United States Department of Agriculture

Economic Research Service

Situation and Outlook

SSS-M-314

October 17, 2014

Sugar and Sweeteners Outlook

Stephanie Riche, coordinator
smriche@ers.usda.gov
Jennifer Bond, contributor
jkbond@ers.usda.gov
Alberto Jerardo, contributor
ajerardo@ers.usda.gov
Stephen Haley, contributor
shaley@oce.usda.gov

U.S. 2013/14 sugar tariff-rate quota (TRQ) imports are reduced by 72,000 short tons, raw value (STRV) based on end-of-year reporting by the U.S. Customs Service. Imports from Mexico are decreased by 12,000 STRV based on a Foreign Agricultural Service (FAS) forecast of 2.124 million with almost all import data in for the fiscal year. Texas cane sugar production is reduced by 2,000 STRV based on revised processor data. For 2013/14, there are no other changes; therefore, ending stocks are reduced by a total of 86,000 STRV to 1.810 million, implying an ending stocks-to-use ratio of 14.5 percent.

The next release is November 17, 2014

Approved by the World Agricultural Outlook Board.

For 2014/15, imports from Mexico are increased by 461,000 STRV to 1.549 million. Beet sugar production is increased 170,000 STRV to 4.970 million based on analysis of National Agricultural Statistics Service (NASS) crop forecasts. Cane sugar is reduced 19,000 STRV to 3.572 million based on processors' reporting. As a residual, ending stocks are increased by 526,000 STRV to 1.554 million for an ending stocks-to-use ratio of 12.8 percent, up 4.3 percentage points over last month.

Recent *Sugar and Sweeteners Outlook* Special Articles

"NAFTA Sugar and HFCS Production Costs," pdf pages 17-23 of the *Sugar and Sweetener* report (http://www.ers.usda.gov/publications/sssm-sugar-and-sweeteners-outlook/sssm-310.aspx)

"The Road to Forfeitures," pdf pages 12-17 of the *Sugar and Sweetener* report http://www.ers.usda.gov/publications/sssm-sugar-and-sweeteners-outlook/sssm-303.aspx)

"World Sugar and High Fructose Syrup Production Costs: 2001/02-2012/13," pdf pages 17-33 of the *Sugar and Sweetener* report (http://www.ers.usda.gov/publications/sssm-sugar-and-sweeteners-outlook/sssm-309.aspx)

For Mexico in 2013/14, imports are reduced by 96,000 metric tons (MT), all of which were intended for Mexico's re-export program (IMMEX) for sugar-containing products. In a mostly parallel adjustment in use, deliveries to the IMMEX are reduced by that same 96,000 MT, plus 10,000 MT from reductions in domestic sourcing, based on pace to date. Deliveries for consumption are reduced by 50,000 MT after a fall-off in late-season domestic shipments. Total deliveries are, therefore, decreased by 156,000 MT. Based on U.S. import data and the FAS forecast, exports to the United States are decreased by 11,000 MT. Based on adjustments to data, exports to third-country destinations are increased by 1,000 MT (681,000 total), and production is increased by 1,000 MT (6.021 million total). These changes imply ending stocks at 685,000 MT, for a stocks-to-consumption ratio of 16.5 percent.

For 2014/15, total Mexico supply is increased by 71,000 MT in beginning stocks. Deliveries for consumption are decreased by 52,000 MT in line with the reduction made for 2013/14. Ending stocks are still forecast at 22 percent of consumption for an 11,000 MT reduction to 936,000 MT. Because total exports are forecast as a residual, their change is equal to the sum of the other changes (positive for supply, negative for use), or 134,000 MT, for a total of 1.650 million. Exports to non-U.S. destinations based on contracts are reduced by 260,000 MT to 325,000. FEESA, the entity that runs the nine Government-owned mills in Mexico, announced that it had renegotiated one earlier contract and is committed to export 40,000 MT instead of the earlier negotiated 300,000 MT. As a consequence, exports to the United States are residually calculated at 1.325 million MT, up 394,000 MT.

Mexico Sugar Supply and Use

Beginning stocks for 2013/14 remained unchanged for September. Mexican sugar supply-and-use estimates for 2012/13-2013/14 and projected 2014/15 are shown in table 1. Production is increased by 1,000 metric tons (MT) for 2013/14 due to a data revision by *Comité Nacional Para El Desarrollo Sustentable de la Caña de Azúcar* (Conadesuca). Imports decline 96,000 MT based on pace to date to 130,000 MT. Imports for consumption are kept at 10,000 MT, but imports for IMMEX, Mexico's sugar-containing product re-export program and other uses, was reduced by the full 96,000 MT to 120,000 MT.

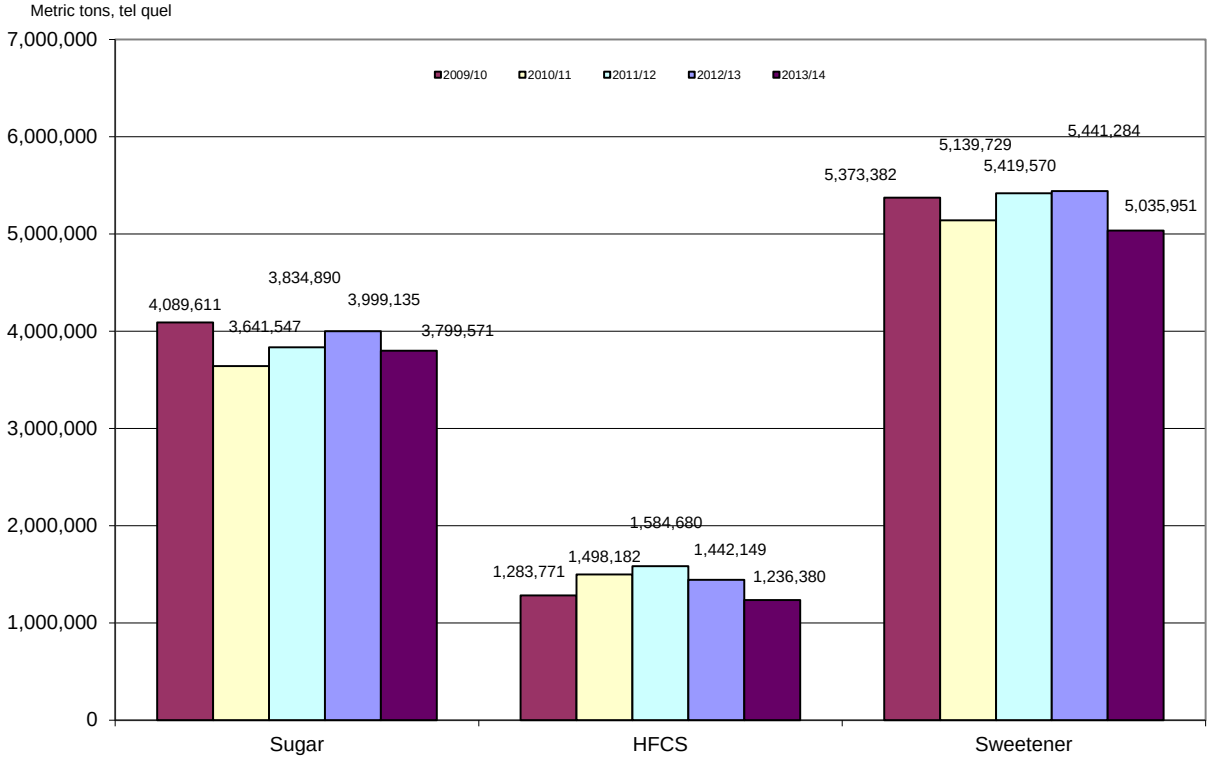
Table 1 -- Mexico sugar supply and use, 2012/13 - 2013/14 and projected 2014/15, October 2014

