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Sugar and Sweeteners Outlook: January 2023

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In this report:

Increased Production Raises U.S. Sugar Supply; Mexican Campaign Progressing Slowly

In the January 2023 *World Agricultural Supply and Demand Estimates* (*WASDE*), the 2022/23 U.S. total sugar supply is increased from last month to 14.525 million STRV, as the combined increase in beet sugar and Louisiana cane sugar production forecasts offset the reduction in total imports. Total imports are reduced from last month as the projected decrease in sugar imported under the World Trade Organization (WTO) raw sugar tariff-rate quota (TRQ) offsets the projected increase in high-tier duty sugar. With total use forecast unchanged at 12.640 million STRV, ending stocks are increased to 1.885 million STRV, up by 178,000 from last month and by 66,000 from 2021/22. This translates to an ending stocks-to-use ratio of 14.9 percent, which is higher by 1.4 percentage points than last month's 13.5 percent and by 0.6 percentage points from last year's 14.3 percent.

The 2022/23 Mexican supply and use balance sheet is unchanged from last month, except for a slight increase in exports to countries other than the United States. The 5.9 million-MT sugar production is carried over from last month, but notable is the slower-than-average pace of this year's campaign.

U.S. Outlook Summary

U.S. Sugar Supply Increased

In the January 2023 *WASDE*, the 2022/23 U.S. total sugar supply is increased from last month by 178,000 short tons, raw value (STRV) to 14.525 million as the 209,000-STRV combined increase in beet sugar and Louisiana cane sugar production forecasts offset the 35,000-STRV reduction in total imports (table 1). As such, total supply would be relatively close to last years' 14.506 million STRV.

Beet sugar production is raised 121,000 STRV to 5.048 million on higher-than-expected sucrose recovery based on actual production data through November reported in the USDA, Farm Service Agency *Sweetener Market Data* (*SMD*). The effect of the higher sucrose recovery offsets the projected reduction of sugarbeet production in the National Agricultural Statistics Service (NASS) January *Crop Production Annual Summary.* Louisiana cane sugar production is raised 88,000 STRV to 2.112 million, thereby overtaking last year's sugar production to set a new record high for the State and marking another milestone of surpassing Florida for a second consecutive year.

Total imports in 2022/23 are reduced from last month by 35,000 STRV to 3.458 million as the projected 86,000-STRV decrease in sugar imported under the WTO raw sugar TRQ offsets the projected 50,000-STRV increase in high-tier duty sugar. Aside from a slight increase in sugar under free trade agreement (FTA) TRQ, there are no other changes to the rest of the import categories, including Mexico.

With total use forecast unchanged at 12.640 million STRV, ending stocks are increased to 1.885 million STRV, up by 178,000 from last month and by 66,000 from 2021/22. This translates to an ending stocks-to-use ratio of 14.9 percent, which is higher by 1.4 percentage points than last month's 13.5 percent and by 0.6 percentage points from last year's 14.3 percent.

Table 1: U.S. sugar: supply and use by fiscal year (October/September), January 2023

Items	2020/21	2021/22			2022/23		
	Final	December (estimate)	January (estimate)	Monthly change	December (forecast)	January (forecast)	Monthly change
			1,000 short tons raw value				
Beginning stocks	1,618	1,705	1,705	0	1,814	1,819	4
Total production	9,233	9,136	9,156	19	9,039	9,248	209
Beet sugar	5,092	5,155	5,155	0	4,927	5,048	121
Cane sugar	4,141	3,981	4,000	19	4,111	4,199	88
Florida	2,090	1,933	1,933	0	1,989	1,989	0
Louisiana	1,918	1,924	1,944	19	2,025	2,113	88
Texas	134	124	124	0	97	97	0
Total imports	3,221	3,646	3,646	0	3,494	3,458	-35
Tariff-rate quota imports	1,749	1,579	1,579	0	1,691	1,606	-85
Other program imports	292	298	298	0	250	250	0
Non-program imports	1,180	1,769	1,769	0	1,552	1,602	50
Mexico	968	1,379	1,379	0	1,477	1,477	0
High-duty	212	390	390	0	75	125	50
Total supply	14,072	14,487	14,506	19	14,347	14,525	178
Total exports	49	29	29	0	35	35	0
Miscellaneous	40	66	81	15	0	0	0
Total deliveries	12,277	12,578	12,578	0	12,605	12,605	0
Domestic food and beverage use	12,161	12,470	12,470	0	12,500	12,500	0
To sugar-containing products re-export program	89	80	80	0	80	80	0
For polyhydric alcohol, feed, other alcohol	27	27	27	0	25	25	0
Commodity Credit Corporation (CCC) for ethanol	0	0	0	0	0	0	0
Total use	12,367	12,673	12,688	15	12,640	12,640	0
Ending stocks	1,705	1,814	1,819	4	1,707	1,885	178
Private	1,705	1,814	1,819	4	1,707	1,885	178
Commodity Credit Corporation	0	0	0	0	0	0	0
Stocks-to-use ratio (percent)	13.8	14.3	14.3	0.0	13.5	14.9	1.4

Source: USDA, World Agriculural Outlook Board, *World Agricultural Supply and Demand Estimates (WASDE)*.

Beet Sugar Production Raised

Beet sugar production in fiscal year 2022/23 is raised from last month by 121,000 STRV to 5.048 million as the increase in the projected sucrose recovery more than offsets the reduction in sugarbeet production reported in the January 12 NASS *Crop Production Annual Summary* (table 2). If realized, this would still denote a 107,000-STRV decrease (2 percent) from last year's 5.155 million.

The sucrose recovery is raised to 15 percent from last month's 14.646 percent based on the actual August to November production data in the *SMD.* The effect of the higher sucrose recovery offsets the projected reduction of sugarbeet production in the NASS January *Crop Production Annual Summary.* The *SMD* shows a cumulative rate of 15.26 percent, the highest

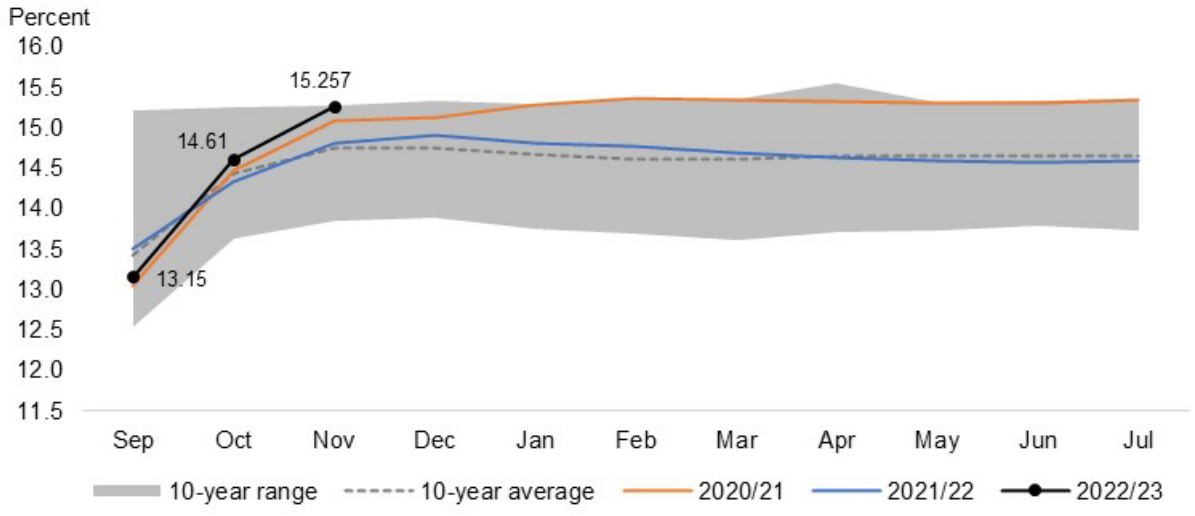
for August–November since 2012/13 (figure 1). So far, the cold weather has been sufficient in helping to keep the outside beet piles cool.

Table 2: Beet sugar production calculations, 2019/20–2020/23

	2020/21 Final	2021/22 December	2021/22 January	Monthly change	2022/23 December	2022/23 January	Monthly change
Sugarbeet production (1,000 short tons) 1/	33,610	36,751	36,751	0	33,462	32,574	-888
Sugarbeet shrink (percent)	6.60	7.9	7.9	0.0	9.5	6.8	-2.6
Sugarbeet sliced (1,000 short tons)	31,392	33,850	33,850	0	30,299	30,348	49
Sugar extraction rate from slice (percent)	15.34	14.63	14.63	0	14.63	15.00	0.37
Sugar from beets sliced (1,000 STRV) 2/	4,817	4,954	4,954	0	4,431	4,552	121
Sugar from molasses (1,000 STRV) 2/	362	341	341	0	360	360	0
Crop year sugar production (1,000 STRV) 2/	5,181	5,294	5,294	0	4,791	4,912	121
Aug.–Sep. sugar production (1,000 STRV)	765	676	676	0	537	537	0
Aug.–Sep. sugar production of subsequent crop (1,000 STRV)	676	537	537	0	643	643	0
Sugar from imported beets (1,000 STRV) 3/	N/A	N/A	N/A	N/A	30	30	0
Fiscal year sugar production (1,000 STRV)	5,092	5,155	5,155	0	4,927	5,048	121

STRV = short tons, raw value; NA = not applicable.
1/ USDA, National Agricultural Statistics Service.
2/ August–July.
3/ Sugar from imported beets in 2020/21 and 2021/22 are already included in the crop year production. Typically, this component is separated for projections and included in total once full crop year slice is available.
Source: USDA, Economic Research Service; USDA, World Agricultural Outlook Board; USDA, Farm Service Agency.

Figure 1
Cumulative sugar extraction rate, beet sugar produced per sugarbeet sliced, by crop year, 2012/13–2022/23



Source: USDA, Economic Research Service; USDA, Farm Service Agency.

The reduction in crop year 2022/23 NASS sugarbeet production is driven by the lowered expectations for both area harvested and yield. National area harvested is reduced from last month by 12,000 acres to 1.137 million, but this nonetheless still represents the second largest area harvested since 2017/18. The largest declines are seen in the Upper Midwest (7,000

acres) and Southwest (6,200) counteracting the slight increases in Great Lakes (1,000) and Great Plains (300) (table 3).

