	84.7	4.3	11.0	100.0
1966	9,523	459	1,229	11,211	84.9	4.1	11.0	100.0
1967[2]	9,488	493	1,134	11,372	83.4	4.8	11.8	100.0
1968[2]	10,106	506	1,228					
1969[2]	9,884	502	1,264	11,650	84.9	4.3	10.8	100.0
1970	10,621	554	1,336	12,511	84.9	4.4	10.7	100.0
1971	10,610	583	1,418	12,611	84.1	4.6	11.3	100.0
1972	10,720	545	1,600	12,865	83.3	4.2	12.5	100.0
1973[2]	10,771	600	1,850[3]	13,221	81.5	4.5	14.0	100.0
1974[2]	10,539	625	2,150[3]	13,314	79.2	4.7	16.1	100.0

[1] Dry basis. [2] Estimates. [3] Includes high-fructose corn sirup production.

Source: Sugar Report, Agr. Stabil. and Conserv. Serv., U.S. Dept of Agr., through 7/75, and Sugar Market News, Agr. Mkt. Serv., U.S. Dept. of Agr., 8/75 through 1/76.

Table 45—Sugar deliveries to U.S. processing industries, with sugar deliveries as percentage of total sugar, dextrose, and corn sirup deliveries, for each type of industry, 1957-74

Year	Baking	Beverage	Canning	Confectionery	Dairy	Other foods	Nonfoods	Total
	- - - 1,000 tons - - -							
1957	931	945	737	766	330	298	56	4,063
1958	949	953	751	727	344	307	57	4,088
1959	960	1,114	798	733	370	319	54	4,348
1960	1.048	1,148	790	804	366	297	65	4,518
1961	1,078	1,210	855	842	395	263	79	4,722
1962	1,120	1,322	847	863	398	267	79	4,896
1963	1,170	1,436	863	894	436	263	69	5,131
1964	1,082	1,400	853	865	438	359	61	5,058
1965	1,156	1,560	838	959	452	451	55	5,471
1966	1,234	1,740	878	1,000	483	441	75	5,851
1967	1,286	1,785	843	1,004	486	424	66	5,894
1968	1,396	2,025	923	1,085	516	471	72	6,488
1969	1,344	2,099	916	1,037	528	442	72	6,438
1970	1,468	2,357	928	1,106	547	426	83	6,915
1971	1,356	2,364	1,029	1,052	556	496	93	6,946
1972	1,449	2,437	987	1,057	599	508	91	7,128
1973	1,454	2,469	1,025	1,035	595	502	111	7,191
1974	1,443	2,350	949	1,019	570	514	128	6,973
	Percent of total deliveries of sugar, dextrose, and corn sirup							
1957	81.0	95.4	87.6	71.0	86.6	55.8	47.9	79.8
1958	78.8	95.2	86.9	68.5	86.2	56.0	42.9	78.4
1959	77.7	95.6	86.3	69.0	85.4	55.3	37.5	78.5
1960	78.9	94.6	85.4	70.2	83.7	55.6	39.4	78.6
1961	78.9	94.4	85.5	70.8	83.5	55.7	39.7	78.9
1962	77.7	93.6	84.1	70.2	81.2	51.2	44.4	78.0
1963	74.8	94.3	82.7	70.8	79.3	50.0	42.6	77.4
1964	72.4	93.9	79.9	68.8	77.1	56.0	39.3	75.8
1965	73.6	94.5	80.5	70.6	75.5	61.4	35.7	77.0
1966	75.4	95.4	80.3	71.0	76.6	59.2	42.2	77.8
1967	76.7	95.0	80.2	71.4	76.1	60.6	38.4	78.4
1968	77.8	95.3	81.6	72.4	75.1	59.2	38.1	78.9
1969	77.1	95.3	81.9	71.3	74.0	57.2	36.6	78.5
1970	77.4	85.4	81.8	71.5	73.2	54.5	36.6	78.5
1971	76.3	96.5	83.8	69.3	72.1	51.1	39.7	77.6
1972	76.2	96.0	81.9	68.0	72.4	50.5	37.6	76.9
1973	73.2	92.5	78.1	67.4	69.3	49.8	41.1	74.6
1974	70.2	88.5	72.4	66.7	64.9	50.1	43.8	71.5

Source: Sugar Report, Agr. Stabil. and Conserv. Serv., U.S. Dept of Agr., through 7/75, and Sugar Market News, Agr. Mkt. Serv., U.S. Dept. of Agr., 8/75 through 1/76.

Table 46—Dextrose deliveries to U.S. processing industries, with dextrose deliveries as percentage of total sugar, dextrose, and corn sirup deliveries, for each type of industry, 1957-74[1]

