



Sugar and Sweeteners Outlook

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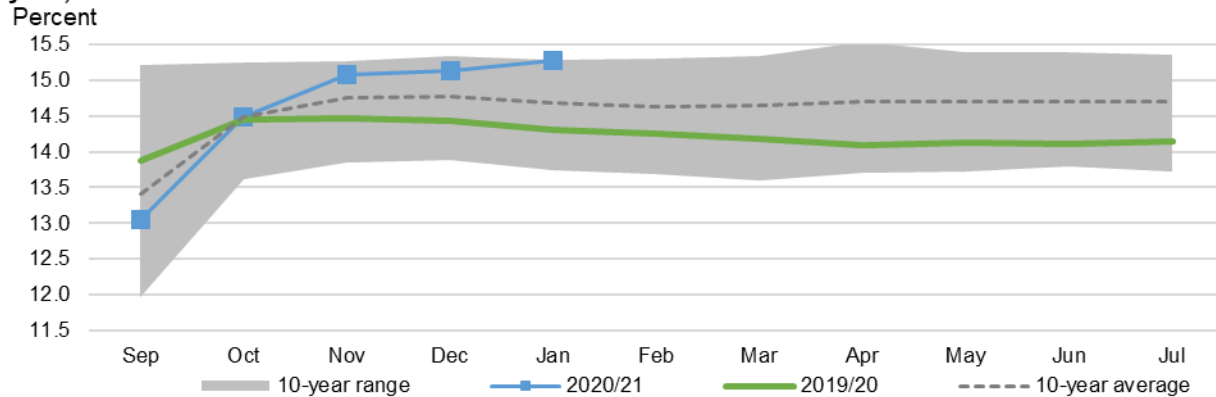
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U.S. Sugar Supplies Lowered as Smaller Imports More than Offset Larger Production

Production of beet sugar is raised this month with a higher anticipated extraction rate. Cane sugar production is increased in Louisiana, more than offsetting a small reduction for Texas. Total supply is reduced based on a downward revision to imports, which is mainly on account of decreased imports from Mexico. Domestic deliveries are reduced on a weak pace through the first 4 months of the fiscal year. U.S. ending stocks are revised lower, as is the projected stocks-to-use ratio. Mexico’s sugar production and deliveries are projected smaller. Mexico’s exports to the United States are reduced, with larger shipments projected to other markets.

Figure 1
Cumulative sugar extraction rate, beet sugar produced per sugar beet sliced, by crop year, 2010/11-2020/21



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

United States Outlook

Imports Lowered, More than Offsetting Larger Production

In the USDA's March *World Agricultural Supply and Demand Estimates (WASDE)*, U.S. supplies of sugar total 14.113 million short tons, raw value (STRV), a 220,000-STRV reduction from the previous month. Total imports are lowered 282,000 STRV to 3.122 STRV, primarily driven by reduced expected imports from Mexico. Imports from Mexico are reduced by 232,000 STRV to 931,000 based on an expected revision to Mexico's export limit. Also contributing to lower imports is a reduction of 50,000 STRV to imports for re-export. Production is raised 62,000 STRV to 9.374 million with larger output of both beet and cane sugar. Deliveries are reduced 75,000 STRV to 12.125 million. Ending stocks are lowered residually by 145,000 to 1.848 million, representing a stocks-to-use ratio of 15.07 percent.

Table 1: U.S. sugar: Supply and use by fiscal year (Oct./Sept.), March 2021

Items	2018/19	2019/20	2020/21 (forecast) February	2020/21 (forecast) March	2020/21 (forecast) Change
	1,000 Short tons, raw value				
Beginning stocks	2,008	1,783	1,618	1,618	0
Total production	8,999	8,149	9,312	9,374	62
Beet sugar	4,939	4,351	5,046	5,093	47
Cane sugar	4,060	3,798	4,265	4,281	15
Florida	2,005	2,106	2,200	2,200	0
Louisiana	1,907	1,566	1,931	1,949	18
Texas	147	126	134	132	-2
Hawaii	0	0	0	0	0
Total imports	3,070	4,235	3,404	3,122	-282
Tariff-rate quota imports	1,541	2,152	1,721	1,721	0
Other program imports	438	432	350	300	-50
Non-program imports	1,092	1,651	1,333	1,101	-232
Mexico	1,000	1,376	1,163	931	-232
High-duty	91	275	170	170	0
Total supply	14,077	14,166	14,333	14,113	-220
Total exports	35	61	35	35	0
Miscellaneous	28	74	0	0	0
Deliveries for domestic use	12,231	12,414	12,305	12,230	-75
Transfer to sugar-containing products for exports under re-export program	98	78	80	80	0
Transfer to polyhydric alcohol, feed, other alcohol	27	20	25	25	0
Commodity Credit Corporation (CCC) sale for ethanol, other	0	0	0	0	0
Deliveries for domestic food and beverage use	12,106	12,316	12,200	12,125	-75
Total use	12,294	12,549	12,340	12,265	-75
Ending stocks	1,783	1,618	1,993	1,848	-145
Private	1,783	1,618	1,993	1,848	-145
Commodity Credit Corporation (CCC)	0	0	0	0	0
Stocks-to-use ratio	14.50	12.89	16.15	15.07	-1.08

Source: USDA, Economic Research Service, *Sugar and Sweeteners Outlook*.

Beet Sugar Production Raised with Stronger Extraction Rate

USDA's National Agricultural Statistics Service (NASS) did not report on sugar beet production this month. As indicated in table 2, beet sugar production is raised 47,000 STRV to 5.093 million, driven by a higher anticipated extraction rate. The expected extraction rate is raised from 15.126 percent to 15.275 percent to match the cumulative extraction rate for the beet crop in the marketing year to date (August through January), which is shown in figure 1 (front page). Recovery rates in all regions are projected to be above average. Overall, the cumulative extraction rate to date is higher than what was observed in any of the previous 10 years. It is worth noting that in the past 10 years, the average extraction rate through January tended to be a good indicator of the final marketing year extraction rate.

Table 2: Beet sugar production projection calculation, 2019/20 and 2020/21

	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21 February	2020/21 March
Sugar beet production (1,000 short tons) 1/	35,371	36,881	35,325	33,282	28,600	33,618	33,618
Sugar beet shrink (percent)	6.52	8.26	7.31	5.17	5.34	6.58	6.58
Sugar beet sliced (1,000 short tons)	33,066	33,834	32,742	31,561	27,072	31,405	31,405
Sugar extraction rate from slice (percent)	14.58	13.72	15.18	14.77	14.14	15.126	15.275
Sugar from beets slice (1,000 STRV) 2/	4,820	4,643	4,970	4,660	3,828	4,750	4,797
Sugar from molasses (1,000 STRV) 2/	380	352	368	352	341	360	360
Crop-year sugar production (1,000 STRV) 2/	5,201	4,995	5,338	5,012	4,169	5,110	5,157
August-September sugar production (1,000 STRV)	688	606	715	655	582	765	765
August-September sugar production of subsequent crop (1,000 STRV)	606	715	655	582	765	665	665
Sugar from imported beets (1,000 STRV) 3/	--	--	--	--	--	36	36
Fiscal year sugar production (1,000 STRV)	5,119	5,103	5,279	4,939	4,351	5,046	5,093

1/ USDA, National Agricultural Statistics Service for historical data. 2/ August-July basis. 3/ Sugar from imported beets split out for projections only, included in total once full crop-year slice is recorded. Sugar from imported beets is incorporated into total production in historical data.

Note: STRV = short tons, raw value.

Source: USDA, Economic Research Service; USDA, World Agricultural Outlook Board; USDA, Farm Service Agency.

Cane Sugar Production Up Slightly

Total cane sugar production in 2020/21 is raised 15,000 STRV to 4.281 million STRV. Output for Louisiana is raised 18,000 STRV to 1.949 million on revised processor estimates published by USDA's Farm Service Agency (FSA) in its *Sweetener Market Data* publication (SMD). On the other hand, Texas cane sugar production is revised down 2,000 STRV to 132,000 based on updated processor reporting. Florida cane sugar production is unchanged at 2.2 million STRV.

Deliveries Lowered for 2020/21 on Weak Pace

Deliveries for 2020/21 are lowered 75,000 STRV to 12.125 million STRV. Total deliveries during the period October-January are down 2.7 percent from the same time last year (table 3).

Deliveries from reporting companies are down 1.2 percent with both beet and cane sectors down slightly from the previous year. Non-reporter (direct consumption) imports are down 25 percent from the same time last year. The deliveries projection for 2020/21 is now 1.5 percent below the final fiscal year delivery total for 2019/20.

Table 3: Food and beverage deliveries, 2015/16 to 2020/21, October-January

	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	Annual change
	<i>1,000 short tons, raw value</i>						<i>Percent</i>
Beet sugar processors	1,434	1,724	1,784	1,623	1,654	1,618	-2.2
Cane sugar refiners	2,092	2,028	1,967	2,108	2,111	2,102	-0.5
Total reporters	3,526	3,752	3,751	3,732	3,765	3,720	-1.2
Non-reporter, direct consumption	231	206	317	265	242	182	-25.0
Total deliveries	3,757	3,957	4,068	3,996	4,008	3,901	-2.7
Final fiscal year deliveries	11,881	12,102	12,048	12,106	12,316	12,125	-1.5

Source: USDA, Farm Service Agency; USDA, World Agricultural Outlook Board.

