



# Sugar and Sweeteners Outlook

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## U.S. Sugar Production Raised Based on September *Crop Production* Report and Higher Factory Extraction Rates

Sugar production in 2018/19 is projected to be 9.328 million short tons, raw value (STRV) in the September *WASDE* report, a 240,000-STRV increase from the previous month. Beet sugar production is raised 236,000 STRV, accounting for most of that increase, due primarily to higher yields forecast by the National Agricultural Statistics Service (NASS). Projected imports in 2018/19 are decreased by 783,000 STRV to 2.766 million STRV. The decrease is primarily due to an 813,000-STRV reduction in shipments from Mexico, based on the terms of the suspension agreements. Increased high-duty imports are raised 30,000 STRV for 2018/19, marginally offsetting the decrease and matching the current estimate for 2017/18. Projected total use for 2018/19 is unchanged from the previous month, totaling 12.490 million STRV. As a result, ending stocks are reduced 574,000 STRV from the August report and the projected stocks-to-use ratio is 13.5 percent.

The reduction in projected shipments to the United States in 2018/19 raises available supplies in Mexico. Projected exports to non-U.S. destinations are raised 264,000 metric tons, actual value (MT). With no changes to the outlook for production or domestic deliveries, ending stocks for 2018/19 result in a projected stocks-to-consumption ratio of 32.0 percent.

# U.S. Domestic Outlook

## High-Yield Sugarbeet Crop Forecast, Raising Production Prospects for 2018/19

Sugar production in the United States is projected to total 9.328 million short tons, raw value (STRV), in the September *WASDE*—a 240,000-STRV increase from the August report. Total supplies are reduced 574,000 STRV, however, to 14.177 million STRV due to less carryover and fewer imports expected.

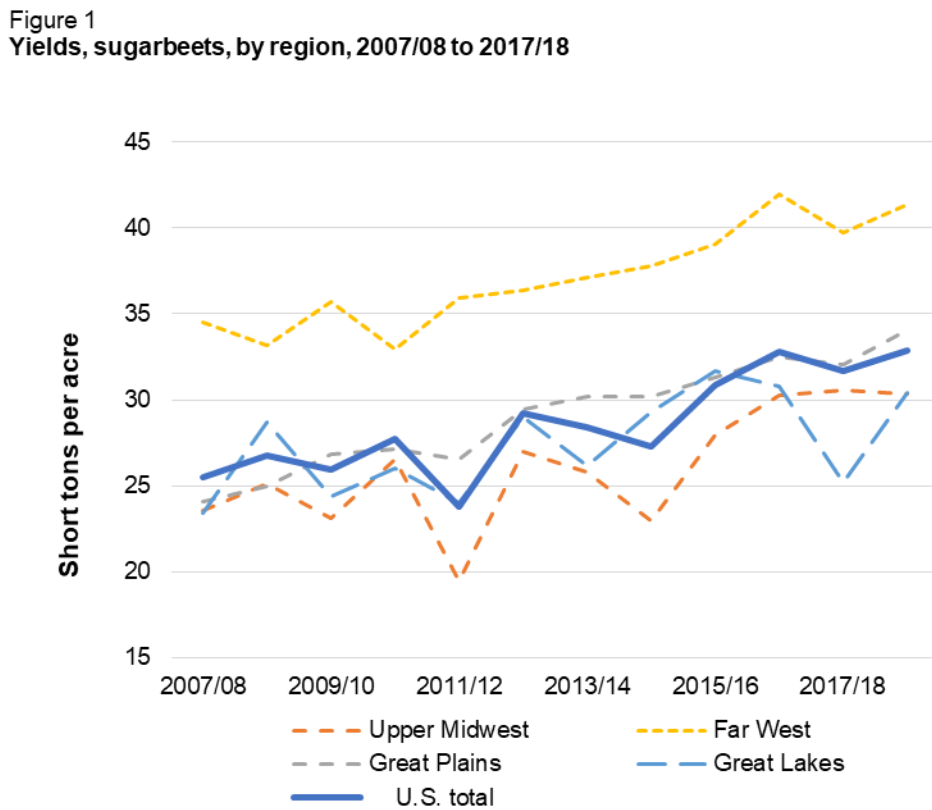
**Table 1: U.S. sugar: supply and use, by fiscal year (Oct./Sept.), September 2018**

Items	1,000 Short tons, raw value			1,000 Metric tons, raw value		
	2016/17	2017/18 (estimate)	2018/19 (forecast)	2016/17	2017/18 (estimate)	2018/19 (forecast)
Beginning stocks	2,054	1,876	2,072	1,863	1,702	1,880
Total production	8,969	9,255	9,328	8,137	8,396	8,462
Beet sugar	5,103	5,245	5,343	4,629	4,758	4,847
Cane sugar	3,866	4,011	3,985	3,507	3,638	3,615
Florida	2,055	1,983	2,050	1,864	1,799	1,860
Louisiana	1,628	1,859	1,785	1,477	1,686	1,619
Texas	140	169	150	127	153	136
Hawaii	43	0	0	39	0	0
Total imports	3,244	3,366	2,776	2,943	3,054	2,519
Tariff-rate quota imports	1,611	1,727	1,539	1,462	1,567	1,396
Other program imports	419	325	350	380	295	318
Non-program imports	1,213	1,314	887	1,101	1,192	805
Mexico	1,201	1,269	842	1,090	1,152	764
Total supply	14,267	14,497	14,177	12,943	13,152	12,861
Total exports	95	170	85	86	154	77
Miscellaneous	38	0	0	35	0	0
Deliveries for domestic use	12,258	12,255	12,405	11,121	11,118	11,254
Transfer to sugar-containing products for exports under re-export program	127	120	120	115	109	109
Transfer to polyhydric alcohol, feed, other alcohol	29	35	35	27	32	32
Commodity Credit Corporation (CCC) sale for ethanol, other	0	0	0	0	0	0
Deliveries for domestic food and beverage use	12,102	12,100	12,250	10,979	10,977	11,113
Total use	12,391	12,425	12,490	11,241	11,272	11,331
Ending stocks	1,876	2,072	1,687	1,702	1,880	1,530
Private	1,876	2,072	1,687	1,702	1,880	1,530
Commodity Credit Corporation (CCC)	0	0	0	0	0	0
Stocks-to-use ratio	15.14	16.68	13.50	15.14	16.68	13.50

Source: U.S. Dept. of Agriculture, Economic Research Service, Sugar and Sweetener Outlook.

Higher production prospects are primarily due to increased beet sugar production projected from the 2018/19 crop, which growers started to harvest in late August and September. The National Agricultural Statistics Service's (NASS) September *Crop Production* report raised its forecast for sugarbeet production by 749,000 short tons to 35.999 million short tons. The

increase is mainly attributed to a forecast yield of 32.8 tons per acre, which would be a record if realized. The 2018/19 crop is expected to be harvested on 1.6-percent fewer acres than the previous year.



Source: U.S. Department of Agriculture, National Agricultural Statistics Service.