Year	Baking	Beverage	Canning	Confectionery	Dairy	Other foods	Nonfoods	Total
	- - - 1,000 tons - - -							
1957	161	20	26	19	9	21	38	294
1958	195	20	29	20	8	26	44	342
1959	205	19	27	20	8	36	48	363
1960	200	27	27	20	9	25	57	365
1961	199	28	26	22	8	25	64	372
1962	213	29	24	25	7	27	71	396
1963	246	35	31	30	7	30	65	444
1964	231	38	32	37	6	36	66	446
1965	229	39	33	36	6	37	68	448
1966	217	35	34	34	7	41	69	438
1967[2]	200	43	34	42	6	95	73	493
1968[2]	199	32	35	44	6	110	80	506
1969[2]	192	20	33	45	6	121	85	502
1970	206	10	36	52	7	145	98	554
1971	187	9	35	57	8	196	91	583
1972	164	9	32	60	7	183	90	545
1973[2]	197	15	41	62	7	182	96	600
1974[2]	221	18	49	59	8	172	98	625
	Percent of total deliveries of sugar, destrose, and corn sirup							
1957	14.0	2.0	3.1	1.8	2.4	3.9	32.5	5.8
1958	16.2	2.0	3.4	1.9	2.0	4.7	33.1	6.6
1959	16.6	1.6	2.9	1.9	1.9	6.2	33.3	6.5
1960	15.1	2.2	2.9	1.7	2.1	4.7	34.5	6.4
1961	14.5	2.2	2.6	1.8	1.7	5.3	32.2	6.2
1962	14.8	2.0	2.4	2.0	1.4	5.2	39.9	6.3
1963	15.7	2.3	3.0	2.4	1.3	5.7	40.1	6.7
1964	15.4	2.5	3.0	3.0	1.1	5.6	42.6	6.7
1965	14.6	2.4	3.2	2.7	1.0	5.0	44.2	6.3
1966	13.2	1.9	3.1	2.4	1.1	5.5	38.7	5.8
1967	12.0	2.3	3.2	3.0	.9	13.6	42.4	6.5
1968	11.1	1.5	3.1	2.9	.9	13.8	42.3	6.2
1969	11.0	.9	2.9	3.1	.8	15.7	43.1	6.1
1970	10.8	.4	3.2	3.4	.9	18.5	43.2	6.3
1971	10.5	.4	2.8	3.8	1.0	20.2	38.9	6.5
1972	8.6	.4	2.7	3.8	.9	18.2	37.2	5.9
1973	9.9	.6	3.1	4.0	.8	18.1	35.6	6.2
1974	10.7	.7	3.7	3.9	.9	16.8	33.6	6.4

[1] Dry basis. [2] Estimates.

Source: Sugar Report, Agr. Stabil. and Conserv. Serv., U.S. Dept. of Agr., through 7/74, and Sugar Market News, Agr. Mkt, Serv., U.S. Dept. of Agr., 8/75 through 1/76.

Table 47—Corn sirup deliveries to U.S. processing industries, with corn sirup deliveries as percentage of total sugar, dextrose, and corn sirup deliveries, for each type of industry, 1957-74[1]

Year	Baking	Beverage	Canning	Confectionery	Dairy	Other foods	Nonfoods	Total
				--- 1,000 tons ---				
1957	59	26	78	294	42	215	23	737
1958	61	28	84	314	47	215	32	781
1959	71	33	100	309	55	222	42	832
1960	80	38	108	322	62	212	43	865
1961	90	44	119	326	70	184	56	889
1962	109	62	136	342	85	227	28	989
1963	148	51	150	338	107	233	28	1,055
1964	182	53	182	355	124	246	28	1,170
1965	185	52	170	363	141	247	31	1,189
1966	186	49	180	374	141	263	34	1,229
1967[7]	190	50	174	360	147	180	33	1,134
1968[2]	200	68	173	370	165	215	37	1,228
1969[2]	208	84	170	373	180	209	40	1,264
1970	223	105	171	389	193	211	46	1,336
1971	234	76	164	408	207	279	50	1,418
1972	288	91	186	438	221	315	61	1,600
1973[2 3]	336	185	246	440	257	324	63	1,850
1974[2 3]	392	288	314	450	300	340	66	2,150
				Percent of total deliveries of sugar, dextrose, and corn sirup				
1957	5.0	2.6	9.3	27.2	11.0	40.3	19.6	14.4
1958	5.0	2.8	9.7	29.6	11.8	39.3	24.0	15.0
1959	5.7	2.8	10.8	29.1	12.7	38.5	29.2	15.0
1960	6.0	3.2	11.7	28.1	14.2	39.7	26.1	15.0
1961	6.6	3.4	11.9	27.4	14.8	39.0	28.1	14.9
1962	7.5	4.4	13.5	27.8	17.4	43.6	15.7	15.7
1963	9.5	3.4	14.3	26.8	19.4	44.3	17.3	15.9
1964	12.2	3.6	17.1	28.2	21.8	38.4	18.1	17.5
1965	11.8	3.1	16.3	26.7	23.5	33.6	20.1	16.7
1966	11.4	2.7	16.6	26.6	22.3	35.3	19.1	16.4
1967	11.3	2.7	16.6	25.6	23.0	25.8	19.2	15.1
1968	11.1	3.2	15.3	24.7	24.0	27.0	19.6	14.9
1969	11.9	3.8	15.2	25.6	25.2	27.1	20.3	15.4
1970	11.8	4.2	15.0	25.1	29.9	27.0	20.2	15.2
1971	13.2	3.1	13.4	26.9	26.9	28.7	21.4	15.9
1972	15.2	3.6	15.4	28.2	26.7	31.3	25.2	17.2
1973	16.9	6.9	18.8	28.6	29.9	32.1	23.3	19.2
1974	19.1	10.8	23.9	29.4	34.2	33.1	22.6	22.1

[1] Dry basis. [2] Estimates. [3] Includes high-fructose corn sirup production.

Source: Sugar Report, Agr. Stabil. and Conserv. Serv., U.S. Dept of Agr., through 7/75, and Sugar Market News, Agr. Mkt. Serv., U.S. Dept. of Agr., 8/75 through 1/76.

nonfood purposes increased. These nonfood uses are mostly in products which involve fermentation, and in this respect these uses are similar to those of the baking industry.

The confectionery industry was the largest user of corn sirup, although the proportion going to that industry has declined somewhat since 1957. Corn sirup in the confectionery industry is largely used in the production of hard candies. It is very difficult to manufacture hard candy of good quality without corn sirup, which has averaged about 40 percent of the mixture in recent years. Comparatively little corn sirup has been used by the beverage or nonfood industries, but the other industrial groups have purchased substantial amounts.