Items	2012/13	2013/14	2014/15
	1,000 metric tons, actual weight		
Beginning Stocks	966	1,460	685
Production	6,975	6,021	6,140
Imports	217	130	399
Imports for consumption	9	10	183
Imports for sugar-containing product exports (IMMEX) 1/	207	120	216
Total Supply	8,157	7,611	7,224
Disappearance			
Human consumption	4,287	4,150	4,254
For sugar-containing product exports (IMMEX)	384	278	384
Statistical adjustment	53	0	0
Total	4,724	4,428	4,638
Exports	1,973	2,498	1,650
Exports to the United States & Puerto Rico	1,818	1,818	1,325
Exports to other countries	155	681	325
Total Use	6,697	6,926	6,288
Ending Stocks	1,460	685	936
	1,000 metric tons, raw value		
Beginning Stocks	1,024	1,548	726
Production	7,393	6,383	6,508
Imports	230	138	423
Imports for consumption	10	11	194
Imports for sugar-containing product exports (IMMEX)	220	127	229
Total Supply	8,646	8,068	7,657
Disappearance			
Human consumption	4,544	4,399	4,509
For sugar-containing product exports (IMMEX)	407	295	407
Statistical adjustment	56	0	0
Total	5,007	4,694	4,916
Exports	2,091	2,648	1,749
Exports to the United States & Puerto Rico	1,927	1,927	1,405
Exports to other countries	164	722	345
Total Use	7,099	7,342	6,666
Ending Stocks	1,548	726	992
Stocks-to-Human Consumption (percent)	34.1	16.5	22.0
Stocks-to-Use (percent)	21.8	9.9	14.9
High Fructose Corn Syrup (HFCS) Consumption (dry weight)	1,567	1,360	1,419

1/ IMMEX = Industria Manufacturera, Maquiladora y de Servicios de Exportación.
Source: USDA, WASDE and ERS, Sugar and Sweeteners Outlook; Conadesuca.

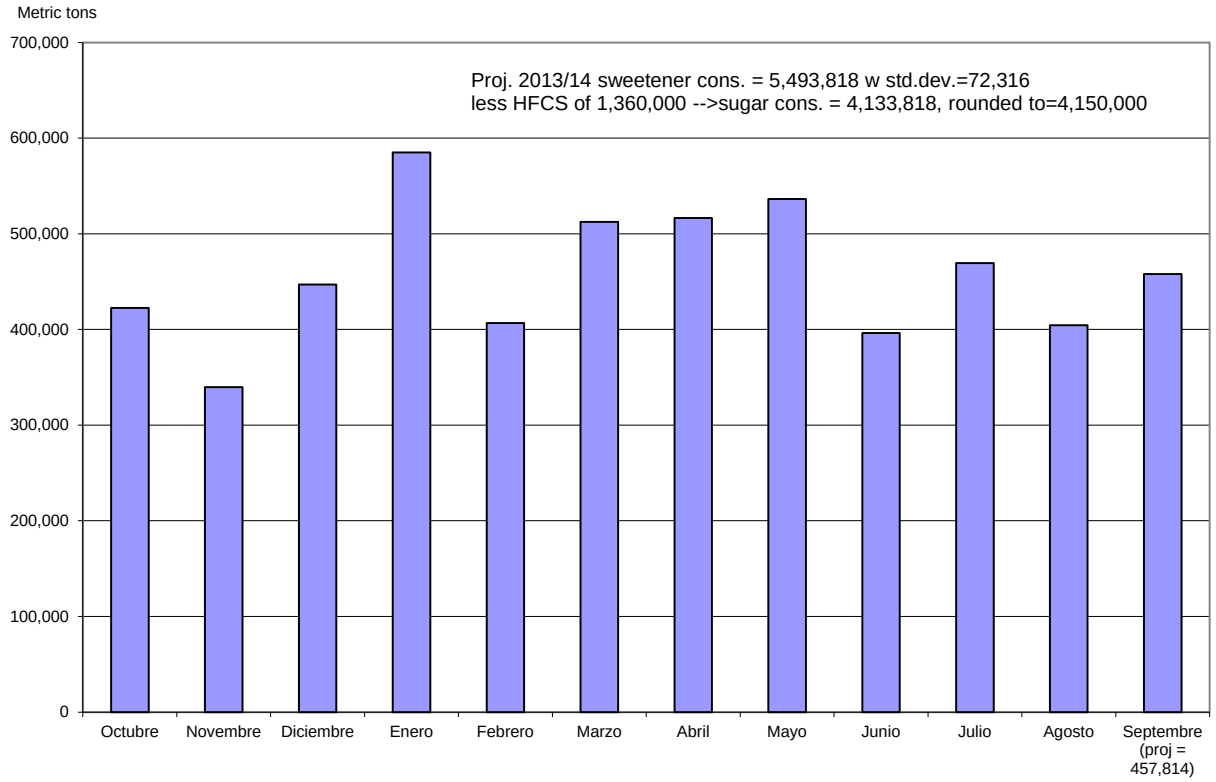
Total deliveries for 2013/14 decline by 156,000 MT to 4.428 million MT. Deliveries for consumption are reduced by 50,000 MT based on pace-to-date analysis to 4.150 million MT. Consumption of high fructose corn syrup (HFCS) is on pace to meet the 1.360 million MT, dry weight, forecast. Deliveries for IMMEX and other uses decline by 106,000 MT based on fewer imports for IMMEX (see above at 96,000 MT) and a reduced 10,000 MT pace-to-date estimate of domestic shipments being made to IMMEX. Deliveries for IMMEX are now estimated at 278,000 MT.

