

**HAWAIIAN
SUGAR
MANUAL**



1980

**Hawaiian Sugar
Planters' Association**

HSPA SUGAR MANUAL 1980

A Hand Book of Statistical Information
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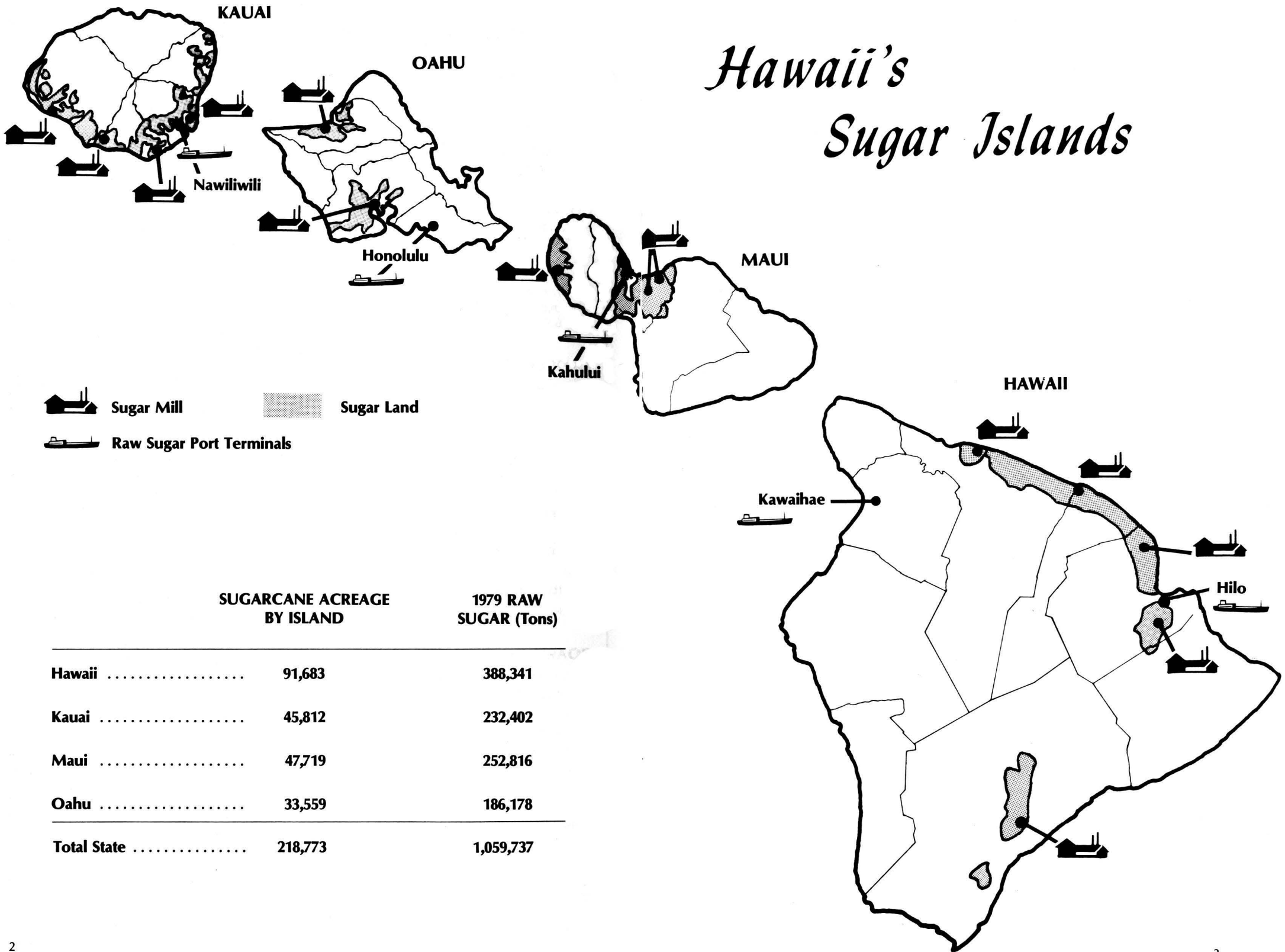
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Hawaii's Sugar Islands



 Sugar Mill
 Sugar Land
 Raw Sugar Port Terminals

	SUGARCANE ACREAGE BY ISLAND	1979 RAW SUGAR (Tons)
Hawaii	91,683	388,341
Kauai	45,812	232,402
Maui	47,719	252,816
Oahu	33,559	186,178
Total State	218,773	1,059,737

HAWAIIAN SUGAR COMPANIES

ISLAND OF KAUAI

GAY & ROBINSON
Makaweli, Kauai 96769
Phone: 338-8233

KEKAHA SUGAR COMPANY, LTD.
T. J. O'Brien, *Pres. & Mgr.*
Kekaha, Kauai 96752
Phone: 337-1472

THE LIHUE PLANTATION COMPANY, LTD.
L. A. Faye, Jr. *Pres. & Mgr.*
Lihue, Kauai 96766
Phone: 245-2112

McBRYDE SUGAR COMPANY, LTD.
R. F. Cameron, *Vice Pres. & Mgr.*
Eleele, Kauai 96747
Phone: 335-5337

OLOKELE SUGAR COMPANY, LTD.
R. B. Cushnie, *Vice Pres. & Mgr.*
Kaunakani, Kauai 96747
Phone: 335-5337

ISLAND OF OAHU

OAHU SUGAR COMPANY, LTD.
W. D. Balfour, Jr., *Pres. & Mgr.*
Waipahu, Oahu 96791
Phone: 677-3577

WAIALUA SUGAR COMPANY, INC.
W.W. Paty, Jr., *Pres. & Gen. Mgr.*
Waialua, Oahu 96791
Phone: 637-4520

ISLAND OF MAUI

HAWAIIAN COMMERCIAL
& SUGAR COMPANY
P. F. Conrad, *Gen. Mgr.*
Puunene, Maui 96784
Phone: 877-0081

PIONEER MILL COMPANY, LTD.
R. T. Vorfeld, *Pres. & Mgr.*
Lahaina, Maui 96761
Phone: 661-0592

WAILUKU SUGAR COMPANY
D. B. Cataluna, *Vice Pres. & Mgr.*
Wailuku, Maui 96793
Phone: 244-7079

ISLAND OF HAWAII

HILO COAST PROCESSING COMPANY¹
T. H. Inglett, *Exec. V. P. & Chief Exec. Off.*
Pepeekeo, Hawaii 96783
Phone: 963-5516; 963-6669

DAVIES HAMAKUA SUGAR COMPANY
P. E. Bouvet, *Vice Pres. & Gen. Mgr.*
Pauilo, Hawaii 96776
Phone: 775-7261

KA'U SUGAR COMPANY, INC.
I.W. Bowman, *Vice Pres. & Mgr.*
Pahala, Hawaii 96777
Phone: 928-8311

MAUNA KEA SUGAR COMPANY, INC.²
S.W. Knox, *Vice Pres. & Mgr.*
Papaikou, Hawaii 96781
Phone: 964-1025

PUNA SUGAR COMPANY, LTD.
J.T. Hummer, *Pres. & Mgr.*
Keaau, Hawaii 96749
Phone: 966-9242

¹Sugarcane milling company cooperatively owned by United Cane Planters Cooperative and Mauna Kea Sugar Co.

²Mauna Kea Sugar Company is a grower which delivers its cane to Hilo Coast Processing Co.

Part I

HAWAII'S SUGAR INDUSTRY

Within the past few years, the visitor industry has become a major economic base for Hawaii. From a very small business following World War II, tourism grew rapidly following Hawaii's statehood and the introduction of the jet aircraft. Military expenditures continue to be the second most important source of outside income for the state; while agriculture, although still important, is not the predominant factor it once was. In 1979 the Hawaiian economy realized an estimated \$2.62 billion from visitor spending and \$1.31 billion from federal defense expenditures. Revenue from agricultural products totaled \$688 million in 1979. Sugar accounted for \$346 million of this, pineapple for \$190 million, and diversified agricultural products for \$152 million.

The State of Hawaii imports most of its essentials—food, building materials, fuel, and clothing—so income from “export” products is necessary in the State's balance of trade.

SUGARCANE IN HAWAII

1778 was the bicentennial of the discovery of the Hawaiian Islands by Capt. James Cook. Capt. Cook noted in his journal that he observed sugarcane growing in the Islands on his discovery visits. This important food plant had been brought to Hawaii by the Polynesians who had arrived some 800 years before Cook. The Hawaiians did not produce crystallized sugar from their sugarcane; they, as did other Pacific Island peoples, chewed it.

Don Francisco de Paula Marin was the first European horticulturist who recorded his experiences with native and introduced plants in Hawaii. In March 1819 he noted that he had extracted juice from the sugarcane. There were other abortive efforts to produce sugar from sugarcane but the first successful operation was a plantation started at Koloa on the Island of Kauai in 1835. Some of the fields at Koloa have grown sugarcane continuously since then and are still producing satisfactorily today. Koloa first milled sugarcane in 1837 and 5,039 pounds of sugar and 400 pounds of molasses were sent out by ship in that year.

Sugarcane growing expanded throughout the Kingdom of Hawaii, slowly at first, but rapidly after the negotiation of the Reciprocity Treaty with the United States in 1876. It expanded even more rapidly after Hawaii became a territory of the U.S. Production had reached 100,000 tons in 1886, had expanded to 250,000 tons by 1897, and had doubled again to 500,000 tons in 1908.

In 1979, a total of 1,059,737 tons of raw sugar and 325,831 tons of molasses were produced in Hawaii.

GROWING SUGARCANE IN HAWAII

Hawaii's sugarcane industry differs from that in other sugarcane growing areas of the world in

two important respects. First, the harvest season is virtually year-round. Each raw sugar mill suspends operations at a selected period for maintenance and overhauling, usually one to two months in each year. Harvesting and planting, therefore, are carried on throughout the year. Second, the age of the sugarcane crop at harvest averages two years. A few fields are harvested at 18 months, while some may be as old as four years.

These characteristics of the sugarcane crop result from the fact that Hawaii has a temperate rather than a truly tropical climate, with more rain falling in the cool part of the year than in the warm part. Rainfall in Hawaii varies tremendously from place to place over very short distances. Average annual rainfall on some sugarcane land exceeds 200 inches, while on others it is as low as 15 inches. Accordingly, 55% of Hawaii's sugarcane lands are irrigated. The irrigated fields produce about 63% of Hawaii's annual production. Demands for available water, especially on the Island of Oahu, have become so great that scientists and engineers have sought more efficient ways of irrigating the sugarcane crop. Drip irrigation has developed rapidly and is now being used on some 30,000 acres, or about 25% of the irrigated area. It provides more efficient use of water, more uniform application and can be automated.

The irrigation systems, including not only the in-field application, but the tunnels, dikes, ditches, wells and pumps have all been designed and built by the sugar companies without any government assistance or contributions.

Hawaii's sugar industry is one of the most highly mechanized in the world. Heavy capital investment in field machinery and in factory processing equipment and controls have made Hawaii's sugarcane workers the most productive in the world.

PLANTING AND HARVESTING

Sugarcane is propagated vegetatively. Pieces of cane stalks, commonly called “seed” in Hawaii and called “cuttings” in many other parts of the world, are cut from growing sugarcane and are planted to start a new crop.

Sugarcane is planted by machines which drop the sugarcane pieces in rows and then cover the pieces with soil.

About half of Hawaii's sugar lands are harvested each year. When sugarcane is harvested, it grows again from the old stubble left in the ground. From two to four ratoon crops are obtained from each original planting. Then the field is plowed again and replanted with new seed pieces.

The fields are burned before harvest to dispose of accumulated dead leaves and other trash. Small, discrete areas are burned immediately before harvest. The fire is intense and brief and although there are large visible clouds of steam and some particulate matter, there are no harmful pollutants in the smoke from cane fires. Field burning is done under permits from the Hawaii State

Department of Health under regulations of the Federal Environmental Protection Agency. Burning is economically essential because the extra costs of transporting unburned trash to the mill and removing it there has been shown to be very high.

After the fields are burned, mechanical harvesters are used. These push the cane into windrows where giant grab cranes load the cane into tractor-trailers which haul the cane to the mill for processing into raw sugar.

Some plantations use a V-cutter, which has a v-shaped blade with a vertical cutting wheel at the front. The cane cut by this machine is also loaded with grab cranes after it is picked up and taken to the edge of the field.

New developments include mechanical harvesters now being used by some non-irrigated plantations. These harvesters cut the cane,

chop it into short lengths and use forced air to blow much of the trash and soil from the cane. Engineers are seeking new ways in which cane can be harvested and cleaned more efficiently.

RAW SUGAR TO THE U.S. MAINLAND

Almost all Hawaiian raw sugar is shipped to the U.S. mainland for refining and marketing. In 1979 this amounted to 95% of the total production. About 5% was refined at the C and H Sugar Company refinery in Aiea, Hawaii, primarily for Hawaiian consumption.

All Hawaiian raw sugar is transported in bulk form. The bulk sugar is loaded on ships from terminals at Kahului, Maui; Hilo and Kawaihae, Hawaii; Honolulu, Oahu; and Nawiliwili on Kauai.

In 1979 there were 52 voyages of ships carrying raw sugar from Hawaii to the U.S. mainland.

**HAWAIIAN SUGAR COMPANIES BY ISLANDS, WITH ACREAGE
AND PRODUCTION FOR 1979
(Raw Value)**

	Total Caneland Acreage	Acreage Harvested	Production (short tons)	Tons Sugar Per Harvestd Acre
HAWAII				
Hilo Coast Processing Co. (Processor only)			113,100 ¹	9.39
Mauna Kea Sugar Co. (Grower only)	17,722	8,478		
United Cane Planter Coop. (Grower only)	6,143	3,567		
(292 member-growers)				
Davies Hamakua Sugar Co.	35,636	15,008	157,845	10.52
Ka'u Sugar Co., Inc.	16,037	5,367	60,746	11.32
Puna Sugar Co., Ltd.	16,145	6,944	56,650	8.16
TOTAL HAWAII	91,683	39,364	388,341	9.85
KAUAI				
Gay and Robinson (Grower only)	2,667	1,259	17,735 ²	14.09
Kekaha Sugar Co., Ltd.	8,066	4,039	48,869	12.10
The Lihue Plantation Co.	17,347	9,117	79,045	8.67
McBryde Sugar Co., Ltd.	12,905	6,486	57,045	8.80
Olokele Sugar Co., Ltd.	4,827	2,344	29,708	12.68
TOTAL KAUAI	45,812	23,245	232,402	10.00
MAUI				
Hawaiian Commercial & Sugar Co.	34,250	14,214	176,234	12.40
Pioneer Mill Co., Ltd.	8,776	4,402	50,768	11.53
Wailuku Sugar Co.	4,693	2,370	25,814	10.89
TOTAL MAUI	47,719	20,986	252,816	12.05
OAHU				
Oahu Sugar Co., Ltd.	18,271	9,480	107,150	11.30
Waiialua Sugar Co., Inc.	15,288	7,535	79,028	10.49
TOTAL OAHU	33,559	17,015	186,178	10.94
TOTAL—ALL ISLANDS	218,773	100,610	1,059,737	10.60

¹82,642 tons attributed to Mauna Kea Sugar Co. 30,458 tons attributed to United Cane Planters Coop.

²Gay & Robinson sugarcane milled by Olokele Sugar Co., Inc.

**AVERAGE RAW SUGAR PRICE, AVERAGE DAILY EARNINGS
FOR NON-SUPERVISORY EMPLOYEES,
AVERAGE NUMBER OF ADULT
HOURLY-RATED EMPLOYEES, AND TOTAL MAN-DAYS
ALL HOURLY-RATED EMPLOYEES
ON HAWAIIAN SUGAR PLANTATIONS**

	Average New York Raw Sugar Price, cents per pound (Hawaiian Basis) ¹	Average Daily Earnings ²	Adult Hourly-Rated Employees ³	Total Man-Days Hourly-Rated Employees
1940	2.78	\$ 2.18	35,062	9,994,863
1941	3.39	2.48	30,646	8,870,704
1942	3.74	2.90	26,371	7,923,641
1943	3.74	3.59	23,847	7,562,690
1944	3.74	3.91	22,543	7,062,227
1945	3.75	5.10	20,806	6,350,489
1946	4.59	5.28	22,131 ⁴	5,247,294 ⁴
1947	6.22	7.63	22,743	6,443,424
1948	5.56	8.02	21,381	5,820,806
1949	5.81	8.04	20,258	5,437, 839
1950	5.93	8.30	19,340	5,069,682
1951	6.06	9.00	18,654	4,894,004
1952	6.26	9.70	18,193	4,653,898
1953	6.29	10.20	17,589	4,386,554
1954	6.09	10.58	16,773	4,163,264
1955	5.95	10.62	15,935	3,896,761
1956	6.09	10.73	15,065	3,646,860
1957	6.25	11.20	14,085	3,457,428
1958	6.27	12.78	13,304 ⁵	2,333,527 ⁵
1959	6.24	12.84	12,755	3,082,207
1960	6.31	13.18	12,111	2,917,459
1961	6.30	14.11	11,660	2,787,714
1962	6.45	14.96	10,960	2,675,974
1963	8.20	16.68	10,722	2,582,706
1964	6.90	17.60	10,516	2,593,094
1965	6.75	18.40	10,346	2,505,839
1966	6.99	19.76	10,040	2,447,554
1967	7.28	21.35	9,756	2,346,197
1968	7.52	21.62	9,481	2,282,654
1969	7.75	23.26	9,213 ⁶	2,066,244 ⁶
1970	8.08	24.24	8,908	2,139,183
1971	8.52	26.08	8,610	2,077,011
1972	9.10	29.09	8,127	1,934,563
1973	10.30	30.86	7,900	1,897,369
1974	29.43	34.41	7,700 ⁷	1,744,346 ⁷
1975	22.49	37.34	7,800	1,937,973
1976	13.31	43.12	7,500	1,854,272
1977	11.11 ⁹	43.92	7,200	1,660,298 ⁸
1978	13.74	47.06	7,200	1,771,530
1979	15.20 ¹⁰	50.49	7,065	1,762,838

¹Hawaiian basis is the average New York raw sugar price computed over all the days in the year. The New York price is computed for days the New York market is operating. Local sugar land leases are based on the Hawaiian basis rather than the New York basis.