The increased yield forecast from NASS raises the projection for beet sugar production to 5.343 million STRV in 2018/19, a 240,000-STRV increase from the previous month. In addition to the raised sugarbeet production, sucrose extraction expectations are increased from the previous month based on weekly crop conditions published by NASS and reports from the field on the current state of the crop. *Cercospora* leaf spot, which can be very detrimental to sugarbeet crop development, has resulted in poor sucrose extraction rates in recent years when the disease has been widespread in some regions. The fungus thrives in the warm, humid conditions typically occurring in the late summer in sugarbeet growing regions. According to the industry, those conditions have not been prevalent this year, and many producers feel that the threat of widespread disease has thus far been controlled through field management techniques. While growers are not completely out of the woods for the current crop, the increased extraction rate reflects the reduced probability of a disease-induced hampering of sugar production.

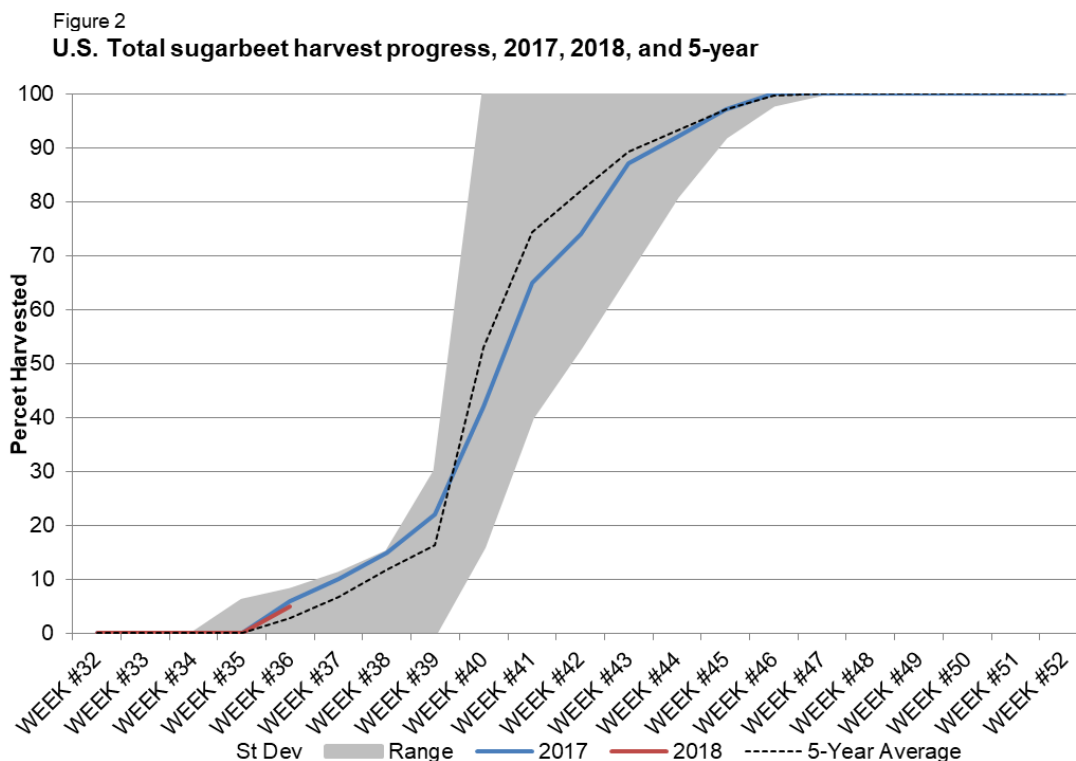
**Table 2: Beet sugar production projection calculation, 2017/18 and 2018/19**

	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2017/18	2018/19	2018/19
						August	September	August	September
Sugarbeet production (1,000 short tons) 1/	35,224	32,789	31,285	35,371	36,881	35,325	35,325	35,250	35,999
Sugarbeet shrink 2/	4.8%	6.8%	5.4%	6.5%	8.3%	7.5%	7.3%	7.3%	6.9%
Sugarbeet sliced (1,000 short tons)	33,532	30,545	29,595	33,066	33,834	32,669	32,742	32,670	33,515
Sugar extraction rate from slice	15.3%	14.3%	14.6%	14.6%	13.7%	15.2%	15.2%	14.5%	14.7%
Sugar from beets slice (1,000 STRV)	5,142	4,325	4,325	4,820	4,643	4,952	4,970	4,726	4,938
Sugar from molasses (1,000 STRV) 2/	327	324	341	380	352	345	368	345	368
Crop-year sugar production (1,000 STRV) 3/	5,469	4,648	4,667	5,201	4,995	5,297	5,338	5,070	5,306
August-September sugar production (1,000 STRV)	708	315	461	688	606	715	715	621	621
August-September sugar production forecast (1,000 STRV)	315	461	688	606	715	621	621	618	618
Sugar from imported beets (1,000 STRV) 4/	--	--	--	--	--	38	--	40	40
Fiscal year sugar production (1,000 STRV)	5,076	4,794	4,893	5,119	5,103	5,241	5,245	5,107	5,343

Notes: 1/ National Agricultural Statistics Service, U.S. Dept. of Agriculture. 2/Projections based on processor forecasts published by U.S. Dept. of Agriculture, Farm Service Agency. 3/ August-July basis. 4/ Sugar from imported beets split out for projections only, included in total once full crop-year slice is recorded. They are incorporated into total production in historical data.

Source: U.S. Dept. of Agriculture, Economic Research Service and World Agricultural Outlook Board.

The sugarbeet harvest is still in its initial stages, with most regions in the early-harvest—or pre-pile—production season. Due to the relatively warm temperatures, sugarbeets harvested early in the season are sent directly to processing facilities to be sliced. This is in contrast to majority of the sugarbeets harvested after October 1, which are piled as temperatures cool and are preserved for processing during the winter slicing campaign. The present estimate for sugar produced from the current crop prior to October 1 is 621,000 STRV—unchanged from the previous month- based on historical relationships between the current crop’s yield forecast and when crop was planted.

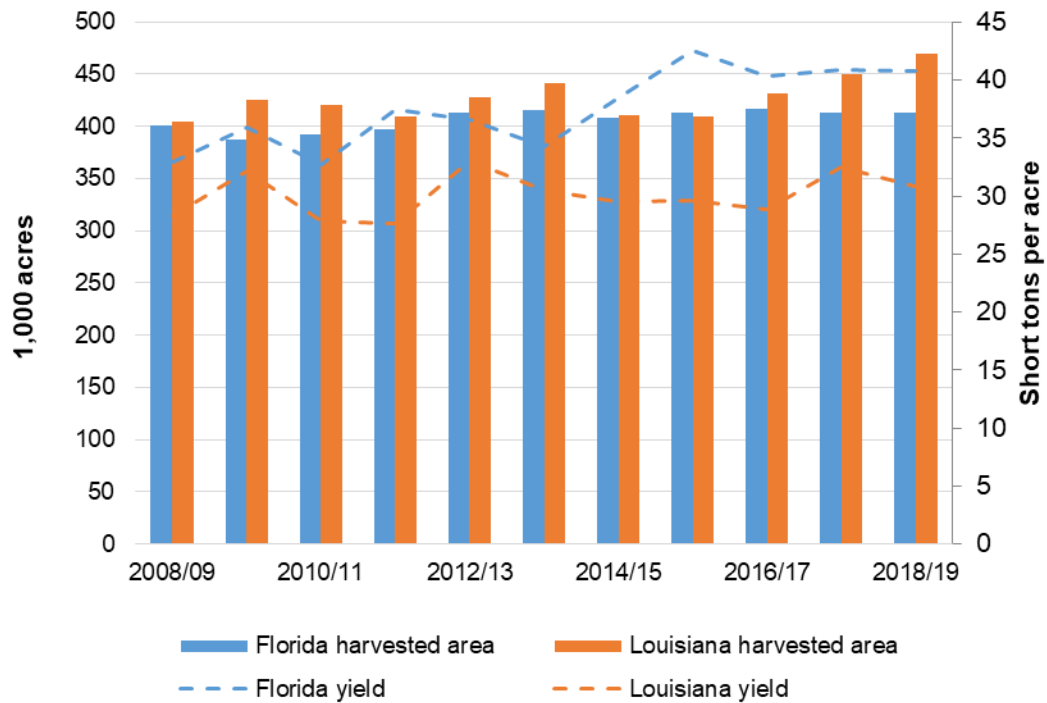


Source: U.S. Department of Agriculture, National Agricultural Statistics Service.