Figure 1
Sweetener consumption in Mexico, 11 months into marketing year, 2009/10 -- 2013/14



Source: Conadesuca.

Figure 2
Mexico 2013/14 monthly sweetener consumption



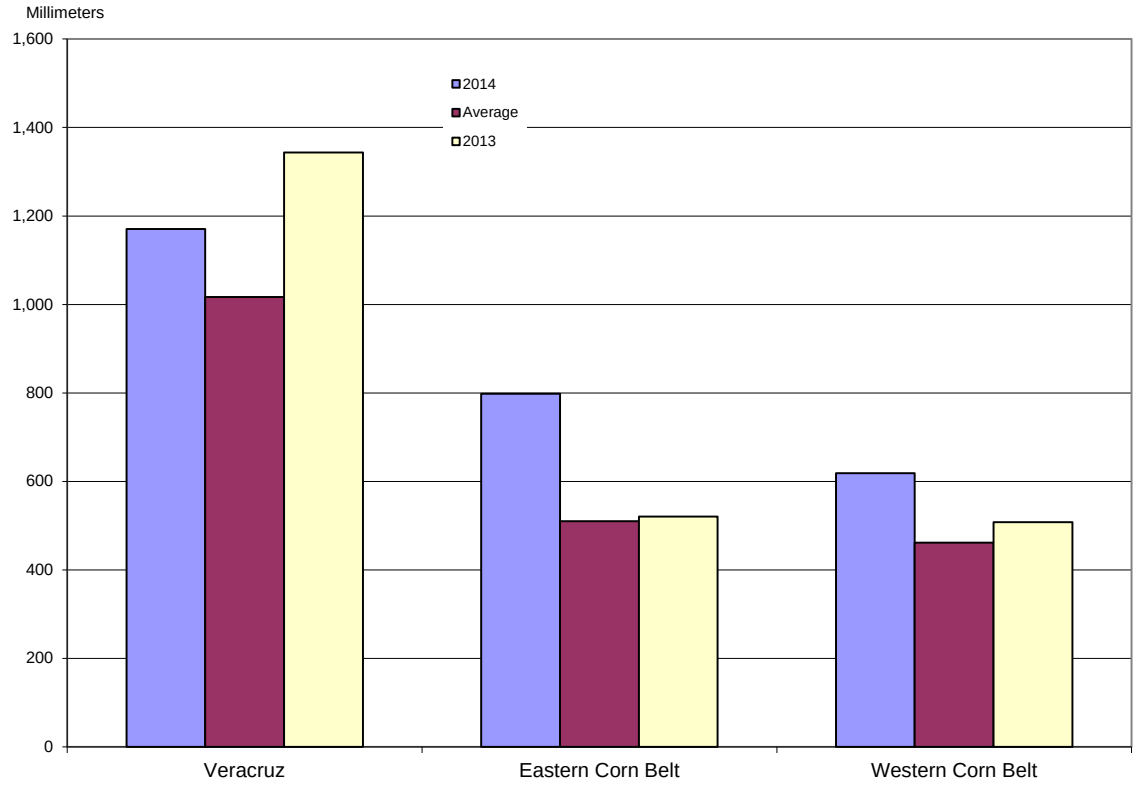
Source: Conadesuca.

Exports are reduced by 10,000 MT to 2.498 million MT. FAS estimates 2013/14 sugar imports from Mexico at a commercial, or actual weight, basis of 1.818 million MT. This estimate is adopted as the Mexican export total to the United States. Conadesuca data through September 5 indicates that Mexico has exported 680,730 MT to other destinations. Because no known ships containing sugar have left Mexican ports since this estimate was made, it is considered final. The two destination totals sum to the 2.498 million MT.

Ending stocks for 2013/14 are calculated residually at 685,000 MT. This represents an increase of 71,000 MT. The ending stocks-to-consumption ratio is 16.5 percent, up from 14.6 percent in August.

Beginning stocks for 2014/15 are increased by 71,000 MT to 685,000 MT, consistent with the increase in ending stocks from 2013/14. There is no predicted change in production for 2014/15. The area harvested is assumed to be consistent with 2013/14. Average sugar cane yield is assumed, as well as a return to trend for sucrose recovery levels. Rainfall amounts seem adequate for crop needs, as evidenced in the charts below.

Figure 3
Mexico primary sugarcane production areas: cumulative precipitation through Oct 5



Source: USDA, WAOB.

There is no change in imports for 2014/15. The change to 2013/14 imports for IMMEX is not carried over to 2014/15. Analysts await additional data and analysis from Mexico before revising subsequent forecasts.

Deliveries are decreased by 52,000 MT to 4.638 million MT. Deliveries for consumption decreased by the entire 52,000 MT in line with the reduction made for 2013/14 (above). Deliveries for IMMEX and other uses are unchanged pending further analysis when more data is made available.

Ending stocks are 936,000 MT. This represents an 11,000 MT reduction. which leaves the ending stocks-to-use ratio at 22.0 percent. Exports are then calculated residually at 1.650 million MT, an increase of 134,000 MT from last month. The increase is based on higher beginning stocks (71,000 MT), decreased deliveries (52,000 MT), and lower ending stocks (11,000 MT).

Exports to non-U.S. destinations based on contracts are reduced by 260,000 MT to 325,000 MT. FEESA, the entity that runs the nine Government-owned mills in Mexico, announced that it had renegotiated one of its earlier contracts and now is committed to export 40,000 MT instead of the earlier negotiated 300,000 MT. As a consequence, exports to the United States are residually calculated at 1.325 million MT, up 394,000 MT. The increase is, therefore, about one-third due to the increase in total exports and two-thirds due to the renegotiated contract.

U.S. Sugar Supply and Use

There is no change in beginning stocks for the United States in 2013/14, as shown in table 2 below. Production is down 2,000 short tons, raw value (STRV) based on revised data from Texas sugar cane producers. Total imports are down by 84,000 STRV to 3.703 million STRV. Imports from Mexico are down by 12,000 STRV based on FAS analysis of preliminary trade data. Tariff-rate quota (TRQ) imports are down 72,000 STRV based on data from U.S. Customs, collected by FAS.

Table 2 -- U.S. sugar: supply and use, by fiscal year (Oct./Sept.), October 2014.