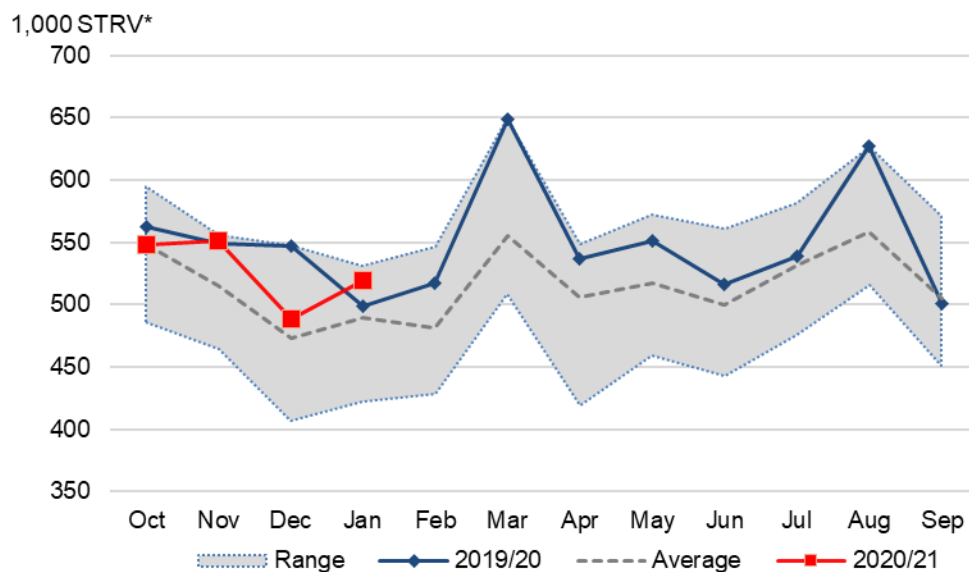
At 3.901 million STRV, October-January deliveries represent 32.2 percent of the revised projection for total 2020/21 deliveries, as indicated in table 4. This compares with last year when those 4 months accounted for 32.5 percent of the total. Over the previous 10 years, October through January deliveries have accounted for between 31.4 and 33.8 percent of the full fiscal year total, with a weighted average of 32.3 percent. During the month of January, total deliveries recovered slightly to 964,000 STRV, up from 829,000 in December. Refiners' melt also rebounded during the month and was stronger than January of the previous year (figure 2). Both raw stocks held by refiners (figure 3) and total stocks held by sugar beet processors (figure 4) are up from last year and the 10-year average.

Table 4: Pace of U.S. deliveries, October-January

	1,000 short tons, raw value		Percent of total
	Oct-Jan	Fiscal year (FY)	
FY11	3,520	11,193	31.4
FY12	3,499	11,141	31.4
FY13	3,745	11,511	32.5
FY14	3,766	11,786	32.0
FY15	3,782	11,921	31.7
FY16	3,757	11,881	31.6
FY17	3,957	12,102	32.7
FY18	4,068	12,048	33.8
FY19	3,996	12,106	33.0
FY20	4,008	12,316	32.5
FY21 (forecast)	3,901	12,125	32.2
10-year average	3,810	11,800	32.3

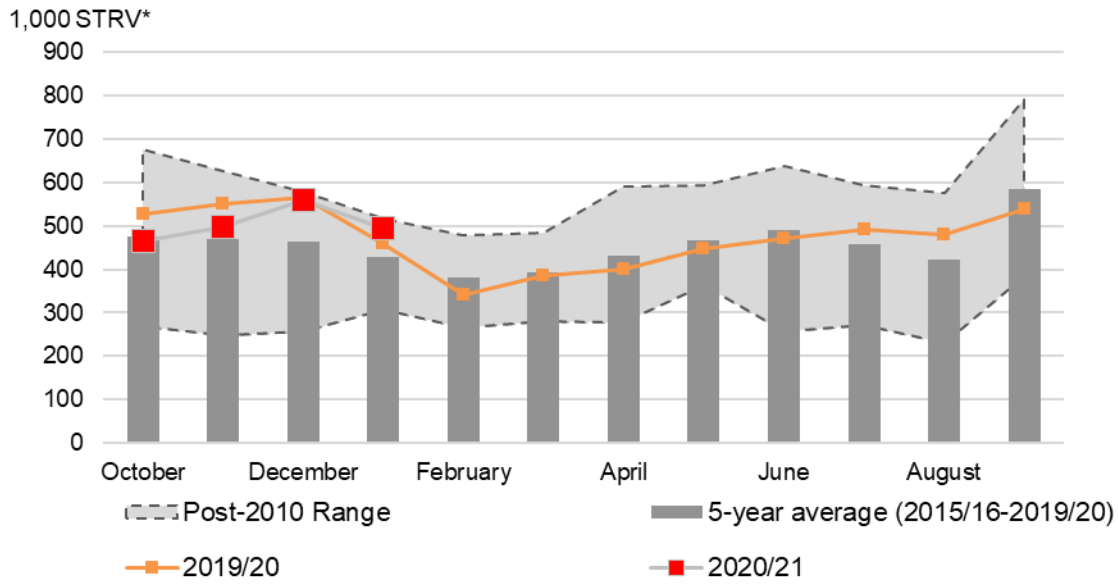
Source: USDA, Farm Service Agency, *Sweetener Market Data*; USDA, Economic Research Service.

Figure 2
Sugarcane refiners' melt, monthly, 2010/11 to 2020/21



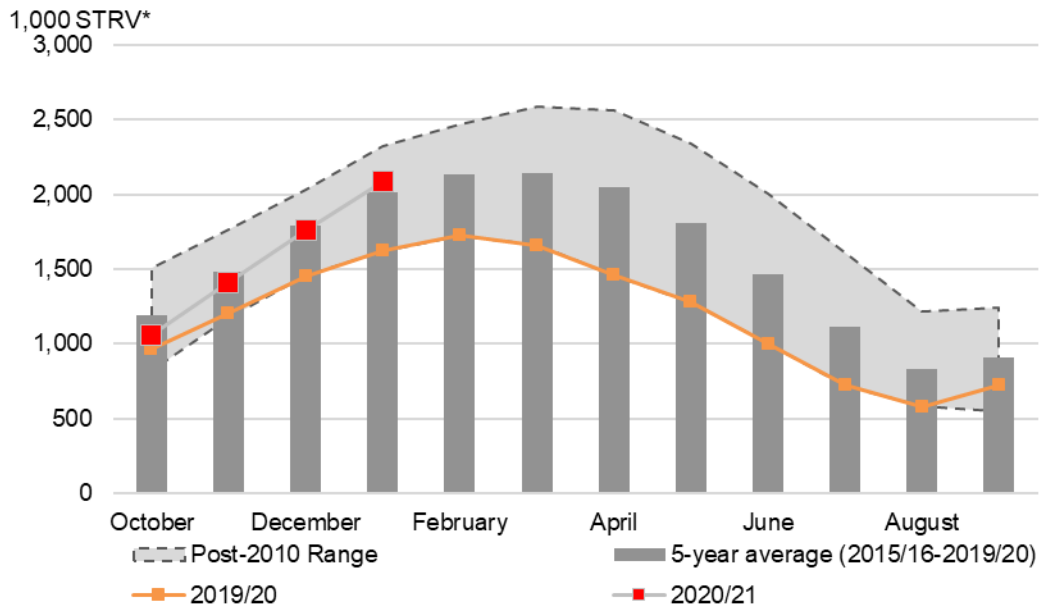
*Short tons, raw value
 Source: USDA, Farm Service Agency.

Figure 3
Sugarcane refiners raw sugar inventories, monthly, 2015/16 to 2020/21



*Short tons, raw value
 Source: USDA, Farm Service Agency.

Figure 4
Sugarbeet processors' total sugar inventories, monthly, 2015/16 to 2020/21



*Short tons, raw value
 Source: USDA, Farm Service Agency.

2020/21 Imports Lowered with Smaller Imports from Mexico

Total projected 2020/21 imports are reduced 282,000 STRV to 3.122 million. The largest revision is imports from Mexico, which are down 232,000 STRV on the expectation that exports will be limited to the export limit set in December. That figure was set by the Department of Commerce at 927,920 STRV, which at the time was 80 percent of the U.S. Needs based on the December *WASDE*. Note that total imports from Mexico are projected at 930,703 STRV, due to inclusion of 2,783 STRV that entered in October 2020 but counted against the previous year's export limit.

Imports for the re-export program are lowered 50,000 STRV to 300,000 on pace to date. If the margin between the U.S. and world raw sugar prices shrinks (see figure 5), the incentive to import program sugar is reduced; it is when that margin is large that the licensed refiners can take best advantage of the program. Table 5 displays refiner balances at the beginning of fiscal years 2016 through 2021, along with imports, export credits, and transfers to sugar-containing product and polyhydric alcohol licensees. All program imports must be balanced, over time, by either exports or transfers to sugar-containing product (SCP) or polyhydric alcohol (Poly) licensees. For many years the largest destination for program sugar exports was Mexico, but Mexico started to apply tariffs in 2015 and exports have declined ever since, with virtually no exports to Mexico now. Therefore, the program is largely dependent upon transfers, which in turn depend upon the ability of U.S. manufacturers of sugar-containing products to be competitive in export markets.

Table 5: U.S. Sugar Re-Export Program refiner license balances

Fiscal Year	Refiner Beginning Balances 1/	Short tons, raw value		
		Imports	Export Credits	Transfers to SCP and Poly Licenses 2/
FY 2016	-102,734	397,223	82,647	294,198
FY 2017	-82,055	411,232	71,095	388,922
FY 2018	-130,840	321,401	76,686	278,169
FY 2019	-164,294	429,027	32,068	373,969
FY 2020	-141,304	432,404	21,623	297,547
FY 2021 3/	-28,070	300,000	NA	346,650

NA = data not available.

1/ A negative balance indicates that cumulative exports and transfers exceed cumulative imports. A positive balance indicates that cumulative imports exceed cumulative exports and transfers.

2/ SCP: sugar-containing product program licensee; Poly: polyhydric alcohol program licensee.

3/ Forecast of 314,476 MT for Transfers based on linear trend of FY 2011-2020 of combined SCP exports and Polyhydric use.

Source: USDA, Foreign Agricultural Service, *Sugar Monthly Import and Re-Export Data*, March report, Table 9.