Cane sugar production for 2018/19 is projected to be 3.985 million STRV, a relatively minor 4,000-STRV increase from the previous month. The increase is based on a small increase in cane sugar production in Louisiana—projected at 1.785 million STRV. Production in Florida (2.050 million STRV) and Texas (150,000 STRV) remains unchanged from the August projection.

The current cane sugar projection, if realized, would be a 0.6 percent decline from 2017/18 estimates. The sugarcane harvest season in Louisiana is expected to begin later this month, and in Florida it typically begins in October. NASS sugarcane production forecasts show annual reduction in sugarcane production for both States. If both States allocate the same amount of sugarcane to be used for seed as in the previous year, Florida would be 0.2-percent below 2017/18 and Louisiana production would be 0.9-percent lower than the previous year. Florida's sugarcane growers are forecast to harvest slightly more acres, but yield forecasts are slightly lower. Sucrose recovery rates are expected to be higher in the State, given the lack of hurricane impacts or abnormally adverse weather thus far during the growing season. Louisiana sugarcane growers have substantially increased the amount of sugarcane acres they are expected to harvest. Yields are not expected to be as strong as last year's exceptional crop, however.

Figure 3  
Harvested area for sugar and yields, sugarcane, Florida and Louisiana,  
2008/09 to 2018/19



Source: U.S. Department of Agriculture, National Agricultural Statistics Service.

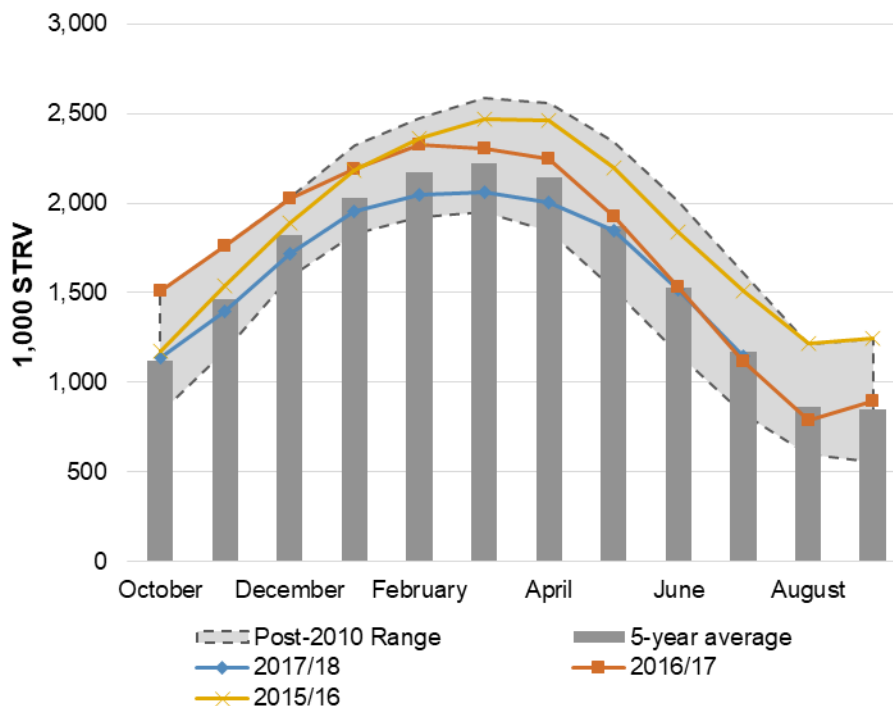
## Domestic Deliveries Pick Up in Recent Months; 2018/19 Food and Beverage Estimates Remain Flat

Total U.S. sugar use is estimated to be 12.391 million STRV in 2017/18, unchanged from the previous month's estimate. Domestic deliveries for food and beverage use are estimated to be 12.100 million STRV, also unchanged from the previous month, and represent a slight decline from 2016/17 deliveries. Through the first 10 months of the fiscal year, food and beverage deliveries have been lagging behind the pace of the previous year, although a 10.7-percent increase in deliveries in July—as reported by the latest Farm Service Agency (FSA) *Sweetener Market Data* (SMD) report—brought 2017/18 deliveries closer to the previous year's levels. Through July, fiscal year deliveries were 0.5-percent lower than the previous year.

Deliveries from beet processors are 1.0 percent behind last year's record level through July. While lower than the previous year, the levels are 8.2 percent larger than the next highest year (in 2013/14), as beet processors have continued to maintain substantially higher delivery levels, which began in 2016/17. The increase can be attributed to: larger sugarbeet crops driven by

yield increases; investment in infrastructure for storing and slicing beets to mitigate pile shrink and increase sucrose extraction of the larger harvests; and wholesale price competitiveness with the cane-refining sector—although recent wholesale prices indicate less of an advantage heading into 2018/19. After its record sugar inventories in 2015/16 and aggressive marketing in 2016/17, the beet sugar sector has carried inventory levels that have allowed firm price levels to be maintained.

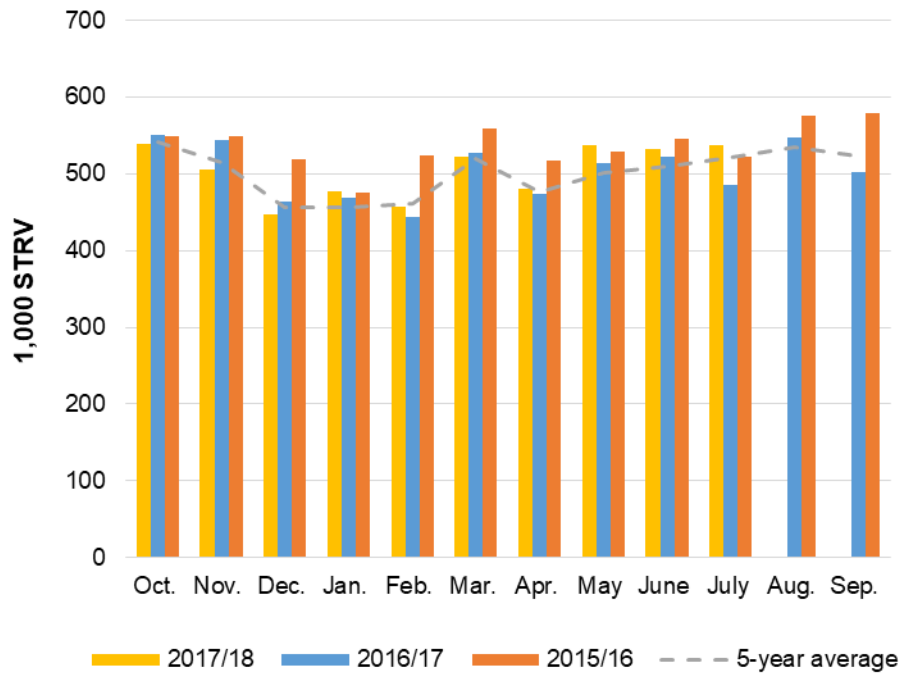
Figure 4  
**Sugarbeet processors' total sugar inventories, monthly, 2015/16 to 2017/18**



Source: U.S. Department of Agriculture, Farm Service Agency.