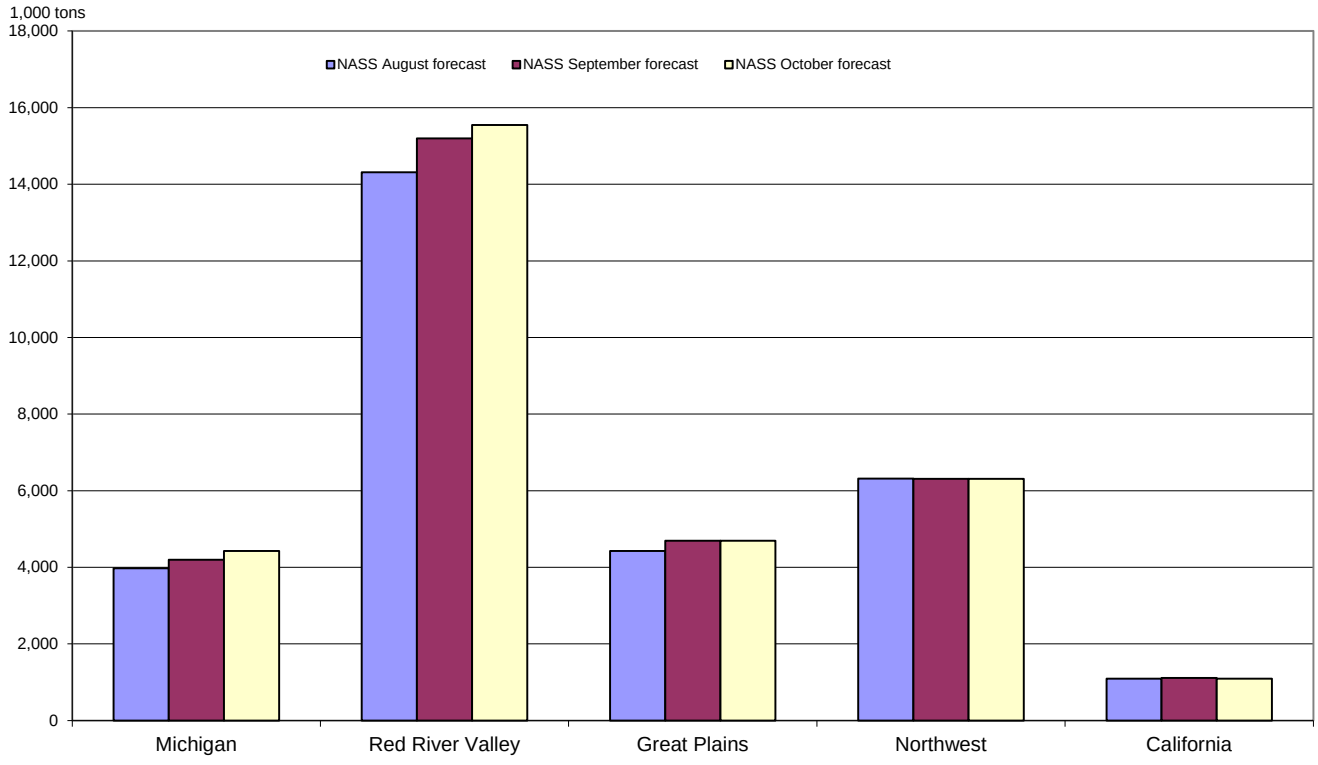
Items	2012/13	2013/14	2014/15	2012/13	2013/14	2014/15
	1,000 Short tons, raw value			1,000 metric tons, raw value		
Beginning stocks	1,979	2,158	1,810	1,796	1,958	1,642
Total production	8,981	8,415	8,542	8,148	7,634	7,749
Beet sugar	5,076	4,750	4,970	4,605	4,309	4,509
Cane sugar	3,905	3,665	3,572	3,543	3,325	3,241
Florida	1,867	1,759	1,770	1,694	1,595	1,606
Louisiana	1,686	1,600	1,500	1,530	1,451	1,361
Texas	173	141	122	157	128	111
Hawaii	179	165	180	163	150	163
Total imports	3,224	3,703	3,336	2,925	3,359	3,027
Tariff-rate quota imports	957	1,299	1,378	868	1,178	1,250
Other program Imports	136	270	400	124	245	363
Non-program imports	2,131	2,134	1,559	1,933	1,936	1,414
Mexico	2,124	2,124	1,549	1,927	1,927	1,405
Total supply	14,185	14,276	13,689	12,868	12,951	12,418
Total exports	274	325	250	249	295	227
Miscellaneous	-24	0	0	-22	0	0
Deliveries for domestic use	11,776	12,141	11,885	10,683	11,014	10,782
Transfer to sugar-containing products for exports under reexport program	80	100	100	73	91	91
Transfer to polyhydric alcohol, feed, other alcohol	32	25	35	29	23	32
Commodity Credit Corporation (CCC) sale for ethanol, other	153	316	0	139	287	0
Deliveries for domestic food and beverage use	11,511	11,700	11,750	10,442	10,614	10,659
Total use	12,025	12,466	12,135	10,909	11,309	11,009
Ending stocks	2,160	1,810	1,554	1,959	1,642	1,410
Private	1,844	1,810	1,554	1,672	1,642	1,410
Commodity Credit Corporation (CCC)	316	0	0	287	0	0
Stocks-to-use ratio	17.96	14.52	12.81	17.96	14.52	12.81

Source: USDA, ERS, Sugar and Sweetener Outlook.

Deliveries for 2013/14 remain unchanged. There has been a strong pace through 11 months, but the final month's direct consumption imports may not be high enough to warrant an increase, mostly due to weak imports from Mexico. There is no change in exports. Ending stocks are calculated residually at 1.812 million STRV, a decrease from last month of 86,000 STRV. The implied stocks-to-use ratio is at 14.5 percent, reduced from 15.2 percent in September.

Beginning stocks for 2014/15 are decreased by 86,000 STRV, consistent with 2013/14 ending stocks. Beet sugar production is increased by 170,000 STRV to 4.970 million based on analysis by the National Agricultural Statistics Service (NASS) crop forecasts. Cane sugar is reduced by 19,000 STRV to 3.572 million STRV based on processors' reporting.

Figure 4
USDA increases in projected 2014/15 beet sugar production linked to increases in sugarbeet production forecasts



Source: USDA, National Agricultural Statistics Service (NASS), Crop Production.

Imports are increased by 461,000 STRV to 3.336 million STRV. This change is entirely attributable to the increase in imports from Mexico. Total imports from Mexico are forecast at 1.549 million STRV. Deliveries and exports for 2014//15 remain unchanged. Ending stocks are calculated residually at 1.404 million STRV, an increase over last month of 377,000 STRV. The implied stocks-to-use ratio is 12.8 percent, a 4.3 percentage point increase over last month.