Table 3: U.S. sugar beet area harvested, yield, and production, by region

	2017/18	2018/19	2019/20	2020/21	2021/22	November 2022/23	January 2022/23	Monthly change	Monthly change
Area harvested by region (1,000 acres)									(percent)
Great Lakes (MI)	143.0	148.0	145.0	154.0	142.0	137.0	138.0	1.0	0.7
Upper Midwest (MN, ND)	621.0	607.0	507.0	647.0	618.0	687.0	680.0	-7.0	-1.0
Great Plains (CO, MT, NE, WY)	148.5	142.7	126.9	138.1	141.5	121.2	121.5	0.3	0.2
Northwest (ID, OR, WA)	176.9	174.1	176.8	179.3	183.2	180.0	179.9	-0.1	-0.1
Southwest (CA)	24.4	24.6	24.4	23.4	23.7	23.9	17.7	-6.2	-25.9
United States	1,113.8	1,096.4	980.1	1,141.8	1,108.4	1,149.1	1,137.1	-12.0	-1.0
Yield by region (short tons per acre)									
Great Lakes (MI)	25.2	29.1	28.6	28.3	37.4	30.5	28.8	-1.7	-5.6
Upper Midwest (MN, ND)	30.5	26.7	25.3	25.7	30.4	25.8	25.8	0.0	0.0
Great Plains (CO, MT, NE, WY)	32.0	31.6	28.7	30.8	31.0	27.9	27.8	-0.1	-0.4
Northwest (ID, OR, WA)	39.2	40.5	39.0	40.6	39.5	39.0	38.0	-1.0	-2.7
Southwest (CA)	43.7	48.8	45.4	46.6	45.4	46.7	45.8	-0.9	-1.9
United States	31.7	30.4	29.2	29.4	33.2	29.1	28.6	-0.5	-1.6
Production by region (1,000 short tons)									
Great Lakes (MI)	3,604	4,307	4,147	4,358	5,311	4,179	3,974	-205	-4.9
Upper Midwest (MN, ND)	18,960	16,217	12,845	16,625	18,758	17,756	17,576	-180	-1.0
Great Plains (CO, MT, NE, WY)	4,759	4,503	3,647	4,258	4,391	3,386	3,380	-6	-0.2
Northwest (ID, OR, WA)	6,928	7,055	6,903	7,279	7,232	7,025	6,833	-192	-2.7
Southwest (CA)	1,066	1,200	1,108	1,090	1,076	1,116	811	-305	-27.3
United States	35,317	33,282	28,650	33,610	36,768	33,462	32,574	-888	-2.7

CA = California, CO = Colorado, ID = Idaho, MI = Michigan, MN = Minnesota, MT = Montana, NE = Nebraska, ND = North Dakota, OR = Oregon, WA = Washington, WY = Wyoming.
Source: USDA, National Agricultural Statistics Service.

National yield in crop year 2022/23 is down from last month by 0.5 tons per acre to 28.6, the lowest since 2017/18. Except in the Upper Midwest where it is mostly unchanged, yield in all regions is down. The largest over-the-month reduction is in Michigan (1.7 ton per acre or 5.6 percent), followed by Northwest (1 ton per acre or 2.7 percent). The late start to the April spring planting negatively affected yields this season. Planting was delayed by almost a month–the latest in history for some areas–due to wet, cold weather, thereby shortening the time for sugarbeets to grow.

With the increase in sucrose recovery outweighing the decreases in area harvested and yield, crop year 2022/23 sugarbeet production is adjusted to 32.574 million short tons, up 888,000 from last month. Using a revised shrink of 6.8 percent, which is based on the beet processors reporting to SMD, the resulting estimate for sugarbeets sliced is 30.348 million short tons, up 49,000 from last month. This amount is multiplied by the higher 15-percent-sucrose recovery, to derive the 2022/23 crop year sugar production of 4.552 million STRV.

The expected sugar production from molasses (360,000 STRV) is unchanged from last month and is added to the 4.552 million STRV resulting in a crop year 2022/23 production of 4.912 million. This represents a 112,000-STRV increase from last month's 4.780 million STRV but would still be the second lowest crop year sugar production in the last 8 years behind the 2019/20 crop that was severely affected by weather.

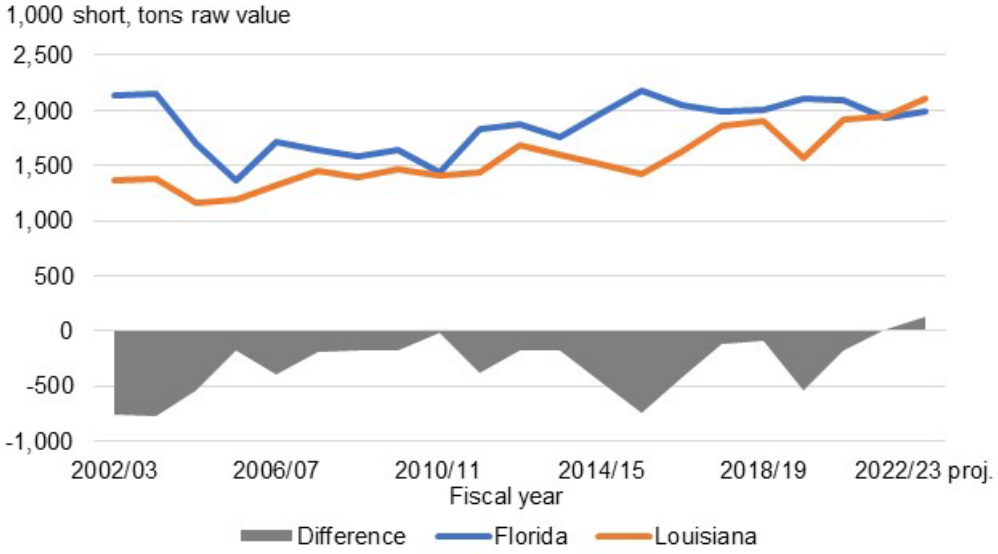
Subtracting the actual sugar production from August–September 2022 (537,000 STRV) and adding both the projected sugar production from the August–September 2023 early season (643,000) and from imported sugarbeets (30,000), which are all unchanged from last month, results in a 5.048-million-STRV fiscal year equivalent. If realized, would be 107,000-STRV lower than last year's 5.155 million.

Louisiana Increases Cane Sugar Production in 2021/22 and 2022/23

Louisiana cane sugar production in both fiscal year 2021/22 and 2022/23 are increased from last month. The former is due to a 19,000-STRV upward adjustment in September 2022 that arises from processor finalization of *SMD* reporting. This increased the 2021/22 fiscal year cane sugar production by the same amount to 1.933 million. This marks a milestone: Louisiana has produced more sugar than Florida for the first time since fiscal year 2002/03 (figure 2).

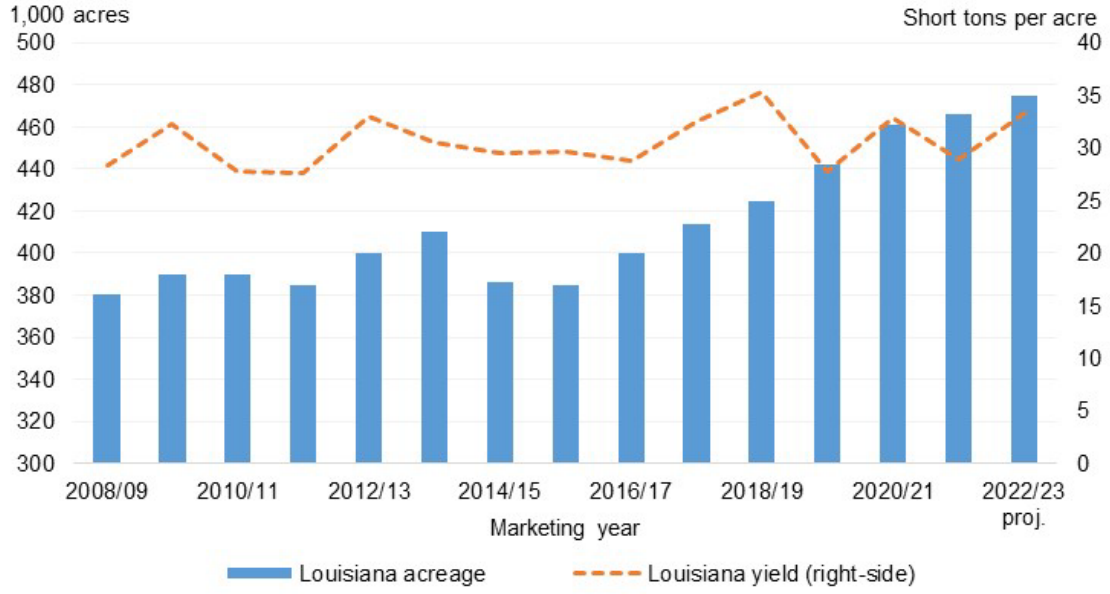
The 2022/23 crop year cane sugar production for Louisiana is up from last month by 88,000 STRV to 2.113 million mostly due to the increased NASS forecast of crop year 2022/23 sugarcane production for sugar in the State. This is a function of NASS increasing its projected area harvested and yield from last month to 475,000 acres and 33.3 tons per acre, respectively, the former setting a record high reflecting the continued area expansion in the State (figure 3). If realized, the 2.113-million STRV represents a 169,000-STRV increase (9 percent) from 2021/22, thereby overtaking last year's sugar production to set a new record high for the State and marking another milestone of surpassing Florida for a second year in a row.

Figure 2
U.S. cane sugar production by Florida and Louisiana, by fiscal year, 2002/03–2022/23



proj. = projected.
Source: USDA, Farm Service Agency; USDA, Economic Researh Service calculations.

Figure 3
Louisiana harvested area for sugar and yields, 2007/08–2022/23



proj. = projected.
Source: USDA, National Agricultural Statistics Service.

