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Sugar and Sweeteners Outlook

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On May 9, 2014, the U.S. Department of Agriculture (USDA) published in the *World Agricultural Supply and Demand Estimates (WASDE)* its latest sugar supply and use projections for the United States and Mexico for fiscal year 2013/14 and its first projections for 2014/15.

The USDA projects 2014/15 beet sugar production at 4.750 million short tons, raw value (STRV), about the same as 2013/14. Area planted is based on National Agricultural Statistics Service (NASS) forecasts from 2014 *Prospective Plantings* and trend yields are used to forecast overall production. The USDA projects 2014/15 cane sugar production at 3.745 million STRV. Because there is no NASS forecast of area harvested until the end of June, the USDA assumes the same area harvested for sugar as in the previous year. Sugarcane and sugar yields are estimated from trend, and these are applied to area for the production forecasts. Total sugar production for 2014/15 is projected at 8.495 million STRV, a slight increase over last year of 15,000 STRV.

Recent *Sugar and Sweeteners Outlook* Special Articles

“Long-term Projection of U.S. and Mexico Sugar Supply and Use through 2024/25,” pdf pages 3-17 of the *Sugar and Sweetener* report
(<http://www.ers.usda.gov/publications/sssm-sugar-and-sweeteners-outlook/sssm306.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/sssm303.aspx>)

The USDA forecasts 2014/15 total tariff-rate quota (TRQ) sugar imports at 1.262 million STRV. TRQ imports are forecast at minimum levels to be consistent with U.S. obligations to the World Trade Organization (WTO) and sugar provisions of Free Trade Agreements (FTA). Because the USDA has not announced a TRQ for additional specialty sugar, it is set at zero for now. Shortfall is projected at 200,000 STRV, the same level as in 2013/14. The USDA projects 2014/15 imports from Mexico at 1.421 million STRV, down 424,000 STRV from 2013/14. This forecast is highly tentative. Re-export program imports for 2014/15 are forecast at 400,000 STRV, reflecting a return to normal refiner re-export balance activity after last year's unusual USDA exchange of sugar owned by its Commodity Credit Corporation (CCC) for program-related export credits.

The USDA expects a 100,000 STRV increase in 2014/15 deliveries for human consumption for a total forecast of 11.700 million STRV. Ending stocks for 2014/15 are projected at 1.099 million STRV. The implied ending stocks-to-use ratio is 9.1 percent. Although very early, this low stocks-to-use level points to tight market conditions in 2014/15.

The USDA projects 2014/15 Mexico sugar production at 6.500 million mt. This forecast is highly tentative and is based on analysis by the Foreign Agricultural Service (FAS) post in Mexico and its contacts with sources in the Mexican sugar industry. The USDA forecasts 2014/15 consumption at 4.306 million metric tons (mt), the same level as in 2013/14. Ending stocks are forecast at 22 percent of domestic consumption. The export forecast is calculated as a residual and is set at 2.036 million mt. This forecast is 362,800 mt lower than that estimated for 2013/14.

Sugar and Sweeteners in the North American Free Trade Area

On May 9, 2014, the U.S. Department of Agriculture (USDA) published in the *World Agricultural Supply and Demand Estimates* (WASDE) its latest sugar supply and use projections for the United States (table 1) and Mexico (table 7 below) for the October/September fiscal year 2013/14 and its first projections for 2014/15.

U.S. Sugar: Production

The USDA made several changes to 2013/14 sugar production. On the basis of processor-reported production estimates, the USDA increased its estimate of Florida cane sugar by 20,000 short tons, raw value (STRV) to 1.760 million STRV. Cane sugar production in other States remained the same as last month. The USDA reduced its 2013/14 beet sugar production estimate by 184,000 STRV to 4.800 million STRV. The USDA accepted beet sugar processors' estimate of September/August production at 4.692 million STRV, but estimated new crop production occurring in September at average levels instead of accepting the processors' very optimistic estimate of record September production of 533,286 STRV. Sugarbeet planting in Idaho, Michigan, and the Red River Valley was only 23 percent complete as of May 4 and far below the 2009/10-2013/14 average of 56 percent, dimming early-season production prospects.