The USDA's Commodity Credit Corporation (CCC) announced on September 26 the loan rates for 2014 crop sugar, as required by the 2014 Farm Bill. The 2014 crop national average loan rate is set at 18.75 cents per pound, raw cane sugar, and 24.09 cents per pound, refined beet sugar. These rates are the same as last year. The national loan rates are adjusted by region to allow for marketing cost differentials. The CCC also announced the initial 2015 overall sugar marketing allotment, which is 9,987,500 STRV. The overall sugar marketing allotment is 85 percent of the estimated human consumption for the crop year, as found in the September 2014 World Agricultural Supply and Demand Estimates report. Of the overall sugar marketing allotment, 54.35 percent is distributed to sugar beet processors and the remaining 45.65 percent goes to the sugarcane States and processors.

Table 3 -- USDA estimate of sugar imports in FY 2014

	October 2014		Change		September 2014	
	Metric tons, raw value	Short tons, raw value			Metric tons, raw value	Short tons, raw value
Raw sugar TRQ	1,117,195	1,231,497	0	0	1,117,195	1,231,497
Less other shortfall	-217,656	-239,925	-37,855	-41,728	-179,801	-198,197
Additional Quota						
Total raw sugar TRQ	899,539	991,572	-37,855	-41,728	937,394	1,033,300
Refined sugar TRQ						
Allocation to Canada	12,050	13,283	0	0	12,050	13,283
Allocation to Mexico	NA	NA			NA	NA
Global	8,294	9,143			8,294	9,143
Specialty						
Base	1,656	1,825	0	0	1,656	1,825
Additional	100,000	110,231			100,000	110,231
Total refined sugar TRQ	122,000	134,482	0	0	122,000	134,482
Free Trade Agreements						
CAFTA/DR CY 2013, entered in FY 2014 2/	24,051	26,512	0	0	24,051	26,512
CAFTA/DR CY 2014, forecast to enter in FY 2014	93,113	102,640	-6,856	-7,557	99,969	110,197
Peru CY 2013, entered in FY 2014	0	0	0	0	0	0
Peru CY 2014, forecast to enter in FY 2014	0	0	-2,000	-2,205	2,000	2,205
Colombia CY 2013, entered in FY 2014	2,700	2,976	0	0	2,700	2,976
Colombia CY 2014, forecast to enter in FY 2014	34,037	37,519	-14,763	-16,273	48,800	53,793
Panama CY 2013, entered in FY 2014	0	0	0	0	0	0
Panama CY 2014, forecast to enter in FY 2014	3,000	3,307	-3,680	-4,057	6,680	7,363
Total Free Trade Agreements	156,901	172,954	-27,299	-30,092	184,200	203,046
Total estimate TRQ entries	1,178,440	1,299,007	-65,154	-71,820	1,243,594	1,370,827
Mexico	1,926,812	2,123,947	-11,188	-12,333	1,938,000	2,136,280
Re-export program imports	244,032	268,999	-908	-1,001	244,940	270,000
Sugar syrups, high-tier	9,072	10,000	0	0	9,072	10,000
Total projected imports	3,358,356	3,701,953	-77,250	-85,154	3,435,606	3,787,107

1/ Total entries from Mexico, quota and non-quota. 2/CY=Calendar Year.
Source: USDA, FAS, Sugar Monthly Import and Re-Export Data Report, September 2014.

Table 4 -- USDA estimate of sugar imports in FY 2015

	October 2014		Change		September 2014	
	Metric tons, raw value	Short tons, raw value			Metric tons, raw value	Short tons, raw value
Raw sugar TRQ	1,117,195	1,231,497	0	0	1,117,195	1,231,497
Less other shortfall	-181,437	-200,000	0	0	-181,437	-200,000
Additional Quota						
Total raw sugar TRQ	935,758	1,031,497	0	0	935,758	1,031,497
Refined sugar TRQ						
Allocation to Canada	10,300	11,354			10,300	11,354
Allocation to Mexico	2,954	3,256			2,954	3,256
Global	7,090	7,815			7,090	7,815
Specialty						
Base	1,656	1,825	0	0	1,656	1,825
Additional	105,000	115,743			105,000	115,743
Total refined sugar TRQ	127,000	139,994	0	0	127,000	139,994
Free Trade Agreements						
CAFTA/DR CY 2014, entered in FY 2015 2/	30,907	34,069	6,871	7,574	24,036	26,495
CAFTA/DR CY 2015, forecast to enter in FY 2015	95,393	105,153	-6,871	-7,574	102,264	112,727
Peru CY 2014, entered in FY 2015	2,000	2,205	2,000	2,205	0	0
Peru CY 2015, forecast to enter in FY 2015	0	0	-2,000	-2,205	2,000	2,205
Colombia CY 2014, entered in FY 2015	17,463	19,250	14,763	16,273	2,700	2,976
Colombia CY 2015, forecast to enter in FY 2015	34,787	38,346	-14,763	-16,273	49,550	54,620
Panama CY 2014, entered in FY 2015	3,680	4,057	3,680	4,057	0	0
Panama CY 2015, forecast to enter in FY 2015	3,060	3,373	-3,680	-4,057	6,740	7,430
Total Free Trade Agreements	187,290	206,452	0	0	187,290	206,452
Total estimate TRQ entries	1,250,048	1,377,942	0	0	1,250,048	1,377,942
Mexico	1,404,795	1,548,521	417,778	460,521	987,017	1,088,000
Re-export program imports	362,874	400,000	0	0	362,874	400,000
Sugar syrups, high-tier	9,072	10,000	0	0	9,072	10,000
Total projected imports	3,026,788	3,336,463	417,778	460,521	2,609,011	2,875,942

1/ Total entries from Mexico, quota and non-quota. 2/CY=Calendar Year.
Source: USDA, FAS, Sugar Monthly Import and Re-Export Data Report, September 2014.

An Overview of the U.S. Honey Market

Busy Bees Produce a Versatile Sweetener

Honey, a versatile and natural material, is produced and gathered via the combined efforts of honey bees, *Apis milifera,* and beekeepers. Honey bees first visit flowers and gather nectar, which is then stored in a special "honey" stomach or sac (NHB, 2014; Somerville, 2002). In the honey stomach, enzymes convert (via inversion) sucrose in the nectar to glucose and fructose (Somerville, 2002). Once the bee returns to the hive, the stomach mixture is then regurgitated into a cell of a honeycomb, after which, worker bees repeat the consumption and regurgitation process (Somerville, 2002). Later, worker bees fan the inverted nectar with their wings to speed evaporation within the cell of the honeycomb (NHB, 2014). When the honey has evaporated to contain between 14-21 percent water, the cell is capped with wax and sealed (Somerville, 2002).