In addition, a slight part of the fiscal year 2022/23 increase (about 5,000 STRV out of the total 88,000 STRV) is due to the September 2022 revision which falls in the crop year 2022/23

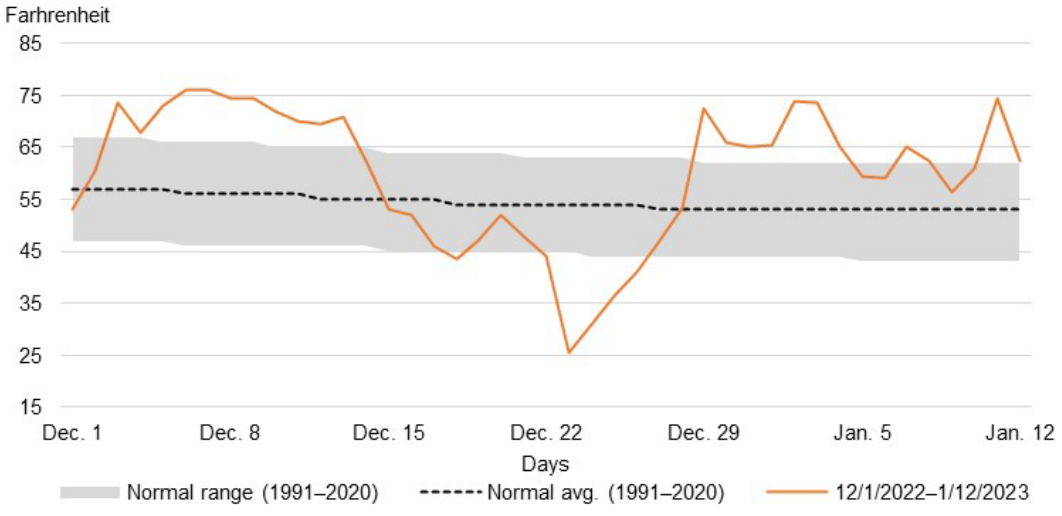
period. Since Louisiana's crop cycle typically starts in September–in contrast with the October start date in Florida and Texas–this month's actual production is subtracted from the crop year production and is included in creating a forecast for the next September production which is added to convert to a fiscal year basis. Thus, any September revision affects the subsequent fiscal year in the State.

The larger forecast for Louisiana cane sugar production comes during the ongoing impact assessment of the multi-day severe freeze during the last two weeks of December. During the freeze event, the U.S. National Weather Service data showed temperatures in the Lafayette Region dropped to an average low of 25.5 degrees Fahrenheit on December 23, which is significantly lower than the normal daily minimum average recorded between 1991–2020 (figure 4). According to the Louisiana State University (LSU) AgCenter's report that was published the Louisiana Farm Bureau News website on December 21, a major concern was about rising temperatures immediately after. When temperatures rise, freeze-affected sugarcane plants deteriorate faster, thereby reducing the amount of recoverable sugar. This is exactly what happened; the average daily temperature rose above 65 degrees Fahrenheit, which is also above the normal daily maximum average recorded between 1991–2020. The freeze could have negative effects on the sugarcane that is scheduled to be harvested next year.

But by the time the freeze started on December 23, growers were reportedly about 83 percent harvested, according to the same LSU report. A fuller assessment is expected after all the mills have ended their campaigns before the end of January.

Given the relatively small NASS changes for Florida and Texas, both State's 2022/23 fiscal year cane sugar production remain the same–1.989 million STRV and 97,000 STRV, respectively. As such, the total cane sugar production in the U.S. is increased from last month, solely on Louisiana's account, by 88,000 STRV to 4.199 million, representing a 199,000 STRV over-the-year increase (5 percent) and toppling the prior record high of 4.142 million STRV set in 2020/21 by 57,000 (1 percent).

Figure 4
Average daily temperature in Lafayette Region, Louisiana, from December 1–January 12



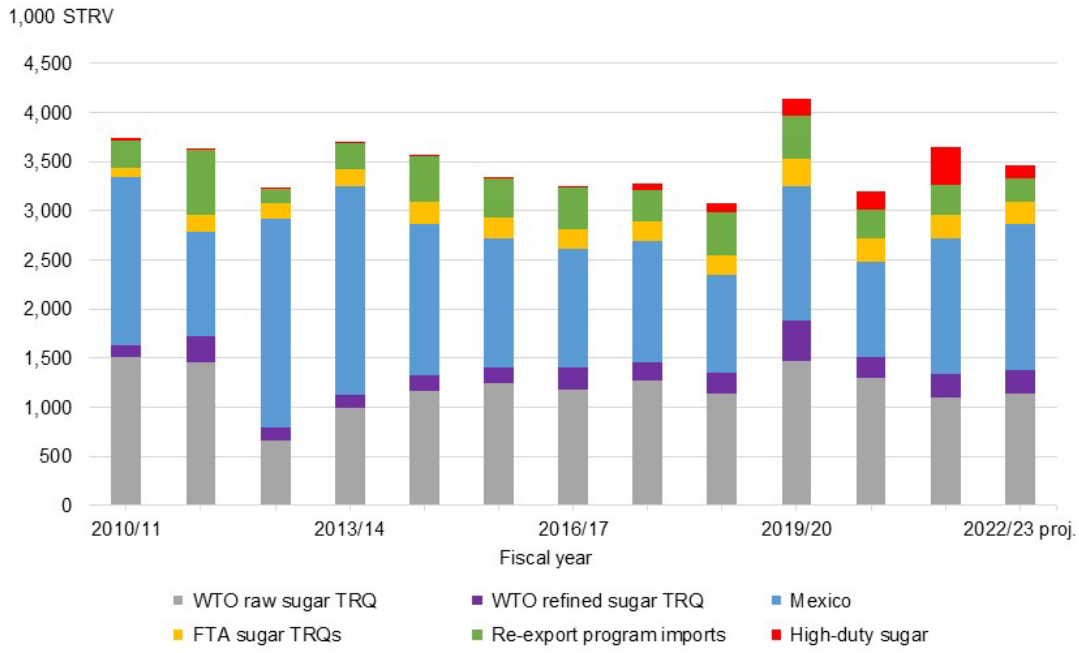
avg. = average.
Source: U.S. National Weather Service.

Total Imports Adjusted Downward; High-tier Imports Raised

Total imports in 2022/23 are reduced from last month by 35,000 STRV to 3.458 million as the projected decrease in sugar imported under the WTO raw sugar TRQ offsets the projected increase in high-tier duty sugar (figure 5). Aside from a slight increase in sugar under the FTA TRQ, the rest of the import categories are unchanged, including Mexico.

The raw sugar TRQ is reduced from last month by 86,000 STRV to 1.141 million. This is primarily due to the lower-than-expected entry of sugar imports under the 2021/22 TRQ quota that were granted an extension entry through December 31. Meanwhile, the FTA TRQ, which is based on a calendar year, was slightly revised upward by 463 STRV to 223,000 as 2022 ends.

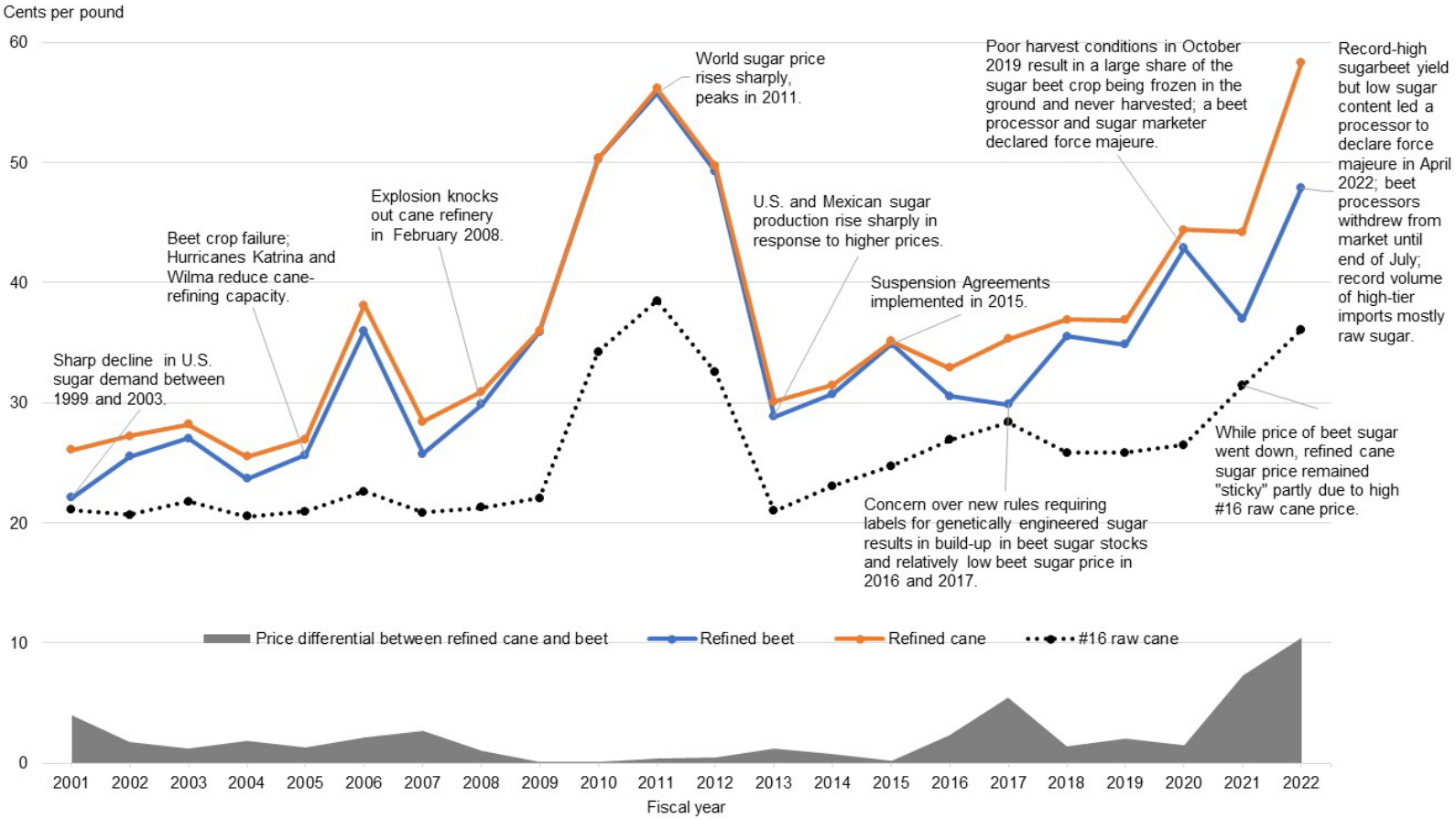
Figure 5
U.S. sugar imports by type, 2010/11–2022/23



STRV = short tons, raw value; FTA = free trade agreement; WTO = World Trade Organization; TRQ = tariff rate quota; proj. = projected.
Source: USDA, Foreign Agricultural Service.