The USDA projects 2014/15 beet sugar production at 4.750 million STRV, about the same as 2013/14. Table 2 shows the assumptions behind the forecast for the five sugarbeet-growing regions. Area planted is based on National Agricultural Statistics Service (NASS) forecasts from 2014 *Prospective Plantings*. Overall area is forecast at 3.6 percent below last year. Several years of recent State-level ratios of harvested-to-planted area are averaged to forecast area harvested. Aggregate harvested area is forecast at 1.119 million acres, about 5.4 percent below last year. On a regional level, harvested area in the Red River Valley (the largest producing region) is down 7.8 percent and area in the Northwest (the second largest) is down 8.0 percent. State-level sugarbeet yields are forecast as the Olympic average (simple averaging that excludes maximum and minimum values) of yields since 2006/07. The implied national sugarbeet yield is 26.8 tons per acre, about 1 ton per acre lower than last year.

National sugar yield (beet sugar per acre) is estimated as a function of the national sugarbeet yield and trend, and the estimate is multiplied by national area harvested to produce the sugar production forecast. (National levels are used because regional beet sugar production data are not published by the USDA.) The 2014/15 forecast, therefore, is 4.737 million STRV, rounded up to 4.750 million STRV.

The NASS sugarbeet crop year runs from September to August, while the USDA sugar fiscal year runs from October to September. Table 3 shows the combined sugarbeet and beet sugar production data based on the NASS crop year and makes a comparison with the fiscal year beet sugar total. (The 2011/12 crop year is adjusted to count beet sugar produced in August 2011 from sugarbeets sliced in August.) As can be seen, the differences can be large: 302,000 STRV in 2011/12 and -254,000 STRV in 2012/13. For the 2014/15 projection, the USDA makes no distinction between the crop and fiscal years, meaning that production for September 2015 is assumed to be at the same level as September 2014.

The USDA projects 2014/15 cane sugar production at 3.745 million STRV. Because there is no NASS forecast of area harvested until the end of June, the USDA assumes the same area harvested for sugar as in the previous year. Sugarcane and sugar yields are estimated from trend, and these are applied to area for the production forecasts. The largest difference from a year earlier is more production in Florida, up 90,000 STRV to 1.850 million STRV. Forecast production in Louisiana, Texas, and Hawaii is close to last-

Table 1 -- U.S. sugar: supply and use, by fiscal year (Oct./Sept.), May 2014.

Items	2012/13	2013/14	2014/15	2011/12	2012/13	2014/15
	1,000 metric tons, raw value					
Beginning stocks	1,979	2,158	1,596	1,796	1,958	1,448
Total production	8,981	8,480	8,495	8,148	7,693	7,707
Beet sugar	5,076	4,800	4,750	4,605	4,354	4,309
Cane sugar	3,905	3,680	3,745	3,543	3,338	3,397
Florida	1,867	1,760	1,850	1,694	1,597	1,678
Louisiana	1,686	1,600	1,580	1,530	1,451	1,433
Texas	173	130	135	157	118	122
Hawaii	179	190	180	163	172	163
Total imports	3,224	3,334	3,093	2,925	3,025	2,806
Tariff-rate quota imports	957	1,369	1,262	868	1,242	1,145
Other Program Imports	136	110	400	124	100	363
Non-program imports	2,131	1,855	1,431	1,933	1,683	1,298
Mexico	2,124	1,845	1,421	1,927	1,674	1,289
Total Supply	14,185	13,972	13,184	12,868	12,676	11,960
Total exports	274	325	250	249	295	227
Miscellaneous	-24	0	0	-22	0	0
Deliveries for domestic use	11,776	12,051	11,835	10,683	10,933	10,737
Transfer to sugar-containing products for exports under reexport program	80	100	100	73	91	91
Transfer to polyhydric alcohol, feed, other alcohol	32	35	35	29	32	32
Commodity Credit Corporation (CCC) sale for ethanol, other	153	316	0	139	287	0
Deliveries for domestic food and beverage use	11,511	11,600	11,700	10,442	10,523	10,614
Total Use	12,025	12,376	12,085	10,909	11,227	10,963
Ending stocks	2,160	1,596	1,099	1,959	1,448	997
Private	1,844	1,596	1,099	1,672	1,448	997
Commodity Credit Corporation (CCC)	316	0	0	287	0	0
Stocks-to-use ratio	17.96	12.90	9.09	17.96	12.90	9.09

Source: USDA, ERS, Sugar and Sweetener Outlook.