Cane refiners' food and beverage deliveries are 0.8 percent higher than the previous year, through July—with the cumulative rate flipping to positive for the first time this fiscal year. Cane refiners have reported higher year-over-year deliveries for the past 4 months, as well as lower raw sugar inventories for the first time since January. Melt rates, which have sputtered at times this year, appeared to have increased in July. Seasonal demand for sugar typically is at its highest from July to November, leading up to the holiday and baking season. Recent years have demonstrated that historical seasonal patterns have been disrupted by market and policy events. The current *WASDE* estimate for 2017/18 deliveries is predicated on cane refiners continuing to increase melt and delivery rates, consistent with the historical patterns.

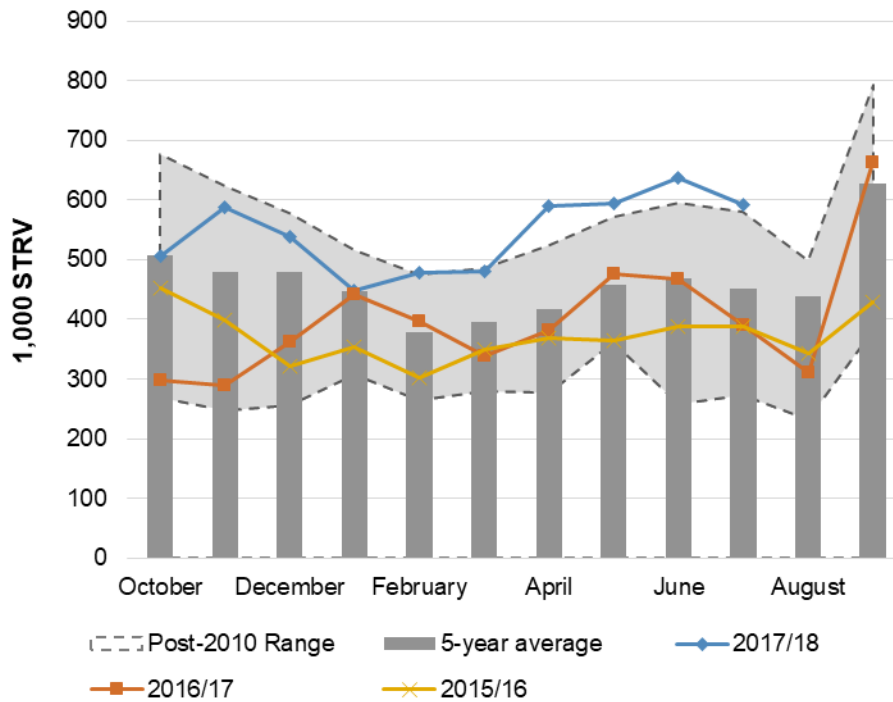
Figure 5  
Cane sugar deliveries, monthly, 2015/16 through 2017/18



Source: U.S. Department of Agriculture, Farm Service Agency.



Figure 6  
**Sugarcane refiners raw sugar inventories, monthly, 2010/11 to 2017/18**



Source: U.S. Department of Agriculture, Farm Service Agency.

Imports from nonreporters, which also contribute to domestic food and beverage deliveries, are 6.8 percent lower than the previous year through July. While difficult to gauge due to the variable nature of the monthly series, the current *WASDE* estimate is based on nonreporter deliveries being lower than the 2016/17 fiscal year total of 710,000 STRV, as the amended terms of the suspension agreements between the U.S. Department of Commerce (USDOC) and the Government of Mexico constrain such shipments from Mexico. Nonreporter imports from FTA countries, as well as the larger volume of high duty sugar imports, could boost delivery totals for the remaining months of the fiscal year.

Food and beverage deliveries in 2018/19 are projected to be 12.250 million STRV, unchanged from the previous month. This would be a 1.2-percent increase from the current 2017/18 estimate. The projection assumes that growth in deliveries will resume, as established by longer term trends. However, the past few years have shown a potentially lower rate of underlying growth compared with growth rates in the first few years after the integration of sweetener markets in the United States and Mexico through NAFTA in 2008.