²Cash wage only. Does not include "employee benefits."

⁷1974: industry-wide strike, 6 weeks.

³Prior to 1947 included only male adults.

⁸1977: industry-wide strike, 3 weeks.

⁴1946: industry-wide strike, 2½ months.

⁹New York spot price discontinued Nov. 2, 1977; after that date based on Clearing Association settlement prices.

⁵1958: industry-wide strike, 4 months.

¹⁰N.Y. spot price reinstated on Aug. 20, 1979.

⁶1969: industry-wide strike, 5 weeks.

WAGES, HOURS & WORKING CONDITIONS

Hawaii's sugar workers, both field and factory, are members of the International Longshoremen's and Warehousemen's Union (ILWU). A new contract was negotiated with the ILWU, running from February 1, 1980 through January 31, 1982. Under this contract, the minimum pay (Grade 1) is currently \$5.26 per hour, increasing to \$6.09 per hour August 1, 1980. The rate of pay for Grade 11 is \$7.50 per hour, increasing to \$8.63 per hour on August 1, 1980.

Unlike some farming areas where crops are seasonal, Hawaii's sugar industry provides year-round, long-term employment.

In 1979 the payroll for all Hawaii's sugar workers amounted to \$121,700,000.

DAILY AVERAGE EARNINGS IN 1979

Wages	50.49
Employee Benefits	22.21
Total	72.70

EMPLOYEE BENEFITS

Year-round employees receive up to four weeks vacation with pay, nine paid holidays a year; paid sick leave for up to 54 days plus a temporary disability supplement for extended illness, medical plan, a dental care plan for dependent children, retirement pensions, severance pay and many other benefits.

APPROXIMATE EMPLOYMENT BY OCCUPATION AT SUGAR COMPANIES

Factory	1,100
Field	2,800
Motive Equipment	1,500
Construction & Surveying	160
Clerical	210
Trades	1,350
Miscellaneous	350
Supervisors	1,030
Total	8,500

SUGAR LANDS

The Hawaiian Islands make up the union's fourth smallest state. The islands are actually the summits of a chain of volcanic mountains, some of which are still active. Only certain lowlands near the coasts are tillable because of the rugged terrain and the character of the soils. The balance is forest, pasture and wasteland.

Hawaii's sugar companies are located along the coastlines of the four sugar islands and push upwards into the foothills and mountains.

Approximately 220,000 acres are devoted to growing sugar in Hawaii, with about 35,000 acres in mill sites, roads, irrigation systems, etc., or un-

cultivated land. This is equal to about 5 percent of total land area and about 9 percent of total private land.

More than half of the sugar lands are owned by the sugar companies. The balance is leased from government or private owners.

ISLAND LAND AREAS WITH SUGAR

Island	Ex-treme Length Miles	Ex-treme Width Miles	Area Square Miles ¹	Acres 000's	1979 Total Cane Acreage ²
Hawaii	93	76	4,038	2,584	91,683
Maui	48	26	729	466	47,719
Oahu	44	30	608	388	33,559
Kauai	33	25	553	354	45,812
Molokai ...	38	10	261	167	—
Lanai	18	13	139	89	—
Niihau	18	6	73	46	—
Kahoolawe .	11	6	45	28	—
Minor Islands ...	—	—	4	2	—
Total			6,450	4,128	218,773

¹Includes land and inland water.

²Does not include mill sites, roads, etc.

HAWAII LAND OWNERSHIP

Private	58.0%
Hawaii State	34.6%
Federal Government	7.3%
Counties	0.1%
	<u>100.0%</u>

Source: State of Hawaii Data Book, 1979.

LAND USED BY SUGAR COMPANIES*

Sugar Companies & Independent Grower Farms		
<i>Land Used</i>		<i>Total</i>
<i>by Sugar Companies</i>	<i>Acreage</i>	<i>Acreage</i>
Owner in fee simple	142,236	
Leased from private owners or estates	69,046	
Leased from State of Hawaii	35,251	
Leased from U.S. Navy	<u>1,440</u>	
		247,973

<i>Land Used By Independent Grower Farms</i>		
Leased from sugar companies .	6,038	
Sub-leased from sugar companies	2,351	
Direct Ownership, or Leased from Other Sources	<u>3,544</u>	
Total		<u>11,933</u>
		<u>259,906</u>

*Includes attributable land (roads, resevoirs, mill sites and irrigation ditch systems) in addition to that used for cultivation.

CANE SUGAR: PRODUCTION IN HAWAII

Calendar year ¹	Tons sugar per acre	Tons cane per ton sugar	Total cane land area	CANE USED FOR SUGAR			SUGAR PRODUCED		Raw value 96° sugar made per short tons of cane	Molasses Production
				Acreage harvested ²	Average yield per acre	Production	Converted to 96° raw value ³	Equivalent refined ⁴		
1908-1909 ...	5.14	7.42	201,641	106,127	38.2	4,050,000	545,738	510,048	270	
1909-1910 ...	4.81	7.78	209,469	110,247	37.4	4,122,000	529,940	495,282	257	
1910-1911 ...	5.16	7.94	214,312	112,796	41.0	4,623,000	582,196	544,120	252	
1911-1912 ...	5.34	7.75	216,345	113,866	41.4	4,711,000	607,863	568,109	258	
1912-1913 ...	4.90	7.99	215,741	113,548	39.1	4,445,000	556,654	520,249	250	
1913-1914 ...	5.54	8.01	217,470	112,700	44.4	5,000,000	624,165	583,345	250	
1914-1915 ...	5.75	7.96	239,800	113,164	45.8	5,184,393	650,970	608,397	251	
1915-1916 ...	5.17	8.14	246,332	115,419	42.1	4,859,424	596,703	557,679	246	
1916-1917 ...	5.57	7.98	247,476	117,468	44.4	5,220,000	654,388	611,591	251	
1917-1918 ...	4.86	8.34	246,813	119,785	40.5	4,855,804	582,192	544,117	240	
1918-1919 ...	5.07	7.81	239,844	119,679	39.6	4,744,070	607,174	567,465	256	
1919-1920 ...	4.91	7.98	247,838	114,105	39.2	4,473,498	560,379	523,730	251	
1920-1921 ...	4.83	8.53	236,510	113,056	41.2	4,657,222	546,273	510,547	235	
1921-1922 ...	4.98	8.23	228,519	124,124	41.0	5,088,062	618,457	578,010	243	
1922-1923 ...	4.85	8.23	235,134	114,182	39.9	4,559,819	554,199	517,954	243	
1923-1924 ...	6.42	7.91	231,862	111,581	50.7	5,661,000	715,918	669,097	253	
1924-1925 ...	6.47	8.06	240,597	120,632	52.2	6,297,000	781,000	730,000	248	
1925-1926 ...	6.58	8.07	237,774	122,309	53.1	6,495,686	804,644	752,020	248	
1926-1927 ...	6.68	8.41	234,809	124,542	56.1	6,992,082	831,648	777,258	238	
1927-1928 ...	7.00	8.37	240,769	131,534	58.6	7,707,330	920,887	860,661	239	
1928-1929 ...	7.16	8.05	239,858	129,131	57.7	7,447,494	925,140	864,636	248	
1929-1930 ...	7.02	8.36	242,761	133,840	58.7	7,853,439	939,287	877,858	239	
1930-1931 ...	7.43	8.33	251,533	137,037	61.9	8,485,183	1,018,047	951,467	240	
1931-1932 ...	7.57	8.38	251,876	139,744	63.4	8,865,323	1,057,303	988,155	239	
1932-1933 ...	7.34	8.05	254,563	144,959	59.1	8,566,781	1,063,605	994,045	248	
1933 (Oct. 1- Dec. 31) ..	—	—	—	—	—	—	127,317	118,990	—	
1934	7.14	8.33	252,237	134,318	59.5	7,992,260	959,337	896,596	240	
1935	7.82	8.67	246,491	126,116	67.8	8,555,424	986,849	922,309	231	
1936	7.97	8.80	245,891	130,828	70.1	9,170,279	1,042,316	974,149	227	
1937	7.46	9.32	240,833	126,671	69.5	8,802,716	944,382	882,619	215	
1938	6.92	9.39	238,302	135,978	65.0	8,835,370	941,293	879,732	213	
1939	7.18	8.66	235,227	138,440	62.2	8,609,543	994,173	929,154	231	
1940	7.16	8.76	235,110	136,417	62.7	8,557,216	976,677	912,802	228	
1941	7.24	9.04	238,111	130,768	65.5	8,559,797	947,190	885,244	221	
1942	7.58	9.10	225,199	114,745	69.0	7,918,342	870,099	813,195	220	
1943	7.79	9.24	220,928	113,754	71.9	8,185,400	885,640	827,719	216	
1944	7.99	8.95	216,072	109,522	71.5	7,832,185	874,947	817,725	223	
1945	7.96	8.98	211,331	103,173	71.4	7,371,158	821,216	767,509	223	
1946	8.06	8.83	208,376	84,379	71.1	6,002,127	680,073	635,596	227	212,230
1947	7.72	9.11	211,624	113,020	70.3	7,942,216	872,187	815,146	220	285,190
1948	8.35	9.03	206,550	100,042	75.4	7,542,613	835,107	780,491	221	254,740
1949	8.76	8.44	213,354	108,794	73.9	8,045,941	955,890 ⁵	893,375	238	251,500
1950	8.78	8.51	220,383	109,405	74.7	8,174,821	960,961 ⁶	898,114	235	259,130
1951	9.09	8.51	221,212	109,494	77.4	8,477,201	995,759	930,636	235	270,585
1952	9.44	8.52	221,990	108,089	80.4	8,693,920	1,020,450	953,712	235	259,360
1953	10.15	8.19	221,542	108,337	83.1	9,003,967	1,099,316	1,027,421	244	287,480
1954	10.02	8.75	220,138	107,480	87.75	9,431,781	1,077,347	1,006,889	228	306,910
1955	10.74	8.66	218,819	106,180	92.94	9,867,978	1,140,112	1,065,525	231	295,550
1956	10.28	9.01	220,606	106,956	92.65	9,909,990	1,099,543	1,027,633	222	305,580
1957	10.16	8.71	221,336	106,742	88.51	9,447,647	1,084,646	1,013,710	230	303,700
1958	9.09	9.87	221,683	84,136	89.77	7,552,750	764,953	714,925	203	307,210
1959	8.83	9.66	222,588	110,371	85.31	9,416,225	974,632	910,891	207	330,790
1960	9.03	9.20	224,617	103,584	83.15	8,613,317	935,744	874,546	217	299,590
1961	10.09	8.78	227,027	108,320	88.58	9,595,342	1,092,481	1,021,033	228	329,960
1962	10.31	8.76	228,926	108,600	90.36	9,812,580	1,120,011	1,046,762	228	335,510
1963	10.25	9.12	231,321	107,436	93.39	10,033,969	1,100,768	1,028,777	219	322,610
1964	10.64	8.90	233,145	110,759	94.76	10,495,175	1,178,770	1,101,678	225	336,250
1965	11.11	8.82	235,576	109,600	97.97	10,737,507	1,217,667	1,138,033	227	340,190
1966	11.12	8.89	237,499	111,005	98.82	10,969,925	1,234,121	1,153,409	225	349,540
1967	10.65	9.27	239,813	111,837	98.74	11,045,949	1,191,042	1,113,148	216	359,170
1968	10.85	9.15	242,476	113,525	99.36	11,279,920	1,232,182	1,151,597	218	368,050
1969	10.44	9.17	242,216	113,232	95.73	10,839,272	1,182,414	1,105,060	218	340,330
1970	10.21	9.00	238,997	113,816	91.88	10,457,377	1,162,071	1,086,000	222	322,480
1971	10.62	8.69	232,278	115,810	92.26	10,685,019	1,229,976	1,149,510	230	330,227
1972	10.32	8.87	229,611	108,456	91.55	9,929,068	1,118,883	1,045,708	225	307,543
1973	10.43	8.55	226,580	108,189	89.15	9,645,452	1,128,529	1,054,723	234	301,500
1974	10.86	8.73	224,227	95,826	94.76	9,082,684	1,040,742	972,677	229	293,380
1975	10.53	8.57	221,426	105,125	90.23	9,485,299	1,107,199	1,034,788	233	301,335
1976	10.51	8.73	221,551	99,926	91.79	9,172,649	1,050,457	981,757	229	275,352
1977	10.68	8.70	220,729	96,770	92.95	8,994,388	1,033,739	966,132	230	284,349
1978	10.36	9.00	220,697	99,355	93.23	9,263,190	1,028,933	961,641	222	310,238
1979	10.53	9.09	218,773	100,610	95.74	9,632,135	1,059,737	990,430	220	325,831

¹Until 1934 represented period Oct. 1 through Sept. 30.

²The average growth of a crop is from 22 to 24 months. Only a portion of the total acreage in cane is harvested each year.

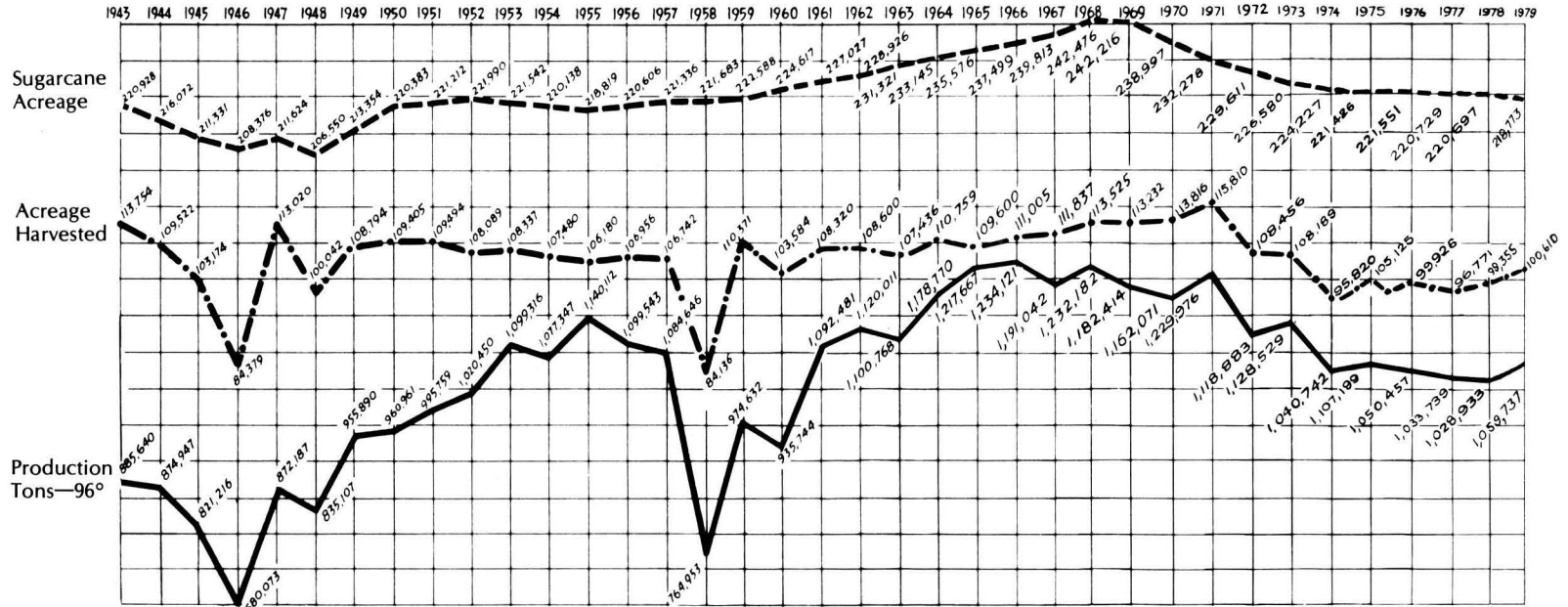
³Converted in accordance with Sugar Regulations, Series 1, No. 1, U.S. Department of Agriculture, Agricultural Adjustment Administration, issued February 18, 1935, or Section 101(h) of the Sugar Act of 1948 or corresponding provisions of its predecessors as the case may be.

⁴1 ton of sugar, 96° test is assumed to be equivalent to 0.9346 tons of refined.

⁵Includes 2,369 tons raw sugar produced from volunteer cane for which no acreage shown.

⁶Includes 2,690 tons raw value sugar produced from volunteer cane for which no acreage shown.

HAWAIIIAN SUGARCANE ACREAGE, ACREAGE HARVESTED, AND PRODUCTION



1946: Industry-wide strike, 2½ months.