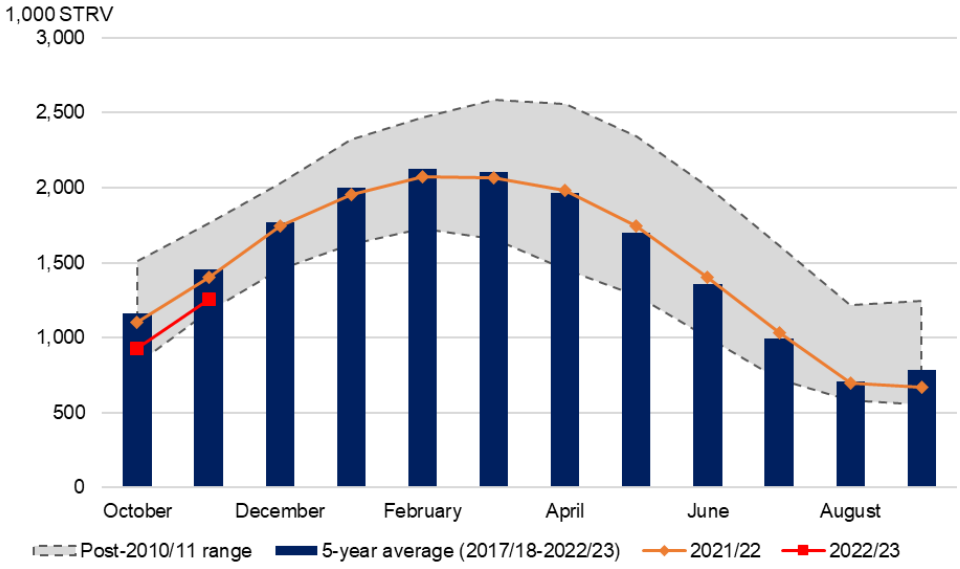
High-tier imports in 2022/23 are raised from last month by 50,000 STRV to 125,000. The upward revision is based on the entries of high-tier raw sugar imports to date, and on the anticipated increase in the pace of high-tier refined sugar imports in the coming months. Both factors are a function of several market dynamics namely, the current high-price environment last experienced in 2011 (figure 6) and tight spot supplies, particularly for refined beet sugar due to back-to-back years of weather-affected campaigns. Beet refined sugar stocks as of November 2022 amounting to 1.260 million STRV are about 197,000 lower than the 5-year average and 141,000 lower than last year. The current stock closely tracks the 10-year minimum of 1.179 million back in November 2011 (figure 7). However, despite the *WASDE* increasing its forecast for the 2022/23 beet sugar and Louisiana cane sugar production this month, uncertainties remain particularly for the latter given the December freeze event, at least until the campaign concludes by the end of January. There also are concerns regarding the slower-than-normal Mexican sugar production, and Mexico's ability to meet its export quota.

Figure 6
U.S. sugar prices, fiscal years 2001–2022



Note: The refined cane sugar price is rhe wholesale refined cane sugar price in the Northeast market and the refined beet sugar is the wholesale refined beet sugar price in the Midwest market.
The #16 raw cane price is the Intercontinental Exchange Contract No. 16 nearest futures month.
The data are from the weekly *Sosland Sweetener Report*.
Source: USDA, Economic Research Service, *Sugar and Sweetener Yearbook Tables*.

Figure 7
Sugarbeet processors' total sugar inventories, monthly, 2010/11 to 2022/23



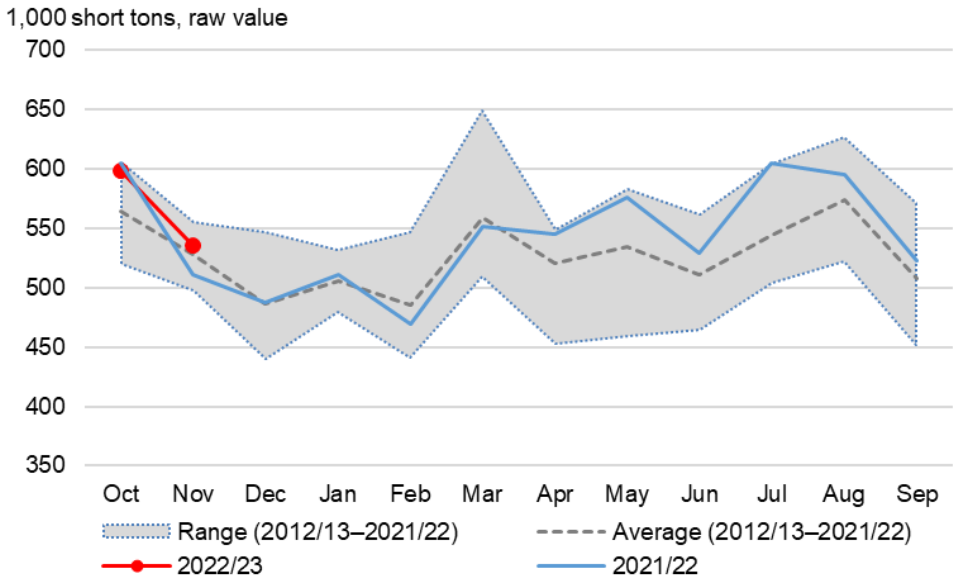
Note: STRV = short tons, raw value.
Source: USDA, Farm Service Agency.

These market dynamics can motivate certain users, non-reporters[1], and cane refiners, particularly those that are import-based, to watch high-tier sugar imports. These imports present a viable option to keep factories efficiently running and fulfill increased customer orders, including those traditionally reliant on refined beet sugar that are still needing inventory. Indeed, a likely indication of increased demand for refined cane sugar is reflected in the strong cane refiners' melt between October and November, which at 1.117 million STRV matches the record high achieved during the same 2-month period in fiscal year 2016 (figure 8). While refiners' total inventory (raw and refined sugar) is relatively at normal levels (figure 9), an unexpected surge in customers' demand might encourage import-based refiners or non-reporters to bring in high-duty imports, if the price margins make it profitable.

[1] Non-reporters are neither beet processors nor cane refiners that are covered under the sugar program. These companies typically import refined sugar for direct consumption or delivery to an end-user.

Figure 8

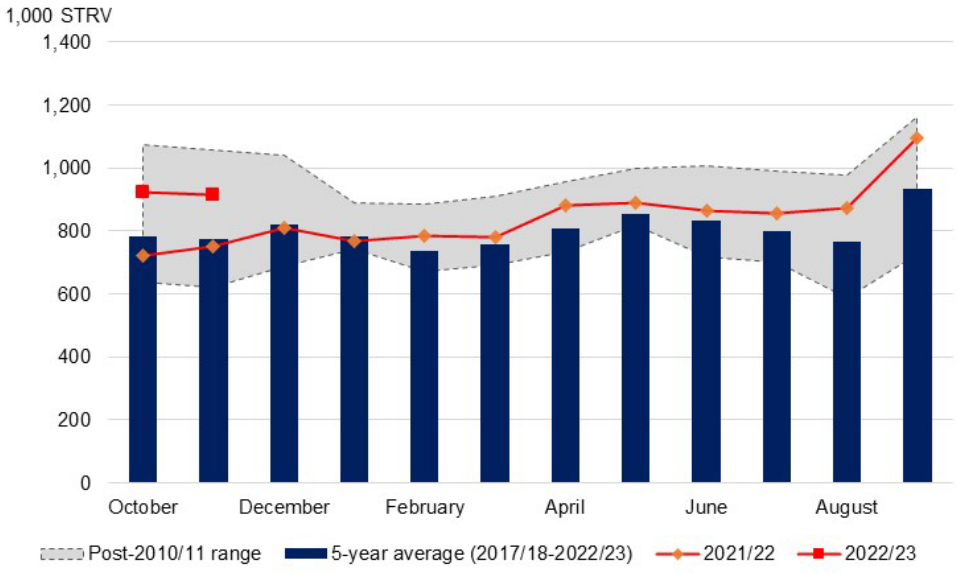
Sugarcane refiners' melt, monthly, 2012/13 to 2022/23



Melt = quantity of raw sugar processed.
Source: USDA, Farm Service Agency.

Figure 9

Sugarcane refiners' total sugar inventories (raw and refined), monthly, 2010/11 to 2022/23

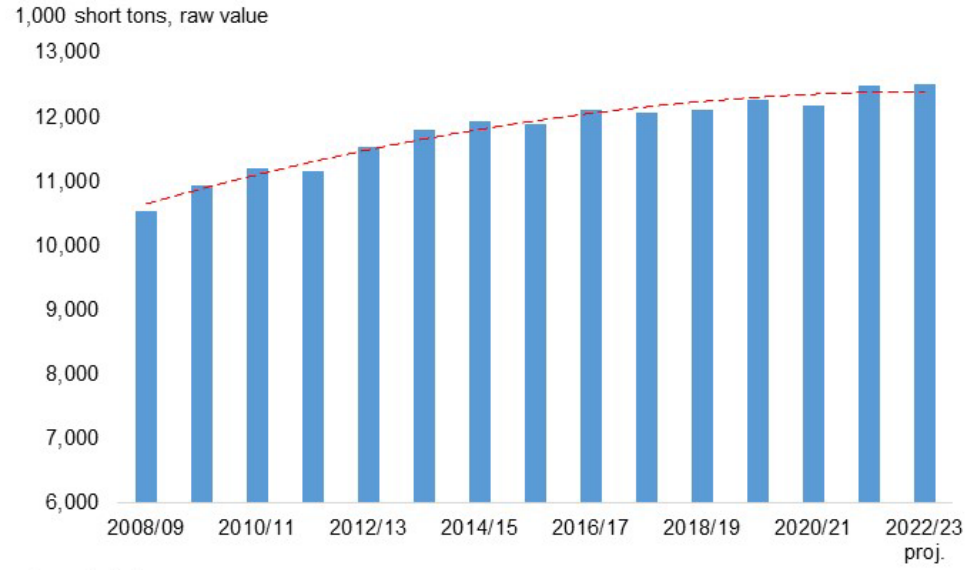


Note: STRV = short tons, raw value.
Source: USDA, Farm Service Agency.

Sugar Deliveries Unchanged

No changes are made to the 2022/23 projected sugar use of 12.605 million STRV. The major subcomponent, domestic food and beverage use deliveries, remains at 12.500 million STRV, reflecting a 27,000-STRV increase (0.2 percent) from 12.470 million in 2021/22 (figure 10).

Figure 10
U.S. sugar deliveries for food and beverage use, fiscal year, 2008/09 to 2022/23



proj. = projected.
Source: USDA, Economic Research Service.