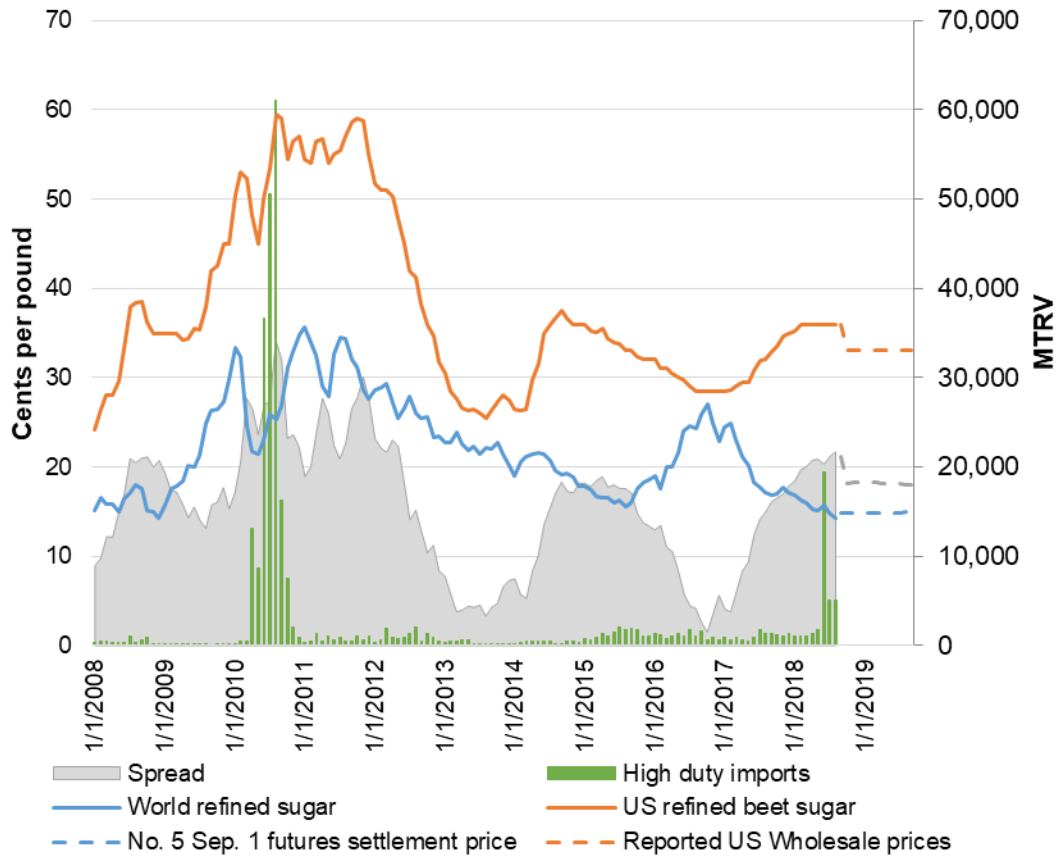
## Imports Reduced for 2018/19

Import projections for 2018/19 are substantially reduced in the September *WASDE*—a reduction of 783,000 STRV to 2.776 million STRV. The reduction is primarily due to adjustments in imports from Mexico based on expected U.S. Needs, as specified in the amended suspension agreements signed in June 2017 between the USDOC and the Government of Mexico. Based on the projections from the September *WASDE*, the USDOC is anticipated to calculate a U.S. Needs of 842,000 STRV. This represents a sizeable 813,000-STRV decrease from the previous announcement subsequent to the July *WASDE*.

Imports under quota programs in 2018/19 are unchanged, projected at 1.539 million STRV. Estimated imports for 2017/18 are adjusted to 1.727 million STRV, however, based on an increased shortfall of the WTO raw sugar tariff rate quota (TRQ).

High duty imports are increased for 2018/19, projected to total 45,000 STRV. This would match the current estimate for 2017/18. Entries of high-duty sugar imports have picked up in the past few months. Price differentials between the world refined sugar on the world futures market and current U.S. wholesale sugar prices have grown in recent months—driven by both increases in U.S. wholesale prices and decreases in world futures markets. The spread between U.S. and world futures market prices makes it more economically feasible to absorb the high tariff rates associated with such imports. While not as high as the amount of high-duty imports that entered in 2009/10 and 2010/11, the most recent levels are substantially larger than at any point since trade with Mexico became a consistently large feature of U.S. supplies in 2012/13. The current projection signals that the forces driving the recent increase in high-duty entries are expected to continue through the early parts of 2018/19, which would mean higher high-duty entries than normal. This outlook will be adjusted, however, as prices and the pace of volumes evolve.

Figure 7  
 U.S. and World refined sugar prices, monthly, January 2008 to October 2019



Source: U.S. Department of Agriculture, Economic Research Service.

# Mexico Outlook

## Outlook for Ending Stocks Raised in Mexico as Shipments to non-U.S. Destinations Become More Significant

Mexico's sugar ending stocks in 2018/19 are projected to be 1.461 million metric tons, actual value (MT), a 453,000-MT increase from the previous month's forecast. The increase is primarily due to changes in trade. The outlook for production remains largely unchanged, with 6.010 million MT of sugar estimated for the 2017/18 crop that concluded its harvest this summer and 6.025 million MT projected for the upcoming 2018/19 sugarcane crop.

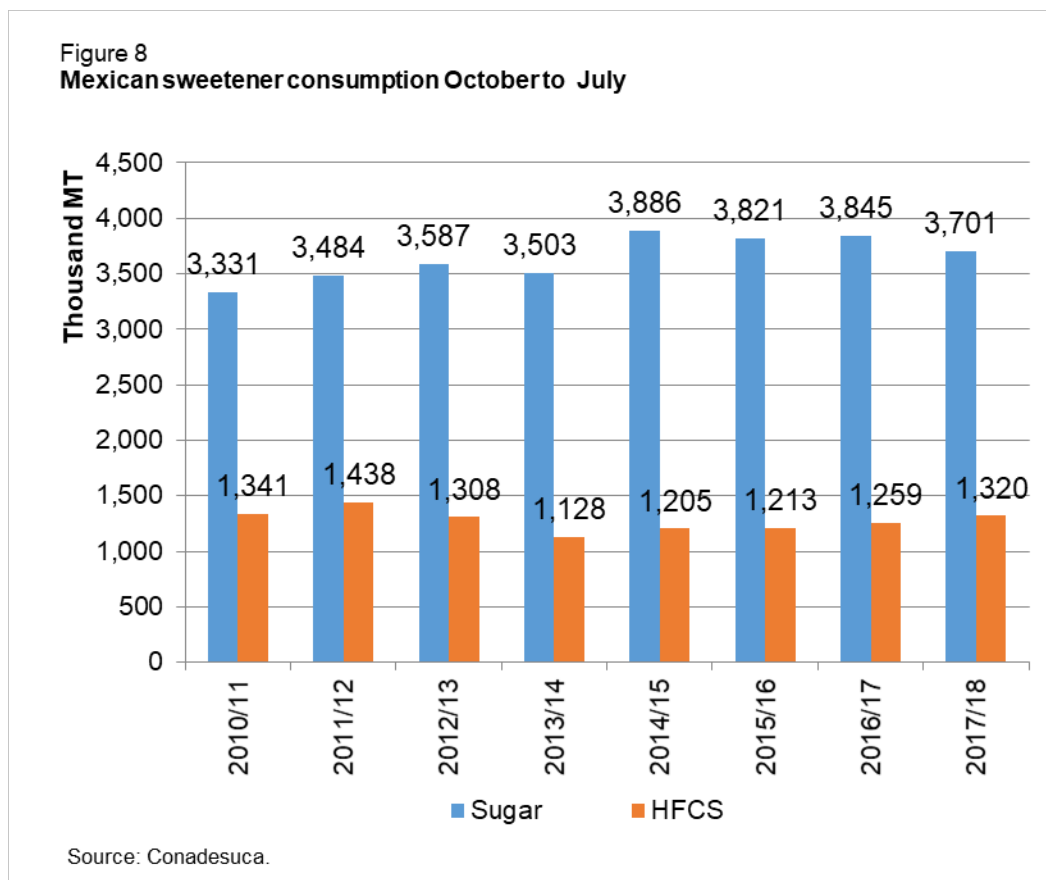
Table 3: Mexico sugar supply and use, 2016/17 - 2017/18 and projected 2018/19, September 2018

Items	2016/17	2017/18 (estimate)	2018/19 (forecast)
	1,000 metric tons, actual weight		
Beginning stocks	1,037	1,002	1,268
Production	5,957	6,010	6,025
Imports	93	190	115
Imports for consumption	48	140	65
Imports for sugar-containing product exports, IMMEX 1/, other	45	50	50
Total supply	7,087	7,202	7,408
Disappearance			
Human consumption	4,515	4,337	4,562
For sugar-containing product exports (IMMEX)	397	390	390
Other deliveries and end-of-year statistical adjustment	-61	0	0
Total	4,851	4,727	4,952
Exports			
Exports to the United States & Puerto Rico	1,234	1,207	995
Exports to other countries	1,028	1,086	721
Exports to other countries	205	121	274
Total use	6,085	5,934	5,947
Ending stocks	1,002	1,268	1,461
	1,000 metric tons, raw value		
Beginning stocks	1,099	1,062	1,344
Production	6,315	6,370	6,387
Imports	98	201	122
Imports for consumption	51	148	69
Imports for sugar-containing product exports (IMMEX)	47	53	53
Total supply	7,512	7,634	7,852
Disappearance			
Human consumption	4,786	4,597	4,835
For sugar-containing product exports (IMMEX)	420	413	413
Other deliveries and end-of-year statistical adjustment	-64	0	0
Total	5,142	5,010	5,249
Exports			
Exports to the United States & Puerto Rico	1,308	1,280	1,055
Exports to other countries	1,090	1,152	764
Exports to other countries	218	128	291
Total use	6,450	6,290	6,303
Ending stocks	1,062	1,344	1,549
Stocks-to-human consumption (percent)	22.2	29.2	32.0
Stocks-to-use (percent)	16.5	21.4	24.6
High fructose corn syrup (HFCS) consumption (dry weight)	1,522	1,608	1,608

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

Source: USDA, *World Agricultural Supply and Demand Estimates* and Economic Research Service, Sugar and Sweeteners Outlook; Conadesuca.