By 1965, the distinction between corn sirup and dextrose became somewhat blurred. As presented, the figures for dextrose refer to a highly refined product which has been crystalized and prepared as a dry product, although some of it may be converted to liquid form before sale. Corn sirup consists of a liquid containing a number of saccharides (sugars) in varying proportions. One of these saccharides is dextrose. The solid matter in some of the material sold as corn sirup contains as much as 96 percent dextrose. Such sirup can be used in some products as a substitute for crystalline dextrose, and this doubtless has had some effect on trends in the use of these products.

The average industrial use of caloric sweeteners during 1957-66 increased by about 264,000 tons per year (table 48). This was somewhat faster than the increase in total usage. Increased consumption of sugar accounted for approximately 72 percent of the total rise, corn sirup for 22 percent, and dextrose for 6

Table 48—Average annual increase in the use of caloric sweeteners by U.S. food and other processing industries, 1957-66[1]

Industry	Sugar	Dextrose	Corn sirup	Total
		--- 1,000 tons ---		
Canning	14	1	12	27
Dairy	16	([2])	12	28
Beverages	84	2	3	89
Baking	32	6	17	55
Confectionery	29	2	8	39
Other food	15	3	5	22
Nonfood	1	3	([2])	4
Total	191	16	57	264
		--- Percent ---		
Canning	1.7	2.6	9.6	2.8
Dairy	4.1	3.9	14.2	5.7
Beverages	6.5	8.1	7.4	6.6
Baking	2.9	3.0	14.5	3.9
Confectionery	3.4	8.4	2.5	3.2
Other food	4.4	5.5	2.4	3.7
Nonfood	1.9	5.8	0.9	2.8
Total	3.9	4.2	6.0	4.3

[1] Least square trends. [2] Less than 500 tons.

percent. The largest increase in sugar consumption—44 percent of the total—was in the beverage industry, where the increase in use of both dextrose and corn sirup was slight. The next largest growth in the use of sugar was in the baking and confectionery industries. These three industries accounted for over three-fourths of the total increase in deliveries to all industries.

The largest increase in the use of dextrose during 1957-66 was in sales to the baking industry, although the percentage rate of increase was slower than in any other industry. This apparent inconsistency is the result of the large quantity of dextrose used by the baking industry and the slow rate of growth in the use of dextrose in the industry.

Nearly three-fourths of the increased use of corn sirup has been in the baking, canning, and dairy industries. In the baking industry, sirup with a high dextrose content appears to have been used to some extent as a substitute for both sugar and dextrose. In the canning industry, nearly half of the increase in the use of caloric sweeteners was in the form of corn sirup. The most important use in the industry is in canned fruits where it is commonly used in a mixture with liquid sugar. The dairy industry's principal use of corn sirup is in manufacturing ice cream, sherbets, and similar items.

Recent Price Trends for Caloric Sweeteners

Since the end of World War II, the predominant trend in price of sugar has been slowly upward, with unusually rapid rises in 1963 and 1974 (table 49). The price of dextrose declined slowly from 1957 through 1962. It was unusually high in 1963, although the rise was not nearly so great as that for sugar. After declining in 1964 and 1965, dextrose prices increased in 1966. The 1966 price of dextrose, however, was only 6.6 percent above 1957, compared with 13.2 percent for sugar. Except for a rise in 1963, corn sirup prices generally trended downward from 1957 through 1965. There was a slight rise in 1966. The price of corn sirup in 1966 was 9 percent below that in 1957, in contrast to the increases in sugar and dextrose prices. Since 1966, prices of sugar and corn sweeteners have risen, but generally sugar prices have increased somewhat more rapidly.

Comparisons of sweetener prices, based on published quotations, never exactly represent the price situation that exists for an individual user. The quotations used for sugar and dextrose represent wholesale prices in 100-pound bags. Most industrial processors do not purchase these products on such terms. The price quotations for all three sweeteners relate to the New York City market. Much more of each of the products is used in markets distant from New York than in that metropolitan area, and price relationships are likely to be different in other areas. The differences in the trends of the quoted prices for the various caloric sweeteners may reflect, more accurately than the prices themselves, the shifting advantages to be obtained by a processor from using a larger or smaller proportion of one of the noncaloric sweeteners (*15*).

In some industries, increased use of corn sirup appears to have been caused mainly by its price decline relative to sugar. In other industries this change in price relationships was of little or no

Table 49—Prices of sugar, dextrose, and corn sirup, 1957-74

Year	Refined sugar, wholesale, New York City[1]	Dextrose, New York City, dry basis[2]	Corn sirup, New York City, dry, basis[3]	Dextrose, relative to sugar, dry basis	Corn sirup, relative to sugar, dry basis
	--- Cents per pound ---			--- Percent ---	
1957	9.15	8.32	9.17	91	100
1958	9.27	8.33	9.18	90	99
1959	9.33	8.13	9.10	87	98
1960	9.43	8.13	9.12	86	97
1961	9.40	8.10	9.00	86	96
1962	9.60	8.04	8.73	84	91
1963	11.94	9.10	9.19	76	77
1964	10.68	8.85	8.36	83	78
1965	10.22	8.70	8.27	85	81
1966	10.36	8.87	8.34	86	81
1967	10.62	9.10	8.40	86	79
1968	10.84	9.27	7.85	86	72
1969	11.44	9.77	7.80	85	68
1970	11.97	10.20	8.46	85	71
1971	12.48	10.71	8.77	86	70
1972	13.09	10.07	5.78	77	44
1973	14.07	10.79	8.53	77	60
1974	34.35	12.27	13.21	51	38

[1] Basis price per 100-pound bag, subject to 2-percent discount. [2] Hydrate, 100-pound bags, less than carlots, through 1963. Since April 1964, price is for 600-bag carload, f.o.b., New York. [3] Regular conversion sirup, in tank cars, f.o.b., New York.