Cane refiners posted record-strong deliveries for the first two months of the fiscal year. Through November, cane sugar deliveries amounted to 1.143 million STRV, which is 45,000 more than last year (4 percent), and surpassed the prior high of 1.126 million in 2020/21 (table 4). This trend parallels the elevated cane refiners' melt for the first two months of the fiscal year which previously noted, matches the record high for this period. Cane sugar deliveries and melt closely track each other because cane refiners typically melt raw cane sugar when there is a contemporaneous customer delivery to be fulfilled; it is costly to store and maintain the quality of refined sugar in inventory for uncontracted needs.

Table 4: Food and beverage deliveries, October–November, 2017/18–2022/23

	2017/18	2018/19	2019/20	2020/21	2021/22 est.	2022/23 proj.	Annual change	
	1,000 short tons, raw value (STRV)						1,000 STRV	Percent
Beet sugar processors	989	886	904	871	937	916	-21	-2
Cane sugar refiners	1,044	1,122	1,076	1,126	1,098	1,143	45	4
Non-reporter (direct consumption)	84	178	187	97	208	108	-100	-48
Total	2,116	2,186	2,166	2,095	2,243	2,167	-76	-3
			Percent share in total				5-year Average	
Beet sugar processors	47	41	42	42	42	42	42	
Cane sugar refiners	49	51	50	54	49	53	51	
Non-reporter (direct consumption)	4	8	9	5	9	5	7	
Total	100	100	100	100	100	100	100	

est. = estimated; proj. = projected.
Source: USDA, Farm Service Agency.

Conversely, cumulative beet sugar deliveries through November amounting to 916,000 STRV are down 21,000 compared with last year's pace. Given that spot supplies in the Midwest market remain unavailable and prices are record high, the reduced pace likely reflects the supply constraint on the processors' side. Virtually all the U.S. beet sugar supply is produced from domestically grown sugarbeets, except for a small quantity of imported beets from Canada. As such, beet sugar deliveries are largely driven by the expected levels of domestic beet sugar production and beginning stocks.

Non-reporter deliveries through November of 108,000 STRV are down year over year by 100,000-STRV and would also be lower than 2018/19 and 2019/20 during the same period. Due to the method of deriving this number, where the underlying data are sourced from different government agencies, generating a reliable forecast based on pace to date generally does not apply to this category. The difference in the timing of the data collection also contributes to the volatility of the data series. Nonetheless, there is a general expectation that non-reporters would step in to fill some of the users' unmet sugar supplies amid the production risks from both the U.S. beet and cane sectors, and the uncertainty surrounding the slower-than-expected Mexican sugar production.

Given that actual data are only available for two months and that deliveries during the first fiscal quarter (October–December) have traditionally been the slowest due to the holidays, there is not enough information that warrants changing the forecast for food and beverage use deliveries for this month.

Mexico Outlook

Sugar Production Unchanged; Pace to Date Lags Recent History

The January 2023 *WASDE* did not change the 2022/23 Mexican supply and use balance sheet, except for a slight 759-metric ton (MT) increase in exports to countries other than the United States. Consequently, with the 2022/23 stocks pegged to a 2.5-months' worth of supply (971,000 MT), deliveries to *Industria Manufacturera, Maquiladora y de Servicios de Exportación* (*IMMEX*) program are adjusted down ton-per-ton to accommodate the increase in exports.

USDA carried over its 5.9 million MT Mexican sugar production for 2022/23 from last month, a 2.6-percent decline from last year's 6.185 million MT (table 4). The USDA forecast is lower than the 6.025 million MT, the first official 2022/23 production forecast that the Mexican National Committee for the Sustainable Development of Sugarcane (CONADESUCA) released on November 11. USDA and CONADESUCA mainly differ on their projections for area harvested, with the former at 814,850 hectares, while the latter is more optimistic in its 832,245-hectare forecast. According to the USDA FAS office in Mexico City, the relatively high sugar price environment has incentivized area expansion. Note that either of the projections, if realized, would be a new record overtaking the prior high of 805,511 hectares in 2018/19.

However, based on CONADESUCA's weekly production report as of January 7, the fifteenth week of the campaign, the pace of this year's harvest lags both last year and the recent 5-year average. Despite another mill coming online, which brought the total to 47 out of the expected 49, area harvested to date is 6,000 hectares and 8,600 hectares behind the same time in 2021/22 and 2017/18–2021/22 (table 5). The rest of field and factory production metrics are also lagging. Consequently, the pace-to-date sugar production amounts to 1.062 million MT, which is about 200,000-MT lower (16 percent) than last year and the 5-year average. If the 5.9 million-MT sugar production forecast is to be met, the mills would have to accelerate their pace in the immediate weeks and possibly extend campaigns beyond normal termination dates. Since the Mexican sugar production is directly tied to fulfilling U.S. import requirements, the developments will be closely watched.

Table 5: Mexican sugar: supply and use by fiscal year (October/September), January 2023

Items	2020/21	2021/22			2022/23		
	Final	December (estimate)	January (estimate)	Monthly change	December (forecast)	January (forecast)	Monthly change
	1,000 metric tons, actual weight						
Beginning stocks	858	1,053	1,053	0	964	964	0
Production	5,715	6,185	6,185	0	5,900	5,900	0
Imports	65	31	31	0	35	35	0
Imports for consumption	32	7	7	0	10	10	0
Imports for sugar-containing product exports (IMMEX) 1/	33	24	24	0	25	25	0
Total supply	6,638	7,269	7,269	0	6,899	6,899	0
Disappearance							
Human consumption	3,935	4,113	4,113	0	4,168	4,168	0
For sugar-containing product exports (IMMEX)	485	532	532	0	494	493	-1
Other deliveries and end-of-year statistical adjustment		-16	-16				
Total	4,420	4,629	4,629	0	4,662	4,661	-1
Exports	1,165	1,676	1,676	0	1,266	1,267	1
Exports to the United States and Puerto Rico	828	1,180	1,180	0	1,264	1,264	0
Exports to other countries	337	495	495	0	2	3	1
Total use	5,585	6,305	6,305	0	5,928	5,928	0
Ending stocks	1,053	964	964	0	971	971	0
Stocks-to-human consumption (percent)	26.8	23.4	23.4	0	23.3	23.3	0
Stocks-to-use (percent)	18.9	15.3	15.3	0	16.4	16.4	0
High-fructose corn syrup (HFCS) consumption (dry weight)	1,320	1,291	1,291	0	1,291	1,291	0

1/ IMMEX = Industria Manufacturera, Maquiladora y de Servicios de Exportación.

Sources: USDA, World Agricultural Outlook Board; Mexico's National Committee for the Sustainable Development of Sugarcane (CONADESUCA).

Table 6: Mexican sugar production as of week 15, 2021/22, 2022/23, and five-year average

	As of week 15			Difference vs. 2021/22		Difference vs. 5-year average	
	2021/22	2022/23	5-year average (2017/18–2021/22)	Level	Percent	Level	Percent
Area harvested (ha)	158,358	152,336	160,966	-6,022	-4	-8,630	-5
Sugarcane processed (MT)	12,526,740	11,027,349	12,650,730	-1,499,391	-12	-1,623,381	-13
Sugarcane yield (MT per ha)	79.10	72.39	78.52	-6.7	-8	-6.1	-8
Number of mills in operation	45	47	48	2	4	-1	-3
Extraction rate (percent)	10.10	9.63	9.92	-0.47	-5	-0.29	-3
Total factory yield (MT per sugar ha)	7.99	6.97	7.79	-1.02	-13	-0.82	-11
Sugar production (MT)							
Sugar production (metric tons)	1,265,535	1,061,769	1,258,269	-203,766	-16	-196,500	-16

ha = hectares; MT = metric tons.

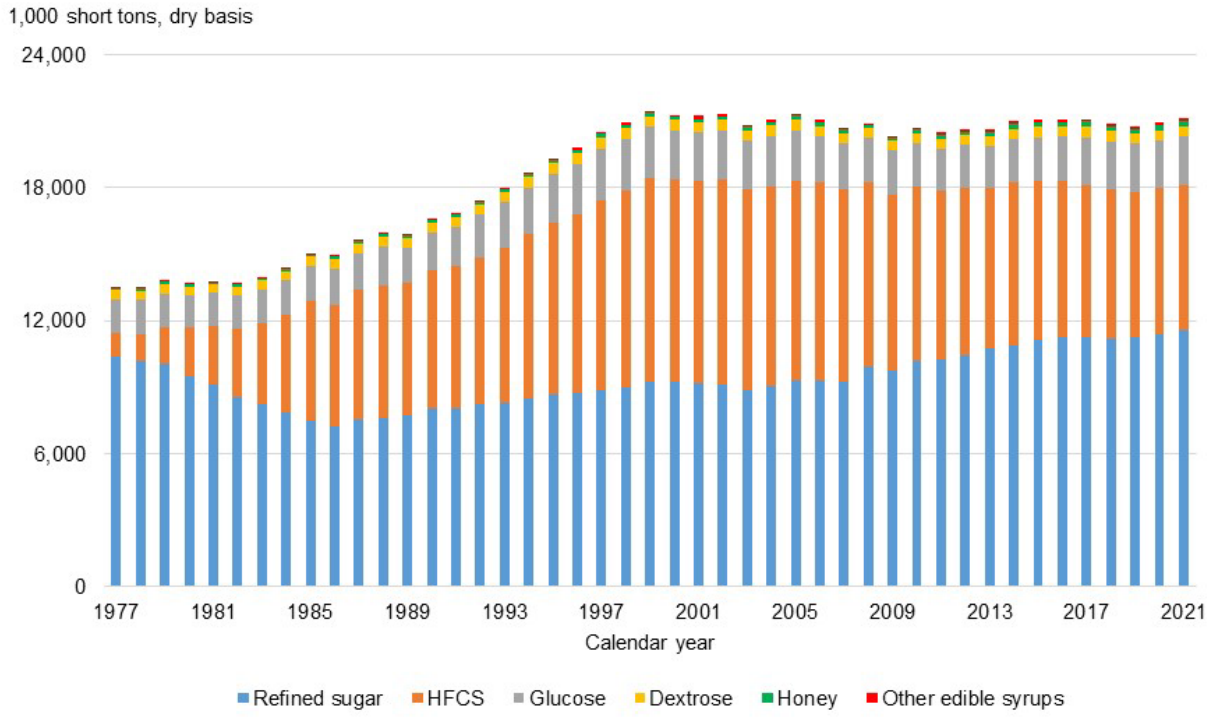
Source: USDA, Economic Research Service calculations using data from Mexico's National Committee for the Sustainable Development of Sugarcane (CONADESUCA).