1958: Industry-wide strike, 4 months.

1969: Industry-wide strike, 5 weeks.

1974: Industry-wide strike, 6 weeks.

1977: Industry-wide strike, 3 weeks.

HAWAIIAN SUGAR PLANTERS' ASSOCIATION

The Hawaiian Sugar Planters' Association is a voluntary, non-profit, incorporated association for the maintenance, advancement, improvement and protection of the sugar industry in Hawaii, the support of an Experiment Station, and the doing of all such matters and things as shall be incidental to such purposes and objects.

Plantation members of the Association are those companies in Hawaii engaged primarily in the business of raising sugarcane and manufacturing sugar from it. Active members are elected from among individuals who are directly connected with the direction, management, or operation of the sugar companies.

The Association carries out many of its activities through standing committees and these are: Accounting, Energy, Environmental Standards, Industrial Relations, Insurance, Land and Water, Legislative, Public Relations, Tax, and Experiment Station Advisory.

EXPERIMENT STATION

The Association's largest program is the Experiment Station which conducts research on basic physiology and biochemistry of the sugarcane plant; on cultural practices, including methods of planting, fertilizing and irrigating; on breeding and selection of new sugarcane varieties; on the control of pests, including insects, weeds, diseases and rats; on chemistry, including methods of analysis for plant and soil constituents, for pesticide residues and for other purposes as needed; on sugarcane factory processes and process control; on sugar recovery from milling sugarcane; on raw sugar quality; and on the design and engineering of equipment, both field and factory.

With recent national and state emphasis on alternate energy sources, the Experiment Station has cooperated with state and federal agencies in evaluating potential energy production from sugarcane and its products.

In addition to its research, the Experiment Station provides some services to its member companies such as routine analyses of raw sugar and molasses, including determinations of pol, moisture, color, filterability, grain size and ash; plant and soil analyses to determine fertilizer needs; the repair and calibration of sugar factory instruments; field, factory, and factory laboratory audits; and short courses for training employees of member companies.

The Experiment Station has a large library, consisting of reference volumes and periodicals on sugarcane growing and milling, as well as on general agriculture, chemistry and engineering.

The Experiment Station maintains and operates substations on Oahu, Kauai, Maui and Hawaii. There are two principal substations on Oahu, one at Kunia for general research and one at Maunawili for the maintenance of parent material and for the crossing of sugarcane varieties for the development of new varieties. Substations on

Kauai, Maui and Hawaii provide areas in which seedlings from the breeding program can be grown and evaluated and where some other agricultural research can be done.

The Experiment Station can now offer its services for sale in other sugarcane growing areas or for any agricultural problem to which its capabilities can be applied. These services include consulting on all agricultural problems, the conduct of experiments either in the Association's laboratories or in the area in question, and the Station can offer sugarcane hybridization to the order of the customer. Information on these services can be obtained from the Experiment Station Director.

WASHINGTON REPRESENTATIVE

The Association maintains an office in Washington, D.C. where a vice president represents the member companies' interests in federal legislative actions and in the actions of federal administrative and regulatory departments.

REFINING AND MARKETING HAWAII'S CANE SUGAR

California and Hawaiian Sugar Company, San Francisco markets all the raw cane sugar and molasses produced in the state of Hawaii. It is the nation's second largest marketer of refined sugar.

ORGANIZATION

Best known by its brand name, "C and H", the company is an agricultural marketing association as defined by the Capper-Volstead Act, which authorizes formation of cooperative marketing associations by producers of agricultural products.

C and H stock is owned by 14-member sugar producing companies in Hawaii in substantially the same proportions as the tonnage each markets through the association.

The company also serves as refining and marketing agency for the 500-600 independent sugarcane farmers in Hawaii.

All proceeds of sugar and molasses sales, less only authorized costs of operation, are returned to member companies and sugarcane growers represented by C and H.

HISTORY

In 1906 Hawaiian producers, representing more than 80 per cent of the islands' production, acquired a refinery at Crockett, California and formed C and H to compete for sales in the U.S. refined sugar market. Their's was a successful effort to overcome price discrimination against Hawaiian raw sugar practiced by a "sugar trust" which existed among mainland sugar refiners at the time.

Originally a commercial corporation, C and H was reorganized along cooperative lines in 1921. Since 1948 it has marketed Hawaii's entire cane sugar and molasses output.

OPERATIONS

C and H takes title to the raw sugar at the factories, transports it to port terminals and ships it

to the refinery in California, or transports it to the refinery at Aiea, Oahu. It has capacity in its two refineries to refine about 1 million tons of raw sugar annually. Raw sugar not required for C and H refining operations is sold to other refiners. Molasses is sold by C and H to distributors primarily for use in animal feed.

The C and H refinery at Crockett, California near San Francisco, which began operations in 1906, has been developed until it is acknowledged as the largest in the world. It has capacity to melt some 960,000 tons of raw sugar annually.

A smaller C and H refinery at Aiea near Honolulu can process about 40,000 tons of raw sugar a year, primarily to supply Hawaii's refined sugar requirements.

Raw sugar is delivered from Hawaii to Crockett in bulk cargo ships carrying from 16,000 to 31,000 tons of raw sugar per voyage. Raw sugar is mechanically discharged into refinery storage bins which have capacity for more than 100,000 tons.

PRODUCTION

The Crockett refinery operates the year around, three shifts a day in 10-day production cycles, followed by four-day shut-downs.

Refined sugars are produced in more than 100 types, grades and package sizes. In addition to an unsurpassed variety of packaged sugars for the grocery trade, sugars are produced for industrial use in packaged, bulk granulated and liquid form. High speed packaging equipment can turn out more than a million consumer-size packages of refined sugar daily.

STORAGE AND DISTRIBUTION

The refinery has storage facilities for approximately 55,000 tons of packaged, dry bulk and liquid sugars. Most customers receive shipments directly from the refinery by rail or truck. However, to expedite service to many customers, C and H maintains inventories of packaged sugars in some 30 public warehouses strategically located throughout the company's marketing territory. In addition, liquid and bulk sugar distri-

bution depots are maintained in Portland, Oregon, Seattle, Washington, Los Angeles, California; and liquid sugar facilities in Phoenix, Arizona.

MARKETING

C and H brand sugar is sold primarily in the west from the Pacific Coast to the Mississippi River Valley plus Hawaii and Alaska. C and H brand sugar is distributed more widely in this region than any other brand.

Competition for sugar sales throughout the region, with beet sugar producers and southern cane and eastern cane refiners, is intense.

C and H marketing is carried out through sales offices in San Francisco, Oakland and Los Angeles, California and through food brokers' offices in major cities from the Northwest into the Midwest.

Intensifying competition in recent years has been the advent of private labels in packaged consumer items, generally sold at a discount below advertised labels. Some of this form of marketing developed as a response to the "brand franchise," or superior consumer acceptance of the C and H brand in a number of major markets. C and H has, however, been able through strong sales and promotion efforts to maintain its share of the market. The greatest impact of private labels has been, however, a depressant on prevailing market price levels, since the private labels generally are sold at a discount below established brands.

GENERAL

Over the past decade, annual C and H sales have averaged about \$395 million, and have returned an average of about \$290 million annually to Hawaii's producers. The company employs approximately 1,500 persons in mainland operations and has about 70 employees at the Aiea refinery. Payroll totals almost \$37 million annually.

Robert O. Nagle is president and chief executive officer of C and H. Company headquarters are at One California Street, San Francisco, 94106.

IMPORTANT HISTORICAL DATES

- 1825 First sugarcane plantation attempted in Manoa Valley, Oahu.
- 1835 Ladd & Company founded first successful plantation, Koloa on Kauai.
- 1837 First Koloa sugar, 2.1 tons.
- 1838 Twenty sugar mills in operation, 18 animal powered, 2 water.
- 1852 Arrival of first Chinese laborers. First sugar centrifugal introduced, Makawao Plantation.
- 1853 First steam engine, Koloa.
- 1857 Irrigation introduced, Lihue.
- 1859 First steam mill, Lihue.

- 1860 Judd and Wilder established first mill on Oahu, Kualoa Plantation.
- 1863 Pepeekeo introduced vacuum pan.
- 1868 First Japanese laborers arrived.
- 1876 Reciprocal trade treaty, Kingdom of Hawaii and United States, admitted sugar duty free. Alexander & Baldwin built Hamakua Ditch at cost of \$80,000, first large-scale irrigation on islands, 17 miles long and producing 40,000,000 gallons a day.
- 1878 Portuguese immigrants arrived.
- 1879 Ewa drilled first artesian well; Onomea pioneered with commercial fertilizer.
- 1881 German immigrants arrived at Lihue; Hamakua bought first steam plow.

- 1882 Planters' Labor & Supply Co. organized.
- 1886 First 100,000-ton crop.
- 1895 Planters' Labor and Supply Co. dissolved and members immediately organized as Hawaiian Sugar Planters' Association. HSPA Experiment Station started and first chemist hired. Makee inaugurated night grinding. Ewa installed 9-roller mill.
- 1897 First 250,000-ton crop.
- 1898 Hawaii annexed to United States.
- 1904 Leaf hopper parasites introduced from Australia.
- 1905 H-109 variety of cane germinated from seedling.
- 1906 California & Hawaiian Sugar Refining Corp. founded; Filipino immigration.
- 1907 Oahu Sugar Co. installed first 12-roller mill.
- 1910 Kilauea introduced gasoline tractor. Cane borer parasite introduced from New Guinea.
- 1916 Anomala beetle parasite introduced from the Philippines.
- 1920 Leaf hopper completely controlled by egg-sucking parasite introduced from Australia and Fiji.
- 1922 First commercial-scale mechanical loading of cane by self-propelled vehicle.
- 1923 First Dorr Clarifiers (2 factories).
- 1924 First of series of ten consecutive record crops.
- 1926 First Oliver Filter, Oahu Sugar Company.
- 1928 Establishment of sugarcane quarantine station on Island of Molokai.
- 1932 First million-ton crop; *bufo marinus*, insectivorous frog, brought to Territory to control pests.
- 1934 First high-speed sugar centrifugals — Waialua.
- 1935 Long-line irrigation widely adopted by plantations.
- 1936 First major use of trucks for cane hauling. HSPA insect and plant disease quarantine started on Midway Island.
- 1937 Expedition to New Guinea to collect wild sugarcane for breeding. Mechanical harvesting begun at Ewa Plantation. Development of "prebaiting" technique of rat control. Research on food yeast from molasses. Mechanical harvesting by "grabs" started—Ewa Plantation.
- 1940 Kaiwika Sugar Co. was first plantation in Hawaii to transport 100 percent of its cane to mill by trucks.
- 1941 32-8560 displaces H-109 as leading variety. First precision refractometer for factory control.
- 1942 New armyworm parasite brought from Texas. Plantation operations subordinated to defense requirements. War brings acute shortage of labor and equipment, resulting in forced use of all known types of mechanization. First bulk sugar plant began operating at Kahului, Maui.
- 1945 Development of activated diesel oil emulsion for weed control. Organization of the Agricultural Engineering Research Department to consolidate and expand research development. HSPA furnished \$100,000 to finance University of Hawaii Agricultural Engineering Institute buildings and equipment. Ion exchange research started.
- 1946 Production reduced severely by two-and-a-half month strike.
- 1947 Plantation railroads rapidly being replaced with trucks. Field testing started on several types of cane cutters. Ion exchange pilot plant in operation.
- 1948 V-cutter and side-mounted cutter for un-irrigated cane and 2-line cutter for irrigated cane developed. Chemical weed control with pre-emergence and contact herbicides used on all plantations.
- 1949 Second bulk sugar plant began operating at Hilo, Hawaii.
- 1950 First commercial models of HSPA-developed harvesting machines for both irrigated and un-irrigated plantations put into operation at three plantations; third bulk sugar plant began operating at Nawiliwili, Kauai; aluminum flumes used on a field scale for irrigation and cane transport.
- 1951 By-products pilot plant installed at Oahu Sugar Co., Ltd.; direct-mounted cane cutter and infield transport machine for un-irrigated plantations developed; 37-1933 replaces 32-8560 as leading cane variety; radioactive materials used in irrigation and fertilization experiments; 40-hour week for half the year established on plantations; first bulk raw sugar shipments made to east coast. Aerial fertilization began.
- 1952 Cane buggy adopted by Hilo Coast plantations.
- 1953 First commercial application of liquid nitrogen fertilizer (aqua ammonia) made at Ewa Plantation Co.; Kauai and Maui plantations hit hardest by one of the Territory's worst droughts.
- 1954 First industry-wide pension plan established; HSPA corrosion inhibitor developed; 124-acre arboretum deeded to the University of Hawaii; HSPA meteorologists participate in Project Shower, "warm" rainfall study.
- 1955 Bulk sugar storage-loading plant completed at Honolulu.
- 1956 California & Hawaiian Sugar Company celebrated its fiftieth anniversary. Total half-century production came to nearly 25 million tons of raw sugar refined.

- 1958 Four-month-long, industry-wide strike drastically reduced production.
- 1959 Tenth Congress of International Society of Sugar Cane Technologists held in Honolulu.
- 1960 Variety 44-3098 replaced 37-1933 as leading cane variety.
- 1961 Production, reduced for three years by the 1958 strike, returned to normal levels.
- 1962 Hakalau Sugar Company was merged into Pepeekeo Sugar Company, reducing the number of sugar companies to 25. Variety 50-7209 replaced 44-3098 as leading cane variety.
- 1964 First sugarcane diffuser began commercial operation at Pioneer Mill.
- 1965 Hilo Sugar Co. and Onomea Sugar Co. merge to form Mauna Kea Sugar Co.
- 1966 Record raw sugar crop of 1,234,121 tons was produced.
- 1967 First commercial model of HSPA developed sugarcane drycleaner tested at Laupahoe Sugar Co.
- 1969 Five-week industry-wide strike over terms of new three-year contracts.
- 1970 First commercial sugarcane drycleaner installed at Paauhau Sugar Co. on Hawaii Island.
- 1971 Months-long West Coast Longshoremens' strike stops shipments C and H, disrupts C and H marketing program, and creates raw sugar and molasses storage problems in Hawaii. Smut disease discovered on Oahu.
- 1972 Subsurface and drip irrigatin research intensified. Smut infection found on more than 5,000 acres on Oahu. Molokai quarantine station closed. USDA agrees to undertake 2-year quarantine for Hawaii canes at Beltsville, Maryland. Hutchinson Sugar Co. and Hawaiian Agricultural Co. merged to form Ka'u Sugar Company, reducing number of sugar companies to 18. Hilo Coast Processing Company organized as a sugar processing cooperative to mill cane produced by Mauna Kea Sugar Co. and members of United Cane Planters' Cooperative.
- 1973 Smut testing of 8,000 varieties completed. Top two varieties, 50-7209 and 59-3775 remain uninfected. First temporary registration for chemical ripener for sugarcane obtained. Nearly 3,000 acres of furrow-irrigated lands converted to flat culture by installing drip irrigation. Harvesting methods field trials stepped up. Success obtained with HSPA rock-removal cane drycleaner tested at Pioneer Mill Company, Ltd. First voyage of new ship, Sugar Islander, leased by California and Hawaiian Sugar Co. to take Hawaii sugar to the Mainland. Grove Farm announced it was going out of sugarcane operations. Grove Farm sugarcane lands and leases were taken over by McBryde Sugar Co. and The Lihue Plantation Co. Paauhau Sugar Co. purchased by Honokaa Sugar Co.
- 1974 Variety 59-3775, developed by HSPA geneticists, became the most widely planted sugarcane within the State. Industry-wide strike closed all but Kohala Sugar Co. from March 9 through April 23. Plans were prepared for new HSPA facility in Aiea on same site as the C and H refinery. Sugar Act expired midnight, December 31. Hamakua Mill Co. merged into Laupahoe-hoe Sugar Co.
- 1975 HSPA offices and Experiment Station moved from Makiki to new \$5 million facility in Aiea. An additional \$600,000 was spent for modernizing and equipping the HSPA breeding station at Maunawili. Kohala Sugar Company was closed at the end of the 1975 grinding season. A total of 46,822 tons Hawaiian raw sugar was sold by California and Hawaiian Sugar Company to Japanese buyers.
- 1976 Hilo Coast Processing Co. closes Wainaku Mill as improvements to conform with EPA regulations completed at company's two other factories—Pepeekeo and Papaikou. Drought continued through 1976 and caused lower raw sugar production. Raw sugar prices in the United States reduced returns to Hawaiian producers. Companies announced reductions in force and measures to economize. On September 26, 1976 the President increased tariff on imported raw sugar from .625 cents per lb. to 1.875 cents per lb. Senate and President request investigation by United States International Trade Commission on effect of imports of raw sugar on domestic producers.
- 1977 President Carter puts into effect "Interim Program" of direct support payments to sugar producers. Congress adopts de la Garza amendment making sugar eligible for loan or purchase under Commodity Credit Corporation program. When bill to which this amendment attached signed by the President, interim payment program terminated. Record quantities of raw and refined sugar imported into the United States. Three-week industry-wide strike in November, 1977. Extended drought conditions; reservoirs and ditch flows below normal.
- 1978 HSPA incorporated. Kona storms returned with substantial rains in November. Sugar Stabilization Act of 1978 fails to pass U.S. Congress. Wailuku factory closes.
- 1979 Laupahoe-hoe and Honokaa Sugar Companies were merged to form a single company called Davies Hamakua Sugar Company. Record-breaking rainfall in Honokaa-Hamakua area, Island of Hawaii, during January-March, several stations recording 2½ times the normal amount for the three months. One station received 93 inches of rain in January alone.
- 1980 U.S. Congress passed enabling legislation making the U.S. a full-fledged participant of the International Sugar Agreement.