Source: Sugar Report, Agr. Stabil. Conserv. Serv., U.S. Dept. of Agr., through 7/75.

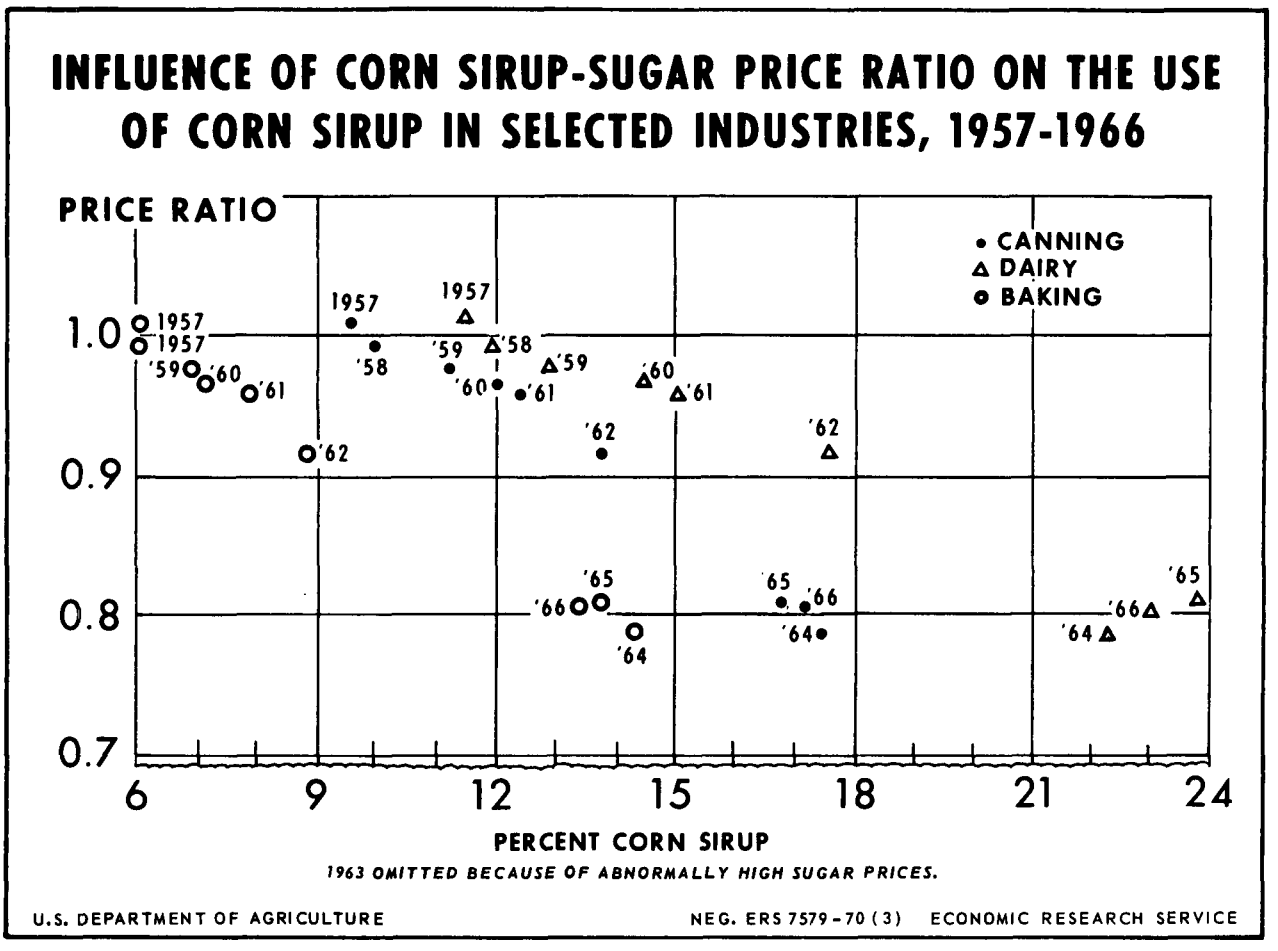

Figure 2

importance. During 1957-66, a decline in the corn sirup-sugar price ratio of 0.10 percent was accompanied by an increase of 3.5 percentage points in the total quantity of sugar plus corn sirup used in the canning industry (except in 1964, when an exceptionally high price for sugar distorted the ratio) (fig. 2). In the dairy industry, the increase was 5.4 points, and in the baking industry, 3.9 points.

In other industrial uses, primarily beverages and confectionery, there appeared to be little relationship between changes in the corn sirup-sugar price ratio and the percentage of corn sirup used in the industry. Such use was small in the beverage industry and the advantage of lower cost in using an increased proportion of corn sirup in sweetening beverage products was apparently offset by quality considerations. Although the confectionery industry was the largest user of corn sirup, the reduction in costs that might have been made by increasing the proportion of corn sirup used appears to have been offset by adverse effects on quality which might have accompanied the change.

In the canning, baking, and dairy industries, quality problems either did not arise or the larger proportions of corn sirup may have improved the quality. On the one hand, the recent development of sirups containing high percentages of dextrose appears to have encouraged the increased use of sirup in the baking industry. On the other hand, the increased use of sirups containing a high proportion of maltose by the confectionery industry, plus lower prices for corn sirup, has not resulted in an increased proportion of corn sirup in the caloric sweeteners used in that industry.