Special Article: Trends in U.S. Sweetener Deliveries

Total Caloric Sweetener Deliveries Higher in 2021 for Second Consecutive Year

Total caloric sweetener deliveries for food and beverage use in the United States for calendar year 2021 totaled 21.145 million short tons, dry basis (figure 11). This represents an annual increase of 1.1 percent from 2020's 20.915 million short tons, dry basis, marking a second consecutive year of increase since 2019's 20.774 million. In addition, the 1.1 percent increase reflects the largest annual growth since 2014 and is relatively higher than the short- and long-term historical trends (table 6). Also, given that the total sweetener deliveries remain relatively flat since peaking in 1999, the 1.1 percent growth is noticeable in that it is on par with the 45-year average (1977–2021), a period that includes the steady increase in total sweetener deliveries up to the 1999 high point.

Figure 11
Total U.S. caloric sweetener deliveries for food and beverage use, calendar year, 1977–2021



HFCS= high-fructose corn syrup.
Source: USDA, Economic Research Service.

Table 6: Average annual growth rates, quantities, and share of total caloric sweeteners deliveries, by type, calendar year 1977–2021

	1-year (2020–2021)	5-year (2017–2021)	10-year (2012–2021)	20-year (2002–2021)	45-year (1977–2021)
Average growth rate (percent)					
Refined sugar	2.0	0.5	1.2	1.2	0.3
HFCS	-1.1	-1.4	-1.4	-1.6	5.3
Other caloric sweeteners	2.5	1.8	1.4	0.1	1.0
Total caloric sweeteners	1.1	0.1	0.3	0.0	1.1
Average quantity (1,000 short tons, dry weight equivalent)					
Refined sugar	11,467	11,270	11,065	10,239	9,322
HFCS	6,600	6,700	7,010	7,832	6,626
Other caloric sweeteners	2,963	2,949	2,818	2,813	2,609
Total caloric sweeteners	21,030	20,919	20,893	20,884	18,557
Average share (percent)					
Refined sugar	55	54	53	49	50
HFCS	31	32	34	38	36
Other caloric sweeteners	14	14	13	13	14
Total caloric sweeteners	100	100	100	100	100

HFCS = high-fructose corn syrup.

Note: Other caloric sweeteners are composed of dextrose, glucose, honey, and other edible syrups.

Source: USDA, Economic Research Service.

In addition, long-term trends among the sweetener types appear to continue. Sugar derived from sugarbeets and sugarcane and high-corn fructose syrup (HFCS) remain the largest components of sweeteners in the U.S. market, averaging 55 percent and 31 percent of the total sweetener deliveries in the last 2 years. Other sweeteners, which are comprised of other corn sweeteners (glucose syrup and dextrose), honey, and edible syrups make up the remaining 14 percent, which has been relatively stable over the years. A breakdown of the total 1.1 percent annual growth indicates that it is mainly driven by an over-the-year increase in the deliveries of refined sugar (2 percent) and partly by the increase in other sweeteners (2.5 percent), albeit the actual quantities are relatively smaller, that offsets the decline in HFCS deliveries (1.1 percent).

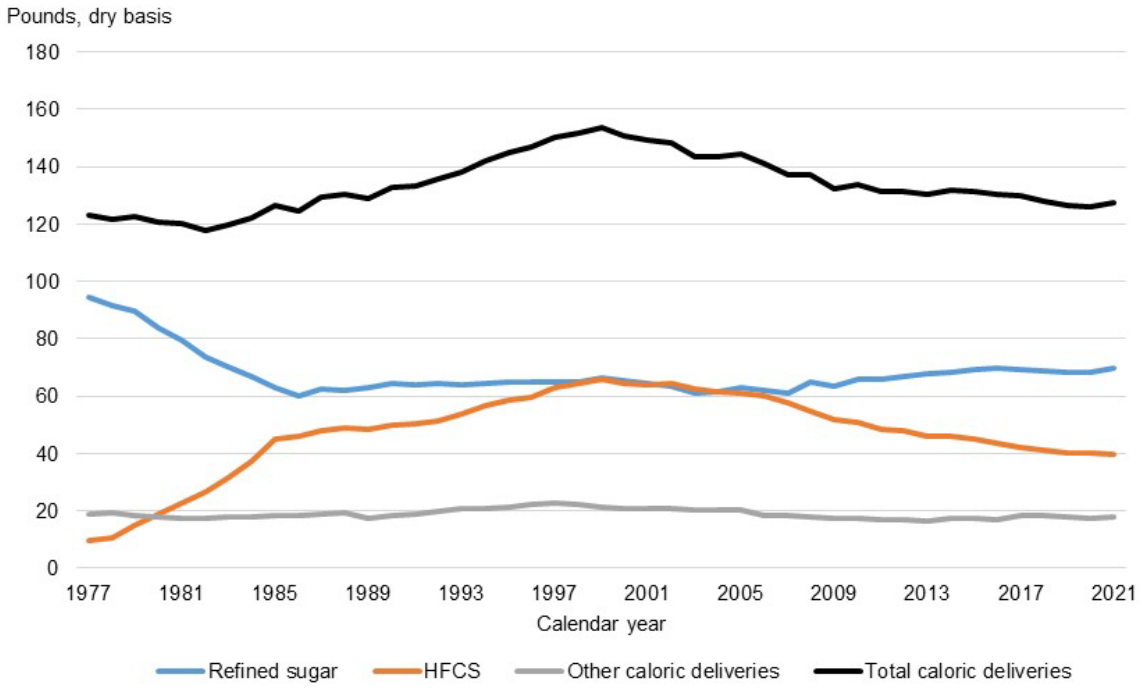
At a 55-percent average in the last 2 years, the share of sugar in total sweetener deliveries has been the highest compared to the short- and long-term trends. This is mostly at the expense of HFCS, whose average share in 2020–21 is down 31 percent compared with 43 percent during its high point in 1999–2002. The divergent trends characterized by the increasing refined sugar and decreasing HFCS, as illustrated by the growth rates and share in total deliveries, are also observed at the per capita level. This is discussed in the next section.

Per Capita Caloric Sweetener Deliveries Also Higher in 2021

The total deliveries of these sweeteners are divided by the U.S. population to estimate the per capita deliveries to provide insights on the general patterns of sweetener consumption in the country over time.

Total per capita caloric sweetener deliveries in 2021 rose from last year by 1 percent to 127.4 pounds per capita, an annual growth not observed seen since 2014 (figure 12; table 7). Much like the gross total caloric sweetener deliveries, most of the over-the-year growth is driven by a 1.9 percent increase in per capita deliveries of refined sugar countering a 1.2 percent decline in per capita HFCS deliveries. While per capita use of other caloric sweeteners (glucose, dextrose, honey, other edible syrups) grew 2.4 percent during the same period, the volumes have been relatively small and historically hovered around 20 pounds.

Figure 12
Per capita U.S. caloric sweetener deliveries for food and beverage use, calendar year, 1977–2021



HFCS= high-fructose corn syrup.
Note: Other caloric sweetener deliveries are componsed of other corn sweetener deliveries (glucose syrup and dextrose), honey, and other edible syrups
Source: USDA, Economic Research Service.

Table 7: Average annual growth rates and quantities of per capita caloric sweeteners deliveries, by type, calendar year 1977–2021

	1-year (2020–2021)	5-year (2017–2021)	10-year (2012–2021)	20-year (2002–2021)	45-year (1977–2021)
Average growth rate (percent)					
Refined sugar	1.9	0.0	0.6	0.4	-0.6
HFCS	-1.2	-1.9	-2.0	-2.4	4.3
Other caloric sweeteners	2.4	1.2	0.7	-0.6	-0.1
Total caloric sweeteners	1.0	-0.5	-0.3	-0.8	0.1
U.S. population	0.1	0.5	0.6	0.8	0.9
Average quantity (pounds, dry basis)					
Refined sugar	69.1	69.0	68.7	66.0	68.0
HFCS	39.8	40.6	43.1	50.2	47.0
Other caloric sweeteners	17.9	18.0	17.5	18.1	18.9
Total caloric sweeteners	126.8	127.6	129.4	134.3	133.8

Note: Other caloric sweeteners are composed of dextrose, glucose, honey, and other edible syrups.
Source: USDA, Economic Research Service.

The long-term trade-off trend between sugar and HFCS observed in the total deliveries data are further highlighted at the per capita level. At 69.8 pounds in 2021, per capita sugar deliveries are at the highest level since 1983 (70.5 pounds). The 1.9 percent growth in per capita sugar deliveries from last year represent the highest growth relative to the short (5-year window), medium (10- and 15-year), and longer-term growth rates periods (45-year). It also marks the first time, relative to the other time windows, when sugar deliveries have outpaced population growth. Despite the 2021's 69.8-pounds of sugar deliveries being 33 percent lower (32.7 pounds) than its historic high of 102.6 pounds in 1972, the longer-term horizon portrays a steady pace in per capita refined sugar deliveries, particularly since 2008.

Conversely, the 39.5-pound per capita deliveries of HFCS in 2021 is the lowest since 1984 (37.3 pounds), right before the onset of steady yearly increases that peaked in 1999 (65.9 pounds). Between 1999–2004, HFCS deliveries averaged 63.8 pounds, mostly matching per capita refined sugar deliveries (at times surpassing it in 2002 and 2003) before progressively trending downward since and continuing through 2021.