Part II

U.S. SUGAR INDUSTRY

The U.S. sugar needs are met from several sources, both domestic and foreign. Nineteen states, including Hawaii, produce sugarcane or sugar beets. Raw sugar, produced from sugarcane, is imported from some 38 countries.

In 1979 the U.S. produced about 53% of its sugar requirements, the balance being made up by imports of foreign produced raw sugar. Of the approximately 5.8 million tons of sugar produced in the U.S. during 1979, approximately 3.1 million tons were from beets and 2.7 million tons from sugarcane. A new factor in the supply of nutritive sweeteners is High Fructose Corn Syrup (HFCS), produced from corn. This product is in addition to corn syrup and dextrose which have been important sweeteners for a long time. Total sweetener production from corn in 1979 was approximately 4.4 million tons.

Sugar beets are grown in 16 states and there are beet processing factories in 14 states (see map below).

Sugarcane is grown and milled in the states of Florida, Hawaii, Louisiana and Texas and also in the Commonwealth of Puerto Rico (see map, page 18).

Corn is grown in significant amounts in 26 states although only a small proportion of the crop is used for processing. HFCS is produced in factories located in 9 states (see map, page 18).

Foreign raw sugar is received at refineries located

in principal port cities on the East Coast and the Gulf of Mexico, plus one large factory which handles Hawaiian raws located near San Francisco.

During 1979 a total of 5.1 million tons of sugar was imported into the U.S. This is more than the amount imported in 1978 and is 1.3 million tons less than the quantity imported in 1977.

Total refined sugar deliveries in the United States in 1979 were 9,934,468 tons. Of this, approximately 6.2 million tons were used in industrially-produced products such as soft drinks, baked goods and dairy products. Most of the balance was used at home and in meals served in restaurants and institutions.

BEET SUGAR INDUSTRY

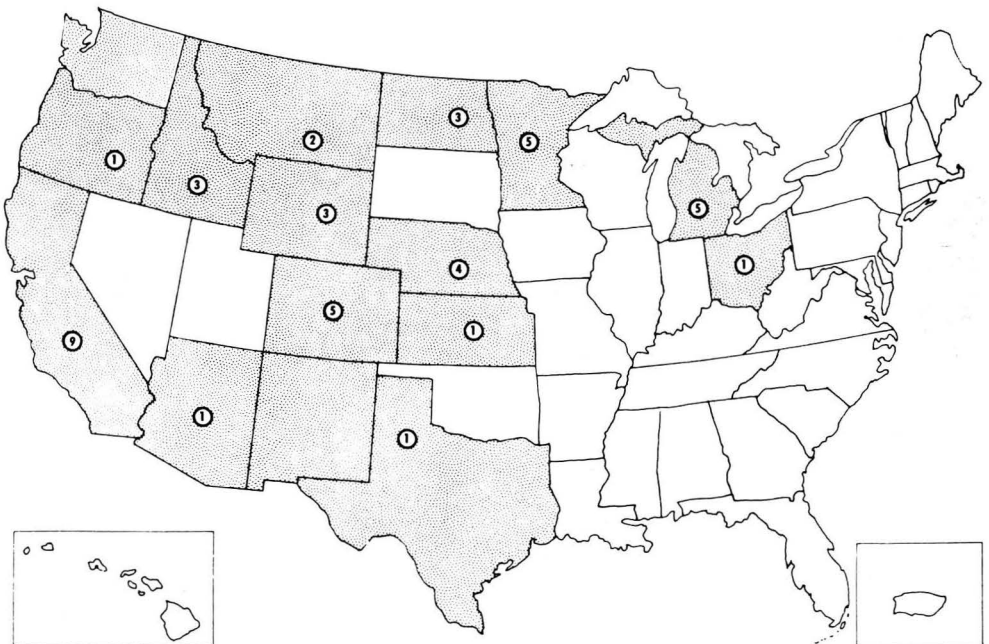
About 53% of the sugar produced in the U.S. comes from beets. Sugar beets are grown by farmers who contract to deliver their crops to the sugar beet processing companies which operate a total of 44 factories in 14 states.

A majority of the nations beet sugar factories are located in 8 western states. There are others, however, in the Red River Valley of North Dakota, Minnesota and in the Upper Midwest.

CANE SUGAR INDUSTRY

Of all the refined sugar consumed in the U.S., almost 70% comes from sugarcane. Most of this cane sugar is refined in the 22 refineries which are located principally on the East and Gulf Coasts.

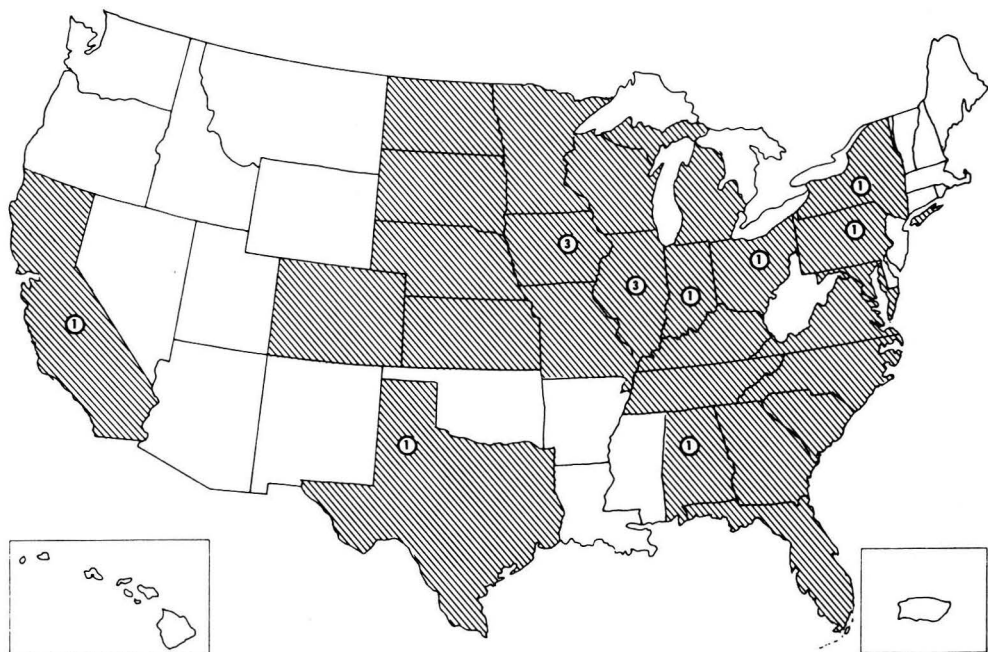
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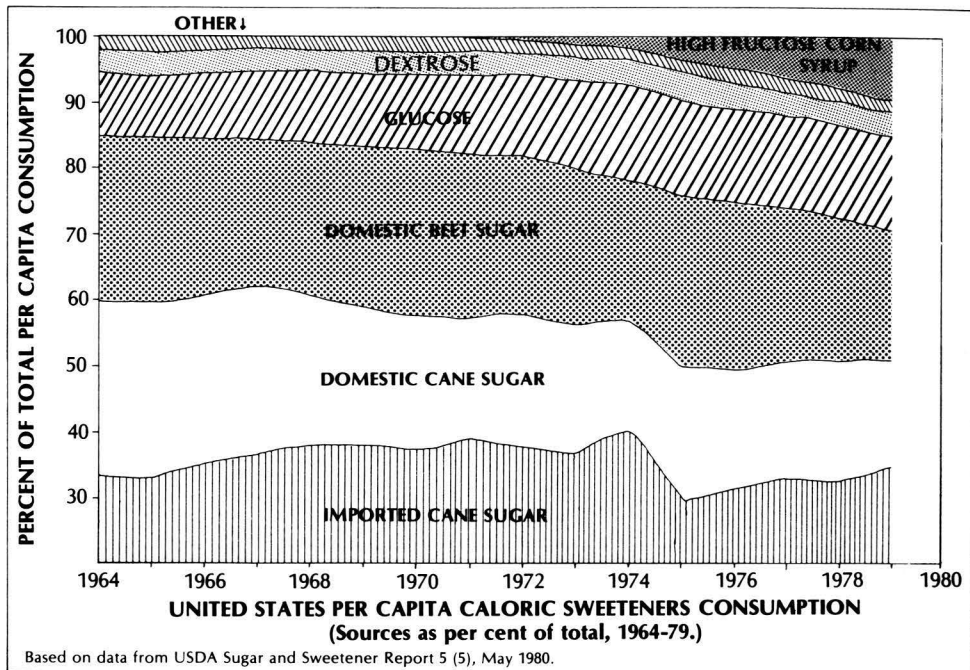
States that are shaded grow sugar beets. Figure in circle indicates number of beet processing factories in state.



States designated by crosshatch grow sugarcane. Figure in circle indicates number of raw sugar mills in state.



States designated by diagonal lines grow a substantial (more than 400,000) acreage of corn. Figure in circle indicates number of factories that produce high fructose corn syrup (HFCS).



Continued from page 17

The 15 companies that operate sugar refineries and the location of their refineries are as follows:

Revere Sugar Corporation	Brooklyn, N.Y.
	Chicago, ILL
	Charlestown, Mass.
Amstar Corp.	Boston, Mass.
	Brooklyn, N.Y.
	Philadelphia, Pa.
	Baltimore, Md.
	Chalmette, La.
Supreme Sugar Co. Inc.	Supreme, La.
California and Hawaiian Sugar Co.	Crockett, Calif.
	Aiea, Hawaii
Colonial Sugars Co.	Gramercy, La.
Everglades Sugar Refinery, Inc.	Clewiston, Fla.
Florida Sugar Refinery, Inc.	Belle Glade, Fla.
Godchaux-Henderson Sugar Co., Inc.	Reserve, La.
Imperial Sugar Co.	Sugar Land, Texas
Industrial Sugars, Inc.	St. Louis, Mo.
The National Sugar Refining Co.	Philadelphia, Pa.
Refined Syrups & Sugars, Inc.	Yonkers, N.Y.

Savannah Foods & Industries, Inc. Port Wentworth, Ga.
 The South Coast Corp. . . Mathews, La.
 Holly Sugar Corp. Santa Ana, Calif.

Source: USDA Economics Statistics & Cooperative Services

CORN SWEETENERS

The principal corn sweeteners—corn syrup or glucose and dextrose—have contributed substantially to total caloric sweetener use in the U.S. for many years. During the past 17 years, however, consumption of corn sweeteners has increased from about 13 lbs per capita to 38 lbs per capita. Per capita consumption of other caloric sweeteners—sugar, honey and other syrups—has declined slightly during the same period.

The comparatively recent development of High Fructose Corn Syrup (HFCS) added a new corn product that is directly competitive with sugar for many industrial uses. This product was first produced in commercial amounts in 1967 and its use increased slowly until the past few years, during which it has become an important product. Per capita consumption in 1979 is estimated to be 15.0 lbs which is 11.5% of all nutritive sweetener consumption. The table on the following page reports per capita consumption of sweeteners in the U.S. for the period 1963-79.

**CALORIC AND NON CALORIC SWEETENERS:
PER CAPITA U.S. CONSUMPTION, 1963-79**

Calendar	Refined cane and beet sugar						Corn sweeteners ¹				Minor caloric ¹			Noncaloric sweeteners ²			
	U.S. grown sugar			Cane sugar							Total caloric	Saccharin	Cyclamate	non-caloric			
	Beet sugar	Cane sugar	Total	Im-ported	Total	Total	Corn syrup		Dex-trose	Total					Honey	Edible syrups	Total
							High-fructose	Glucose									
									<i>Pounds</i>								
1963	27.2	28.2	55.4	41.9	70.1	97.3	—	9.9	4.3	14.2	1.1	.7	1.8	113.3	3.0	.7	3.7
1964	28.6	30.3	58.9	37.9	68.2	96.8	—	10.9	4.1	15.0	1.0	.7	1.7	113.5	3.5	1.3	4.8
1965	29.1	30.1	59.2	37.8	67.9	97.0	—	11.0	4.1	15.1	1.1	.7	1.8	113.9	4.0	1.7	5.7
1966	28.3	28.7	57.0	40.3	69.0	97.3	—	11.2	4.2	15.4	1.0	.7	1.7	114.4	4.5	1.9	6.4
1967	26.6	29.6	56.2	42.3	71.9	98.5	.1	11.9	4.2	16.2	.9	.5	1.4	116.1	4.8	2.1	6.9
1968	27.8	26.8	54.6	44.6	71.4	99.2	.3	12.6	4.3	17.2	.9	.7	1.6	118.0	5.0	2.2	7.2
1969	30.3	25.3	55.6	45.4	70.7	101.0	.5	13.2	4.5	18.2	1.0	.6	1.6	120.8	5.3	1.6	6.9
1970	31.3	25.0	56.3	45.5	70.5	101.8	.7	14.0	4.6	19.3	1.0	.5	1.5	122.6	5.8	(³)	5.8
1971	31.1	22.8	53.9	48.5	71.3	102.4	.9	15.0	5.0	20.9	.9	.5	1.4	124.7	5.1	(³)	5.1
1972	30.4	25.4	55.8	47.0	72.4	102.8	1.3	15.6	4.4	21.3	1.0	.5	1.5	125.6	5.1	(³)	5.1
1973	30.4	24.9	55.3	46.2	71.1	101.5	2.1	16.7	4.8	23.6	.9	.5	1.4	126.5	5.1	(³)	5.1
1974	26.1	21.0	47.1	49.5	70.5	96.6	3.0	17.4	4.9	25.3	.8	.4	1.2	123.1	5.9	(³)	5.9
1975	30.5	24.9	55.4	34.8	59.7	90.2	5.0	17.7	5.1	27.8	.9	.4	1.3	119.3	6.2	(³)	6.2
1976	32.5	22.7	55.2	39.5	62.2	94.7	7.2	17.7	5.1	30.0	1.0	.4	1.4	126.1	6.1	(³)	6.1
1977	30.3	23.3	53.6	42.1	65.4	95.7	9.4	17.9	4.7	32.0	.9	.4	1.3	129.0	6.6	(³)	6.6
1978 ⁴ ...	27.9	23.3	51.2	41.9	65.2	93.1	11.5	18.1	4.5	34.1	1.1	.4	1.5	128.7	6.9	(³)	6.9
1979 ⁵ ...	27.2	21.7	48.9	42.4	64.1	91.3	15.0	18.5	4.2	37.7	1.1	.4	1.5	130.5	7.0	(³)	7.0

¹Dry basis. Recent corn sweetener consumption may be understated due to incomplete data.

²Sugar sweetness equivalent—assumes saccharin is 300 times as sweet as sugar, and cyclamate is 30 times as sweet as sugar.

³Cyclamate food use was banned by the Food and Drug Administration, effective in 1970.

⁴Preliminary.

⁵Estimated.

Source: 1962-1978—U.S. Dept. of Agriculture Sugar and Sweetener Report, Vol. 4 (5), May 1979.

1979—USDA Sugar and Sweetener Report, Vol. 5 (2), February 1980.

**PRIMARY DISTRIBUTION OF SUGAR, CONTINENTAL
UNITED STATES, BY REGION, JANUARY-DECEMBER 1979**

Region	Cane Sugar Refiners	Beet Sugar Processors	Mainland Cane Sugar Mills	Total
Short Tons ¹				
New England . . .	345,450	1,650	0	347,100
Mid-Atlantic	1,600,500	14,100	200	1,614,800
North Central . . .	1,472,500	1,862,200	14,200	3,348,900
Southern	2,889,350	145,550	3,450	3,038,350
Western	626,800	958,450	0	1,585,250
Unspecified	0	0	0	0
Grand Total . . .	6,934,600	2,981,950	17,850	9,934,400

¹Reported as produced or imported and delivered except liquid sugar which is on a sugar solids content basis.
Source: U.S. Department of Agriculture, Sugar and Sweetener Report, Vol 5 (3), March 1980.

**SUGAR DELIVERIES, BY TYPE OF PRODUCT OR BUSINESS OF
BUYER AND BY TYPE OF SUGAR, CALENDAR YEAR 1979
UNITED STATES**

Product or Business of Buyer	Beet (Total)	Cane (Total)	Total All Sugar	Liquid Sugar Included in Totals	
				Beet	Cane
Short Tons ¹					
INDUSTRIAL					
Bakery, cereal and allied products	467,203	768,683	1,235,886	6,226	93,044
Confectionery and related products	278,858	602,184	881,042	5,661	98,125
Ice cream and dairy products	164,901	295,013	459,915	72,122	196,134
Beverages	496,336	1,857,108	2,353,444	215,828	1,089,073
Canned, bottled, frozen foods, jams, jellies and preserves	299,557	344,804	644,361	88,634	166,343
Multiple and all other food uses . .	159,140	305,553	464,693	10,222	55,376
Non-food products	31,555	91,581	123,136	564	31,601
SUB-TOTAL	1,897,550	4,264,926	6,162,477	399,257	1,729,696
NON-INDUSTRIAL					
Hotels, restaurants, institutions	7,463	94,425	101,888	330	6,228
Wholesale grocers, jobbers, sugar dealers	529,367	1,451,835	1,981,202	3,632	38,909
Retail grocers, chain stores, super markets	229,966	984,226	1,214,193	9,442	6,789
All other deliveries, including deliveries to Government agencies	39,980	127,934	167,914	871	17,672
SUB-TOTAL	806,776	2,658,420	3,465,197	14,275	69,598
Unspecified	277,636	29,158	306,794	—	—
TOTAL DELIVERIES	2,981,962	6,952,504	9,934,468	413,532	1,799,294
Deliveries in consumer-size packages (less than 50 lbs.)	375,441	2,034,166	2,409,607	—	—
Deliveries in bulk (unpacked) . .	1,462,100	1,895,685	3,357,785	—	—

¹Reported as produced or imported and delivered except liquid sugar which is on a sugar solids content basis.
Source: U.S. Department of Agriculture, Sugar and Sweetener Report, Vol. 5 (5), May 1980.