Trends in the Use of Noncaloric Sweeteners

Saccharin has been the noncaloric sweetener used in significant volume in the United States in the seventies, although cyclamate and mixtures of these were used extensively in the sixties. Saccharin has been used since early in the 20th century. Commercial production of cyclamate began in the fifties, and the use of mixtures of these became common early in the sixties. Comparatively few statistics are available concerning the production and consumption of saccharin and cyclamate. However, the use of saccharin prior to the sixties appears to have been confined largely to persons who, for reasons of health, could not use sugar, although during periods of wartime shortages of sugar saccharin use became more widespread. The use of cyclamate increased slowly during the fifties.

The most rapid growth in the use of saccharin-cyclamate mixtures was in soft drinks and in dry beverage bases. There was also considerable growth early in the sixties in retail sales of saccharin-cyclamate mixtures. Increased consumption in nonbeverage food industries, such as canning, bakery, and confectionery, was appreciable but much slower. By 1967, noncaloric sweeteners, measured in terms of sweetening power relative to sugar, accounted for 6 to 7 percent of the approximately 12 million tons of caloric and noncaloric sweeteners consumed in the United States.

One unfavorable characteristic of both saccharin and cyclamate is that, in addition to tasting sweet, each has an off-flavor which is objectionable to many users. When saccharin and cyclamate are mixed, the sweetness is, in effect, additive, but the off-flavors are not. Consequently, it is possible to attain a higher degree of sweetness in various products without noticeable off-flavors by using mixtures of the two than can be attained by using either product alone. As a result, the use of mixtures increased rapidly. The use of cyclamate has been banned for several years; and a recent ruling requires that products containing saccharine, except those already on store shelves, carry warning labels.

RETROSPECT AND PROSPECT

Perhaps the most prominent, nearly universal, and continuous feature of the economic development of the sugar industry in past centuries has been the influence of governmental regulations on production, trade, and price (*17*). These influences can be traced in considerable detail since the establishment of the sugar industry in the Western Hemisphere following the discovery of America. They were probably important before that time, but very little information is available concerning governmental controls of the sugar industry before its establishment in the New World.

The attempt to compel all shipments from a colony to be made to the mother country was one of the first features of government regulation of the sugar trade to assume importance in connection with the sugar industry in the New World. This was part of the attempt, made by all European countries with colonies, to make their colony a source of profit to the mother country. The early shipments of sugar were of very poor quality, because of the lack of needed machinery and skills in the colony. This led to the establishment of sugar refining plants in European countries. These refiners tended to become the center of the sugar trade in Europe, both as purchasers of raw sugar and as distributors of the refined product.

Sugar also soon became a favorite object of taxation, usually in the form of excise taxes or import duties on raw sugar. In this way the European countries obtained revenue from their colonies. The objec-

tion of the colonists to having profits reduced by such taxes was sometimes countered by the claim that the revenue was needed to help pay the expense of protecting the colony from its enemies in Europe and America.

In these respects, sugar did not differ greatly from other products produced in the colonies for export to Europe. It was, however, for a long time the most important of these products except for gold and silver. Not until the development of the beet sugar industry in the 19th century was there any important competition in Europe or the United States for cane sugar, which could be produced only in a tropical climate. The Western Hemisphere was the principal source of such sugar, although supplies from Asia, Africa, and Australia competed with those from the Americas.

Under these circumstances of limited competition, the absence of any effective substitute for cane sugar and the universal desire of consumers for a product of such pleasant taste, the sugar producing colonies of the world were generally prosperous. And the "sugar isles" of the Caribbean were among the most valuable colonial possessions of European nations.

Despite these favorable circumstances, the system had certain weaknesses which produced more or less chronic difficulties between colonies and mother countries. The regulation of the sugar trade largely ignored the economic advantages of trade in sugar and other commodities among colonies without the necessity of shipping the goods to Europe and back again. Of course, people in the colonies frequently managed to ignore those regulations that interfered most with their business operations. The usual result of this was smuggling, frequently involving both sugar and other commodities.

The smuggling of sugar was of great advantage to the people living in colonies where little or no sugar was produced. The 13 English Colonies on the mainland of North America were the largest and most populous of such areas. Also they possessed articles for export, such as lumber, salt pork, and dried fish, which were needed in the sugar producing areas. Often, the most advantageous place for trading was with Spanish or French colonies rather than English sugar producing colonies. Such smuggling deprived the English Government of the revenue it hoped to collect, and it limited the size of the market served by the English sugar producing colonies.

Although difficulties with the sugar trade undoubtedly were a factor causing the Revolutionary War, the independence of the United States resulted in less change in governmental control of the sugar trade in this country than might have been expected. The new Government needed money, and it promptly imposed import duties on the product. And the consumers gained little or nothing in the way of lower prices. Also, following the Louisiana Purchase in 1803, the import duty incidentally provided protection for the first domestic sugar industry in the United States. This was the beginning of protection for the domestic sugar industry which has since continued in some form, as tariff, subsidy, or quota.

The first serious competitor for sugar obtained from sugarcane was the appearance of sugar from sugarbeets in the first half of the 19th century. This first became of commercial importance in European countries which formerly imported cane sugar. In France, Government regulations gradually assumed the function of protecting the beet industry and providing less attention to the sugar trade with French colonies. Other European countries with no sugar colonies, particularly Germany, Austria-Hungary, Italy and Russia, gradually adopted subsidy systems for their sugarbeet industries similar to those developed by France. Late in the 19th century, increased production of beet sugar in these countries led to the payment of export subsidies as a means of disposing of part of their supplies. At this point, a nation such as France had shifted from obtaining revenue for itself from a colonial sugar industry to supporting a domestic industry at considerable Government expense.