Thus, it appears that refined sugar continues to take market share from HFCS. Since the declining trend in HFCS deliveries started around 2008, which corresponds with the onset of the North American Free Trade Agreement's (NAFTA) sweetener market provisions, one account is that by allowing sugar imports from Mexico to enter the United States duty free, the

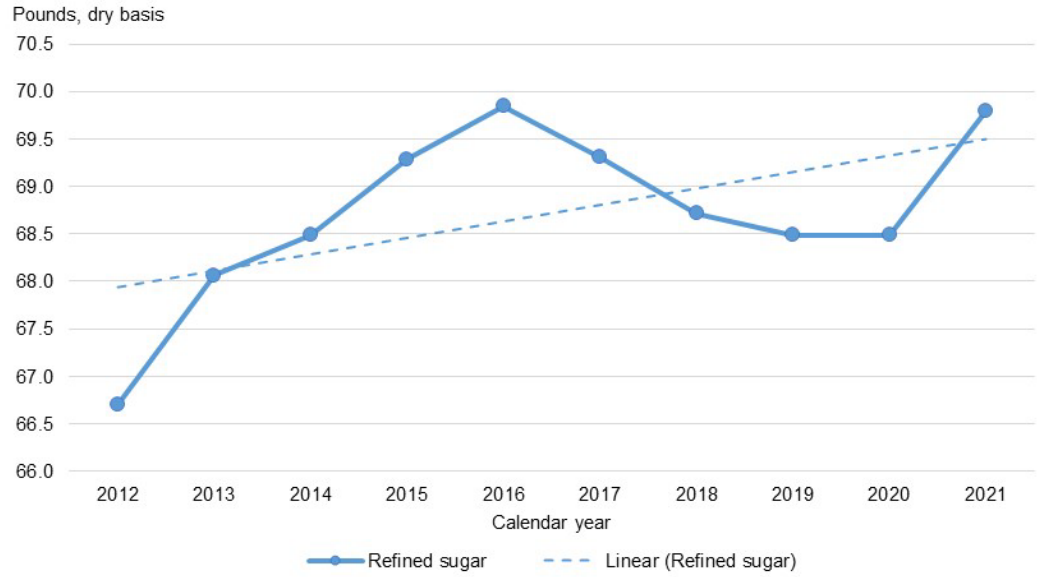
relatively inexpensive sugar from Mexico displaced HFCS in some beverages. It is also possible that the reduction of HFCS deliveries occurs in isolation and instead, captures the consumers' shift from consuming HFCS-sweetened beverages to others, such as bottled water.

The changing dietary and consumer preferences may also explain the persistence of the offsetting trend between sugar and HFCS deliveries despite the implementation of the U.S.–Mexico Sugar Suspension Agreements at the end of 2014. While sugar from Mexico is now subject to quota and minimum price requirements, imports remain duty free as long as sugar from Mexico is in compliance. Mexico remains the largest single-country source of U.S. total sugar imports from a single country despite the current suspension agreements. Mexican sugar, which is sourced from non-genetically engineered (GE) sugarcane, could have a partial role in fulfilling recent government package labelling requirements, food manufacturers' ingredient formulation, and consumer trends away from products with HFCS as an ingredient and/or towards non-GE ingredients.

Nonetheless, except for 2021's 1.9 percent over-the-year growth, per capita sugar deliveries grew at a rate either below or equal to that of the population. Looking at the trend over the recent decade (2012–2021), the 69.8 pounds in 2021 is above the trend line (figure 13). Disentangling whether this resurgence is temporary, or if it reflects an actual increase in customers' sugar demand as opposed to market reactions to a slew of economic conditions can have implications for the management of U.S. sugar imports.

The COVID-19 pandemic started in early 2020 and introduced many market distortions that created domino effects (e.g., pent-up customer demand, logistical bottlenecks and delays, high transportation costs, labor unavailability). These effects are still being felt and/or have exacerbated other situations including overall inflation, sustained multi-year high prices for sugar, Russia-Ukraine war resulting in increased farm input costs such as fertilizer, and weather-reduced beet sugar production that led to force majeure. For instance, it can be possible that the increase in sugar deliveries reflect a change in food and beverage companies' stockpiling behavior in response to uncertain supplies of beet sugar, high U.S. sugar prices, and difficulty in securing trucks and rail cars to meet the sugar delivery agreement timeframe to ensure efficient factory operations.

Figure 13
Per capita U.S. caloric sweetener deliveries for food and beverage use and corresponding linear trend, calendar year, 2012–2021



Source: USDA, Economic Research Service.

To hedge against sugar supply uncertainties, food and beverage companies could have adopted a just-in-case inventory philosophy, as opposed to the more common, cost-efficient just-in-time approach. Consequently, these companies could have increased the magnitude and accelerated the timing of their sugar orders and could be the reason for the relatively large growth in sugar deliveries in 2021. Since markets generally take time to adjust to normal levels after a market shock, such as COVID-19 and the Russia-Ukraine war, continued monitoring is warranted. The availability in the spring of the two data series used in the per capita calculation–calendar year 2022 sugar deliveries data from the USDA, Farm Service Agency's *Sweetener and Market Data* and the HFCS deliveries data from industry and various government sources–can help determine if sugar demand in the country continued increasing in 2022.

A discussion follows of import and export patterns of sugar-containing products pointing to a general trend of increasing sweetener consumption in the U.S.

Special Article: Trends in Estimated Sweeteners in Imported and Exported Products

Many food and beverage products that are imported (exported) to (from) the United States contain sugar and/or other types of sweeteners such as HFCS. For brevity, the term sugar-containing products (SCPs) is used to represent the different types of sweeteners contained in these products. To analyze the trends in imported (exported) SCPs, two datasets are needed: the trade data from the U.S. Department of Commerce, Bureau of the Census identified by the U.S. Harmonized Tariff Schedule (HTS) that was downloaded from Trade Data Monitor; and an internal USDA database containing a range of sugar-content coefficients[2] corresponding to the HTS codes under which the imported (exported) products are classified.

In this report, the average of the lower and upper range for each coefficient is used. The sugar content is estimated by multiplying the imported (exported) quantities from Census with the corresponding coefficient. Coefficients are available for SCPs in the following categories: confectionery (HTS chapter 17.04), which includes cocoa and cocoa preparations (chapter 18); cereal and bakers' preparations (chapter 19.01, 19.04, and 19.05); miscellaneous edible preparations (chapter 21); and beverages, which is mostly comprised of carbonated soft drinks (chapter 22).

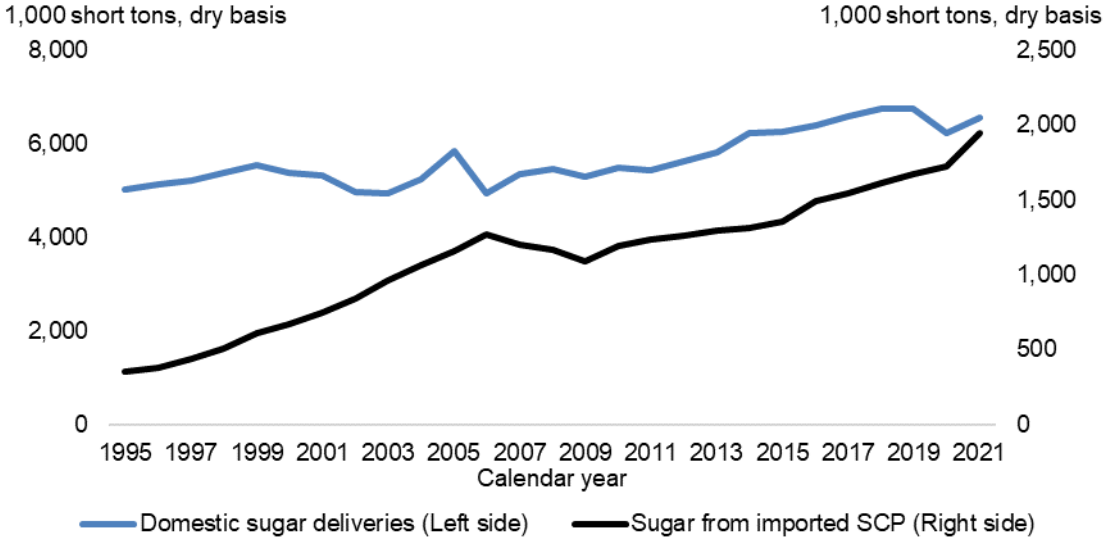
Sweeteners in Imported Products Continue to Trend Upward

The estimated sweeteners from imported SCPs in calendar year 2021 totaled 1.9 million short tons, dry basis, up 8 percent from 2020 (figure 14; table 8). Similar with domestic sugar deliveries, this most recent annual growth of sugar from imported SCPs is noticeably larger when compared with its respective short- and long-term historical trends. Taken together, it appears that imported SCPs and domestic caloric sweetener deliveries in the last two years provide evidence indicating increased consumer demand for sugar and sweetened products, and that the two avenues have been complementary in meeting increased sweetener needs.

[2] The sugar-content coefficients are available upon request. To view a sample listing, see the USDA, Economic Research Service SSS-237-01 report titled "Measuring the Effect of Imports of Sugar-Containing Products on U.S. Sugar Deliveries" by Stephen Haley in September 2003.

In terms of individual end-user sectors, imported confectionery products contribute the highest share of sweeteners from SCP, followed by cereal and bakers' preparations, then food products, and finally beverages (figure 15). Confectionery's share of the total has been as high as 61 percent in 2006–07 but has since gradually fallen, reaching its lowest level of 49 percent in 2021. This is because two categories–cereal and bakers' preparations, and beverage–have been growing. The share of cereal and bakers' preparations in 2021 was 22 percent, up from 14 percent in 1995, while beverage's share in 2021 was 14 percent, which is almost double than what it was in 1995 (8 percent).

Figure 14
Domestic sugar deliveries to industrial users and estimated sugar from imported SCP, by calendar year, 1995–2021



SCP = sugar-containing products.
Source: USDA, Economic Research Service.

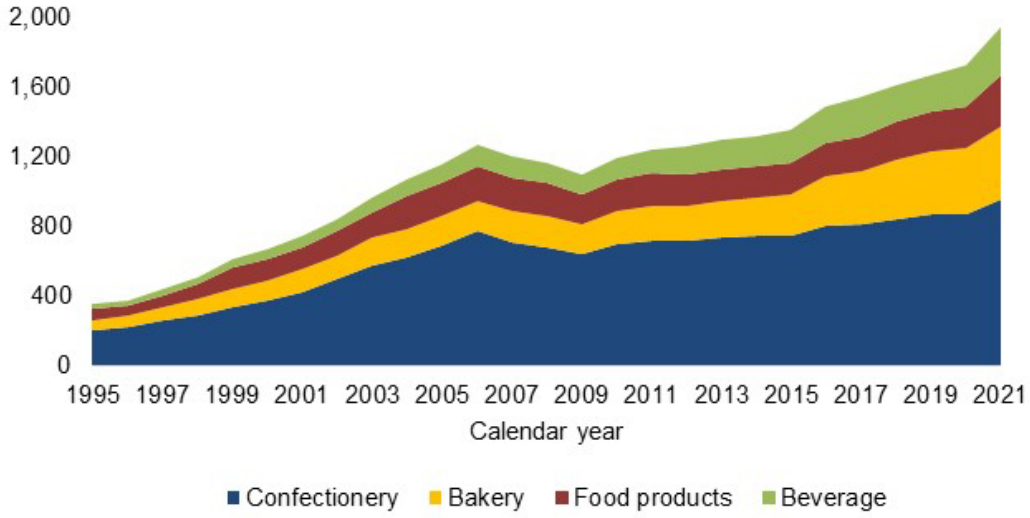
Table 8: Average annual growth rates, calendar year 1996–2021

	1-year (2020–2021)	5-year (2017–2021)	10-year (2012–2021)	20-year (2002–2021)	25-year (1996–2021)
			Percent		
Domestic sugar deliveries	1.9	0.0	0.6	0.4	0.3
Imported SCP	8.0	5.5	4.7	5.1	7.0
Exported SCP	1.2	-0.5	0.6	3.2	4.0
U.S. population	0.1	0.5	0.6	0.8	0.9

SCP = sugar-containing product.