**SUGARBEETS: ACREAGE, PRODUCTION, SEASON AVERAGE
PRICE PER TON RECEIVED BY FARMS AND VALUE:
AND PRODUCTION OF BEET SUGAR IN THE UNITED STATES**

Year	Acreage Planted 1,000 acres	Acreage Harvested 1,000 acres	Average Yield Per Acre short tons	Production 1,000 short tons	Price ¹ Dollars per ton	Farm Value ¹ 1,000 Dollars	Sugar Produced (In thousands of short tons)		Tons Sugar Raw Value per Harvested Acre
							Raw Value Basis	Equiv. Refined	
1940 ..	971	912	13.4	12,194	5.11	62,287	1,881	1,758	2.06
1941 ..	796	755	13.7	10,342	6.43	66,522	1,592	1,488	2.11
1942 ..	1,048	954	12.2	11,685	6.84	79,905	1,730	1,617	1.81
1943 ..	619	550	11.9	6,547	8.81	57,674	1,000	935	1.82
1944 ..	633	555	12.1	6,718	10.60	71,156	1,048	979	1.89
1945 ..	775	713	12.1	8,616	10.20	87,539	1,274	1,191	1.79
1946 ..	905	802	13.2	10,582	11.10	117,840	1,522	1,422	1.90
1947 ..	968	879	14.2	12,503	11.80	148,080	1,839	1,719	2.09
1948 ..	800	694	13.6	9,424	10.60	99,639	1,370	1,280	1.97
1949 ..	768	687	14.8	10,196	10.80	110,369	1,563	1,461	2.28
1950 ..	1,014	925	14.6	13,535	11.20	151,293	2,009	1,878	2.17
1951 ..	758	691	15.2	10,482	11.70	122,483	1,549	1,448	2.24
1952 ..	719	665	15.3	10,169	12.00	121,970	1,505	1,407	2.26
1953 ..	794	745	16.2	12,084	11.60	140,364	1,816	1,697	2.44
1954 ..	964	876	16.1	14,082	10.80	152,151	2,043	1,909	2.33
1955 ..	798	740	16.5	12,228	11.20	136,477	1,739	1,625	2.35
1956 ..	831	785	16.6	12,993	11.90	155,087	1,966	1,837	2.50
1957 ..	918	880	17.7	15,530	11.20	174,261	2,194	2,050	2.49
1958 ..	935	891	17.0	15,150	11.70	177,807	2,200	2,056	2.47
1959 ..	955	905	18.8	17,015	11.20	191,186	2,340	2,187	2.59
1960 ..	977	957	17.2	16,421	11.60	190,109	2,451	2,291	2.56
1961 ..	1,129	1,077	16.4	17,704	11.20	197,547	2,404	2,247	2.23
1962 ..	1,182	1,103	16.5	18,254	12.80	233,243	2,586	2,417	2.34
1963 ..	1,285	1,235	18.9	23,328	12.20	285,011	3,096	2,893	2.34
1964 ..	1,460	1,395	16.8	23,389	11.80	275,660	3,288	3,073	2.36
1965 ..	1,314	1,249	16.8	20,915	11.95	249,836	2,894	2,705	2.32
1966 ..	1,240	1,161	17.5	20,342	12.80	260,355	2,828	2,643	2.44
1967 ..	1,197	1,122	17.1	19,197	13.55	260,114	2,636	2,464	2.35
1968 ..	1,476	1,410	18.0	25,363	13.81	350,207	3,483	3,255	2.47
1969 ..	1,647	1,541	18.0	27,736	12.72	352,863	3,330	3,112	2.16
1970 ..	1,483	1,419	18.6	26,427	14.84	390,813	3,421	3,179	2.41
1971 ..	1,406	1,342	20.2	27,096	15.40	416,279	3,552	3,320	2.65
1972 ..	1,420	1,329	21.4	28,410	16.00	455,830	3,624	3,387	2.73
1973 ..	1,280	1,218	20.1	24,499	29.60	725,661	3,199	2,990	2.63
1974 ..	1,252	1,213	18.2	22,123	46.80	1,035,567	2,916	2,725	2.40
1975 ..	1,595	1,517	19.6	29,704	27.60	820,743	4,019	3,756	2.65
1976 ..	1,525	1,479	19.9	29,386	21.00	616,813	3,895	3,640	2.63
1977 ..	1,273	1,216	20.6	25,007	24.20	604,399	3,368	3,148	2.77
1978 ..	1,305	1,269	20.3	25,788	25.20	649,846	3,250	3,037	2.56
1979 ² ..	1,166	1,124	19.6	22,073	NA	NA	2,900	2,710	2.58

¹Includes production incentive payments which were payments made to producers of sugar beets and sugarcane by the Commodity Credit Corporation during the period of government price control in World War II, to stimulate production, but excludes Sugar Act payments.

²Preliminary.

Source: 1940-1959—Agricultural Statistics, 1972, Table 114, USDA, Washington; 1960-1974—Agricultural Statistics, 1976, Table 98, USDA, Washington; 1975—Agricultural Statistics, 1977, Table 104, USDA, Washington; 1976-1977—Crop Production and Crop Values, USDA Economic Statistics and Cooperatives Services; 1978-1979—USDA Economic Statistics and Cooperatives Service, Crop Production, June 1980.

LOUISIANA—SUGAR PRODUCTION—ACREAGE—YIELD

Crop Year	Sugarcane Used for Sugar			Sugar Produced		Raw Sugar 96° made per ton of sugarcane (Pounds) ¹	Tons 96° sugar per harvested acre
	Acres harvested (1000 acres)	Average yield of cane per acre (Tons)	Production (1,000 tons)	(In thousands of short tons)			
				Raw Value Basis ¹	Equivalent refined ²		
1939-40 ..	234	21.7	5,084	436	408	172	1.86
1940-41 ..	211	13.8	2,923	234	219	160	1.11
1941-42 ..	224	17.6	3,947	322	301	163	1.44
1942-43 ..	269	17.6	4,734	397	371	168	1.48
1943-44 ..	257	20.9	5,388	432	404	160	1.68
1944-45 ..	246	20.0	4,929	369	345	150	1.50
1945-46 ..	234	21.9	5,128	370	346	144	1.58
1946-47 ..	255	17.6	4,484	331	309	148	1.30
1947-48 ..	259	15.1	3,917	297	277	152	1.15
1948-49 ..	274	19.2	5,257	393	367	150	1.43
1949-50 ..	279	17.9	4,984	414	387	166	1.48
1950-51 ..	273	19.5	5,312	451	421	170	1.65
1951-52 ..	258	17.3	4,463	295	276	132	1.14
1952-53 ..	274	20.7	5,667	451	422	159	1.65
1953-54 ..	280	20.6	5,759	479	448	166	1.71
1954-55 ..	247	22.8	5,625	478	447	170	1.94
1955-56 ..	232	24.4	5,664	454	425	161	1.96
1956-57 ..	203	23.7	4,817	429	401	178	2.11
1957-58 ..	226	22.0	4,976	396	370	159	1.75
1958-59 ..	219	22.0	4,869	443	414	182	2.02
1959-60 ..	250	20.3	5,073	440	411	174	1.76
1960-61 ..	255	21.9	5,583	470	439	169	1.84
1961-62 ..	277	25.7	7,118	650	607	183	2.35
1962-63 ..	254	20.9	5,315	472	441	178	1.86
1963-64 ..	296	28.9	8,554	759	710	177	2.56
1964-65 ..	325	22.7	7,383	573	536	155	1.76
1965-66 ..	288	22.7	6,542	550	514	168	1.91
1966-67 ..	288	22.7	6,563	562	526	171	1.95
1967-68 ..	294	27.6	8,110	740	692	182	2.52
1968-69 ..	282	26.1	7,377	669	625	181	2.37
1969-70 ..	235	24.1	5,676	537	502	189	2.29
1970-71 ..	266	26.1	6,927	602	563	174	2.26
1971-72 ..	301	21.4	6,438	571	534	177	1.90
1972-73 ..	311	25.8	8,022	660	617	165	2.12
1973-74 ..	319	20.6	6,570	558	522	170	1.75
1974-75 ..	308	21.3	6,558	594	555	181	1.93
1975-76 ..	308	21.0	6,468	640	598	198	2.08
1976-77 ..	291	25.6	7,451	650	607	174	2.23
1977-78 ..	304	23.9	7,265	668	624	183	2.24
1978-79 ..	278	21.0	5,838	560	523	192	2.01
1979-80 ³ ..	243	20.5	4,981	498	465	200	2.05

¹Production reported on raw value basis.

²Raw value multiplied by 0.9346.

³Estimate.

Source: 1939-40 to 1973-74—U.S. Department of Agriculture, Sugar Statistics and Related Data, Vol 2, Statistical Bulletin No. 244.

1974-75 to 1975-76—U.S. Department of Agriculture, Sugar and Sweetener Report, Vol. 3 (5), May 1978.

1976-77 to 1977-78—U.S. Department of Agriculture, Sugar and Sweetener Report, Vol. 4 (5), May 1979.

1979-80—U.S. Department of Agriculture, Sugar and Sweetener Report, Vol. 5 (2), February 1980.

FLORIDA—SUGAR PRODUCTION—ACREAGE—YIELD

Crop Year	Sugarcane Used for Sugar			Sugar Produced		Raw Sugar 96° made per ton of sugarcane (Pounds) ¹	Tons 96° sugar per harvested acre
	Acreage harvested (1000 acres)	Average yield of cane per acre (Tons)	Production (1,000 tons)	Raw Value Basis ¹	Equivalent refined ²		
1939-40 ..	20	35.5	714	70	65	197	3.50
1940-41 ..	29	32.1	933	98	91	209	3.38
1941-42 ..	31	30.7	944	94	88	198	3.03
1942-43 ..	21	30.6	648	61	57	187	2.90
1943-44 ..	27	25.7	699	65	60	185	2.41
1944-45 ..	27	28.8	780	69	64	176	2.56
1945-46 ..	31	33.2	1,041	100	93	192	3.23
1946-47 ..	32	32.6	1,037	94	88	181	2.94
1947-48 ..	35	26.7	921	80	75	173	2.29
1948-49 ..	35	28.7	1,010	80	75	158	2.29
1949-50 ..	37	30.8	1,126	105	98	186	2.84
1950-51 ..	37	31.3	1,169	109	102	186	2.95
1951-52 ..	39	32.4	1,260	122	114	195	3.13
1952-53 ..	43	34.9	1,495	154	144	207	3.58
1953-54 ..	45	32.6	1,453	151	141	207	3.36
1954-55 ..	39	32.6	1,258	132	123	210	3.38
1955-56 ..	35	33.4	1,160	118	110	204	3.37
1956-57 ..	30	39.7	1,197	128	120	214	4.27
1957-58 ..	33	41.7	1,358	135	126	201	4.09
1958-59 ..	34	37.8	1,303	135	126	208	3.97
1959-60 ..	46.4	38.2	1,771	175	164	198	3.77
1960-61 ..	48.9	31.8	1,554	160	150	205	3.27
1961-62 ..	56.2	36.2	2,036	208	194	204	3.70
1962-63 ..	114.3	35.4	4,050	380	355	188	3.32
1963-64 ..	142.5	31.2	4,446	424	396	191	2.98
1964-65 ..	219.8	29.3	6,439	574	536	178	2.61
1965-66 ..	185.4	29.1	5,505	554	518	201	2.99
1966-67 ..	190.7	31.8	6,057	652	609	215	3.42
1967-68 ..	190.6	34.3	6,542	717	670	219	3.76
1968-69 ..	182.1	29.5	5,368	546	510	203	3.00
1969-70 ..	153.4	33.8	5,197	535	500	205	3.49
1970-71 ..	170.0	33.4	5,670	652	609	230	3.84
1971-72 ..	189.9	31.7	6,022	635	593	211	3.34
1972-73 ..	243.8	38.1	9,289	961	898	207	3.94
1973-74 ..	257.6	31.5	8,119	824	770	203	3.20
1974-75 ..	258.4	29.0	7,184	803	758	224	3.11
1975-76 ..	286.6	35.3	10,264	1,061	992	207	3.70
1976-77 ..	286.0	32.6	9,324	930	869	198	3.25
1977-78 ..	285.0	29.8	8,493	894	836	210	3.13
1978-79 ..	296.0	30.8	9,117	940	878	206	3.20
1979-80 ³ ..	315.0	33.8	10,647	1,090	1,019	205	3.46

¹Production reported on raw value basis.

²Raw value multiplied by 0.9346.

³Estimate.

Source: 1939-40 to 1973-74—U.S. Department of Agriculture, Sugar Statistics and Related Data, Vol. 2, Statistical Bulletin No. 244.

1974-75 to 1975-76—U.S. Department of Agriculture, Sugar and Sweetener Report, Vol. 3 (5), May 1978.

1976-77 to 1977-78—U.S. Department of Agriculture, Sugar and Sweetener Report, Vol. 4 (5), May 1979.

1979-80—U.S. Department of Agriculture, Sugar and Sweetener Report, Vol. 5 (2), February 1980.

TEXAS—SUGAR PRODUCTION—ACREAGE—YIELD

Crop Year	Sugarcane Used for Sugar			Sugar Produced		Raw Sugar 96° made per ton of sugarcane (Pounds) ¹	Tons 96° sugar per harvested acre
	Acreage harvested (1000 acres)	Average yield of cane per acre (Tons)	Production (1,000 tons)	(In thousands of short tons)			
				Raw Value Basis ¹	Equivalent refined ²		
1974-75 ..	28.0	32.4	898	74	69	165	2.64
1975-76 ..	35.0	35.3	1,236	126	118	204	3.60
1976-77 ..	27.1	35.8	971	94	88	194	3.47
1977-78 ..	33.5	29.2	978	88	80	143	2.62
1978-79 ..	33.8	28.0	948	60	56	126	1.78
1979-80 ³ ..	31.5	29.0	914	85	79	186	2.70

¹Production reported on raw value basis.

²Raw value multiplied by 0.9346.

³Estimate.

Source: 1974-79—U.S. Department of Agriculture Sugar and Sweetener Report, Vo. 4 (5), May 1979.

1979-80—U.S. Department of Agriculture, Sugar and Sweetener Report, Vol., 5 (2), February 1980.

PUERTO RICO—SUGAR PRODUCTION—ACREAGE—YIELD

Crop Year	Sugarcane Used for Sugar			Sugar Produced		Raw Sugar 96° made per ton of sugarcane (Pounds) ¹	Tons 96° sugar per harvested acre
	Acreage harvested (1000 acres)	Average yield of cane per acre (Tons)	Production (1,000 tons)	(In thousands of short tons)			
				Raw Value Basis ¹	Equivalent refined ²		
1945	288.6	27.7	7,994	971	908	242.9	3.36
1950	367.1	28.9	10,615	1,299	1,214	244.7	3.54
1955	361.1	27.3	9,873	1,166	1,090	236.2	3.23
1960	327.9	30.5	9,997	1,019	952	203.9	3.11
1962	308.6	31.3	9,663	1,008	942	208.8	3.27
1963	303.4	33.4	10,123	989	924	195.5	3.26
1964	303.1	32.3	9,802	989	924	201.9	3.26
1965	287.6	30.6	8,807	897	838	203.7	3.12
1966	272.8	34.7	9,465	883	825	186.7	3.24
1967	263.3	31.0	8,160	818	764	200.6	3.11
1968	237.1	27.8	6,590	645	603	195.9	2.72
1969	180.1	32.8	5,902	484	452	163.9	2.69
1970	188.8	31.2	5,891	460	430	156.2	2.44
1971	153.4	29.9	4,581	324	303	141.5	2.11
1972	152.4	28.7	4,382	298	278	135.7	1.96
1973	132.1	27.4	3,621	255	238	140.9	1.93
1974	121.6	29.5	3,585	291	272	162.4	2.39
1975	137.5	25.6	3,520	302	282	171.7	2.20
1976	123.9	29.3	3,630	312	291	172.0	2.52
1977	116.2	27.3	3,177	268	250	168.7	2.31
1978	101.1	28.0	2,835	204	191	143.9	2.02
1979	85.6	26.7	2,288	193	180	168.7	2.25

¹Production reported on raw value basis.

²Raw value multiplied by 0.9346.

Source: 1945-76: U.S. Department of Agriculture, Sugar and Sweetener Report, Vol. 2 (5), May 1977.

1977: USITC Publication 881, April 1978.

1978: U.S. Department of Agriculture, Economics, Statistics & Cooperative Service.