At regular intervals, beekeepers gather honeycomb frames and scrape the wax cap off of each cell (NHB, 2014). Frames are then placed in extractors and spun to force honey out of the comb so that it can be collected, strained, packaged, and distributed for sale. While some beekeepers may sell honey directly to consumers for in-home use, the majority of honey is sold to food manufacturers who incorporate it into processed food products and package honey for retail or table use (NBH, 2014). A small amount of honey is also sold for industrial use, as in cosmetics.

Domestic honey supplies come from both U.S. honey production and foreign producers, through imports. In 2013, the United States imported honey from 100 different countries, although the vast majority of imports are sourced from a handful of countries. Honey stocks from the preceding production or import year also enter the current market as additional supply. Thus, total supply of honey in the U.S. market is the sum of domestic production, imports, and stocks.

Consumers drive demand for honey either in consuming food products containing honey or in purchasing natural honey directly for consumption at home or in a food service setting. Aggregate domestic use, which amounted to 247.4 million pounds in 1989, had grown to 468.3 million pounds in 2013. Per capita, consumption has grown from 1 pound to 1.48 pounds between 1989 and 2013. According to Ward (2014), demand for food manufacturing is determined by the amount suppliers sell to manufacturers, which was 190.2 million pounds in 1989. By 2013, food manufacturers had increased their purchases to 340.7 million pounds. This volume represented 69.5 percent of total domestic honey supply in 2013 and is on a par with the long run (1965-2013) average manufacturing share of 67.5 percent of total supply.

For table use, consumers purchased 105.2 million pounds of honey in 2013, up from 57.3 million pounds in 1989. The share of honey sold for table use is estimated at 21.5 percent of supply in 2013, up slightly from 19.7 percent in 1989 and the average of 18.9 percent since 1965 (Ward, 2014). A small amount of domestically produced honey is sold as exports and stored as year-end stocks.

Domestic Production Trending Downward

In 2013, U.S. beekeepers produced 149.5 million pounds of honey, down about 35 percent from levels produced 20 years earlier (USDA, NASS, 2013). According to Ward (2014), U.S. honey production has been on a downward trend for the last two decades, even with year-to-year variations.[1] Over the same time period, per colony honey production declined from 80.2 pounds in 1993 to a record low 56 pounds in 2012, representing an average annual decline of approximately 1.3 pounds over the period (USDA, NASS, 2013). Annual per colony production declines

[1]Dr. Ronald Ward, Emeritus Professor of the University of Florida, recently completed a 5-year evaluation of the U.S. honey market and quantified the impact of the National Honey Board's generic promotion programs;
Dr. Ward's report and NASS's Honey Annual Reports provide the basis for ERS's summary.

have accelerated in recent years, averaging 3 percent between 2006 and 2012, up from 0.6 percent between 1993 and 2005 (table 5).

Table 5: Selected U.S. honey market statistics

Year	Value of production	Total production	Per colony production
	---------$100,000--------	*----100,000 pounds----*	*--------Pounds--------*
1993	1,242.8	2,305.8	80.2
1994	1,152.0	2,181.9	78.4
1995	1,445.9	2,110.7	79.5
1996	1,771.7	1,995.1	77.3
1997	1,478.0	1,965.4	74.7
1998	1,474.7	2,205.3	84.0
1999	1,250.0	2,030.7	77.0
2000	1,328.7	2,202.9	84.0
2001	1,329.9	1,860.5	73.0
2002	2,283.4	1,717.2	67.0
2003	2,520.5	1,817.2	69.9
2004	1,996.4	1,834.9	71.8
2005	1,609.9	1,746.1	72.5
2006	1,556.9	1,549.1	64.7
2007	1,597.6	1,483.4	60.7
2008	2,327.4	1,637.9	69.9
2009	2,156.7	1,464.2	58.6
2010	2,856.9	1,764.6	65.6
2011	2,618.5	1,483.6	59.6
2012	2,834.5	1,423.0	56.0
2013	3,140.9	1,495.0	56.6

Sources: USDA, Economic Research Service using data from USDA, NASS, *QuickStats* data portal.

Observed declines in per colony honey productivity likely stem from a combination of factors. First, the relatively recent onset of multiple honey bee health challenges may be weakening colony strength (measured in numbers of adult bees) and vigor, which, in turn, affects honey production (see box "Honey Bee Health Concerns"). Second, the value and quantity of honey produced by foraging bees is affected by the crops from which bees gather nectar (Ward, 2014).

Honey Bee Health Concerns

High levels of overwinter hive losses are not uncommon for beekeepers. Oldroyd (2007) notes that "(s)ome winter losses are normal, and because the proportion of colonies dying varies enormously from year to year, it is difficult to say when a crisis is occurring and when losses are part of the normal continuum." However, prolonged periods of sustained high losses occurring across a large geographic area are unusual and have created considerable concerns for honey bee health since these losses were first observed following the 2006-07 winter. Possible contributing factors to overall losses include the following:

- **Reduced genetic diversity,** resulting in increased susceptibility to diseases and parasites.
- **Problematic pollinator management practices,** resulting in bee stress attributable to transporting hives long distances, insufficient hive protection during inclement weather, exposure to pesticides via improper hive placement, and improper use of chemicals, including antibiotics, to manage hive health.
- **Poor nutrition,** resulting from a lack of nutritious forage and supplemental feeding when forage is scarce, which affects colony health and longevity.
- **Diseases and pests,** including ongoing issues with the Varroa destructor and Tracheal mites and accompanying miticide resistance, and diseases such as American and European Foulbrood, Chalk brood, Israeli Acute Paralysis virus, Nosema, Phorid Flies, small hive beetles, and invertebrate pests.
- **Loss of diversity of foraging areas and accompanying floral resources**, resulting from expanded contiguous production of non-nectar producing crops, such as corn.
- **Combinations of the above factors and other stressors.**

For example, bees that feed on nectar-rich orange blossoms and clover will produce relatively greater volumes of commercially useful honey than bees that pollinate almonds and produce a more bitter honey (Ward, 2014; Browning, 2014). With proportionally more colonies being sent to pollinate almond orchards—as opposed to crops that are more valuable for honey production— a lower average volume of useable honey per colony can be expected.

Furthermore, there is evidence of a connection between honey production and weather conditions, and, in particular, rainfall levels, especially over a 2-year period (Le Conte and Navajas, 2008; Adee, 2014). Relatively abundant soil moisture is likely to increase the number of flowers and the amount of nectar available for bees to gather. Under these conditions, ultimately more honey can be produced (Le Conte and Navajas, 2008; Browning, 2014; Adee, 2014). In circumstances of prolonged dry weather conditions, such as those in 2012 when about 80 percent of U.S. agricultural land experienced drought (USDA, ERS, 2014), it would be reasonable to expect the observed decline in honey production. Finally, some commercial honey producers attribute the lower productivity to a drop in summer foraging area across the Northern Plains and Upper Midwest, a function of both declining acreage enrolled in USDA's Conservation Reserve Program and the expansion of corn and soy production.