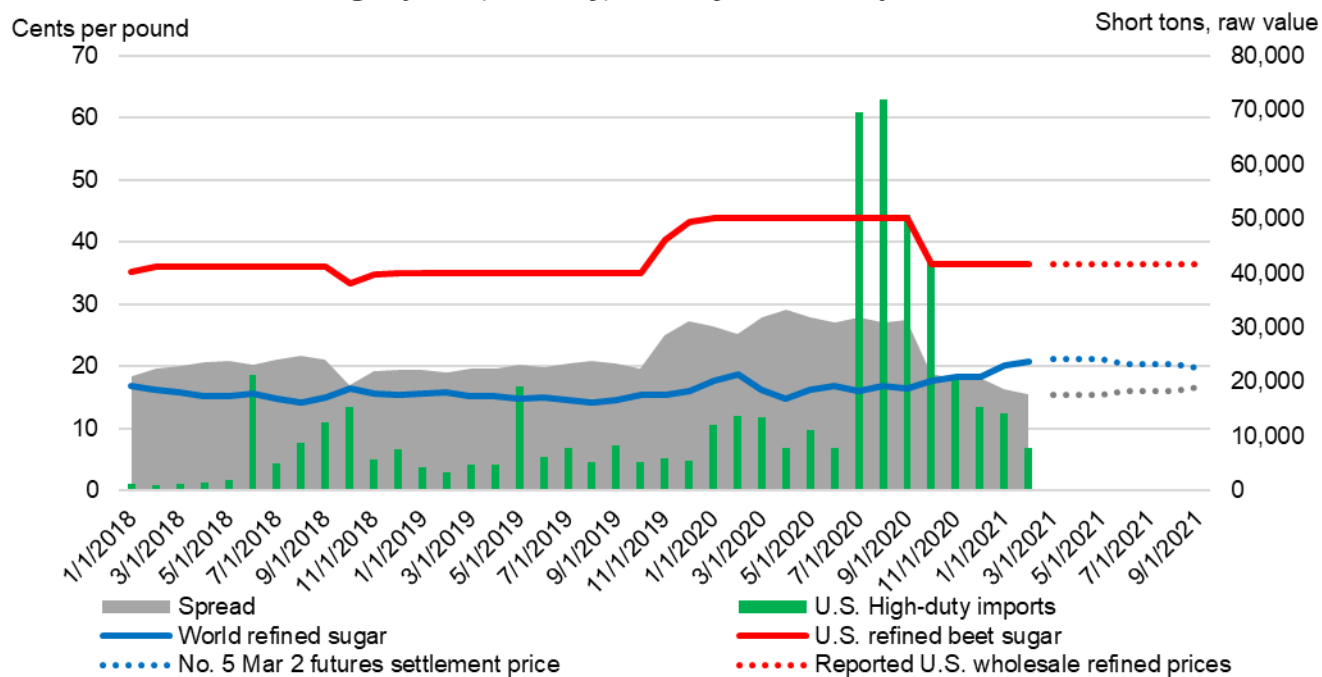
High-tier imports remain at 170,000 STRV. As shown in table 6, this trade is estimated at around 100,000 STRV in October through February. The projection assumes that high-tier imports over the next 7 months will be approximately 10,000 STRV each month. As shown in figure 5, this trade does tend to dwindle when the spread between U.S. and world prices narrows. The spread between the U.S. refined beet sugar and world refined sugar prices was around 28 cents per pound from July through September, then fell sharply to less than 20 cents per pound as the U.S. beet sugar price declined based on projections of a much-improved 2020/21 beet crop. Based on forward price indications, the spread would remain below 20 cents per pound for the next 6 months. Note that for raw sugar, the tariff is set at 33.87 cents per kilogram or 15.4 cents per pound; for refined sugar, it is set at 35.74 cents per kilogram or 16.21 cents per pound. Depending upon the country of origin, the usual cost of freight and associated logistics can be as low as 2-4 cents per pound for raw sugar and 5-6 cents per pound for refined sugar.

Table 6: High-tier imports, by month, in short tons, raw value

	October	November	December	January	February	March	April	May	June	July	August	September	Oct-Feb	Total
2015/16	1,888	1,098	1,131	1,539	1,300	825	1,167	1,490	1,121	1,954	1,153	1,775	6,956	16,441
2016/17	723	1,041	624	1,038	653	932	635	573	1,023	2,010	1,477	1,433	4,080	12,162
2017/18	1,298	1,196	1,448	1,182	1,076	1,160	1,395	1,975	21,352	5,043	8,682	12,483	6,200	58,290
2018/19	15,324	5,683	7,539	4,290	3,424	4,783	4,745	19,052	6,122	7,916	5,369	8,406	36,260	92,653
2019/20	5,169	5,923	5,514	12,189	13,809	13,574	7,933	11,035	7,835	69,610	71,929	50,793	42,603	275,313
2020/21	42,360	20,543	15,420	14,110	7,779								100,211	170,000

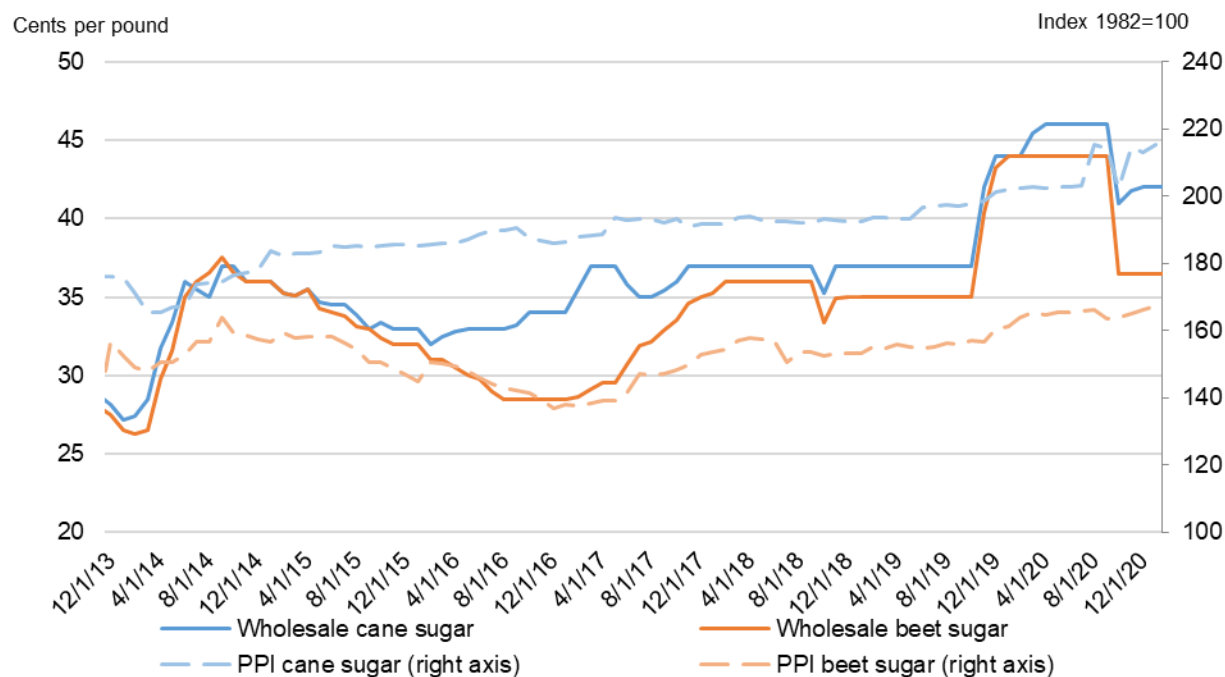
Source: USDA, Farm Service Agency; USDA, Foreign Agricultural Service.

**Figure 5
U.S. and world refined sugar prices, monthly, January 2018 to September 2021**



Source: USDA, Economic Research Service.

Figure 6
Refined sugar prices, wholesale and Producer Price Indexes, monthly



Note: Producer Price Index (PPI).
 Source: USDA, Economic Research Service.

Stocks Lowered Residually

U.S. stocks are lowered residually by 145,000 STRV to 1.848 million STRV. This represents a stocks-to-use ratio of 15.07 percent, down from 16.15 percent last month. U.S. Needs, as calculated in this month's *WASDE* report, would have indicated that a lower level of imports from Mexico would be needed to arrive at a 13.50 stocks-to-use ratio. With this trade instead governed by the higher export limit set in December, imports from Mexico are consequently projected larger. The stocks-to-use ratio, as projected, would be the largest ending stocks-to-use ratio since 2017/18 (which was 16.14 percent).

Mexico Outlook

Production and Deliveries Lowered; Exports Adjusted

The USDA's March 2021 *World Agricultural Supply and Demand Estimates (WASDE)* publication forecasts Mexico's sugar production at 5.90 million metric tons, actual value (MT), down 50,000 from last month. This reduction is owing to a reduced expectation of sugarcane yields. Mexico's National Committee for the Sustainable Development of Sugarcane (CONADESUCA) currently forecasts sugar output at 6.06 million MT. CONADESUCA holds slightly higher expectations for both sugarcane area and yield.

As of March 6, Mexico's total sugar produced is at 3.371 million MT, up from 2.800 million MT at the same time last year, but down slightly from the same point in 2017/18 and 2018/19 (figure 7). Area harvested to date is at 432,229 hectares, up from 400,907 last year. In recent weeks, the sugarcane yield (figure 8) has begun to decline relative to the same points in 2017/18 and 2018/19. Lingering effects from last year's severe drought appear to be hampering sugarcane yields in some locations. Note that sugarcane yields tend to decline throughout the season. The cumulative sugar extraction rate from the sugarcane is higher than at the same point in 2018/19 and 2019/20, but lower than 2017/18 (figure 9). In contrast to sugarcane yields, extraction rates tend to increase throughout the season.

Exports to the United States are lowered 199,000 MT to 797,000 based on the previously discussed reduction to Mexico's export limit. With U.S. supplies having swelled in recent months, a revised calculation of U.S. Needs based on this month's *WASDE* would fall well below the figure that was established by the Commerce Department following the release of the December *WASDE*. The export limit is therefore calculated at 80 percent of December U.S. Needs, as per the terms of the Suspension Agreements with Mexico. With Mexico's domestic deliveries lowered (discussed in greater detail in next section), Mexico's stocks are revised down 9,000 MT to 926,000 to remain at 2.5 months of domestic consumption. This is the target that Mexican authorities use to monitor and manage the domestic sugar program. Mexico's total exports are adjusted upward slightly to 1.492 million MT as exports to other countries are residually higher at 695,000.