1979: U.S. Department of Agriculture, Economics, Statistics & Cooperative Service.

**EDIBLE SYRUPS: UNITED STATES PRODUCTION, FOREIGN TRADE,
AND INDICATED DOMESTIC CONSUMPTION, 1950-1979**
(000 GALLONS)

Year	PRODUCTION ¹ SYRUPS								IMPORTS				
	Corn	Cane	Sorghum	Maple ²	Refiners	Edible Molasses	Honey	Total	Maple Syrup	Edible Molasses and Cane Syrup ³	Honey	Shipments from Territories Honey	Total
1950	130,448	9,745	3,539	2,006	4,005	3,314	19,780	172,837	479	2,214	1,020	30	3,743
1951	131,831	8,775	3,671	1,742	4,971	4,339	21,923	177,252	323	2,050	692	—	3,065
1952	127,405	5,510	2,856	1,603	3,405	3,284	23,091	167,154	522	5,710	720	—	6,952
1953	131,767	5,540	2,418	1,208	3,907	4,077	18,996	167,913	442	1,793	831	—	3,066
1954	133,071	4,805	2,552	1,672	3,814	2,958	18,372	167,244	371	2,015	777	—	3,163
1955	138,226	4,730	2,405	1,578	3,853	2,820	21,666	175,278	457	2,305	837	—	3,599
1956	141,504	4,990	3,594	1,529	3,882	3,193	18,169	176,861	643	2,046	406	—	3,095
1957	142,089	3,965	2,516	1,697	3,620	2,384	20,447	176,748	757	573	404	—	1,734
1958	153,481	3,135	2,282	1,392	4,892	2,553	22,116	189,851	656	1,286	335	—	2,277
1959	162,197	3,617	2,286	1,137	3,999	3,084	20,083	196,403	691	2,138	383	—	3,212
1960	169,776	3,676	1,943	1,143	4,134	2,714	20,611	203,997	908	1,884	1,049	—	3,841
1961	180,397	3,519	—	1,524	3,846	3,379	21,721	214,386	904	911	768	—	2,583
1962	201,259	3,303	—	1,460	2,691	3,075	21,189	232,977	929	3,827	604	—	5,360
1963	215,573	2,702	—	1,143	2,769	2,772	22,647	247,606	1,068	1,706	221	—	2,995
1964	238,832	2,814	—	1,546	2,862	2,685	21,323	270,062	666	2,119	417	—	3,202
1965	243,682	2,989	—	1,266	2,994	2,648	20,427	274,006	879	3,349	1,127	—	5,355
1966	252,337	2,923	—	1,476	2,493	2,563	20,403	282,195	938	3,061	806	—	4,805
1967	255,860	2,121	—	979	2,402	2,477	18,225	282,064	1,147	1,065	1,416	—	3,628
1968	274,000 ⁴	2,346	—	983	2,561	2,466	16,165	298,521	988	3,732	1,427	—	6,147
1969	282,000 ⁴	2,661	—	1,032	2,235	2,532	22,591	313,051	1,185	2,266	1,244	—	4,695
1970	292,000 ⁴	—	—	1,110	1,695	2,121	18,726	315,652	956	2,165	749	—	3,870
1971	304,000 ⁴	—	—	962	1,883	2,517	16,708	326,070	577	2,470	967	—	4,014
1972	387,880 ⁴	—	—	1,099	2,077	2,290	18,210	411,556	710	1,694	3,291	—	5,695
1973	451,264	—	—	857	2,309	1,926	20,193	476,549	803	2,935	900	—	4,638
1974	498,313	—	—	1,087	2,564	1,559	15,866	519,389	801	2,508	2,196	—	5,505
1975	561,215	—	—	1,207	2,482	2,114	16,823	583,841	607	2,483	3,917	—	7,007
1976	615,498	—	—	927	2,403	2,574	16,756	638,158	886	3,188	5,608	—	9,682
1977	695,196	—	—	1,221	2,197	2,538	15,076	716,228	867	1,773	5,396	—	8,036
1978	751,809	—	—	1,154	2,571	2,750	19,466	777,750	811	2,077	4,727	—	7,615
1979 ⁵	845,741	—	—	1,219	2,524	2,900	20,039	872,423	857	2,944	4,947	—	8,748

Year	EXPORTS				INDICATED DOMESTIC CONSUMPTION SYRUPS					
	Corn Syrup	Edible Molasses and Syrup including Maple ⁶	Honey	Total	Corn	Maple	Sorghum	Cane Syrup, Refiners Syrup, and Edible Molasses	Honey	Total
1950	3,761	242	801	4,804	126,687	2,485	3,539	19,036	20,029	171,776
1951	4,287	231	1,075	5,593	127,544	2,065	3,671	19,904	21,540	174,724
1952	3,101	153	1,968	5,222	124,304	2,125	2,856	17,756	21,843	168,884
1953	3,241	267	2,789	6,297	128,526	1,650	2,418	15,050	17,038	164,682
1954	3,233	272	2,061	5,566	129,838	2,043	2,552	13,320	17,088	164,841
1955	3,386	248	1,739	5,373	134,840	2,035	2,405	13,460	20,764	173,504
1956	3,189	249	1,548	4,986	138,315	2,172	3,594	13,862	17,027	174,970
1957	2,745	250	1,681	4,676	139,344	2,454	2,516	10,292	19,200	173,806
1958	2,396	165	1,902	4,463	151,085	2,048	2,282	11,701	20,549	187,665
1959	2,245	155	1,062	3,462	159,952	1,828	2,286	12,683	19,404	196,153
1960	1,836	182	797	2,815	167,940	2,051	1,943	12,226	20,863	205,023
1961	1,370	173	607	2,150	179,027	2,428	—	11,482	21,882	214,819
1962	1,514	140	1,158	2,812	199,745	2,389	—	12,756	20,635	235,525
1963	2,055	192	2,125	4,372	213,518	2,211	—	9,757	20,743	246,229
1964	1,632	205	760	2,597	237,200	2,212	—	10,275	20,980	270,667
1965	1,003	—	1,166	2,169	242,679	2,145	—	11,980	20,388	277,192
1966	1,038	—	1,219	2,257	251,299	2,414	—	11,040	19,990	284,743
1967	1,113	—	986	2,099	254,747	2,126	—	8,065	18,655	283,593
1968	1,541	—	684	2,225	272,459	1,971	—	11,105	16,908	302,443
1969	2,169	—	833	3,002	279,831	2,217	—	9,694	23,002	314,744
1970	1,324	—	688	2,012	290,676	2,066	—	5,981	18,787	317,510
1971	1,324	—	640	1,964	302,676	1,539	—	6,870	17,035	328,120
1972	1,205	—	346	1,551	386,675	1,809	—	6,061	21,155	415,700
1973	1,377	—	1,484	2,861	449,887	1,660	—	7,170	19,609	478,326
1974	1,736	—	386	2,122	496,577	1,888	—	6,631	17,676	522,772
1975	1,070	—	337	1,407	560,145	1,814	—	7,079	20,403	588,441
1976	1,674	—	396	2,070	613,824	1,813	—	8,165	21,968	645,770
1977	1,543	—	466	2,009	693,653	2,088	—	6,508	20,006	722,255
1978	1,694	—	679	2,373	750,115	1,965	—	7,398	23,514	782,992
1979 ⁵	1,211	—	747	1,958	844,350	2,076	—	8,368	24,239	879,213

¹Production of cane syrup, sorghum syrup, and edible molasses is of the fall of the preceding year. Estimates of sorghum discontinued beginning 1961; cane syrup discontinued beginning 1970. ²Does not include varying quantities produced on nonfarm lands in Somerset County, Maine. ³U.S. Department of Commerce molasses and sugar syrups series, less liquid sugar imports reported to Sugar Division, Agricultural Stabilization and Conservation Service. ⁴Unofficial estimates 1968-71, estimates for 1972-77 from USITC Pub. 881, April 1978. ⁵Preliminary. ⁶Assumed to be largely refiners' syrup. Beginning 1965, data not available because of change in export classification.

Source: U.S. Department of Agriculture, Economics, Statistics and Cooperative Service.

CONTINENTAL U.S. SUGAR CONSUMPTION

Five Year Intervals—1873-1943

Year	Total Sugar Consumption* (Short tons, raw value)	Per Capita Consumption (Pounds, refined value)
1873	897,072	40.2
1878	926,929	36.4
1883	1,402,577	48.8
1888	1,746,385	54.4
1893	2,283,985	63.8
1898	2,400,278	61.1
1903	3,055,492	70.5
1908	3,817,849	80.1
1913	4,485,778	86.9
1918	4,189,134	75.6
1923	5,729,172	96.0
1928	6,658,400	103.8
1933	6,613,200	99.7
1938	6,597,200	96.3
1943	6,725,720	94.2

Yearly Intervals—1944-1979

1944	6,170,000	89.5
1945	5,046,000	73.9
1946	5,552,000	75.1
1947	7,357,000	95.5
1948	7,263,000	94.0
1949	7,451,000	95.8
1950	8,217,000	100.8
1951	7,552,000	93.8
1952	8,008,000	98.2
1953	8,354,000	97.9
1954	8,106,000	96.3
1955	8,350,000	97.5
1956	8,962,000	98.4
1957	8,708,000	95.0
1958	9,017,000	96.8
1959	9,135,000	96.4
1960	9,434,000	97.6

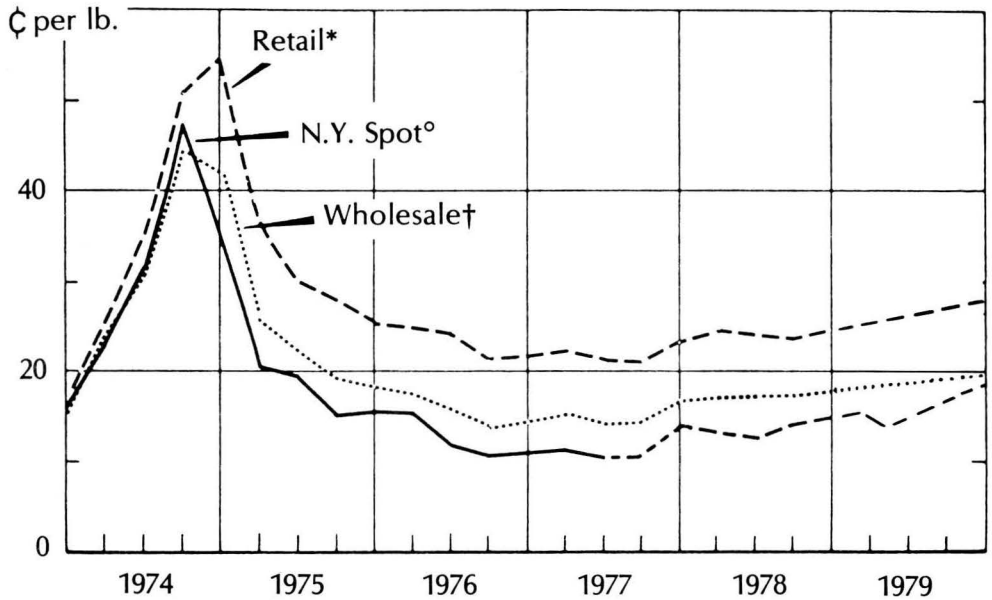
Year	Total Sugar Consumption* (Short tons, raw value)	Per Capita Consumption (Pounds, refined value)
1961	9,612,000	97.7
1962	9,709,000	97.2
1963	9,856,000	97.3
1964	9,938,000	96.8
1965	10,080,000	97.0
1966	10,235,000	97.3
1967	10,474,000	98.5
1968	10,656,000	99.2
1969	10,950,000	101.0
1970	11,163,000	101.8
1971	11,345,000	102.4
1972	11,487,000	102.8
1973	11,429,000	101.5
1974	10,946,000	96.6
1975	9,304,000	90.2
1976	10,895,000	94.7
1977	11,100,000	95.7
1978	10,889,000	93.1
1979 ¹	10,761,000	91.3

*Theoretical consumption. (Actually deliveries for consumption, and includes deliveries for U.S. military forces at home and abroad.)

¹Estimated.

Source: 1873-1943—Lamborn Sugar Market Reports.
1944-1977—U.S. Dept. of Agriculture Agricultural Statistics, 1958, 1968, 1978.
1978-1979—U.S. Dept. of Agriculture Sugar and Sweetener Report, Vol. 5 (2), February 1980.

U.S. Sugar Prices



*Granulated—BLS data.

° Bulk raw sugar through Nov. 1977. Derived from London daily price, pound sterling, thereafter.

† Bulk, dry beet sugar, F.O.B. plant in Colorado-BLS data.

Source: 1972-77: Adapted from Fig. S-6, USDA Sugar and Sweetener Report, Vol. 3, pg. 17, February 1978.

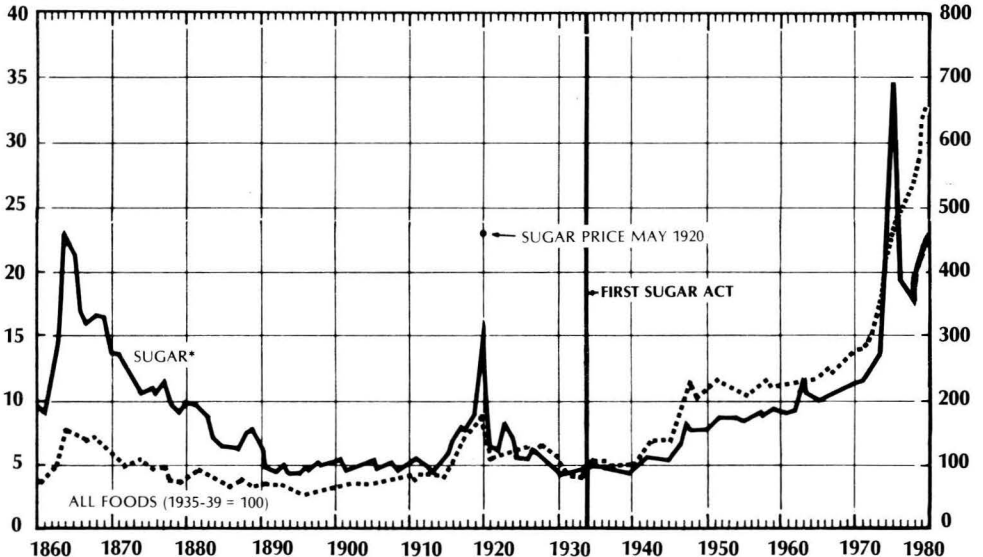
1978: Adapted from Fig S-5, USDA Sugar and Sweetener Report, Vol. 4 pg. 20, May 1979.

1979: Adapted from "U.S. Sugar Prices" figure, USDA Sugar and Sweetener Report, Vol. 5 (5), pg. 9, May 1980.

REFINED SUGAR PRICES, AND INDEX OF ALL FOOD PRICES AT WHOLESALE, 1860-1979

SUGAR (CENTS PER POUND)

ALL FOODS (PERCENT OF 1935-39)



*Refined sugar prices, net cash, Northeast.

Source: All food prices—U.S. Dept. of Labor

All sugar prices—U.S. Dept. of Agriculture.

**TOTAL FOREIGN IMPORTS INTO U.S.A. (Mainland) BY COUNTRIES
OF ORIGIN: 1976 THROUGH 1979**

Source of Supply	1976	1977	1978	1979
(Short Tons, Raw Value)				
<u>OFFSHORE</u>				
<u>FOREIGN</u>				
Argentina	86,729	266,968	271,019	234,820
Australia	469,528	494,225	165,493	107,715
Belgium	717	1,690	25,147	—
Belize	14,350	35,549	87,261	57,967
Bolivia	52,990	49,473	62,441	89,189
Brazil	—	660,633	600,684	1,262,358
Canada	49,457	138,027	98,144	89,521
China-Taiwan	—	—	56,585	28,200
Colombia	84,289	14,249	113,410	26,103
Costa Rica	65,076	95,365	78,318	80,405
Denmark	—	3,099	—	—
Dominican Republic	971,084	974,788	733,530	816,967
Ecuador	28,441	55,380	37,294	82,227
El Salvador	143,154	166,028	130,365	160,957
Fiji Islands	—	18,407	50,722	130,161
France	14,275	27,215	42,851	—
Germany, West	904	19,906	16,539	2
Guatemala	330,578	300,938	156,033	170,869
Haiti	6,218	—	5,757	11,287
Honduras	7,483	20,634	17,781	65,303
Hong Kong	—	1	3	—
India	188,545	—	58	14
Ireland	—	—	2	—
Japan	—	—	1	—
Korea	940	288	1,036	354
Malagasy Republic	13,400	12,052	14,295	9,610
Malawi	17,659	38,358	37,028	35,727
Mauritius	29,811	57,363	112,212	115,529
Mexico	543	274	52,998	60,258
Mozambique	31,847	97,311	12,913	98,139
Netherlands	1,538	—	7	—
Nicaragua	165,710	119,529	108,204	122,307
Panama	95,031	131,162	123,003	157,287
Paraguay	10,187	—	—	—
Peru	312,726	314,186	225,241	188,630
Philippines	913,781	1,442,991	833,341	413,191
Romania	—	—	13,209	—
South Africa	98,472	274,227	60,100	88,779
Swaziland	45,923	61,855	82,456	102,672
Sweden	2	2	3	2
Switzerland	745	—	—	—
Taiwan	86,564	86,055	—	—
Thailand	70,059	—	64,761	9,436
United Kingdom	84	44	43	—
Uruguay	5,229	—	8,220	—
West Indies	243,978	159,745	184,392	210,910
Total Foreign	4,658,039	6,138,048	4,682,900	5,026,297
Note: Above totals include direct consumption imports in the following amounts:	92,971	286,099	108,624	95,773

Source: U.S. Dept. of Agriculture, Sugar & Sweetener Report, Vol. 5 (3), March, 1980.