Honey Imports Rising Over Time

As per hive honey production has declined, honey prices have climbed (USDA, NASS, 2013). In 2006, the average farm-gate price of honey was $1.01 per pound; by 2012, it reached $1.99 per pound, a 98-percent increase. Steady per capita use of 1.3 to 1.4 pounds per year, in combination with population growth, has increased aggregate honey demand in the United States and supports the price increase, as well as growing imports (Haley and Jerardo, 2013). Ward (2014) characterizes growing honey imports, with increasing volumes originating from Asian countries, as a major structural change in the honey market. Ward further notes that in 1965, U.S. honey imports totaled just 13.3 million pounds and that by 2012, this figure had risen to 310.9 million pounds, a 23-fold increase.

Table 6: U.S. Honey imports, by HTC classification 2004-2013

Product	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
	----------Metric Tons----------									
Organic honey	0	0	0	0	0	0	0	0	3,276	3,517
Honey comb packaged for retail	6,934	7,340	3,992	4,258	7,935	4,521	5,027	4,252	2,512	2,597
Flavored honey	166	266	879	316	399	249	595	469	801	866
Natural extra light amber honey (not packaged for retail)	10,419	16,563	33,051	31,498	30,068	25,191	25,904	31,471	41,506	52,285
Natural light amber honey (not packaged for retail)	29,211	34,418	42,501	36,630	32,443	40,707	49,329	56,279	59,946	58,631
Other honey (not packaged for retail)	1,898	2,554	2,618	2,751	4,000	4,221	3,594	3,133	8,103	7,937
Natural white honey (not packaged for retail)	32,532	44,803	43,777	30,539	30,539	20,834	30,077	35,630	25,685	27,916
U.S. Total honey imports	81,160	105,942	126,818	105,992	105,384	95,724	114,525	131,234	141,828	153,749

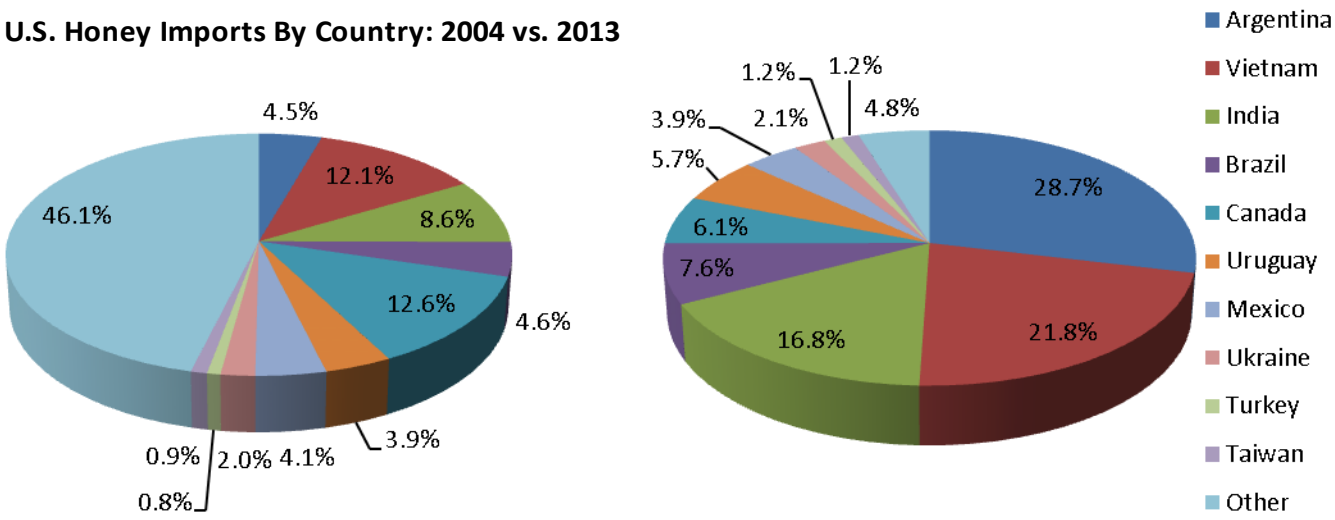
Source: USDA Foreign Agricultural Service, Global Agricultural Trade System.

Honey imports comprised fully 65 percent of U.S. honey supply in 2013. Imported honey amounted to a record 337 million pounds with a value of $480 million. While import volume has risen 6.3 percent on average annually since 2004, the value of imports has grown 11.2 percent each year. This indicates that import unit values have increased by an average 5.1 percent per year in the past decade. The largest source of imported honey is Argentina, followed by Vietnam and then India. These three countries supplied 67.3 percent of U.S. imports in 2013; in 2004, they supplied just 25.1 percent of total U.S. honey imports (fig. 5).

Table 7: Honey imports by country (ranked by amount of honey supplied), 2004-2013

Rank	Country	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
			----------Metric Tons----------								
1	Argentina	3,620	22,776	28,878	20,403	10,050	10,899	17,414	33,502	42,482	44,221
2	Vietnam	9,792	13,582	13,263	15,707	19,386	17,430	20,738	27,826	20,705	33,586
3	India	6,948	7,632	11,090	7,671	13,648	13,137	18,462	26,936	21,455	25,897
4	Brazil	3,696	3,785	10,807	12,103	13,598	17,709	10,036	14,981	11,303	11,678
5	Canada	10,265	10,270	11,580	13,973	17,384	8,319	11,058	7,150	15,986	9,387
6	Uruguay	3,137	4,010	1,525	1,893	227	19	852	7,083	10,877	8,710
7	Mexico	3,291	1,525	2,663	3,299	1,529	1,756	3,471	3,055	6,430	5,988
8	Ukraine	1,596	337	1,134	502	84	635	440	454	1,302	3,308
9	Turkey	622	225	57	167	54	73	37	183	1,073	1,897
10	Taiwan	759	2,424	314	756	3,984	5,589	1,778	903	1,357	1,849
Other		37,434	39,377	45,509	29,519	25,439	20,159	30,239	9,162	8,847	7,426
Grand Total		81,160	105,942	126,818	105,992	105,384	95,724	114,525	131,234	141,818	153,948

Source: USDA Foreign Agricultural Service, Global Agricultural Trade System.