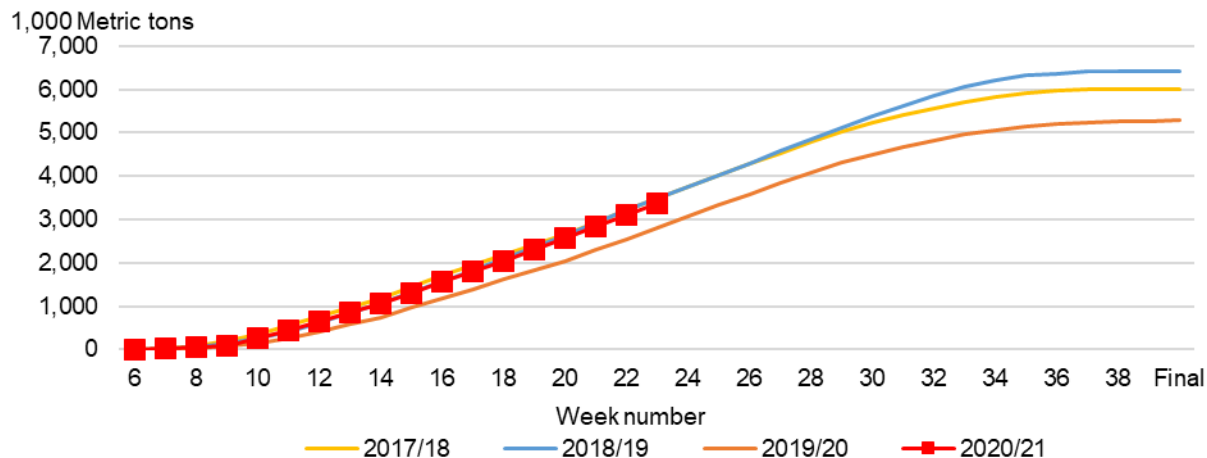
Table 7: Mexico sugar supply and use 2018/19 - 2019/20 and projected 2020/21, March 2021

Items	2018/19	2019/20	2020/21 (forecast) February	2020/21 (forecast) March	2020/21 (forecast) Change
	1,000 metric tons, actual weight				
Beginning stocks	1,395	1,169	858	858	0
Production	6,426	5,278	5,950	5,900	-50
Imports	85	77	105	105	0
Imports for consumption	22	55	40	40	0
Imports for sugar-containing product exports, IMMEX 1/, other	63	23	65	65	0
Total supply	7,905	6,524	6,913	6,863	-50
Disappearance					
Human consumption	4,092	4,101	4,073	4,030	-43
For sugar-containing product exports (IMMEX)	460	352	415	415	0
Other deliveries and end-of-year statistical adjustment	-20	1	0	0	0
Total	4,532	4,455	4,488	4,445	-43
Exports	2,204	1,212	1,490	1,492	2
Exports to the United States and Puerto Rico	856	1,177	995	797	-199
Exports to other countries	1,348	35	494	695	201
Total use	6,737	5,667	5,978	5,937	-41
Ending stocks	1,169	858	935	926	-9
	1,000 metric tons, raw value				
Beginning stocks	1,478	1,239	909	909	0
Production	6,811	5,595	6,307	6,254	-53
Imports	90	82	111	111	0
Imports for consumption	23	58	42	42	0
Imports for sugar-containing product exports (IMMEX)	67	24	69	69	0
Total supply	8,380	6,916	7,327	7,274	-53
Disappearance					
Human consumption	4,337	4,347	4,317	4,271	-46
For sugar-containing product exports (IMMEX)	488	373	440	440	0
Other deliveries and end-of-year statistical adjustment	-21	1	0	0	0
Total	4,804	4,722	4,757	4,711	-46
Exports	2,337	1,285	1,579	1,582	3
Exports to the United States and Puerto Rico	908	1,248	1,055	844	-210
Exports to other countries	1,429	37	524	737	213
Total use	7,141	6,007	6,336	6,293	-43
Ending stocks	1,239	909	991	982	-10
Stocks-to-human consumption (percent)	28.6	20.9	23.0	23.0	0.0
Stocks-to-use (percent)	17.3	15.1	15.6	15.6	0.0
High-fructose corn syrup (HFCS) consumption (dry weight)	1,528	1,388	1,377	1,377	0

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

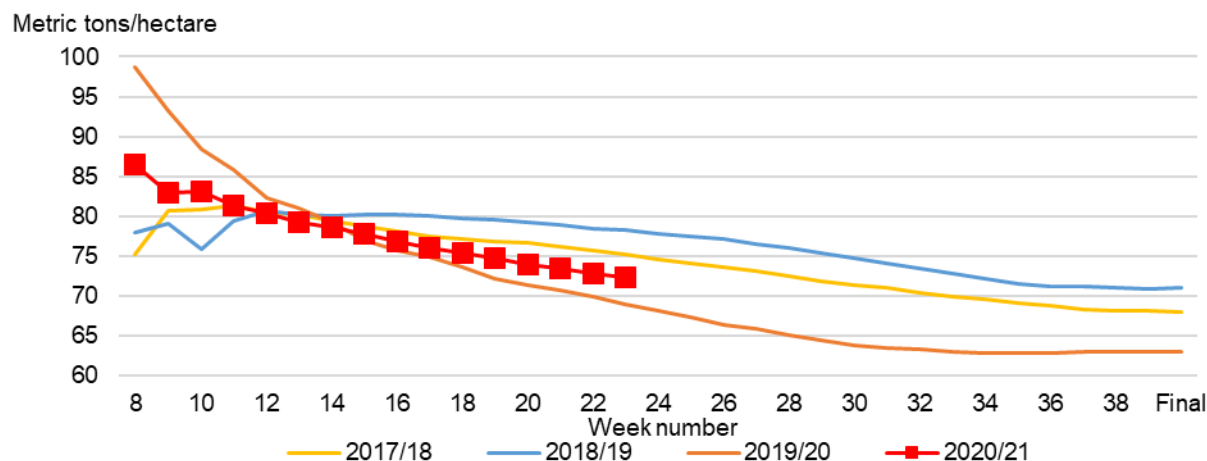
Sources: USDA, World Agricultural Outlook Board; USDA, Economic Research Service; CONADESUCA.

Figure 7
Mexico cumulative sugar production, by week



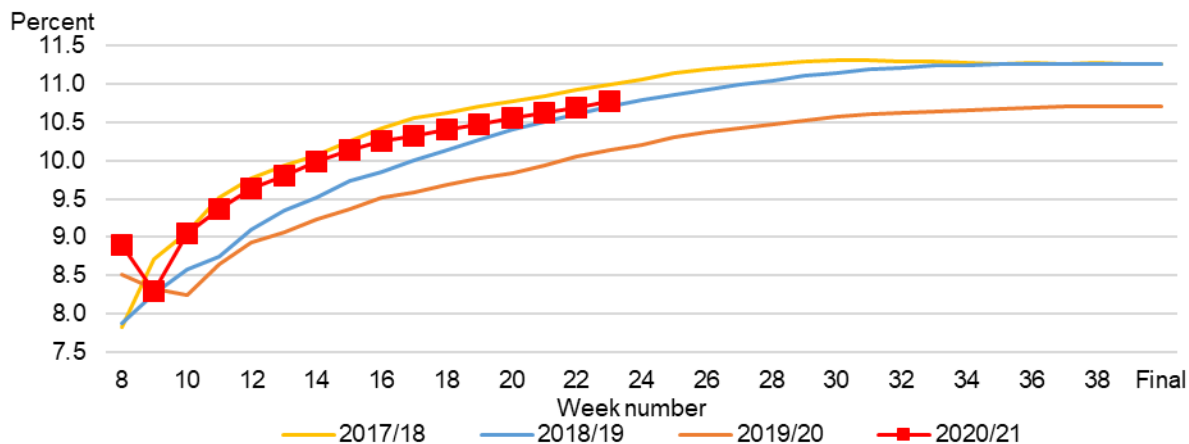
Source: CONADESUCA.

Figure 8
Mexico cumulative sugarcane yields, by week



Source: CONADESUCA.

Figure 9
Mexico cumulative sugar extraction rate, by week



Source: CONADESUCA.

Deliveries Lowered on Weak Pace

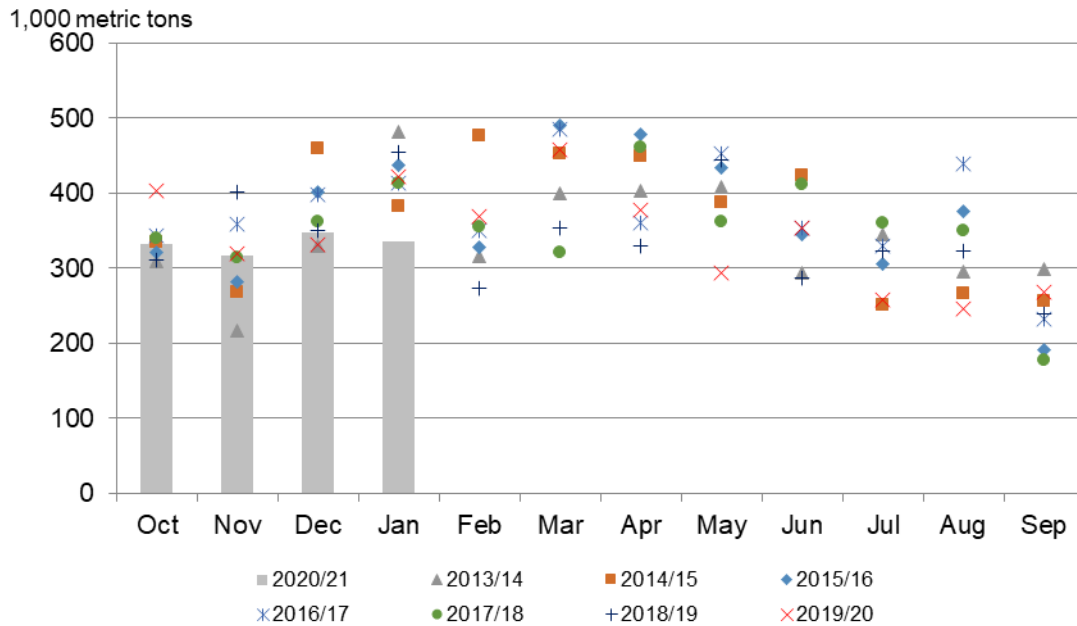
Sugar deliveries are reduced 43,000 MT to 4.030 million MT, driven by a weak pace through the first 4 months of the fiscal year. As shown in table 8 below, deliveries from October to January totaled 1.331 million MT, down significantly from the same 4 months last year. These 4 months account for 33.0 percent of the revised forecast for total fiscal year 2020/21 deliveries. Over the past 10 years, these 4 months account for a weighted average of about 33.8 percent of the full fiscal year deliveries. Projected deliveries of high-fructose corn syrup (HFCS) are unchanged this month as deliveries to date are on target to meet the full year forecast. During the past several years, deliveries of both products have trended lower, partly driven by Government initiatives aimed at reducing sweetener consumption (figure 11). Even as Mexico's population has grown, sugar deliveries are projected to be the smallest in 10 years and HFCS deliveries are forecast as the lowest since 2008/09.