The outlook for domestic deliveries is also unchanged from the previous month's report. Domestic deliveries for human consumption are estimated to be 4.337 million MT for 2017/18, which would be a 4.0-percent decline from the previous year. Through July, Conadesuca shows fiscal year domestic deliveries of sugar down 3.7 percent, likely attributed to relatively high domestic sugar prices in Mexico. This has been offset to a degree by a 4.9-percent increase in HFCS deliveries over the same period. The pace for both deliveries has moderated a bit, moving more in line with the volumes recorded during 2016/17 as market price conditions have also flattened out.



Domestic deliveries in 2018/19 are projected to be 4.562 million MT, which would be a 5.2-percent increase from the current 2017/18 estimate. This forecast is predicated on per capita sweetener levels being unusually low in the current year due to high domestic sugar prices. The 2018/19 delivery forecast assumes that per capita sweetener and sugar consumption returns to the levels in previous years, which are consistent with longer term trends.

Exports for 2018/19 are projected at 995,000 MT in the September *WASDE*. This represents a 432,000-MT decline from the August report. Shipments to the United States are reduced

696,000 MT to 721,000 MT based on the updated calculation of U.S. Needs from the September *WASDE*, as specified in the amended suspension agreements.

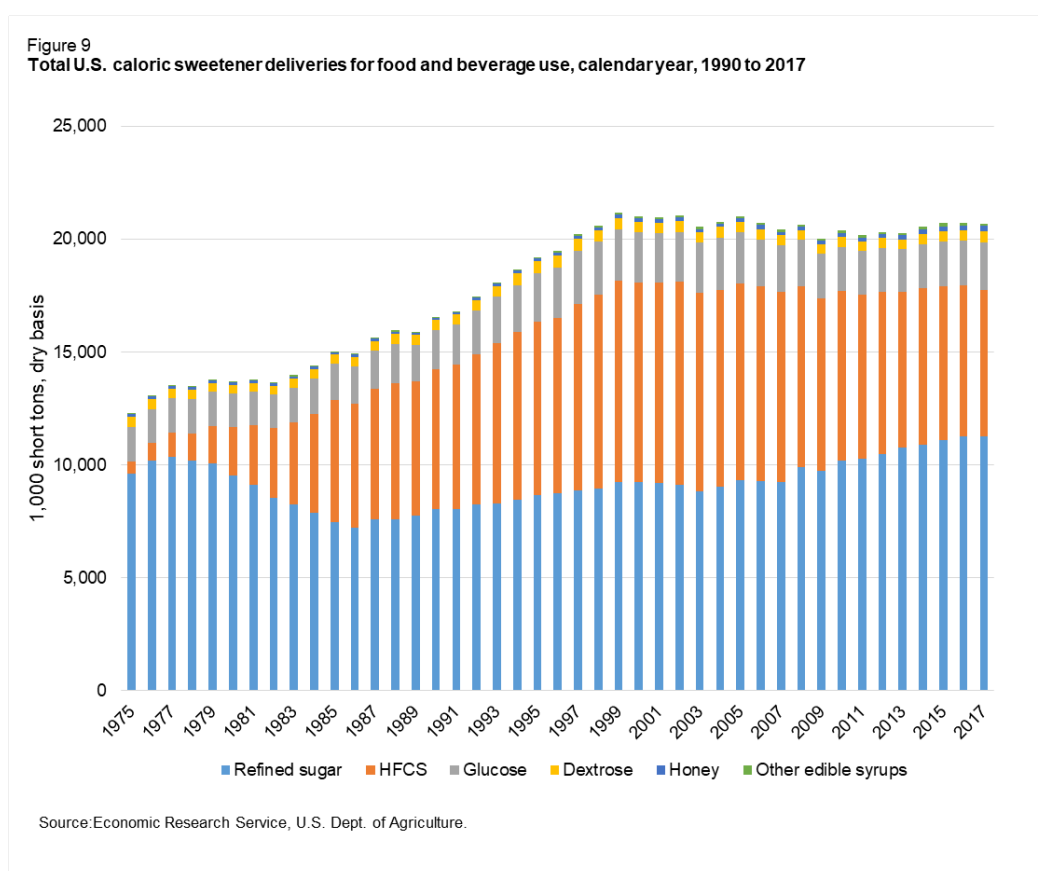
Shipments to non-U.S. destinations are raised, however, by 264,000 MT to 274,000 MT. Conadesuca announced a program—a trust known by its Spanish acronym of FIMAE—to manage exports from Mexican processors to the world markets. FIMAE will convert unsold sugar from domestic processors into export certificates and manage the marketing of these exports in accordance with Conadesuca objectives and policies, as sugar sold into the world market is factored into the sugarcane payment calculation for domestic growers. These exports are expected to be supplies from the 2017/18 harvest season and are required to be shipped by December 31, 2018; which would mean that the supplies would be off the market before the 2018/19 harvest season supplies are fully marketed. The Foreign Agricultural Service (FAS) Post in Mexico City reports indicate that the volume of this program is expected to be the equivalent of about 264,000 MT—corresponding to the increase in the September *WASDE*.

The reduction in use for 2018/19 results in a projected ending stock level of 1.461 million MT, which would result in a 32.0 percent stocks-to-consumption ratio.

# Special Article: Caloric Sweetener Deliveries

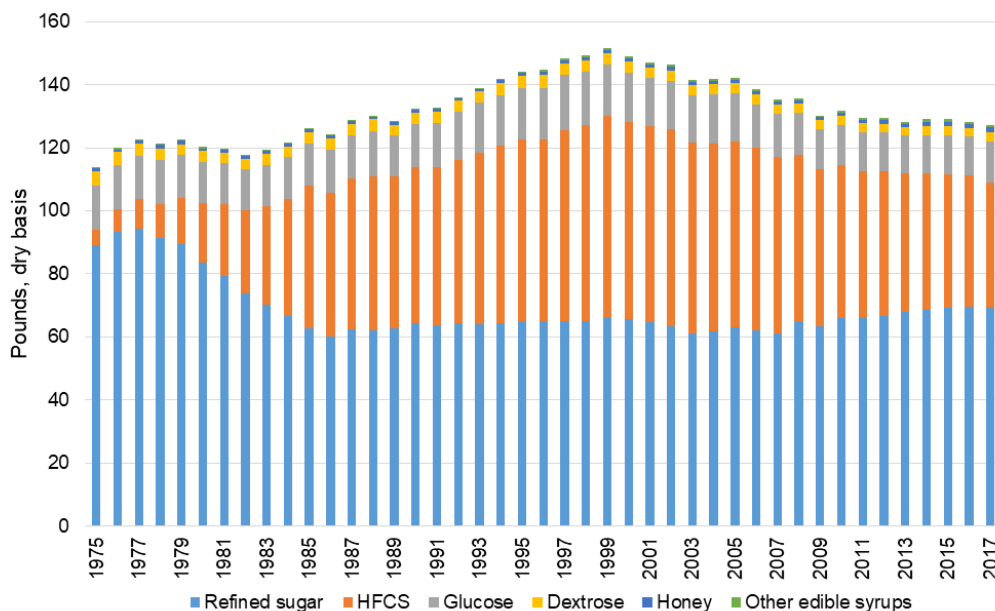
## Caloric Sweeteners Decline in 2017 for the Second Consecutive Year