Significant Gains in Honey Prices, Production Values

According to the USDA NASS *Honey* report, honey prices increased to a record high of 212.1 cents per pound in 2013, a 6-percent increase over the 2012 average price. The report lists color classes for honey (essentially, varying shades of white or amber, along with an "other honey" classification). Prices for all color classes except "other honey" rose in 2013 relative to 2012 levels despite a 5-percent increase in year-to-year honey production. Honey prices have increased by 8 percent per year since 1989 when the price was 50 cents per pound. To assist producers during periods of low prices, price support is offered in the form of nonrecourse marketing assistance loans and loan deficiency payments. The 2014 national loan rate for honey is set at 69 cents per pound, far below the current farm gate prices. Retail prices recorded by the National Honey Board and published in the *American Bee Journa*l have increased an average of 7 percent per year since 1989.

Table 8: Farm gate and retail honey prices and total value, 2006-2012 1/

Year	Honey farm gate prices	Average retail price	Value of production (retail)
	---$/Pound---	---$/Pound---	---$1,000---
2006	1.005	3.85	596,662
2007	1.077	4.09	606,591
2008	1.421	4.33	709,479
2009	1.473	4.65	681,200
2010	1.619	4.85	856,135
2011	1.765	5.15	764,533
2012	1.951	5.55	816,483
2013	2.121	5.86	861,837

1/Retail prices are a simple average of monthly retail prices.
Sources: USDA-NASS QuickStats (Production and Farm Gate Prices); *Bee Culture Magazine* (retail prices).

The domestic wholesale price margin over import prices rose from 21.3 percent in 1989 to 30.4 percent in 2013. The price competitiveness of imported honey is a major factor behind its strong demand by food manufacturers. Although some imported honey is mixed in with domestic honey for food manufacturing or for sale to consumers, a larger proportion of imports are used by food manufacturers; a proportionally larger share of domestic honey is sold to consumers for table use.

Honey Market Summary

The industrious honey bee produces honey through the process of pollination, and, in doing so, provides food for the hive while creating a valuable revenue stream for beekeepers. Consumer demand continues to rise for this simple, natural sweetener as evidenced by long-term growth in per capita honey consumption and 9 consecutive years of honey farm-gate price increases.

Honey production is also important to producers of pollinated crops as pollination fees are, in part, a function of beekeepers' ability to produce marketable honey from forage sources. Recent honey bee health challenges have underscored the importance of the commercial honey bee industry to the U.S. economy. The effect of increased overwinter losses, related health concerns, and changes in the pollination services market are most apparent in the domestic honey production statistics (Bond, Plattner, and Hunt, 2014). Aggregate U.S. honey production in 2013 is one-third lower than the volume produced in 2000, and hives produced an average of 56.6 pounds of honey in 2013 compared with 84 pounds in 2000.

To compensate for domestic productivity declines, the market for imported honey has surged; honey import volume is 90 percent larger in 2013 than 10 years previously. Imported honey is commonly used in food manufacturing and comprised fully 65 percent of total U.S. honey supplies in 2013. An increasing portion of imports comes from fewer nations. In 2004, the top 10 suppliers provided 54 percent of total imports; by 2013 more than 95 percent of total import originated from the top 10 suppliers. Increasingly, the U.S. is sourcing honey from Argentina, Vietnam, and India; an antidumping duty on honey directly originating from China has largely eliminated U.S. imports from that country.

References:

Adee, Brett. 2014. Personal communication. January 23.

Browning, Zach. 2014. Personal communication. January 22.

Bond, J.K., K. Plattner, and K. Hunt. 2014. "U.S. Pollination-Services Mark." *Special Article*. USDA-ERS Fruit and Tree Nuts Outlook: Economic Insight. FTS-357S-A. Available at: http://www.ers.usda.gov/media/1679173/special-article-september_-pollinator-service-market-4-.pdf

Haley, S., and A. Jerardo. 2014. "Sugar and Sweeteners Outlook." April 2014. Available at: http://www.ers.usda.gov/media/1370787/sss_m_308.pdf

Le Conte, Y, and M. Navajas. 2008. "Climate Change: Impact on Honey Bee Populations and Diseases." Translated from *Revue Scientifique et Technique-Office International de Epizooties* 27(2): 499-510.

National Honey Board (NHB). 2014. "The Story of Honey." Available at: http://www.bjcp.org/mead/storyofhoneyweb.pdf

Somerville, D. 2002. "Removing Honey from the Hive." New South Wales Agriculture Service Agnote DAI-133. March 2002.

U.S. Department of Agriculture, National Agricultural Statistics Service (NASS). 2014. "Honey." March 2014. Available at: http://usda.mannlib.cornell.edu/usda/current/Hone/Hone-03-21-2014.pdf

U.S. International Trade Commission (ITC). 2012. "Honey from China." USITC Publication 4364. November 2012.

U.S. International Trade Commission (ITC). 2007. "Honey from Argentina and China." USITC Publication 3929. June 2007.

Ward, Ronald W. 2014. "Honey Demand and the Impact of the National Honey Board's Generic Promotion Programs," National Honey Board, March 2014.

Ward, Ronald W., and Bruce Boynton. 2010. "U.S. Honey Supply Chain: Structural Change, Promotions and the China Connection." *International Journal of Food System Dynamics*, January 2010.

Contacts and Links

Contact Information
Stephanie Riche, (202) 694-5490, smriche@ers.usda.gov (coordinator)
Verna Daniels, (202) 694-5301, vblake@ers.usda.gov (web publishing)

Subscription Information
Subscribe to ERS' e-mail notification service at http://www.ers.usda.gov/updates/ to receive timely notification of newsletter availability. Printed copies can be purchased from the USDA Order Desk by calling 1-800-363-2068 (specify the issue number).

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/
WASDE http://usda.mannlib.cornell.edu/MannUsda/viewDocumentInfo.do?documented=1194
Sugar Topics http://www.ers.usda.gov/topics/Sugar/

E-mail Notification

Readers of ERS outlook reports have two ways they can receive an e-mail notice about release of reports and associated data.

• Receive timely notification (soon after the report is posted on the web) via USDA's Economics, Statistics and Market Information System (which is housed at Cornell University's Mann Library). Go to http://usda.mannlib.cornell.edu/MannUsda/aboutEmailService.do and follow the instructions to receive e-mail notices about ERS, Agricultural Marketing Service, National Agricultural Statistics Service, and World Agricultural Outlook Board products.

• Receive weekly notification (on Friday afternoon) via the ERS website. Go to http://www.ers.usda.gov/Updates/ and follow the instructions to receive notices about ERS outlook reports, *Amber Waves* magazine, and other reports and data products on specific topics. ERS also offers RSS (really simple syndication) feeds for all ERS products. Go to http://www.ers.usda.gov/rss/ to get started.