No beet sugar industry was developed in England in the 19th century. Rather, England gradually adopted free trade in sugar and became the principal recipient of subsidized sugar exports from various European countries, thus becoming part of the European beet sugar system. This acceptance of cheap subsidized sugar is the most important instance in the history of sugar marketing of a country neglecting the interests of its own sugar industry, and that of its colonies where sugarcane was grown, to obtain the advantage of cheap sugar for its consumers. The United States, to which European countries also exported beet sugar, reacted differently. It soon moved to protect its domestic sugar industry by establishing countervailing duties equal to the export subsidies paid by the country in which the sugar was produced.

The cost of subsidies to the governments of various European countries was a major factor bringing about the negotiation of the Brussels Sugar Convention of 1902, the first international sugar agreement and the only one dealing primarily with beet sugar. The agreement was successful in greatly reducing export subsidies, until World War I created a worldwide shortage of sugar and export subsidies were no longer a problem.

Although the United States was not greatly affected by the sugar export subsidies of Europe, events following the Spanish-American War produced marked changes in this country's regulations affecting sugar. The tariff remained the instrument of control, but it was gradually removed from shipments coming from Puerto Rico and the Philippines. Sugar from Cuba was granted a 20-percent preferential in tariff rates. These measures, together with the later addition of the quota system, largely determined the

sources of U.S. sugar imports until 1960 when imports from Communist Cuba ceased.

The first effect of World War I on the world's sugar industry was to destroy much of the beet sugar industry in Europe. This greatly increased the demand for sugar from countries exporting cane sugar. The largest response to this increased demand came from Cuba. As a result, Cuba became the world's largest exporter of sugar.

The demand for sugar from such tropical exporters as Cuba following World War I was reduced by the gradual restoration of the beet sugar industry in Europe, the reversal of Britain's sugar policy from free trade to protection for a newly developing beet industry in that country and tariff preferences for British colonies and dominions, together with sharply increased tariffs established by the United States, and similar protectionist moves by several other sugar-importing countries. The resulting economic decline in Cuba and elsewhere led to a succession of attempts to establish an international sugar agreement primarily for the relief of the sugar industries in exporting countries. Except for interruptions during World War II and one or two other lesser emergencies, attempts to establish or maintain international agreements for the protection of countries exporting sugar to the so-called "world" market have continued since the twenties and are still in effect.

Until 1975, quota systems and tariff preferentials, which channeled most of the world's sugar exports to specific countries, were somewhat reminiscent of the situation in colonial America when each European country with sugar producing colonies attempted to preempt the trade for its own benefit. One result was to divide the sugar trade of the world into fairly definite blocks. The price received by the exporter frequently varied substantially with the destination of the shipment. Political rather than economic considerations usually were the most important factor in determining the direction of international trade in sugar and which countries had the greatest access to markets with higher prices.

The production and marketing of starch sweeteners and of noncaloric sweeteners has not, in general, been subject to the same types of Government control as have characterized sugar throughout its history. International trade in such commodities is subject to import duties by most countries. But foreign trade in these commodities has generally not been large, and tariffs have been of lesser importance in determining the volume and direction of trade than has frequently been the case with sugar.

Starch and the noncaloric sweetener industries in the United States have been especially concerned with regulations relating to labeling and so forth. Use limiting effects of such regulations appear to have been even more restrictive in some European countries and sugar-exporting countries. Had regulations affecting use been less stringent, the consumption of both starch and noncaloric sweeteners would have likely increased more rapidly. Still, the consumption of starch sweeteners in the United States has increased substantially. Prices of corn and the value of byproducts have been important factors enabling corn sirup producers to maintain relatively low sirup prices and increase their share of the domestic sweetener market.

The emergence of high fructose sirup as an article of commerce in the United States is potentially of great importance. Technically, it might satisfy 50 percent or more of the total domestic sweetener demand. The extent of its growth seems primarily dependent on the relative costs of producing high fructose sirup and sugar. Commercial production of high fructose sirup began in 1968 but did not reach a volume of much commercial significance until 1974. Trade estimates suggest that sales of such sirups in 1975 may have equaled about 5 percent of the total sales of sugar, dextrose, and all types of corn sirup. Trade announcements indicated further increases in manufacturing capacity for high fructose sirup in the United States and lesser developments in a number of other countries.

At the present time, high fructose sirup containing 43 percent fructose, 50 percent glucose, and 7 percent higher saccharides is being produced only in liquid form. Commercial production of an ultrahigh fructose sirup has been announced. Further improvements are likely. Among the improvements believed possible by some people in the industry are (1) the eventual commercial production of sucrose from starch and (2) the production of sugars, such as glucose, fructose, and sucrose, from cellulose. These things can be done in the laboratory at the present time but at costs which make commercial production uneconomical. In its present form, high fructose sirup represents the first nutritive substance equal to sucrose in sweetness that has been manufactured from a nonsweet substance. In a sense, it ends an era in which sucrose occupied an exclusive position. So, these recent developments in sweetener production, use, and substitutability indicate that the future of sweeteners may be as interesting as the past.