Total caloric sweetener deliveries available for food and beverage use in the United States totaled 20.692 million short tons, dry basis (tons), in calendar year 2017. This represents a small decline from the previous year's level of 20.701 million tons, marking the second consecutive year of annual declines. Total caloric sweetener consumption has largely remained flat since reaching its peak in 1999.



Due to increasing population growth, per capita rates have continued to fall on an annual basis, totaling 127.1 pounds, dry basis (lbs) per person—or 0.8 percent below the previous year's total of 128.1 lbs. Per capita caloric sweetener deliveries also peaked in 1999 and have been steadily trending downward since. The rate at which per capita deliveries for consumption is declining has moderated a bit in recent years, however, with trends flatter than they were a decade ago.

Figure 10  
Per capita U.S. caloric sweetener deliveries for food and beverage use, calendar year, 1990 to 2017



Source: Economic Research Service, U.S. Dept. of Agriculture.

Table 4: Average annual growth rates for per capita caloric sweeteners deliveries, calendar year

	3-year	10-year	15-year	20-year
Refined sugar	0.35%	1.23%	0.59%	0.32%
HFCS	-2.92%	-3.41%	-3.02%	-2.12%
Total caloric sweetener	-0.53%	-0.63%	-0.94%	-0.77%

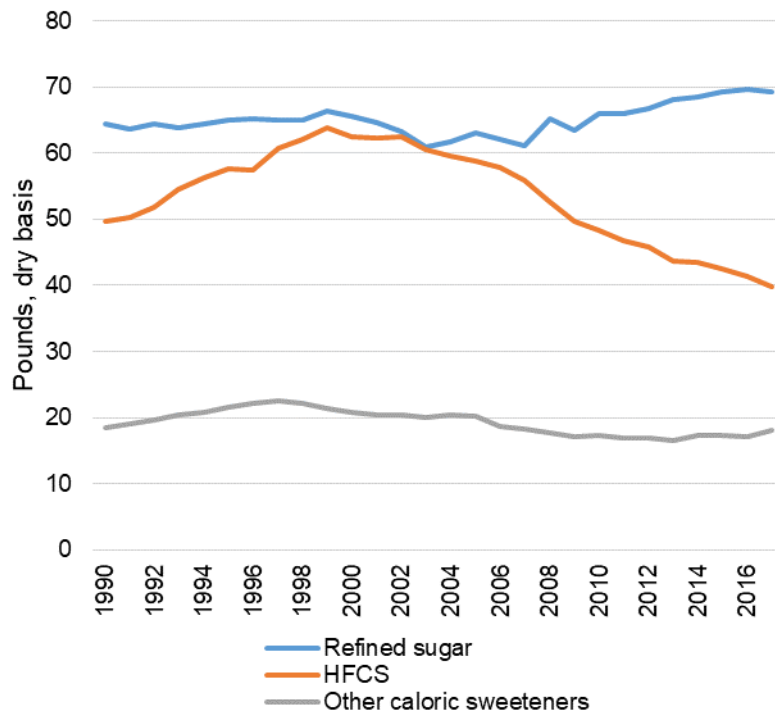
Source: Economic Research Service, USDA.

In addition to total caloric sweetener deliveries, important trends of specific sweeteners continue. Refined sugar (derived from sugarbeets or sugarcane) and high-fructose corn syrup (HFCS) continue to be the largest component of caloric sweeteners in the U.S. market, accounting for 85.7 percent of total per capita deliveries in 2017. Refined sugar makes up the majority of caloric sweeteners, although per capita refined sugar deliveries fell slightly from 69.7 lbs. per person to 69.2 lbs.; the first year-over-year decline since 2011. Over the longer term, however, refined sugar has shown an increasing trend in per capita deliveries, particularly since 2008. Per capita deliveries of HFCS continued to decline in 2017—accounting for much of the total decline in caloric sweeteners. The main drivers for the trends of increasing refined sugar and decreasing HFCS during this period have been increased refined sugar availability as sugar imports from Mexico became a more significant part of the U.S. sweetener market subsequent to the 2008 implementation of sweetener market terms of NAFTA and increased focus by food



manufacturers on ingredient formulation and front-of-package labeling to accommodate perceived consumer preferences.

Figure 11  
Per capita U.S. caloric sweetener deliveries for food and beverage use, calendar year, 1990 to 2017



Source: Economic Research Service, U.S. Dept. of Agriculture.

# Special Article: Corn Sweetener Markets

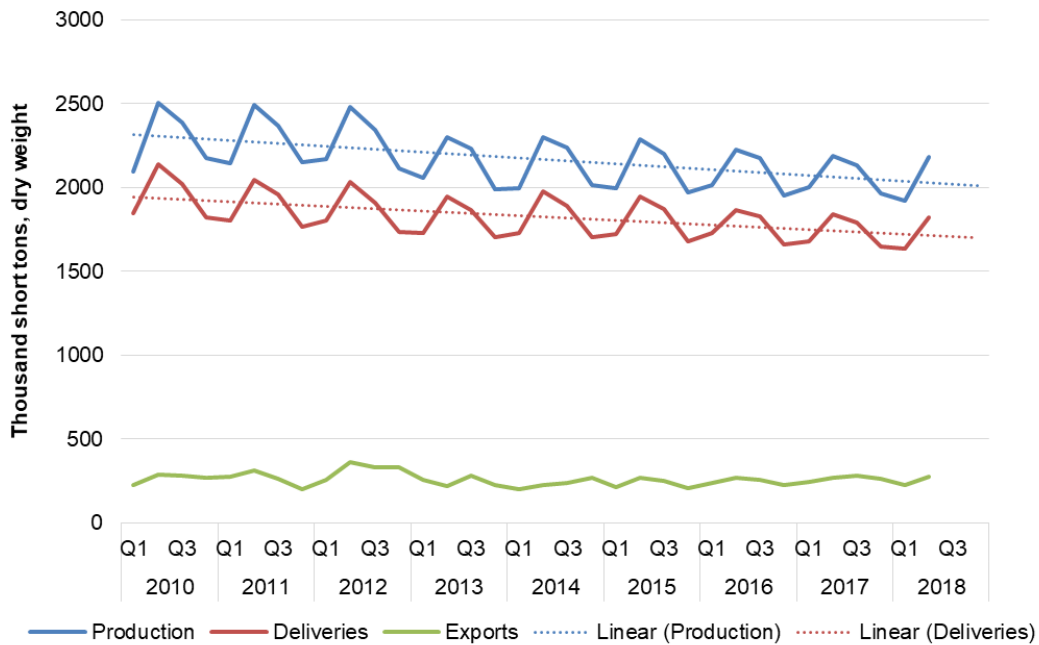
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## Through First Half of 2018, U.S. HFCS Production and Deliveries Continue Trends