Table 8: Pace of Mexico sweetener deliveries through first quarter of fiscal year

	<i>Sugar, 1,000 metric tons (MT)</i>			<i>High-fructose corn syrup, 1,000 MT, dry weight</i>		
	<i>Oct-Jan</i>	<i>Fiscal year</i>	<i>Percent of total</i>	<i>Oct-Jan</i>	<i>Fiscal year</i>	<i>Percent of total</i>
FY11	1,377	3,950	34.9	489	1,635	29.9
FY12	1,356	4,135	32.8	544	1,721	31.6
FY13	1,379	4,287	32.2	552	1,567	35.2
FY14	1,338	4,098	32.6	456	1,372	33.3
FY15	1,445	4,408	32.8	465	1,444	32.2
FY16	1,442	4,387	32.9	447	1,482	30.1
FY17	1,513	4,515	33.5	470	1,522	30.9
FY18	1,429	4,228	33.8	513	1,593	32.2
FY19	1,518	4,092	37.1	468	1,528	30.6
FY20	1,478	4,101	36.0	460	1,388	33.2
FY21 (forecast)	1,331	4,030	33.0	441	1,377	32.0
10-year average	1,427	4,220	33.8	486	1,525	31.9

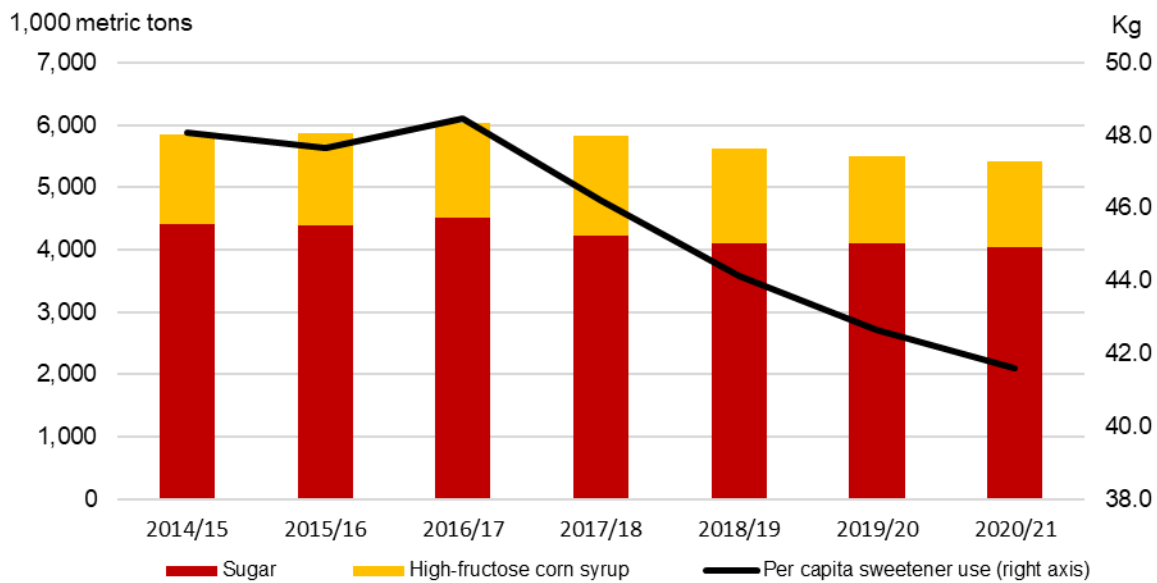
Source: CONADESUCA.

Figure 10
Mexican sugar deliveries for consumption, monthly, 2013/14 to 2020/21



Source: CONADESUCA.

Figure 11
Mexico sweetener consumption by year



Source: USDA, World Agricultural Outlook Board.

Special Article: Long-Term Projections for Baseline and Alternative Scenarios

Background on Long-Term Projections and Underlying Assumptions

USDA released updated Agricultural Projections tables in November 2020 and a full *Agricultural Projections to 2030* report in February 2021. Included in these publications were updated long-term projections for the U.S. sugar market through the 2030/31 fiscal year. These projections are developed by the sugar Interagency Commodity Estimates Committee (ICEC) and are used to evaluate the likelihood and amount of costs associated with current U.S. sugar programs that are incorporated into the President's annual budget published by the Office of Management and Budget (OMB). In addition to the information published in the tables and report, the ICEC also evaluates a number of alternative scenarios. These alternative scenarios are used to test the impact of various market and policy conditions on U.S. sugar programs and the U.S. sugar market. The analysis is based on a bilateral partial-equilibrium model of the sugar markets in the United States and Mexico. The model treats U.S. and global macroeconomic conditions and world sugar prices as exogenous. It should also be noted that due to the methodology and timing, the 2019/20 and 2020/21 projections are not changed from what was projected in the October *World Agricultural Supply and Demand Estimates (WASDE)*.

Baseline Scenario Results

The results of the Baseline scenario, which are the same results published in the *Agricultural Projections to 2030* report, project no costs to the U.S. Government from sugar loan forfeitures in the next decade. Forfeitures would likely occur if U.S. sugar prices were sufficiently low to incentivize sugar producers to forfeit their collateral (i.e., sugar) to USDA's Commodity Credit Corporation (CCC) instead of repaying their nonrecourse loans. When forfeitures occur, the CCC is required to sell the forfeited sugar for biofuel use or other nonfood use, which generally entails selling the sugar at a loss.

This model result is not surprising. Under the provisions of the U.S./Mexico Suspension Agreements, which took effect in 2015, Mexican producers agreed to minimum prices for any sugar destined for the U.S. market that are significantly higher than the support prices provided

by the U.S. sugar program. Further, there is a maximum quantity for exports to the United States that is calculated by the U.S. Department of Commerce, based on USDA's *WASDE* report. The combination of these price and quantity limits on Mexico greatly reduces the probability that U.S. sugar prices would decline to the levels at which U.S. producers would choose to forfeit sugar. For more detail on U.S. sugar policy, please refer to the ERS Sugar Policy web page.

Full model results are shown for the U.S. market in table 9 and for Mexico in table 10. Deliveries for food and beverages in the United States are seen expanding at an average rate of 0.8 percent per year from 12.200 million short tons, raw value (STRV) in 2020/21 to 13.181 million in 2030/31. As sugar deliveries have generally not been found to be sensitive to income and price effects, the main driver of rising deliveries over the projection period is population growth as well as trends in consumers' and food manufacturers' preferences for ingredient formulations. As shown in figure 12, the baseline scenario does show a continuation of the multi-year decline in per capita consumption of sweeteners (here defined as the combination of sugar and HFCS). For the 10 years of the projection, period per capita sugar consumption is forecast relatively flat, while the per capita consumption of HFCS is projected to decline at about 2 percent per year. Thus combined per capita sweeteners demand is projected to decline at 0.7 percent per year.

Table 9: U.S. supply and use projections, baseline scenario

	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31
Sugar beet harvested area (1,000 acres)	979	1,149	1,167	1,151	1,150	1,139	1,132	1,123	1,115	1,106	1,097	1,088
Sugar beet yield (short tons/acre)	29.2	31.2	31.7	32.1	32.4	32.7	33.0	33.3	33.6	33.9	34.1	34.4
Sugarcane harvested area (1,000 acres)	868.9	887.2	884.0	884.3	884.7	885.3	886.0	886.8	887.7	888.6	889.5	890.3
Sugarcane yield (short tons/acre)	34.9	36.6	36.6	36.8	37.0	37.2	37.4	37.6	37.8	38.0	38.2	38.4
<i>1,000 short tons, raw value</i>												
Beginning stocks	1,783	1,702	1,749	1,694	1,708	1,721	1,733	1,745	1,757	1,768	1,779	1,789
Total production	8,128	9,268	9,366	9,377	9,450	9,481	9,531	9,569	9,610	9,646	9,686	9,720
Beet sugar	4,293	5,206	5,215	5,189	5,223	5,216	5,226	5,224	5,225	5,219	5,218	5,211
Cane sugar	3,835	4,062	4,152	4,189	4,226	4,265	4,305	4,345	4,386	4,427	4,468	4,509
Total imports	4,136	3,120	3,127	3,284	3,308	3,369	3,409	3,456	3,497	3,539	3,574	3,610
Tariff-rate quota entries	2,071	1,832	1,869	1,873	1,877	1,881	1,884	1,888	1,892	1,896	1,900	1,900
Other program imports	432	350	350	350	350	350	350	350	350	350	350	350
Non-program imports	1,633	938	908	1,061	1,081	1,138	1,174	1,218	1,255	1,293	1,324	1,360
Mexico	1,382	888	852	974	995	1,053	1,090	1,135	1,173	1,212	1,244	1,281
High-tier	251	50	55	87	86	85	84	84	82	81	80	79
Total supply	14,047	14,089	14,243	14,356	14,465	14,571	14,673	14,770	14,864	14,954	15,039	15,119
Total exports	45	35	35	35	35	35	35	35	35	35	35	35
Deliveries for domestic use	12,300	12,305	12,514	12,613	12,710	12,803	12,892	12,979	13,061	13,140	13,215	13,286
Reexport program	80	80	80	80	80	80	80	80	80	80	80	80
Transfer to polyhydric alcohol, feed, ethanol	20	25	25	25	25	25	25	25	25	25	25	25
Deliveries for domestic food and beverage use	12,200	12,200	12,409	12,508	12,605	12,698	12,787	12,874	12,956	13,035	13,110	13,181
Total use	12,345	12,340	12,549	12,648	12,745	12,838	12,927	13,014	13,096	13,175	13,250	13,321
Ending stocks	1,702	1,749	1,694	1,708	1,721	1,733	1,745	1,757	1,768	1,779	1,789	1,798
Privately owned	1,702	1,749	1,694	1,708	1,721	1,733	1,745	1,757	1,768	1,779	1,789	1,798
Commodity Credit Corporation	0	0	0	0	0	0	0	0	0	0	0	0
Stocks-to-use ratio	13.79	14.18	13.50	13.50	13.50	13.50	13.50	13.50	13.50	13.50	13.50	13.50
World raw sugar price (U.S. cents per pound)	12.25	12.38	11.46	11.91	12.20	12.56	12.83	13.15	13.44	13.70	13.98	14.26
Raw sugar price, 3q No. 16 (U.S. cents per pound) 1/	26.94	25.57	25.66	25.93	26.11	26.31	26.46	26.64	26.80	26.94	27.09	27.23
Refined beet sugar price, 3q Midwest (U.S. cents per pound)	44.00	36.24	37.48	37.87	38.12	38.41	38.62	38.88	39.11	39.30	39.52	39.73
Sugar beet price (U.S. dollars per short ton)	38.40	50.25	46.90	49.46	49.13	49.77	49.82	50.04	49.94	50.13	50.02	50.35
Sugarcane price (U.S. dollars per short ton)	37.80	33.15	35.33	35.71	36.04	36.39	36.72	37.06	37.39	37.71	38.04	38.36