Part III

WORLD SUGAR

Sugar, a basic food obtained mainly from sugarcane and sugar beets, is produced in some 125 nations throughout the world.

Total centrifugal sugar production for the 1979-80 crop year is estimated to be 87.8 million metric tons. Of this, approximately 40% was from sugar beets and 60% was from sugarcane. An additional 12 million short tons of non-centrifugal sugar was produced. Non-centrifugal sugar ordinarily is not traded because it is consumed in areas near where it is produced.

It is estimated that total world centrifugal sugar consumption for 1979 will be 91 million metric tons. About 75% of this will be used in the countries where the sugarcane or sugar beets were grown and the sugar produced. The other 25% is traded to countries that either produce no sugar or require more than they produce. Some of this sugar trade is under bilateral agreements, some of them of relatively long duration.

INTERNATIONAL SUGAR AGREEMENT

A series of meetings in 1976 and 1977 by representatives to the International Sugar Organization culminated in an International Sugar Agreement on October 7, 1977. The new Agreement became provisionally effective on January 1, 1978 and is now in full effect.

The objective of the Agreement is to so regulate exports of sugar to the world market that prices will be maintained within a specified corridor. The regulation of exports is to be achieved

through quotas applied to basic export tonnages assigned to each exporting country. The mechanism provided in the Agreement is to reduce basic export tonnages by 15% when the world price is less than 11 cents. Sugar retained under this quota provision would enter a reserve stock which would be released only when the world price exceeded 19 cents.

There are a great many detailed provisions in the Agreement providing for the administration of the program, providing special quotas for designated producing areas, for financing the stocks to be held in reserve and for import-export fees.

A total of 87 countries—53 exporters and 34 importers—were allocated votes in the International Sugar Agreement. A sufficient number of countries holding votes had approved the Agreement for it to begin operating provisionally January 1, 1978.

The International Sugar Agreement is now fully effective and, beginning July 1, 1980, the Stock Financing Fund came into operation. The U.S. Senate, after lengthy consideration, ratified the International Sugar Agreement on November 30, 1979. Enabling legislation to permit full U.S. participation was passed by the House of Representatives in March, 1980 and by the Senate in April 1980. This legislation was signed by the President July 1, 1980.

In recent months the world sugar price has been higher than the triggering point for setting aside special stocks and the International Sugar Council, at a meeting in London on May 30, indicated that it is not anticipated that set-aside stocks will need to be established in the near future.

WORLD CENTRIFUGAL SUGAR PRODUCTION IN SPECIFIED COUNTRIES

Raw value, 1975/76 to 1979/80

Region and Country	1975	1976	1977	1978	1979 ²
	(to convert to short tons, multiply by 1.1023) (1,000 metric tons)				
<u>NORTH AMERICA:</u>					
United States:					
Mainland cane	1,657	1,519	1,497	1,441	1,387
Hawaii	953	953	938	1,002	962
Puerto Rico	279	243	184	174	164
Total U.S. cane	2,889	2,715	2,619	2,617	2,513
Sugar beets	3,646	3,534	2,820	2,945	2,613
Total U.S.	6,535	6,249	5,439	5,562	5,144
Caribbean:					
Cuba	6,200	6,100	7,000	7,000	6,500
Dominican Republic ..	1,249	1,222	1,179	1,190	1,200
Other countries	873	774	785	841	859
Total Caribbean	8,322	8,096	8,964	9,031	8,559
Other Mainland:					
Mexico	2,698	2,697	3,030	3,058	3,100
Canada	141	165	149	125	114
Central America	1,506	1,599	1,527	1,554	1,597
Total Other Mainland	4,345	4,461	4,706	4,737	4,811
Total North America ³	19,202	18,806	19,109	19,330	18,514
<u>SOUTH AMERICA:</u>					
Argentina	1,349	1,592	1,661	1,387	1,400
Brazil	6,200	7,500	8,600	7,758	6,950
Colombia	965	882	916	1,052	1,052
Peru	956	941	850	720	800
Venezuela	462	443	389	325	375
Other countries	1,386	1,403	1,125	1,284	1,270
Total South America ³	11,318	12,761	13,541	12,526	11,847
<u>EUROPE:</u>					
Western Europe:					
E.C.-9 ⁴					
Belgium-Luxemburg ..	722	714	729	888	875
Denmark	423	416	566	435	439
France	3,239	2,974	4,293	4,065	4,174
Germany, Fed. Rep. of	2,540	2,734	3,075	2,998	2,930
Ireland	199	186	179	201	180
Italy	1,455	1,748	1,364	1,616	1,623
Netherlands	914	931	890	1,019	856
United Kingdom	697	755	1,003	1,113	1,200
Total E.C.-9 ³	10,189	10,458	12,099	12,335	12,277
Non E.C.					
Austria	512	391	475	375	382
Greece	307	385	295	351	353
Spain	934	1,472	1,267	1,105	814
Sweden	277	302	343	322	321
Other countries	158	183	189	219	229
Total Non E.C. ³	2,188	2,733	2,569	2,372	2,099
Total Western Europe ³	12,377	13,191	14,668	14,707	14,376

**WORLD CENTRIFUGAL SUGAR PRODUCTION (cont.)
IN SPECIFIED COUNTRIES**

Raw value, 1975/76 to 1979/80

Region and country	1975	1976	1977	1978	1979²
	(to convert to short tons, multiply by 1.1023) (1,000 metric tons)				
Eastern Europe:					
Czechoslovakia	750	685	900	970	1,000
German Demo. Rep. ..	650	600	782	700	725
Poland	1,860	1,801	1,851	1,736	1,587
Romania	560	800	609	650	700
Yugoslavia	489	707	784	765	840
Other countries	621	707	734	826	836
Total Eastern Europe ³	<u>4,930</u>	<u>5,300</u>	<u>5,660</u>	<u>5,647</u>	<u>5,688</u>
Total Europe ³	<u>17,307</u>	<u>18,491</u>	<u>20,328</u>	<u>20,354</u>	<u>20,064</u>
U.S.S.R.	7,700	7,350	8,825	9,000	8,500
AFRICA:					
Egypt	620	662	634	657	670
Mauritius	496	731	705	705	745
Mozambique	216	200	260	250	250
South Africa	1,802	2,166	2,211	2,210	2,228
Other countries	2,293	2,366	2,377	2,595	2,778
Total Africa ³	<u>5,427</u>	<u>6,125</u>	<u>6,187</u>	<u>6,417</u>	<u>6,671</u>
ASIA:					
China-Peoples Republic	2,550	2,600	2,970	2,675	2,550
China-Rep. of Taiwan ..	817	1,123	768	891	890
India	5,464	6,043	7,720	7,343	6,524
Indonesia	1,050	1,105	1,000	1,159	1,325
Iran	713	745	686	683	640
Japan	471	565	640	693	697
Pakistan	632	742	856	653	749
Philippines	2,875	2,750	2,397	2,347	2,383
Thailand	1,641	2,212	1,584	1,828	1,260
Turkey	986	1,285	1,082	1,079	1,070
Other countries	463	513	607	579	603
Total Asia ³	<u>17,662</u>	<u>19,683</u>	<u>20,310</u>	<u>19,930</u>	<u>18,691</u>
OCEANIA:					
Australia	2,988	3,405	3,322	2,965	2,975
Fiji Islands	284	307	369	347	400
Total Oceania ³	<u>3,272</u>	<u>3,712</u>	<u>3,691</u>	<u>3,312</u>	<u>3,375</u>
Northern Hemisphere ...	64,429	66,871	71,003	71,269	68,379
Southern Hemisphere ...	<u>17,459</u>	<u>20,057</u>	<u>20,988</u>	<u>19,600</u>	<u>19,283</u>
TOTAL WORLD ³	<u>81,888</u>	<u>86,928</u>	<u>91,991</u>	<u>90,869</u>	<u>87,662</u>

¹Crop years are on a September/August basis, but include the output of sugar from harvests of several Southern Hemisphere countries which begin prior to September.

²Preliminary.

³May not add due to rounding.

⁴E.C. Economic Community.

Source: U.S. Dept. of Agriculture, Sugar and Sweetener Report, Vol. 5 (2), February 1980.

NON-CENTRIFUGAL SUGAR:¹
Production in Specified Countries, Annual 1974/75-1979/80²

Region and Country	1975-76	1976-77	1977-78	1978-79	1979-80 ³
	(to convert to short tons, multiply by 1.1023) (1,000 metric tons)				
<u>NORTH AMERICA:</u>					
Costa Rica	40	45	45	48	50
El Salvador	16	16	10	12	12
Guatemala	54	37	36	35	35
Mexico	65	65	50	55	50
Nicaragua	10	10	10	10	10
Panama	3	2	3	3	3
TOTAL	<u>186</u>	<u>175</u>	<u>154</u>	<u>163</u>	<u>160</u>
<u>SOUTH AMERICA:</u>					
Brazil	200	200	200	200	200
Colombia	829	735	818	910	920
Ecuador	40	42	45	50	55
Peru	13	14	13	15	15
Venezuela	38	39	40	42	45
TOTAL	<u>1,120</u>	<u>1,030</u>	<u>1,116</u>	<u>1,217</u>	<u>1,235</u>
<u>ASIA:</u>					
Burma	135	138	140	140	140
China, Peoples Rep. ..	820	825	830	860	800
China, Rep. of (Taiwan)	27	30	42	40	38
India	6,200	6,200	6,800	6,800	7,300
Indonesia	200	200	225	225	200
Japan	12	11	12	11	14
Pakistan	1,445	1,450	1,450	1,550	1,200
Philippines	54	51	60	68	74
Thailand	370	700	700	650	750
Vietnam, South	10	10	11	10	10
TOTAL	<u>9,273</u>	<u>9,615</u>	<u>10,270</u>	<u>10,354</u>	<u>10,526</u>
WORLD TOTAL	<u><u>10,581</u></u>	<u><u>10,820</u></u>	<u><u>11,540</u></u>	<u><u>11,734</u></u>	<u><u>11,921</u></u>

NOTE: Due to rounding, may not add to area total.

¹Noncentrifugal sugar includes all types of sugar produced by other than centrifugal process which is largely for consumption in the relatively few areas where produced. The estimates include such kinds known as piloncillo, panela, papelon, chancaca, radura, jaggery, gur, muscovado, panaocha, etc.

²Years shown are last year's crop-harvesting season. For chronological arrangements here all campaigns which begin not earlier than September of one year nor later than August of the following year, are placed in the same crop-harvesting year. The entire season's production of each country is credited to the September/August year in which harvesting and sugar production began.

³Preliminary.

Source: USDA Foreign Agricultural Service, Circular FS 1-80, Jan. 1980. Prepared or estimated on the basis of official statistics of foreign governments, other foreign source materials, reports of U.S. Agricultural Attaches and Foreign Service Officers, results of office research and related information.

PRICES OF WHITE REFINED SUGAR IN SELECTED COUNTRIES
Representative Prices for Years 1976-1978 (U.S. Cents per Pound)

Note: Data for 1979 not available at time of printing

Countries	Locality	Representative Prices					
		1976		1977		1978	
		Wholesale	Retail	Wholesale	Retail	Wholesale	Retail
<u>NORTH AMERICA</u>							
Canada	Montreal	19.2	24.1	16.5	20.2	14.9	21.0
U.S.A.	whole country	19.2	24.0	17.3	21.6	20.9	24.1
<u>CENTRAL AMERICA</u>							
Barbados	whole country	N.A.	N.A.	17.0	18.5	17.0	18.5
Belize		5.8	6.5	7.0	7.9	7.0	7.9
Dominican Republic	whole country	14.8	17.0	14.2	17.0	14.2	17.0
El Salvador	whole country	14.0	16.0	14.5	16.0	N.A.	N.A.
Guatemala	whole country	9.5	11.0	9.5	11.0	N.A.	N.A.
Honduras	whole country	11.0	12.5	N.A.	N.A.	12.5	14.0
Jamaica	whole country	N.A.	N.A.	14.2	15.0	18.2	20.5
Leeward islands:							
St. Kitts	whole country	N.A.	N.A.	8.6	9.3	8.6	9.3
Mexico	whole country	N.A.	N.A.	11.1	11.9	11.2	12.0
Nicaragua	whole country	N.A.	N.A.	16.0	18.0	16.0	18.0
Panama	whole country	17.9	20.0	18.3	20.0	18.3	20.0
Trinidad & Tobago	whole country	N.A.	N.A.	8.2	8.8	8.2	8.8
<u>SOUTH AMERICA</u>							
Argentina	whole country	N.A.	N.A.	20.6	23.6	23.4	27.6
Bolivia	whole country	N.A.	N.A.	14.6	15.2	14.9	17.8
Brazil	Rio de Janeiro	13.5	14.0	13.5	15.2	15.0	15.6
Chile	whole country	N.A.	N.A.	N.A.	N.A.	19.5	21.3
Colombia	Cauca Valley	N.A.	N.A.	10.0	11.0	9.6	9.8
Ecuador	—	N.A.	N.A.	9.5	10.4	12.0	13.6
Guyana	Georgetown	N.A.	N.A.	2.3	2.6	4.6	4.9
Peru	—	7.8	8.3	6.5	7.0	8.6	9.4
Venezuela	whole country	N.A.	N.A.	16.6	18.5	17.1	18.5
<u>ASIA</u>							
Afghanistan	whole country	N.A.	N.A.	N.A.	N.A.	N.A.	29.0
Hong Kong	whole country	N.A.	N.A.	N.A.	30.0	N.A.	27.4
India	Kanpur	11.0	11.1	11.0	11.1	11.6	12.2
Iraq	whole country	19.2	20.1	N.A.	N.A.	N.A.	N.A.
Israel	whole country	20.0	25.0	N.A.	N.A.	N.A.	N.A.
Japan	Tokyo	31.8	40.8	31.4	40.7	40.8	50.3
Jordan	—	20.6	21.2	N.A.	N.A.	15.1	16.7
Korea, Rep. of	Seoul	43.4	45.8	39.3	41.5	N.A.	N.A.
Philippines	Manila	9.4	10.7	12.2	13.0	12.3	14.2
Saudi Arabia	—	N.A.	N.A.	16.0	20.0	N.A.	N.A.
Singapore	whole country	22.1	22.8	22.3	22.9	23.1	23.7
Sri Lanka	—	N.A.	N.A.	N.A.	54.6	N.A.	N.A.
Syrian Arab Rep.	whole country	33.8	34.5	33.8	34.5	20.9	21.9
Thailand	Bangkok	11.7	13.0	12.3	13.4	12.8	14.0
<u>EUROPE</u>							
Austria	whole country	13.8	16.1	N.A.	N.A.	N.A.	N.A.
Cyprus	whole country	—	—	15.0	16.0	14.0	15.0
Finland	whole country	45.1	57.4	35.2	47.5	36.0	48.7
Greece	Athens	23.8	27.1	25.0	28.5	24.4	26.7
Hungary	whole country	N.A.	N.A.	28.6	31.7	N.A.	N.A.
Malta	whole country	N.A.	N.A.	12.0	13.0	12.7	14.1
Norway	whole country	N.A.	N.A.	N.A.	N.A.	17.8	26.5

PRICES OF WHITE REFINED SUGAR IN SELECTED COUNTRIES
Representative Prices for Years 1976-1978 (U.S. Cents per Pound) (cont.)

Note: Data for 1979 not available at time of printing

Countries	Locality	Representative Prices					
		1976		1977		1978	
		Wholesale	Retail	Wholesale	Retail	Wholesale	Retail
EUROPE (continued)							
Portugal	whole country	20.0	23.0	19.0	22.0	19.7	22.3
Spain	whole country	N.A.	N.A.	N.A.	N.A.	23.0	24.0
Sweden	whole country	21.3	33.3	23.5	37.1	25.6	38.5
Switzerland	whole country	N.A.	N.A.	18.1	26.4	21.9	31.2
Turkey	Ankara	20.1	N.A.	20.1	N.A.	19.1	N.A.
Yugoslavia	whole country	30.0	33.0	29.1	31.2	N.A.	N.A.
AFRICA							
Burundi	whole country	38.0	45.6	23.0	26.0	55.0	76.0
Egypt, Arab Rep. of	whole country	—	—	10.4	11.3	N.A.	N.A.
Ethiopia	whole country	32.6	36.0	15.0	16.0	21.5	23.1
Ivory Coast	whole country	41.8	47.5	39.6	46.1	43.2	50.3
Madagascar	major cities	N.A.	N.A.	N.A.	N.A.	21.4	24.7
Malagasy Rep.	Tananarive	10.7	13.0	N.A.	N.A.	N.A.	N.A.
Malawi	whole country	7.0	11.3	14.0	18.4	12.7	21.8
Mauritius	whole country	4.0	5.0	3.0	4.0	3.0	4.0
Somalia	whole country	N.A.	N.A.	3.0	4.0	N.A.	N.A.
South Africa	Durban	11.0	12.1	14.3	15.4	15.0	16.3
Sudan	major cities	N.A.	N.A.	89.2	92.2	N.A.	N.A.
Swaziland	whole country	6.4	9.8	6.4	9.8	9.4	14.6
Tanzania, Un. Rep. of	whole country	N.A.	N.A.	24.3	27.4	25.0	27.0
Upper Volta	—	N.A.	N.A.	N.A.	N.A.	34.1	40.2
Zambia	whole country	11.0	11.6	12.2	12.9	23.0	25.0
OCEANIA							
Australia	major cities	13.0	16.0	12.5	15.5	17.0	19.0
Fiji	main centers	9.8	11.4	10.7	12.4	10.7	12.4
New Zealand	4 main cities	20.8	22.8	19.1	21.1	21.4	24.4
Western Samoa	Apia	22.0	31.0	14.0	20.0	22.0	27.0

Source: International Sugar Organization, Sugar Year Book, 1978.