The price of both types of high fructose corn syrup (HFCS-42 and 55) have continued to be stable this year, with no changes reported at all for HFCS-42 and only a 0.8 cent per pound change in January for HFCS-55. HFCS-42 currently is 24.75 cents per pound, and HFCS-55 is 39.29 cents per pound, dry weight (down from 39.61 in January). Buyers and sellers are in the process of negotiating pricing and contracts for 2019. Reports indicate that refiners are communicating to buyers to expect small increases in pricing compared with 2018 levels. Additionally, Ingredion announced in July that the Stockton, CA wet mill would cease production of HFCS in 2018, which would further consolidate the sector's production capacity in the United States.

Production continues to decrease year over year, with first-quarter (January to March) production lower this year compared to last year. Production of HFCS peaked in 1999, with gradual decreases in most years since; these decreases are also observed across many other sweeteners. In the first quarter, production for HFCS was 1.923 million short tons, dry weight, down from 2.000 million in 2017. In the second quarter of 2018 production again tracked lower than in the prior year at 2.184 million short tons, dry weight, compared to 2.191 million short tons, dry weight in 2017. Overall, through the first-half of the year HFCS production was 2.0-percent lower than the previous year.

**Figure 12**  
Quarterly production, deliveries, and exports of HFCS, calendar year



Source: U.S. Department of Agriculture, Economic Research Service.

Deliveries of HFCS domestically in 2018 have been marginally weaker in 2018 than in 2017. In the first quarter of the year, HFCS deliveries were pegged at 1.638 million short tons dry weight, a decrease of 43,000 short tons dry weight from the prior year. In the second quarter this trend continued with a decrease of 17,000 short tons, dry weight, year over year, totaling 1.822 million short tons, dry weight. Through the first half of the year, total deliveries were 1.7 percent lower than the previous year, continuing the longer term trend of declining domestic deliveries.

HFCS trade with Mexico, the largest export market for U.S. HFCS producers by a large margin, continues to be an increasingly important segment of the market. Total HFCS trade volumes have been down thus far in 2018, however. Through the first two quarters of the year, exports of HFCS to Mexico were 501,000 short tons, dry weight, down 2.8 percent from last year's figure of 515,000 short tons. The year-over-year decline comes after 2017 calendar year shipments to Mexico increased 6.3 percent from the previous year, however, due in part to high domestic sugar prices.

## U.S. Glucose and Dextrose Production Expands in 2017 With Growing Food and Nonfood Markets for Glucose

Glucose and dextrose are two corn sweeteners used in food and beverage manufacturing. The products are chemically identical, with dextrose being primarily a dry product and glucose a liquid, each used for various applications. Food and beverage applications include a broad customer base, such as: the cereal and baking industry, confectionary industry, alcoholic beverage manufacturing, food canning, and dairy products. These products also have nonfood applications such as chemical manufacturing, pharmaceutical production, and other nonfood industrial uses. Production and markets for these two products are not as large as the market for HFCS, but the products are still significant components of the corn wet milling industry in the United States.

In 2017, glucose production was 5.559 million short tons, dry weight (tons), a 4.4-percent increase from the previous year's level. Deliveries for food use also increased, by 6.4 percent, from 2.001 in 2016 million tons to 2.129 million tons in 2017. In context, however, glucose deliveries are still about one-quarter to one-third of total HFCS deliveries. Nonfood use has undergone a substantial increase in the past 2 years, including an 8.8 percent annual increase in 2017. Exports declined for the fourth consecutive year but were only 0.4 percent lower than 2016. Overall, the increase in glucose production seems to be largely fueled by developing demand in non-food sectors.

Table 5: U.S. glucose supply and use, calendar year

	Production	Imports	Total supply	Total use	Exports	Non-food use	Food and beverage use
	<i>Short tons, dry basis</i>						
2000	3,038	28	3,066	3,065	99	736	2,230
2001	3,037	27	3,063	3,068	114	748	2,205
2002	3,021	32	3,053	3,062	131	704	2,224
2003	3,101	30	3,131	3,116	139	764	2,209
2004	3,156	45	3,201	3,177	126	754	2,292
2005	3,126	47	3,173	3,187	182	743	2,261
2006	3,451	59	3,510	3,449	261	1,134	2,053
2007	3,547	73	3,620	3,591	317	1,207	2,067
2008	3,497	83	3,579	3,568	270	1,262	2,036
2009	3,363	67	3,430	3,455	261	1,203	1,991
2010	3,624	81	3,705	3,671	377	1,338	1,956
2011	4,077	92	4,169	4,080	521	1,651	1,908
2012	3,965	83	4,048	4,026	401	1,656	1,969
2013	4,214	93	4,307	4,237	403	1,932	1,903
2014	4,392	124	4,516	4,444	394	2,109	1,941
2015	4,212	128	4,340	4,350	331	2,046	1,972
2016	5,327	170	5,497	5,197	279	2,917	2,001
2017	5,559	149	5,709	5,580	277	3,174	2,129

Source: Economic Research Service, USDA.

Dextrose production is substantially smaller than the glucose market, but increased 3.7 percent in 2017, totaling 692,000 tons. This was the first annual production increase since 2014.

Domestic deliveries also rebounded in 2017 by 3.7 percent, after several annual declines. In contrast to the glucose market, however, food and nonfood markets have been relatively stable, and food use for dextrose remains the largest segment of demand.

Table 6: U.S. dextrose supply and use, calendar year

	Production	Imports	Total supply	Total use	Exports	Non-food use	Food and beverage use
	<i>Short tons, dry basis</i>						
2000	708	1	708	707	56	169	476
2001	693	1	693	698	62	160	469
2002	696	1	697	700	76	148	473
2003	752	4	757	747	96	201	449
2004	744	2	745	743	81	172	487
2005	726	1	726	733	92	156	481
2006	719	0	719	724	102	156	463
2007	732	0	732	734	116	167	448
2008	692	0	692	703	115	165	419
2009	620	0	620	630	74	136	417
2010	691	0	691	685	112	121	450
2011	684	0	684	683	109	127	446
2012	695	0	695	692	112	159	420
2013	687	0	687	688	110	161	415
2014	706	0	706	699	100	126	472
2015	671	0	671	674	84	113	476
2016	667	0	667	676	113	119	443
2017	692	0	692	685	101	102	481

Source: Economic Research Service, USDA.

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# Contacts & Additional Information

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## Data

Tables from the *Sugar and Sweeteners Yearbook* are available in the Sugar and Sweeteners Topics at <http://www.ers.usda.gov/topics/sugar/>. They contain the latest data and historical information on the production, use, prices, imports, and exports of sugar and sweeteners.

## Related Websites

Sugar and Sweeteners Outlook <http://www.ers.usda.gov/Publications/SSS/>  
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