1/ 3q: 3rd quarter of calendar year (July-September)

Source: USDA, Economic Research Service; USDA, World Agricultural Outlook Board.

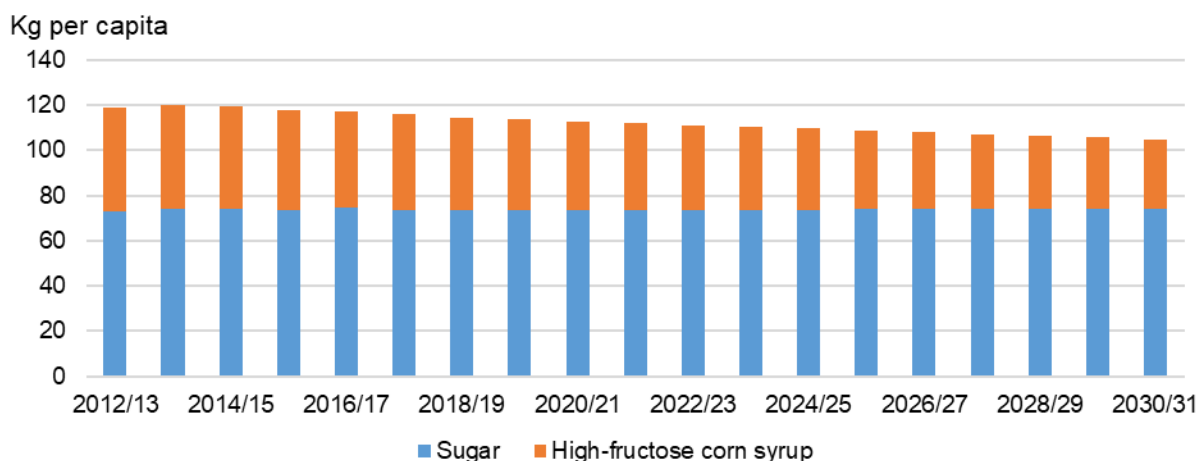
Table 10: Mexico sugar supply and use projections, baseline scenario

	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31
Sugarcane harvested area (1,000 hectares)	783	806	807	802	798	794	791	787	783	779	774	770
Sugarcane yield (metric tons/hectare)	62.9	68.0	68.4	68.8	69.2	69.6	70.0	70.4	70.8	71.3	71.7	72.1
<i>1,000 metric tons, actual value</i>												
Beginning stocks	1,169	852	935	856	856	855	855	854	852	851	849	846
Production	5,278	6,000	6,138	6,130	6,140	6,147	6,155	6,161	6,167	6,170	6,171	6,172
Imports	110	89	89	89	89	89	89	89	89	89	89	89
Total supply	6,557	6,941	7,163	7,074	7,084	7,091	7,099	7,103	7,108	7,109	7,108	7,107
Disappearance	0	0	0	0	0	0	0	0	0	0	0	0
Human consumption	4,103	4,073	4,107	4,107	4,105	4,102	4,097	4,091	4,083	4,073	4,062	4,050
Other consumption	385	415	415	415	415	415	415	415	415	415	415	415
Total domestic deliveries	4,488	4,488	4,522	4,522	4,520	4,517	4,512	4,506	4,498	4,488	4,477	4,465
Exports	1,218	1,518	1,785	1,697	1,709	1,720	1,733	1,745	1,759	1,772	1,785	1,798
To the United States	1,183	760	730	834	852	901	933	971	1,004	1,038	1,065	1,096
To rest of world	35	757	1,055	863	857	818	800	774	756	735	720	702
Total use	5,705	6,006	6,307	6,219	6,229	6,237	6,245	6,251	6,257	6,261	6,262	6,263
Ending stocks	852	935	856	856	855	855	854	852	851	849	846	844
Stocks-to-human consumption	20.8%	23.0%	20.8%	20.8%	20.8%	20.8%	20.8%	20.8%	20.8%	20.8%	20.8%	20.8%
Stocks-to-use	14.9%	15.6%	13.6%	13.8%	13.7%	13.7%	13.7%	13.6%	13.6%	13.6%	13.5%	13.5%
HFCS consumption (1,000 metric tons, dry weight) 1/	1,380	1,470	1,409	1,423	1,437	1,450	1,463	1,475	1,487	1,499	1,510	1,521

1/ HFCS: High-fructose corn syrup.

Source: USDA, Economic Research Service; USDA, World Agricultural Outlook Board.

Figure 12
Per capita sweetener deliveries projected to continue downward trend



Source: USDA, World Agricultural Outlook Board; USDA, Economic Research Service

Previous Work on this Topic

In the February 2020 *Sugar and Sweeteners Outlook*, four alternative scenarios were tested: High Oil Price; Low Oil Price; Elevated Stocks-to-use Ratio (14.5 percent instead of 13.5 percent); and Removal of the Suspension Agreement (also assumed no duties on sugar from Mexico). The only scenario in which forfeitures to the CCC occurred was the Removal of the Suspension Agreement, and then only in the first year. Compared to the base scenario, U.S. sugar production was lower in all scenarios except for Low Oil Price, which showed U.S. beet production increasing due to lower input costs (which are linked to the price of oil). In all scenarios, U.S. cane production shifts were relatively small compared to changes in beet sugar production, due to the multi-year harvest cycles of sugarcane. U.S. sugar prices were lower in

all scenarios except for the High Oil price, where the reduction in domestic beet sugar production tightened overall supply sufficiently to raise domestic sugar prices.

This year, those same four model scenarios were recreated, with updated data, with largely similar results. Last year's baseline models were completed before adverse weather impacted both the U.S. sugar beet crop as well as the Mexican sugarcane crop. At that time, the model did not anticipate the subsequent tightening of the market and increase in prices in fiscal year 2021. These elevated prices were thus the starting point for this year's 10-year projections. With the Removal of the Suspension Agreement scenario, the updated model projects slightly lower U.S. raw and refined beet prices, lower U.S. beet and cane sugar production, larger imports from Mexico, and forfeitures in 3 years (fiscal years 2022-2024) instead of just 1 year, (fiscal year 2021). There are no forfeitures to the CCC in any other scenarios.

New Scenario: Higher U.S. Ending Stocks-to-Use Ratio of 16.5 Percent

There is often debate about the appropriate target for the U.S. ending stocks-to-use ratio. Results of a scenario in which the stocks-to-use ratio was maintained at 16.5 percent are shown in table 11, showing 10-year averages for key variables. Total U.S. sugar production declines an average of 98,000 STRV per year, with a larger decline for beet sugar than for cane sugar. Total imports rise an average of 138,000 STRV per year, with imports from Mexico rising 199,000 STRV offset by a decline of 61,000 STRV per year for high-tier imports. There is no change in imports under tariff-rate quotas. The U.S. refined beet sugar price declines by 7.72 cents per pound from the baseline scenario but is still well above the U.S. sugar program support level at which forfeitures might occur.

Table 11: U.S. projections, base vs. higher stocks-to-use ratio scenarios

<i>Attribute 1/</i>	<i>Average 2021/22 through 2030/31</i>			
	<i>Base</i>	<i>16.5 percent stocks-to-use ratio</i>	<i>Difference</i>	<i>Percent difference</i>
Total production	9,544	9,446	-98	-1.0
Beet sugar	5,217	5,159	-58	-1.1
Cane sugar	4,327	4,287	-40	-0.9
Imports, Total	3,417	3,555	138	4.0
Under tariff-rate quota	1,886	1,886	0	0.0
From Mexico	1,101	1,300	199	18.1
Under high-tier tariff	81	19	-61	-76.1
Total Use	12,956	12,956	0	0.0
Stocks-to-use ratio (Percent)	13.50	16.50	3.00	22.2
World raw sugar price 2/	12.95	12.95	0	0.0
Refined beet sugar price (3q Midwest) 2/	38.70	30.98	-7.72	-19.9

1/ Thousand short tons raw value unless otherwise identified.

2/ U.S. cents per pound; 3q: 3rd quarter of calendar year (July-September).

Source: USDA, Economic Research Service; USDA, World Agricultural Outlook Board.