Table 2 -- Sugar and Sweetener Outlook projections of sugarbeet production and sugar production from sugarbeet slicing for 2014/15

	Great Lakes 1/	Red River Valley 2/	Great Plains 3/	Northwest4/	Southwest 5/	Total
Planted area (acres) 6/	154,000	653,000	151,800	171,300	24,500	1,154,600
Harvested area (acres) 7/	152,570	629,970	144,000	168,600	24,310	1,119,450
Yield (tons/acre) 7/	25.25	24.76	26.67	33.58	44.26	26.82
Sugarbeet production (tons) 7/	3,852,000	15,599,000	3,840,000	5,662,000	1,076,000	30,029,000

1/ Great Lakes = Michigan; 2/ Minnesota and North Dakota; 3/ Colorado, Montana, Nebraska, and Wyoming; 4/ Idaho and Oregon; 5/ California.

6/ USDA, NASS, Prospective Plantings; 7/ USDA, ERS, Sugar and Sweetener Outlook.

Table 3 -- U.S. sugarbeet and beet sugar area, yield, and production -- sugarbeet crop year and sugar fiscal year

Year	Planted (1,000 acres)	Harvested (1,000 acres)	Harvested- to-Planted ratio (Percent)	Yield (Tons/acre)	Beets (1,000 tons)	Sugar recovery (Percent)	Sugar yield (Tons/acre)	Beet sugar (1,000 tons, raw value)	Beet sugar: Oct/Sept fiscal year (1,000 tons, raw value)
September/August crop year except where noted									
2006/07	1366.2	1303.6	95.42	26.13	34,064	14.85	3.88	5,057	5,008
2007/08	1268.8	1246.9	98.27	25.53	31,834	15.22	3.89	4,846	4,721
2008/09	1090.7	1004.5	92.10	26.76	26,881	15.20	4.07	4,087	4,214
2009/10	1185.8	1148.5	96.85	25.93	29,783	14.97	3.88	4,457	4,575
2010/11	1171.9	1156.1	98.65	27.71	32,034	15.29	4.24	4,897	4,663
2011/12	1232.8	1213.2	98.41	23.82	28,896	15.91	3.79	4,598	4,900
2012/13	1230.1	1204.2	97.89	29.26	35,236	15.13	4.43	5,330	5,076
2013/14 1/	1198.1	1183.2	98.76	27.75	32,832	14.29	3.97	4,693	4,800
2014/15 1/	1154.0	1119.4	97.01	26.83	30,030	15.78	4.23	4,737	4,750

1/ Forecast.

Source: USDA, ERS, Sugar and Sweetener Outlook.

Table 4 -- Sugar and Sweetener Outlook projections of sugarcane production and cane sugar production for 2014/15

State	Area harvested for sugar (1,000 acres)	Yield (ton per acre)	Sugarcane (1,000 tons)	Recovery (percent)	Raw sugar (1,000 tons, raw value)	Sugar yield (tons per acre)
Florida	397.0	36.7	14,564.1	12.7	1,849.7	4.66
Louisiana	400.0	30.7	12,261.2	12.9	1,577.5	3.94
Texas	34.1	35.9	1,222.9	11.0	134.6	3.95
Hawaii	16.0	80.0	1,280.0	14.1	180.0	11.25
Total	847.1	34.6	29,328.2	12.8	3,741.8	4.42

Source: USDA, ERS, Sugar and Sweetener Outlook.

year levels, but as a sum is down 25,000 STRV. As the growing year progresses, more information will be available to make adjustments to yield and area forecasts.

Total production for 2014/15 is projected at 8.495 million STRV, a slight increase over last year of 15,000 STRV.

U.S. Sugar: Imports and Exports

Sugar imports entering under the 2013/14 raw sugar tariff-rate quota (TRQ) have summed to 383,667 metric tons, raw value (MTRV), or 422,920 STRV, through the end of April. TRQ entries in April totaled 99,414 MTRV, a highest one-month total since the beginning of the fiscal year. The USDA reduced its estimate of raw sugar TRQ shortfall by 45,359 MTRV, or 50,000 STRV (table 5). New shortfall is estimated at 181,437 MTRV, or 200,000 STRV. Estimated shortfalls from both Argentina and Paraguay were zero and 3,300 MTRV, respectively, and shortfall from the Dominican Republic was 20,000 MTRV. With this revision, raw sugar imports through the end of April are 41 percent of their expected total for the year. Average monthly imports through the rest of year should average 121,715 STRV, or about 101 percent higher than the average for the first 7 months (60,416 STRV).