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APPENDIX A

Sugar, raw and refined: Rate of import duty per pound, United States, 1789-1968

Item	Cents per pound
Act of July 4, 1789	
On brown sugars	1.00
On loaf sugars	3.00
On all other sugars	1.50
Act of August 10, 1790	
On loaf sugars	5.00
On brown sugars	1.50
On all other sugars	2.50
Act of June 5, 1794	
Same as August 10, 1790, except on refined sugar an additional	4.00
Act of June 7, 1795	
After June 30 on clayed or lumb sugar shipped to the United States: In	
United States vessels, an additional rate of	1.00
In foreign vessels, an additional rate of	1.10
Act of January 29, 1795	
"That after the said last day of March next, the present duties payable upon clayed sugars, shall cease and there shall be paid upon all white clayed or white powdered sugars - three cents per pound, and upon all other clayed or powdered sugars, one-and-one-half cents per pound."	
Act of March 3, 1797	
After June 30 next on all brown sugar, an additional duty of	.50
Act of May 13, 1800	
On all brown sugar an additional duty of	.50
Act of July 1, 1812	
Loaf sugar	18.00
White clayed and white powdered sugar	6.00
Brown, and brown clayed sugar	5.00
Act of April 27, 1816	
On brown sugars	3.00
White clayed or powdered sugar	4.00
Lump sugars	10.00
Loaf sugars	12.00
Act of July 14, 1832	
Brown sugar and sirup of sugarcane, in casks	2.50
White clayed sugar	3.33
Act of August 30, 1842	
Raw sugar and on brown clayed sugar	2.50
On all other sugars not refined	4.00
Refined sugar, including tinctured, colored, or otherwise adulterated	6.00
Act of July 30, 1846	
Thirty percentum ad valorem on sugars of all kinds	
Act of March 2, 1861	
Raw sugar	.75
Refined sugar	2.00
Refined sugar, when tinctured, colored or adulterated	4.00
(Dutch standard of color test adopted)	
Act of August 5, 1861	
Sugars not above No. 12 Dutch standard of color	2.00
Sugars above No. 12 Dutch standard of color	2.50
Refined sugars	4.00
Refined sugars, when tinctured, colored or adulterated	6.00
Act of December 24, 1861	
Raw sugar and sugars not above No. 12 Dutch standard	2.50
White and clayed sugars above No. 12 Dutch standard	3.00
Refined sugar	5.00
Refined sugar tinctured or colored or adulterated	8.00
Act of July 14, 1862	
Sugars not above No. 12 Dutch standard of color	2.50
Sugars from No. 12 to No. 15 Dutch standard of color	3.00
Sugars above No. 15 and not above No. 20 standard of color	3.50
Refined sugar and sugar above No. 20 Dutch standard of color	4.00
Refined sugar when tinctured, colored or adulterated	10.00
Act of June 30, 1864	
Sugars not above No. 12 Dutch standard of color	3.00
Sugars from No. 12 to No. 15 Dutch standard of color	3.50
Sugars from No. 15 to No. 20 Dutch standard of color	4.00
Refined sugar and sugar above No. 20 Dutch standard of color	5.00
Act of July 14, 1870	
Sugars not above No. 7 Dutch standard of color	1.75
Sugars from No. 7 to No. 10 Dutch standard of color	2.00
Sugars from No. 10 to No. 13 Dutch standard of color	2.25
Sugars from No. 13 to No. 16 Dutch standard of color	2.75
Sugars from No. 16 to No. 20 Dutch standard of color	3.25
Refined sugar and sugar above No. 20 Dutch standard of color	4.00
Act of March 3, 1875	
Increasing existing rate of 25 percent	
Act of June 3, 1875	
All raw sugar from Hawaii free as per treaty concluded January 30, 1875.	
(polariscope text adopted in combination with the Dutch standard in color test)	

See notes at end of Appendix A.

Item	Rate per pound			
	Raw		Refined	
	Full duty	Cuban	Full duty	Cuban
	Cents			
Act of March 3, 1883 (Morrill Act)	2.24	2.24	3.5	3.5
Act of October 1, 1890 (McKinley Act)	Free[1]	Free[1]	.5	.5
	Percent			
Act of August 17, 1894 (Wilson Bill) (ad valorem)	40	40	40[2]	40[2]
	Cents			
Act of July 24, 1897 (Dingley Bill)	1.685	1.685	1.95	1.95
On May 1, 1900, Puerto Rican sugar was Admitted into the United States at a reduction of 85% in the duty. Beginning with 1901, Puerto Rican sugar was admitted free in the United States. In 1902, the duty on Philippine sugars was reduced 25% from the then prevailing rate of 1.685 on raw sugar. Effective December 27, 1903, the duty on Cuban sugars was reduced 20% in accordance with the Reciprocity Act	1.685	1.348	1.95	1.56
Act of August 5, 1909 (Payne Act) admitted Philippine sugars into the U.S., free of duty to the extent of 300,000 tons.	1.685	1.348	1.95	1.52
Act of October 3, 1913 (Underwood Bill) 1. Duty reduced approximately 25% effective March 1, 1914. 2. Philippine sugars admitted free, no limitation. 3. Placed sugar on the free list, effective May 1, 1916. On April 27, 1916, this provision was repealed.	1.256	1.0048	1.36	1.088
Act of May 27, 1921 (Emergency Tariff Act)	2.00	1.60	2.16	1.728
Act of Sept. 22, 1922 (Fordney-McCumber Act)	2.206	1.7648	2.39	1.912
Tariff Act of 1930 (Hawley-Smoot Act, June 18, 1930)	2.50	2.00	2.65	2.12
Proclamation (based on Tariff Commission Report) by President Roosevelt on May 9, 1934, effective June 8, 1934	1.875	1.50	1.9875	1.59
Cuban Reciprocal Trade Treaty, proclaimed on August 24, 1934 effective Sept. 3, 1934	1.875	.90	1.9875	.954
President Roosevelt on Sept. 11, 1939, suspended quotas, automatically restoring duty on Cuban sugar to rate effective previous to Treaty of 1934	1.875	1.50	1.9875	1.59
Suspension of quotas terminated by President On December 26, 1939 duty on Cuban sugar reverted to rate prior to suspension.	1.875	.90	1.9875	.954
Supplemental Cuban Trade Treaty, proclaimed December 29, 1941, effective January 5, 1942	1.875	.75	1.9875	.795
Reciprocal Trade Treaty with Peru proclaimed June 29, 1942, effective July 29, 1942	.9375	.75	.99375	.795
United States Conference on Trade and Employment, at Geneva. Agreement with Cuba signed on October 30, 1947, as effective January 1, 1948	.6875	.50	.72875	.53
Torquary Tariff Conference, Agreement with Dominican Republic and Peru announced by State Dept. on May 8, 1951, proclaimed by President Truman on June 4, effective June 6, 1951	.625	.50	.6625	.53
Philippine Trade Act of 1946 Authorizing Agreement with the Philippines signed on July 4, 1946, effective July 4, 1954; amended by P.L. 83-474 (Act of July 5, 1954) and by Philippine Trade Agreement Revision Act of 1955, approved August 1, 1955 authorizing Revised Agreement signed Sept. 6, 1955, effective:				
January 1, 1956		.025		.0265
January 1, 1959		.05		.053
January 1, 1962		.10		.106
January 1, 1965		.20		.222
January 1, 1968		.30		.318