Source: USDA, Economic Research Service.

Figure 15
Estimated sugar from imported SCP, by product type and calendar year, 1995–2021
1,000 short tons, dry basis



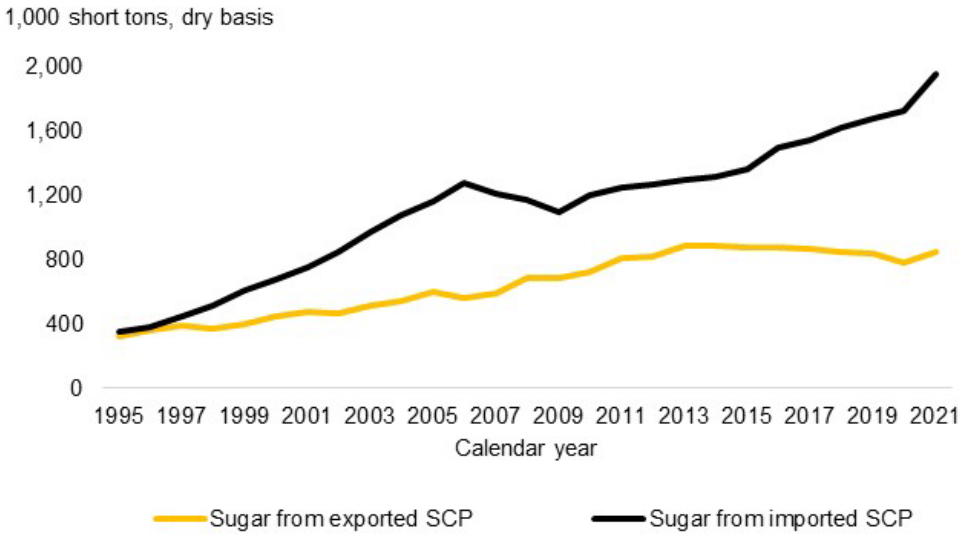
SCP = sugar-containing products.
Source: USDA, Economic Research Service.

Sugar in Exported Products Grew in 2021 After Multiple Years of Negative Growth

As discussed above, the method applied to imported products was also used to U.S. SCP exports of like products. Despite U.S. sugar prices being relatively high compared to the world market, entities can still be motivated to export. For instance, the share of sugar costs in an exported product is possibly relatively small compared to the product's total value, and thus, does not diminish the product's comparative trade advantage.

In 2021, sugar contained in exported products grew by 1.2 percent to 850,000 short tons, dry basis, marking the first time a growth was recorded since 2014 (figure 16). While sugar contained in exported and imported SCPs hovered between 300,000 to 400,000 short tons, dry basis during 1995 to 1997, the former grew at a higher pace after 1997. The divergence between the two narrowed after 2006, but widened since 2014.

Figure 16
Estimated sugar from imported and exported SCP, by calendar year, 1995–2021



SCP = sugar-containing products.
Source: USDA, Economic Research Service.

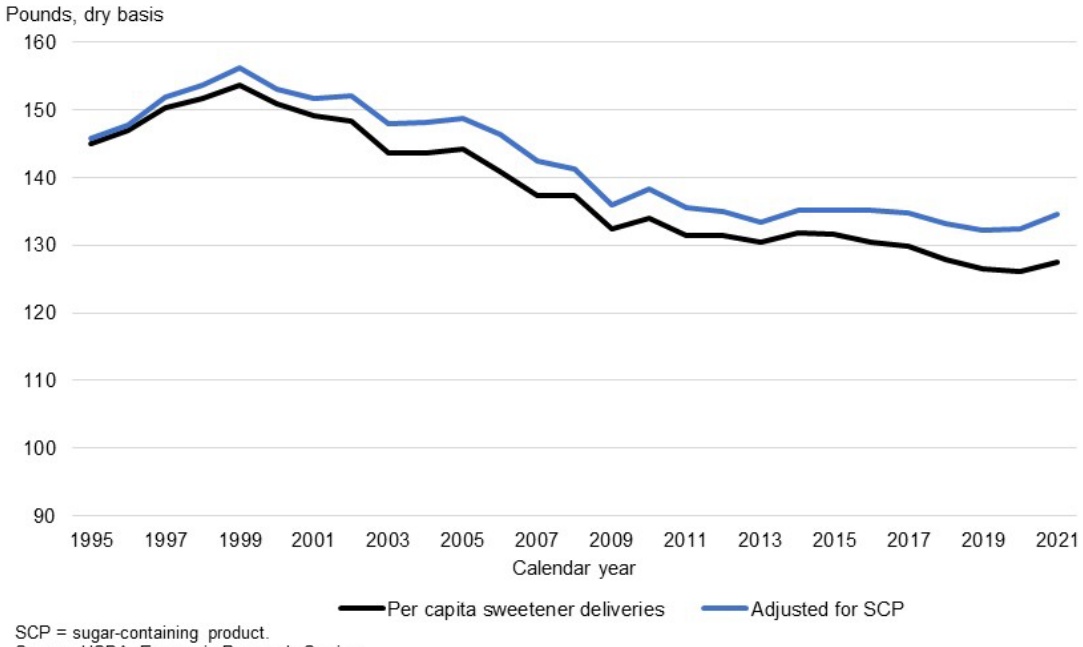
Per Capita Sweetener Deliveries Higher After Accounting for Sugar in Imported Products

In practice, the per capita sweetener deliveries that are published in the ERS *Sugar and Sweeteners Yearbook* tables do not include the estimated sugar from imported SCPs. But if the U.S. per capita sweetener deliveries were adjusted to include the sugar from traded SCPs, then subtracting the sugar in exported products is an essential step. This ensures that only the sugar from imported products that is available for domestic consumption is accounted for and the portion intended for exports are excluded.

As expected, the comparison between the per capita sweetener deliveries before and after the inclusion of estimated sugar from imported SCP shows that the per capita sweetener deliveries are higher than the original series (figure 17). For instance, after adjustment, the per capita sweetener deliveries would be 134.6 pounds in 2021, instead of 127.4 pounds, which reflects a difference of 7.2 pounds (table 9, figure 18). Since 1995, the 2 series moved in parallel and remain relatively close, implying that the declining trend in per capita sweetener deliveries cannot be fully accounted for by the increase in imported products. However, it is interesting to note that the average difference between the two series has been increasing over the years, thus merits further research.

Figure 17

Per capita U.S. caloric sweetener deliveries for food and beverage use, calendar year, 1977–2021



SCP = sugar-containing product.
Source: USDA, Economic Research Service.

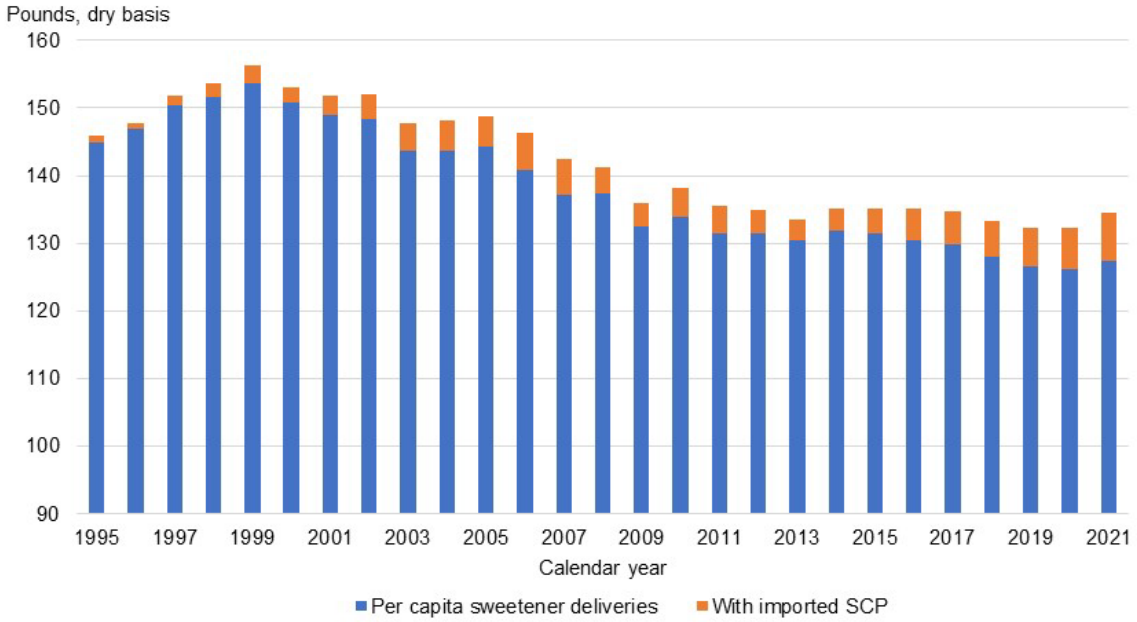
Table 9: Average per capita sweetener deliveries, calendar year 1995–2021

	1996–2000	2001–2005	2006–2010	2011–2015	2016–2020	2021
			Pounds, dry basis			
Total sweeteners deliveries	150.7	145.8	136.4	131.3	128.2	127.4
Adjusted for imported SCP	152.5	149.7	140.8	134.8	133.5	134.6
Difference	1.8	3.9	4.5	3.5	5.3	7.1

SCP = sugar-containing product.
Source: USDA, Economic Research Service.

Figure 18

Per capita U.S. caloric sweetener deliveries for food and beverage use, calendar year, 1977–2021



SCP = sugar-containing product.
Source: USDA, Economic Research Service.

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