New Scenario: Higher and Lower World Sugar Prices

A new scenario added for this analysis is the impact of changes in the world sugar price. Recall that the model treats the global sugar price as exogenous, so iterations of the model were created to test how the U.S. and Mexican markets would operate under alternative world prices. The high-price scenario sets a world raw sugar price equal to the highest monthly average of the nearby #11 raw sugar futures contract quote over the 10-year period, January 2011-December 2020. The low-price scenario is similarly derived from the lowest monthly average over the same period. The high price, 32.09 cents per pound, is from January 2011, while the low price, 10.07 cents per pound, occurred in April 2020. Those extreme prices are assumed to persist for the entirety of the projection period.

Tables 14 and 15 (end of the article) show the full results for the high world sugar price scenarios for the U.S. and Mexican markets, respectively. Similarly, tables 16 and 17 display the results for the low world sugar price scenario for the U.S. and Mexico, respectively. Given the assumptions of U.S. policies that are built into the model, the results show the U.S. market to have relatively minimal responses to changes in the global sugar price. On the contrary, the model indicates that Mexico's sugar market responds more significantly to global price movements, particularly in any years in which its exportable surplus is larger than its access to the U.S. market. Similar to previous model scenario results, both world price scenarios indicate that no forfeitures of U.S. sugar to CCC are anticipated during the projection period.

A summary of results is found in table 12 below. The low-price scenario, in which the global price is reduced by an average of 22 percent from the baseline scenario, projects that the U.S.

Midwest beet sugar price would average 36.22 cents over the projection period, a decrease of 6 percent from the baseline scenario. Similarly, the high world price scenario, in which the world price is on average 148 percent above the baseline scenario, indicates the U.S. price would average 33.93 cents per pound, an increase of 28 percent from the baseline scenario.

Table 12: Key U.S. projections for the next decade

Attribute 1/	Average 2021/22 through 2030/31				
	Base	High world price	Percent change	Low world price	Percent change
World price (No. 11 contract, cents per pound)	12.95	32.09	148	10.07	-22
U.S. price (Midwest beet sugar, cents per pound)	38.70	49.28	27	36.22	-6
Total production	9,544	9,716	1.8	9,505	-0.4
Beet	5,217	5,279	1.2	5,202	-0.3
Cane	4,327	4,437	2.5	4,303	-0.6
Total imports	1,181	1,009	-15	1,220	3
High-tier	81	19	-76	86	7
From Mexico	1,101	990	-10	1,134	3
Deliveries for domestic use	12,921	12,921	0.00	12,921	0.00

1/ Units are 1,000 short tons, raw value, unless otherwise specified.

Source: USDA, Economic Research Service; USDA, World Agricultural Outlook Board.

Since demand for sugar is known to demonstrate very little price elasticity, domestic deliveries for food and beverage are not affected by changes in price. Production is impacted to a limited degree as total production rises by an average of only 1.8 percent in the high-price scenario and drops by 0.4 percent in the low-price scenario. Beet sugar production increases by only 1.2 percent in the high-price scenario and declines 0.3 percent in the low-price scenario. Cane sugar production can be seen to increase by 2.5 percent in the high-price scenario and decline by 0.6 percent in the low-price scenario. It is worth noting that in modelling scenarios of high or low oil prices, it has been found that beet sugar production is more responsive than cane sugar; this is due in part to sugar beets being an annual crop and thus having a more immediate response to changing input costs.

In the model, U.S. tariff-rate quota (TRQ) imports are not responsive to price movements, but only change in the event that Mexico would not have sufficient surplus sugar to supply U.S. import requirements. However, the level of high-tier imports is responsive whenever the margin between the U.S. and world prices exceeds the high duty and freight costs. In the high world price scenario, high-tier imports fall as a result of the narrowing spread between U.S. and world prices. On the flip side, high-tier imports are elevated in the low world price scenario as the wider spread between U.S. and world prices provides a greater incentive to pay the tariff to import.

This dynamic results in changes in calculated U.S. Needs and thus, reduced Mexican exports to the United States. In the high world price scenario, U.S. imports from Mexico average 990,000

STRV over the projection period, down from 1.101 million STRV in the base scenario. In the low world price scenario, however, U.S. imports from Mexico rise to an average 1.134 million STRV.

Table 13: Mexico projections for the next decade

<i>Attribute 1/</i>	<i>Average 2021/22 through 2030/31</i>				
	<i>Base</i>	<i>High world price</i>	<i>Percent difference</i>	<i>Low world price</i>	<i>Percent difference</i>
Reference price (USD per metric ton)	584	695	19	567	-3
Production	6,155	6,589	7	6,071	-1
Total exports	1,750	2,184	25	1,666	-5
Exports to the United States	942	848	-10	971	3
Exports to other countries	808	1,336	65	695	-14
Deliveries for domestic use	4,088	4,088	0	4,088	0

1/ Units are metric tons, actual value (or tel quel), unless otherwise indicated.

Source: USDA, Economic Research Service; USDA, World Agricultural Outlook Board.

Trade and production for Mexico are more responsive than for the United States, as shown in table 13 above. In the high world price scenario, Mexico's exports to other countries rise significantly with the higher price, more than offsetting the reduced exports to the United States. Mexico's Reference Price is calculated using a weighted average of the prices for sales to the United States, world, and domestic markets. Consequently, a sufficiently high world price can incentivize production, even if exports to the United States decline. On the other hand, when global prices are sustained at a low level, Mexico is projected to export more to the United States and less to other countries, with overall exports at a lower level. Overall, Mexico's production rises significantly with higher world prices and decreases substantially with lower world prices.

When global prices are low, nearly 60 percent of Mexico's sugar exports are destined for the United States. Mexico's reference price declines with the lower world price, but the reduction in this price is dampened by the shifting of exports into the higher-priced U.S. market. On the other hand, when global prices are higher, U.S. Needs are reduced and exports to the United States represent less than 40 percent of Mexico's exports as shipments to other countries increase.

In the global sugar market, major suppliers of sugar will typically adjust their production in the event of changing price dynamics, which would make it unlikely for such high and low prices to be sustained over a long period. For example, in January 2011, when the world market reached 32.09 cents per pound, the market did not stay at that elevated level for long. By January of 2012, prices were down to 24.05 cents and by January of 2013, the price had settled down to 18.37 cents per pound. Sustained high prices tend to be unlikely given that major producers such as Brazil and Thailand are poised to respond to elevated price levels with larger output such that prices would revert closer to long-run average levels. The Mexico portion of this model

exemplifies this, as Mexico is observed supplying the world market with substantially more sugar in response to rising prices and exports less to the world market when prices decline. The model, however, does not account for the impact of Mexico's export volumes on the level of world prices. In spite of these limitations, the model does provide key insights for some of the ways in which world prices impact the sugar markets in both the United States and Mexico.

Table 14: U.S. supply and use projections, high world price scenario

	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31
Sugar beet harvested area (1,000 acres)	979	1,149	1,167	1,151	1,168	1,156	1,150	1,140	1,132	1,122	1,113	1,103
Sugar beet yield (short tons/acre)	29.2	31.2	31.7	32.1	32.4	32.7	33.0	33.3	33.6	33.9	34.1	34.4
Sugarcane harvested area (1,000 acres)	868.9	887.2	884.0	892.3	899.1	904.8	909.7	913.8	917.3	920.3	922.8	924.9
Sugarcane yield (short tons/acre)	34.9	36.6	36.6	36.8	37.0	37.2	37.4	37.6	37.8	38.0	38.2	38.4
<i>1,000 short tons, raw value</i>												
Beginning stocks	1,783	1,702	1,749	1,694	1,708	1,721	1,733	1,745	1,757	1,768	1,779	1,789
Total production	8,128	9,268	9,366	9,415	9,601	9,655	9,728	9,780	9,835	9,880	9,928	9,968
Beet sugar	4,293	5,206	5,215	5,189	5,306	5,295	5,308	5,303	5,303	5,295	5,293	5,284
Cane sugar	3,835	4,062	4,152	4,227	4,295	4,359	4,420	4,477	4,532	4,585	4,636	4,685
Total imports	4,136	3,120	3,127	3,246	3,157	3,196	3,211	3,245	3,272	3,305	3,332	3,362
Tariff-rate quota entries	2,071	1,832	1,869	1,873	1,877	1,881	1,884	1,888	1,892	1,896	1,900	1,900
Other program imports	432	350	350	350	350	350	350	350	350	350	350	350
Non-program imports	1,633	938	908	1,023	930	965	977	1,007	1,030	1,060	1,082	1,112
Mexico	1,382	888	852	1,008	915	950	962	992	1,015	1,045	1,067	1,097
High-tier	251	50	55	15	15	15	15	15	15	15	15	15
Total supply	14,047	14,089	14,243	14,356	14,465	14,571	14,673	14,770	14,864	14,954	15,039	15,119
Total exports	45	35	35	35	35	35	35	35	35	35	35	35
Deliveries for domestic use	12,300	12,305	12,514	12,613	12,710	12,803	12,892	12,979	13,061	13,140	13,215	13,286
Reexport program	80	80	80	80	80	80	80	80	80	80	80	80
Transfer to polyhydric alcohol, feed, ethanol	20	25	25	25	25	25	25	25	25	25	25	25
Deliveries for domestic food and beverage use	12,200	12,200	12,409	12,508	12,605	12,698	12,787	12,874	12,956	13,035	13,110	13,181
Total use	12,345	12,340	12,549	12,648	12,745	12,838	12,927	13,014	13,096	13,175	13,250	13,321
Ending stocks	1,702	1,749	1,694	1,708	1,721	1,733	1,745	1,757	1,768	1,779	1,789	1,798
Privately owned	1,702	1,749	1,694	1,708	1,721	1,733	1,745	1,757	1,768	1,779	1,789	1,798
Commodity Credit Corporation	0	0	0	0	0	0	0	0	0	0	0	0
Stocks-to-use ratio	13.79	14.18	13.50	13.50	13.50	13.50	13.50	13.50	13.50	13.50	13.50	13.50
World raw sugar price (U.S. cents per pound)	12.25	12.38	32.09	32.09	32.09	32.09	32.09	32.09	32.09	32.09	32.09	32.09
Raw sugar price, 3q No. 16 (U.S. cents per pound) 1/	26.94	25.57	33.93	33.93	33.93	33.93	33.93	33.93	33.93	33.93	33.93	33.93
Refined beet sugar price, 3q Midwest (U.S. cents per pound)	44.00	36.24	49.28	49.28	49.28	49.28	49.28	49.28	49.28	49.28	49.28	49.28
Sugar beet price (U.S. dollars per short ton)	38.40	50.25	46.90	55.00	54.41	55.32	55.15	55.35	55.06	55.17	54.92	55.16
Sugarcane price (U.S. dollars per short ton)	37.80	33.15	39.48	39.74	40.00	40.27	40.53	40.80	41.06	41.33	41.60	41.87

1/ 3q: 3rd quarter of calendar year (July-September).