SUGAR SUPPLY AND DISTRIBUTION BY COUNTRIES, 1978

Note: Data for 1979 not available at time of printing.

(Tonnes—Raw Value)

(To convert to short tons, multiply by 1.1023)

Countries	SUPPLY		DISTRIBUTION	
	Production	Imports	Consumption	Exports
NORTH AMERICA:				
Canada	122,786	1,083,333	1,099,221	136,321
U.S.A. (Includes Mainland, Hawaii, Puerto Rico and Virgin Islands)	5,270,114	3,616,355*	9,982,276	13,431
TOTAL	5,392,900	4,699,688	11,081,487	149,752
EUROPE:				
Albania	20,000 ¹	20,997 ⁴	40,000 ¹	0
Austria	364,817	0	350,567	29,582
Bulgaria	200,000 ¹	215,487 ⁴	415,000 ¹	0
Cyprus	0	17,625	17,570	55
Czechoslovakia	885,000	80,406	700,000	306,101
E.E.C.	12,816,214	1,656,121	10,550,306	3,566,248
Finland	104,205	133,378	198,790	22,747
French Overseas Terr. ⁷	0	7,533 ⁴	7,500 ¹	0
German Dem. Republic	777,300	211,514	820,000 ¹	81,304
Gibraltar	0	771 ⁴	800 ¹	0
Greece	354,157	0	304,329	20,733
Hungary	538,438	58,772	579,055	10,403
Iceland	0	13,997 ⁴	11,000 ¹	0
Malta	0	18,131	18,134	0
Norway	0	166,901	161,171	0
Poland	1,603,558	59,582	1,496,599	281,654
Portugal	10,001	339,100	324,336	8,543
(Includes Mainland, Azores, and Madeira)				
Romania	690,000 ¹	0	650,000 ¹	92,000
Spain	1,184,888	29,571 ⁴	1,065,610	0
(Includes Penin., Bal. and Canary Islands)				
Sweden	327,988	27,797	338,841	27,893
Switzerland	107,154	175,600	274,097	4,685
Turkey	1,184,905	0	1,182,000	3,674
U.S.S.R.	9,353,290	3,993,463	12,200,000	174,288
Yugoslavia	750,000 ¹	0	790,000 ¹	0
TOTAL	31,271,915	7,226,746	32,495,705	4,629,910
CENTRAL AMERICA:				
Bahamas	0	7,523 ⁴	7,300 ¹	0
Barbados	103,785	0	16,015	88,935
Belize	119,138	0	7,730	117,039
Bermuda	0	1,851 ⁴	2,000 ¹	0
Costa Rica	227,400	0	130,000 ¹	86,836
Cuba	7,661,546	0	552,006	7,231,219
Dominican Republic	1,198,956	0	182,066	936,678
El Salvador	278,911	0	138,070	133,114
Guatemala	445,931	0	215,671	152,542
Haiti	57,000 ¹	5,420 ⁴	62,000 ¹	5,223 ⁵
Honduras	131,346	0	105,368	22,596
Jamaica	305,580	21,740	113,862	203,106
Mexico	3,130,682	0	2,933,940	73,711
Netherlands Antilles	0	9,646 ⁴	14,000 ¹	5 ⁵
Nicaragua	222,352	0	109,794	103,651 ⁵
Panama	187,000	97	60,723	126,293
Panama Canal Zone	0	2,500 ¹	2,500 ¹	0
St. Kitts-Nevis-anquilla	40,899	0	2,211	38,524
Trinidad & Tobago	148,137	8,698	45,502	103,083
Other Caribbeans ⁸	0	8,367 ⁴	8,500	0
TOTAL	14,258,663	65,842	4,709,258	9,422,555

*Note: This is not consistent with U.S. imports for 1978 reported in table on page 30.

SUGAR SUPPLY AND DISTRIBUTION BY COUNTRIES, 1978 (cont.)

Note: Data for 1979 not available at time of printing.
(Tonnes—Raw Value)

Countries	SUPPLY		DISTRIBUTION	
	Production	Imports	Consumption	Exports
SOUTH AMERICA:				
Argentina	1,396,912	0	953,290	336,822
Bolivia	285,000 ¹	0	167,000 ¹	77,816
Brazil	7,912,612	0	5,289,445	1,924,591
Chile	131,338	295,000 ¹	406,655	30,839 ⁵
Colombia	1,014,075	0	856,081	132,000
Ecuador	346,700	15,120	280,300	40,338
Guyana	341,911	0	35,816	295,456
Paraguay	68,655	0	59,500	0
Peru	856,472	0	546,320	265,891
Surinam	4,000 ¹	9,982	14,000 ¹	5,457 ⁵
Uruguay	91,243	0	92,500 ¹	6,999
Venezuela	402,641	440,274	680,992	0
TOTAL	12,851,559	760,376	9,381,899	3,146,209
ASIA:				
Afghanistan	10,623 ⁶	51,834	62,000 ¹	0
Bangladesh	120,000 ¹	374 ⁴	130,000 ¹	0
Brunei	0	6,000 ¹	6,000 ¹	0
Burma	65,000 ¹	201 ⁴	65,000 ¹	0
China	4,000,000 ¹	1,438,239 ⁴	5,400,000 ¹	38,863 ⁵
(Taiwan Province)	780,000 ¹	0	400,000 ¹	363,588
Democratic Kampuchea	0	1,500 ¹	1,500 ¹	0
Hong Kong	0	105,755	100,000 ¹	3,427
India	7,102,694	0	5,211,940	687,474
Indonesia ^{3,9}	1,127,800	460,288	1,557,400	0
Iran	620,000	875,868 ⁴	1,400,000 ¹	0
Iraq	35,000 ¹	430,815	460,000 ¹	0
Israel	10,000 ¹	170,375 ⁴	180,000 ¹	0
Japan	664,519	2,353,047	2,886,618	1,341
Jordan	0	85,778	80,000 ¹	0
Korea, Dem. People's Rep.	0	150,000	150,000 ¹	0
Korea, Republic of	0	616,409 ⁴	450,000 ¹	90,508 ⁵
Kuwait	0	42,953 ⁴	42,000 ¹	0
Lao, People's Dem. Rep.	0	5,000 ¹	5,000 ¹	0
Lebanon	10,000 ¹	77,540 ⁴	120,000 ¹	0
Macao ³	0	3,000 ¹	3,000 ¹	0
Malaysia	70,000 ¹	398,154	450,000 ¹	16,332
Maldives	0	2,918	3,800 ¹	0
Mongolia	0	38,419 ⁴	40,000 ¹	0
Nepal	15,000 ¹	0	16,000 ¹	0
Pakistan	700,000 ¹	627 ⁴	750,000 ¹	0
Persian Gulf	0	66,463 ⁴	70,000	0
Philippines	2,272,929	0	1,086,646	1,141,926
Saudi Arabia	0	274,858 ⁴	260,000 ¹	0
Singapore	0	109,854	107,418	7,621
Socialist Rep. of Vietnam	120,000 ¹	93,644 ⁴	220,000 ¹	7,707 ⁵
Sri Lanka	25,892 ³	176,162	190,000 ¹	0
Syrian Arab Republic	18,977	182,196	229,265	0
Thailand	1,664,209	0	607,070	1,028,675
Yemen	0	112,796 ⁴	110,000 ¹	0
Yemen Democratic	0	105,690 ⁴	100,000 ¹	2
TOTAL	19,412,643	8,436,757	22,950,657	3,387,434

SUGAR SUPPLY AND DISTRIBUTION BY COUNTRIES, 1978 (cont.)

Note: Data for 1979 not available at time of printing.
(Tonnes—Raw Value)

Countries	SUPPLY		DISTRIBUTION	
	Production	Imports	Consumption	Exports
OCEANIA:				
Australia	2,978,309	0	785,778	2,002,109
British Oceania	0	3,750 ¹	3,750 ¹	0
Fiji	357,328	77	33,336	296,754
New Zealand	0	158,104	167,438	42
Papua New Guinea	0	28,640 ⁴	25,000 ¹	0
U.S. Oceania	0	2,547 ⁴	2,500 ¹	0
Western Samoa	0	3,118	3,230	0
TOTAL	3,335,637	196,236	1,021,032	2,298,905
AFRICA:				
Algeria	15,000 ¹	410,680 ⁴	470,000 ¹	0
Angola ³	50,000 ¹	68,129 ⁴	120,000 ¹	0
Benin	0	7,000 ¹	7,000 ¹	0
Botswana	0	13,000 ¹	13,000 ¹	0
Burundi	0	4,066	4,000 ¹	0
Cameroon, United Republic of	37,000 ¹	18,180	55,000 ¹	0
Cape Verde Islands ³	0	7,427 ⁴	7,500 ¹	0
Central African Republic	0	4,789 ⁴	4,500 ¹	0
Chad	20,000 ¹	10,885 ⁴	30,000 ¹	0
Comoro Islands	0	2,132 ⁴	2,000 ¹	0
Congo	10,000 ¹	11,936 ⁴	20,000 ¹	5,266 ⁵
Djibouti ¹⁰	0	26,262 ⁴	25,000 ¹	0
Egypt, Arab Republic of	589,443	509,062 ⁴	966,226	12,000
Equatorial Guinea	0	850	850 ¹	0
Ethiopia	157,713	0	112,243	30,000 ¹
Gabon	0	3,052 ⁶	5,000 ¹	0
Gambia	0	23,499 ⁴	15,000 ¹	0
Ghana	20,000 ¹	38,577 ⁴	60,000 ¹	0
Guinea	15,000 ¹	3,710 ⁴	20,000 ¹	0
Guinea Bissau ³	0	1,419 ⁴	1,800 ¹	0
Ivory Coast	32,000	41,642 ⁴	43,672	17,452
Kenya	236,439	44,495	278,817	0
Liberia	0	7,098 ⁴	7,800 ¹	0
Libyan Arab Jamahiriya	0	140,855 ⁴	140,000 ¹	0
Madagascar	123,214	0	93,896	24,379
Malawi	96,583	0	39,202	56,484
Mali	25,000 ¹	7,948 ²	32,000 ¹	0
Mauritania	0	28,970 ⁴	35,000 ¹	0
Mauritius	705,398	11	38,723	613,315
Morocco	397,636	260,640 ⁴	630,000 ¹	0
Mozambique ³	189,702	0	150,000	36,041
Niger	0	18,929 ⁴	17,000 ¹	0
Nigeria	30,000 ¹	594,501 ⁴	600,000 ¹	561 ⁵
Rwanda	1,000 ¹	3,657 ⁴	4,700 ¹	0
St. Helena	0	150 ¹	150 ¹	0
St. Thome and Principe ³	0	1,738 ⁴	1,800 ¹	0
Senegal	40,000 ¹	37,377 ⁴	87,000 ¹	0
Seychelles	0	1,000 ¹	1,000 ¹	0
Sierra Leone	0	28,458 ⁴	28,000 ¹	0
Somalia	10,000 ¹	67,896 ⁴	85,000 ¹	0
South Africa	2,287,364	535	1,133,334	718,856
Southern Rhodesia	160,000 ¹	0	160,000 ¹	0
Sudan	151,949	220,193	307,168	0
Swaziland	256,874	0	24,925	226,193
Tanzania, United Rep. of ³	135,537	35,615	140,444	13,608
Togo	0	12,791	13,000 ¹	0

SUGAR SUPPLY AND DISTRIBUTION BY COUNTRIES, 1978 (cont.)

Note: Data for 1979 not available at time of printing.
(Tonnes—Raw Value)

Countries	SUPPLY		DISTRIBUTION	
	Production	Imports	Consumption	Exports
<i>AFRICA: Continued</i>				
Tunisia	7,500 ¹	210,217 ⁴	200,000 ¹	0
Uganda	7,942	0	4,129	0
Upper Volta	31,065	0	27,200	1,600
Zaire	60,000	12,392 ⁴	75,000 ¹	0
Zambia	78,914	0	74,918	0
TOTAL	5,978,273	2,941,743	6,412,997	1,755,755
WORLD TOTAL	92,501,590	24,327,388	88,053,035	24,790,520

¹Estimated.

²Calculated.

³Tel Quel.

⁴As reported by countries of origin.

⁵As reported by countries of destination.

⁶Partly estimated.

⁷French Oceania, New Caledonia, New Hebrides and St. Pierre & Miquelon.

⁸Antigua, Dominica, Grenada, Montserrat, St. Lucia, St. Vincent and Virgin Islands (U.K.)

⁹Including Timor.

¹⁰Previously under French Overseas Territories as Afars en Issas.

Source: ISO (London) Statistical Bulletin, Vol. 38 (7), July 1979.

Part IV

MISCELLANEOUS

GLOSSARY

BAGASSE: Fibrous residue remaining after sugarcane has been milled to extract the sugar-containing juices.

BLACKSTRAP MOLASSES: The final product remaining after all the commercially recoverable sucrose has been removed from the juices expressed from cane. It is a dark colored, heavy, viscous liquid.

BRIX: The measure of density of a solution containing sucrose as determined by a hydrometer.

CALORIE: Unit expressing the energy-producing value of food. A pound of sugar contains 1,790 calories. A standard teaspoon contains 18.

DEXTRINE: A widely occurring crystallizable, simple sugar which contains 6 carbon atoms in contrast to the 12 found in sucrose. It is obtained in commercial quantities by the action of acid on cornstarch. It is less sweet than sucrose.

FRUCTOSE: An alternate chemical name for levulose.

GLUCOSE: (1) An alternate chemical name for dextrose. (2) A name given to corn syrups which are obtained by the action of acids and/or enzymes on cornstarch. Commercial corn syrups are nearly colorless and very viscous. They consist principally of dextrose and another sugar, maltose, combined with gummy organic materials known as dextrans, in water solution.

GUR: Cane juice, concentrated nearly to dryness by boiling over an open fire, without centrifuging and with no purification than by skimming. This ancient process is still used for producing a large share of the sugar consumed in India and some other countries. The crude product is high in glucose and correspondingly low in sucrose.

HIGH FRUCTOSE CORN SYRUP: High fructose corn syrups (HFCS) are produced by the enzymatic conversion of a portion of the glucose in corn syrup to fructose.

Composition of presently available products ranges from 7 to 55% glucose and 42 to 90% fructose on dry solids, the balance being other saccharides. Dry solids average about 71% on total weight. The product is roughly comparable to invert syrup made from sucrose in terms of sweetness and physical properties.

HIGH TEST MOLASSES: A concentrated, clarified cane juice which has been inverted (usually about 2/3) to prevent sucrose from crystallizing at the high concentrations normally employed.

INVERT OR INVERT SUGAR: The mixture of equal parts of dextrose and levulose produced by the action of acid or enzymes on solutions of sucrose.

LEVULOSE: A highly soluble, simple sugar, also containing 6 carbon atoms, it is crystallized with great difficulty, is generally considered sweeter than sucrose, and is used in considerable quantities in combination with dextrose and sucrose in invert sugars.

LIQUID SUGAR: A concentrated solution of refined sucrose or of a mixture of sucrose and invert sugar.

MASSECUITE: A dense mass of sugar crystals mixed with mother liquor, obtained by evaporation.

MOLASS: The mother liquor separated from sugar crystals in massecuite.

NON-CENTRIFUGAL SUGARS: Crude sugars made from the sugarcane juice by evaporation and draining off the molasses. Among local names are "muscovado," "panocha," and "papelon."

PLANT CROP: The sugarcane crop started with seed pieces (setts).

POLARIZATION: The value (designated as "pol") determined by direct or single polarization of a normal weight solution in a saccharimeter or polariscope. (Based on Spencer and Meade.)

RATOON: Second and subsequent crops grown from the root systems of previous plantings of sugarcane. Usually one or more ratoon crops are harvested before the fields are plowed and replanted.

RAW SUGAR: The impure centrifugal sugar of commerce, a light brown crystalline material, generally containing between 96 and 99% sucrose, plus various impurities and moisture. Other names are "panocha" and "demarra."

SOFT SUGARS: Highly refined, dark-colored, molasses-flavored sugars which are frequently called brown sugars. They contain significant amounts of non-sucrose.

SUCROSE: A sweet crystallizable, colorless sugar which constitutes the principal sugar of commerce. Refined cane and beet sugars are essentially 100% sucrose. Under certain conditions sucrose breaks down to dextrose and levulose.

SYRUP: Concentrated clarified cane juice before crystallization.

TEL QUEL: Literally, such as (it is). When used describing sugar it means "as made," hence of a polarization usually varying among mills and producing areas.

TURBINADO: Direct consumption raw sugar of high polarization which must be dried in a granulator to a very low moisture content.



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