[1] A bounty of 2 cents per lb. was paid by the Government on domestic production. [2] Plus 1/8 cents per pound.

See notes at end of Appendix A.

APPENDIX B

Chronology of Principal U.S. Government Sugar Controls During World War II, 1939-1947

September 11, 1939—The President suspended sugar quotas under the Sugar Act of 1937. As provided in the Reciprocal Trade Agreement of 1934 with Cuba, the tariff on raw sugar from Cuba was increased from 0.90 cent per pound to 1.50 cents when quotas were suspended.

December 26, 1939—The President restored sugar quotas, and the tariff on raw sugar from Cuba was lowered from 1.50 cents per pound to 0.90 cent.

August 14, 1941—First ceiling price established by the United States Government in the World War II period was for sugar at 3.50 cents per pound, raw sugar, duty paid, basis New York City.

January 5, 1942—Ceiling price of raw sugar was raised to 3.74 cents per pound, basis New York City, with small differentials for other refining ports.

January 28, 1942—The U.S. Government, through the Defense Supplies Corporation, contracted for the purchase of the entire 1942 Cuban sugar crop, except for the quantity needed for consumption in Cuba, for 2.65 cents per pound, raw value, f.o.b. Cuban ports. The equivalent of approximately 700,000 tons of sugar was purchased in the form of invert molasses under the contract, which specified that one-third of the crop was to be processed into invert molasses.

April 14, 1942—The President suspended sugar quotas under the Sugar Act of 1937.

May 1, 1942—Sugar rationing was established for industrial and institutional users.

May 5, 1942—Sugar rationing was established for household consumers.

June 9, 1942—The President of the United States and the Prime Minister of Great Britain jointly authorized the creation of the Combined Food Board to recommend international allocations of sugar and other foods in short supply.

April 3, 1943—The U.S. Government contracted for the purchase of 2,700,000 tons of Cuban raw sugar for 2.65 cents per pound, f.o.b. Cuban ports. The purchase contract provided that Cuba would limit the total production of sugar in Cuba in 1943 to not more than 3,225,000 tons of raw sugar.

September 22, 1943—The U.S. Government contracted for the purchase of the 1944 Cuban sugar crop, with the exception of 200,000 tons for consumption in Cuba, for 2.65 cents per pound, f.o.b. Cuban ports.

April 1, 1944—The U.S. Government contracted for the purchase of invert molasses from the 1944 Cuban sugar crop. The quantity of 1944 crop Cuban raw sugar previously contracted for from Cuba was reduced sufficiently to permit the production of the invert molasses.

September 3, 1944—A uniform ceiling price on raw sugar, duty paid for all refining ports, was established at 3.75 cents per pound by the U.S. Government.

April 26, 1945—The U.S. Government contracted for the purchase of the entire 1945 crop of Cuban sugar, less 454,320 tons for consumption in Cuba and "free" export chiefly to Latin America, at 3.10 cents per pound for raw sugar, f.o.b. Cuban ports.

February 10, 1946—The ceiling of raw sugar, duty paid, was raised to 4.205 cents per pound.

July 1, 1946—The International Emergency Food Council took over the activities of the Combined Food Board.

July 16, 1946—The U.S. Government contracted for the purchase of the 1946 and 1947 crops of Cuban sugar, less 704,196 tons in 1946 and 738,270 tons in 1947 for consumption in Cuba and "free" export chiefly to Latin America. The basic minimum price for the 1946 crop of Cuban raw sugar was 3.675 cents per pound f.o.b. Cuban ports; that for the 1947 crop was the highest price actually paid by the United States for any of the 1946 crop of Cuban sugar. These prices were subject to increase in the event of certain contingencies.

September 18, 1946—The ceiling price of raw sugar, duty paid, was raised to 5.575 cents per pound.

November 20, 1946—The ceiling price of raw sugar, duty paid, was raised to 5.94 cents per pound.

January 18, 1947—The ceiling price of raw sugar, duty paid, was raised to 6.125 cents per pound.

March 30, 1947—The ceiling price of raw sugar, duty paid, was raised to 6.185 cents per pound.

June 11, 1947—The rationing of sugar to household users was ended.

July 28, 1947—The rationing of sugar to industrial and institutional users was ended. This was the last commodity removed from ration control during World War II.

August 6, 1947—The ceiling price of raw sugar, duty paid, was raised to 6.32 cents per pound.

September 23, 1947—The International Emergency Food Council announced that sugar-importing countries would be permitted to exceed their previously recommended allocations of sugar. This, in effect, ended international sugar allocations.

October 31, 1947—All price ceilings on sugar were removed, ending all World War II price controls except rent.

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