Source: USDA, Economic Research Service; USDA, World Agricultural Outlook Board.

Table 15: Mexico sugar supply and use projections, high world price scenario

	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31
Sugarcane harvested area (1,000 hectares)	783	806	807	831	849	850	850	850	850	850	850	850
Sugarcane yield (metric tons/hectare)	62.9	68.0	68.4	68.8	69.2	69.6	70.0	70.4	70.8	71.3	71.7	72.1
<i>1,000 metric tons, actual value</i>												
Beginning stocks	1,169	852	935	856	856	855	855	854	852	851	849	846
Production	5,278	6,000	6,138	6,356	6,532	6,577	6,616	6,655	6,694	6,734	6,773	6,813
Imports	110	89	89	89	89	89	89	89	89	89	89	89
Total supply	6,557	6,941	7,163	7,300	7,476	7,521	7,559	7,597	7,635	7,673	7,711	7,749
Disappearance	0	0	0	0	0	0	0	0	0	0	0	0
Human consumption	4,103	4,073	4,107	4,107	4,105	4,102	4,097	4,091	4,083	4,073	4,062	4,050
Other consumption	385	415	415	415	415	415	415	415	415	415	415	415
Total domestic deliveries	4,488	4,488	4,522	4,522	4,520	4,517	4,512	4,506	4,498	4,488	4,477	4,465
Exports	1,218	1,518	1,785	1,923	2,101	2,150	2,194	2,239	2,287	2,336	2,387	2,440
To the United States	1,183	760	730	863	783	813	824	849	869	894	914	939
To rest of world	35	757	1,055	1,060	1,318	1,337	1,370	1,390	1,418	1,442	1,474	1,501
Total use	5,705	6,006	6,307	6,445	6,621	6,667	6,706	6,745	6,785	6,825	6,865	6,905
Ending stocks	852	935	856	856	855	855	854	852	851	849	846	844
Stocks-to-human consumption	20.8%	23.0%	20.8%	20.8%	20.8%	20.8%	20.8%	20.8%	20.8%	20.8%	20.8%	20.8%
Stocks-to-use	14.9%	15.6%	13.6%	13.3%	12.9%	12.8%	12.7%	12.6%	12.5%	12.4%	12.3%	12.2%
HFCS consumption (1,000 metric tons, dry weight) 1/	1,380	1,470	1,409	1,423	1,437	1,450	1,463	1,475	1,487	1,499	1,510	1,521

1/ HFCS: High-fructose corn syrup.

Source: USDA, Economic Research Service; USDA, World Agricultural Outlook Board.

Table 16: U.S. supply and use projections, low world price scenario

	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31
Sugar beet harvested area (1,000 acres)	979	1,149	1,167	1,151	1,147	1,136	1,129	1,119	1,111	1,101	1,092	1,083
Sugar beet yield (short tons/acre)	29.2	31.2	31.7	32.1	32.4	32.7	33.0	33.3	33.6	33.9	34.1	34.4
Sugarcane harvested area (1,000 acres)	868.9	887.2	884.0	883.3	882.7	882.2	881.8	881.5	881.2	881.0	880.7	880.4
Sugarcane yield (short tons/acre)	34.9	36.6	36.6	36.8	37.0	37.2	37.4	37.6	37.8	38.0	38.2	38.4
<i>1,000 short tons, raw value</i>												
Beginning stocks	1,783	1,702	1,749	1,694	1,708	1,721	1,733	1,745	1,757	1,768	1,779	1,789
Total production	8,128	9,268	9,366	9,373	9,430	9,453	9,494	9,525	9,558	9,586	9,618	9,645
Beet sugar	4,293	5,206	5,215	5,189	5,213	5,203	5,210	5,206	5,204	5,197	5,194	5,185
Cane sugar	3,835	4,062	4,152	4,184	4,217	4,250	4,284	4,319	4,354	4,389	4,424	4,459
Total imports	4,136	3,120	3,127	3,289	3,328	3,397	3,445	3,501	3,549	3,599	3,642	3,686
Tariff-rate quota entries	2,071	1,832	1,869	1,873	1,877	1,881	1,884	1,888	1,892	1,896	1,900	1,900
Other program imports	432	350	350	350	350	350	350	350	350	350	350	350
Non-program imports	1,633	938	908	1,066	1,101	1,167	1,211	1,263	1,307	1,354	1,392	1,435
Mexico	1,382	888	852	976	1,011	1,077	1,121	1,173	1,218	1,264	1,303	1,346
High-tier	251	50	55	90	90	90	90	90	90	90	90	90
Total supply	14,047	14,089	14,243	14,356	14,465	14,571	14,673	14,770	14,864	14,954	15,039	15,119
Total exports	45	35	35	35	35	35	35	35	35	35	35	35
Deliveries for domestic use	12,300	12,305	12,514	12,613	12,710	12,803	12,892	12,979	13,061	13,140	13,215	13,286
Reexport program	80	80	80	80	80	80	80	80	80	80	80	80
Transfer to polyhydric alcohol, feed, ethanol	20	25	25	25	25	25	25	25	25	25	25	25
Deliveries for domestic food and beverage use	12,200	12,200	12,409	12,508	12,605	12,698	12,787	12,874	12,956	13,035	13,110	13,181
Total use	12,345	12,340	12,549	12,648	12,745	12,838	12,927	13,014	13,096	13,175	13,250	13,321
Ending stocks	1,702	1,749	1,694	1,708	1,721	1,733	1,745	1,757	1,768	1,779	1,789	1,798
Privately owned	1,702	1,749	1,694	1,708	1,721	1,733	1,745	1,757	1,768	1,779	1,789	1,798
Commodity Credit Corporation	0	0	0	0	0	0	0	0	0	0	0	0
Stocks-to-use ratio	13.79	14.18	13.50	13.50	13.50	13.50	13.50	13.50	13.50	13.50	13.50	13.50
World raw sugar price (U.S. cents per pound)	12.25	12.38	10.07	10.07	10.07	10.07	10.07	10.07	10.07	10.07	10.07	10.07
Raw sugar price, 3q No. 16 (U.S. cents per pound) 1/	26.94	25.57	24.78	24.78	24.78	24.78	24.78	24.78	24.78	24.78	24.78	24.78
Refined beet sugar price, 3q Midwest (U.S. cents per pound)	44.00	36.24	36.22	36.22	36.22	36.22	36.22	36.22	36.22	36.22	36.22	36.22
Sugar beet price (U.S. dollars per short ton)	38.40	50.25	46.90	48.81	48.29	48.75	48.65	48.75	48.52	48.59	48.38	48.59
Sugarcane price (U.S. dollars per short ton)	37.80	33.15	34.84	35.07	35.30	35.54	35.77	36.01	36.24	36.48	36.71	36.95

1/ 3q: 3rd quarter of calendar year (July-September).

Source: USDA, Economic Research Service; USDA, World Agricultural Outlook Board.

Table 17: Mexico sugar supply and use projections, low world price scenario

	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31
Sugarcane harvested area (1,000 hectares)	783	806	807	799	792	786	780	774	769	763	757	751
Sugarcane yield (metric tons/hectare)	62.9	68.0	68.4	68.8	69.2	69.6	70.0	70.4	70.8	71.3	71.7	72.1
<i>1,000 metric tons, actual value</i>												
Beginning stocks	1,169	852	935	856	856	855	855	854	852	851	849	846
Production	5,278	6,000	6,138	6,106	6,094	6,083	6,073	6,063	6,054	6,043	6,032	6,021
Imports	110	89	89	89	89	89	89	89	89	89	89	89
Total supply	6,557	6,941	7,163	7,051	7,039	7,027	7,017	7,006	6,995	6,983	6,969	6,956
Disappearance	0	0	0	0	0	0	0	0	0	0	0	0
Human consumption	4,103	4,073	4,107	4,107	4,105	4,102	4,097	4,091	4,083	4,073	4,062	4,050
Other consumption	385	415	415	415	415	415	415	415	415	415	415	415
Total domestic deliveries	4,488	4,488	4,522	4,522	4,520	4,517	4,512	4,506	4,498	4,488	4,477	4,465
Exports	1,218	1,518	1,785	1,673	1,663	1,655	1,651	1,648	1,647	1,646	1,646	1,648
To the United States	1,183	760	730	836	866	922	960	1,004	1,042	1,082	1,115	1,152
To rest of world	35	757	1,055	838	798	733	691	643	604	564	531	496
Total use	5,705	6,006	6,307	6,195	6,184	6,172	6,163	6,153	6,145	6,134	6,123	6,113
Ending stocks	852	935	856	856	855	855	854	852	851	849	846	844
Stocks-to-human consumption	20.8%	23.0%	20.8%	20.8%	20.8%	20.8%	20.8%	20.8%	20.8%	20.8%	20.8%	20.8%
Stocks-to-use	14.9%	15.6%	13.6%	13.8%	13.8%	13.8%	13.8%	13.8%	13.8%	13.8%	13.8%	13.8%
HFCS consumption (1,000 metric tons, dry weight)	1,380	1,470	1,409	1,423	1,437	1,450	1,463	1,475	1,487	1,499	1,510	1,521

1/ HFCS: High-fructose corn syrup.

Source: USDA, Economic Research Service; USDA, World Agricultural Outlook Board.

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