The USDA forecasts 2014/15 total TRQ sugar imports at 1.262 million STRV. Table 6 shows the component detail. TRQ imports are forecast at minimum levels to be consistent with U.S. obligations to the World Trade Organization (WTO) and sugar provisions of Free Trade Agreements (FTA). Because the USDA has not announced a TRQ for additional specialty sugar, it is set at zero for now. Shortfall is projected at 200,000 STRV, the same level as in 2013/14.

Table 5 -- USDA estimate of sugar imports in FY 2014

	May 2014		Change	April 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	45,359	50,000	-226,796	-250,000
Additional Quota						
Total raw sugar TRQ	935,758	1,031,497	45,359	50,000	890,399	981,497
Refined sugar TRQ						
Allocation to Canada	12,050	13,283			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	3,000	3,307	0	0	3,000	3,307
CAFTA/DR CY 2014, forecast to enter in FY 2014	121,020	133,402	0	0	121,020	133,402
Peru CY 2013, entered in FY 2014	0	0	0	0	0	0
Peru CY 2014, forecast to enter in FY 2014	2,000	2,205	0	0	2,000	2,205
Colombia CY 2013, entered in FY 2014	5,000	5,512	0	0	5,000	5,512
Colombia CY 2014, forecast to enter in FY 2014	46,500	51,257	0	0	46,500	51,257
Panama CY 2013, entered in FY 2014	0	0	0	0	0	0
Panama CY 2014, forecast to enter in FY 2014	6,680	7,363	0	0	6,680	7,363
Total Free Trade Agreements	184,200	203,046	0	0	184,200	203,046
Total estimate TRQ entries	1,241,958	1,369,024	45,359	50,000	1,196,599	1,319,025
Mexico	1,673,756	1,845,000	90,718	100,000	1,583,037	1,745,000
Re-export program imports	99,790	110,000	0	0	99,790	110,000
Sugar syrups, high-tier	9,072	10,000	0	0	9,072	10,000
Total projected imports	3,024,576	3,334,024	136,077	150,000	2,888,499	3,184,025

1/ Total entries from Mexico, quota and non-quota, reflected below.

Source: USDA, FAS, Sugar Monthly Import and Re-Export Data Report, May 2014.

Table 6 -- USDA estimate of sugar imports in FY 2015

	May 2014		Change	May 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	NA	NA			NA	NA
Allocation to Mexico	NA	NA			NA	NA
Global	NA	NA			NA	NA
Specialty						
Base	1,656	1,825	0	0	1,656	1,825
Additional	NA	NA			NA	NA
Total refined sugar TRQ	22,000	24,251	0	0	22,000	24,251
Free Trade Agreements						
CAFTA/DR CY 2014, entered in FY 2015	23,830	26,268	0	0	23,830	26,268
CAFTA/DR CY 2015, forecast to enter in FY 2015	102,470	112,954	0	0	102,470	112,954
Peru CY 2014, entered in FY 2015	0	0	0	0	0	0
Peru CY 2015, forecast to enter in FY 2015	2,000	2,205	0	0	2,000	2,205
Colombia CY 2014, entered in FY 2015	14,000	15,432	0	0	14,000	15,432
Colombia CY 2015, forecast to enter in FY 2015	38,250	42,163	0	0	38,250	42,163
Panama CY 2014, entered in FY 2015	1,500	1,653	0	0	1,500	1,653
Panama CY 2015, forecast to enter in FY 2015	5,240	5,776	0	0	5,240	5,776
Total Free Trade Agreements	187,290	206,452	0	0	187,290	206,452
Total estimate TRQ entries	1,145,048	1,262,199	0	0	1,145,048	1,262,199
Mexico	1,289,110	1,421,000	0	0	1,289,110	1,421,000
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	2,806,103	3,093,199	0	0	2,806,103	3,093,199

1/ Total entries from Mexico, quota and non-quota, reflected below.

Source: USDA, FAS, Sugar Monthly Import and Re-Export Data Report, May 2014.

The USDA raised its estimate of 2013/14 sugar imports from Mexico by 100,000 STRV to 1.845 million STRV. Imports through the end of April have been strong at 1.337 million STRV. Imports through the end of the year are expected to average 101,500 STRV. The USDA projects 2014/15 imports from Mexico at 1.421 million STRV, down 424,000 STRV from 2013/14. This forecast is highly tentative and is discussed in greater detail in the Mexico section below.

Re-export program imports for 2014/15 are forecast at 400,000 STRV. This is a substantial increase over the estimate for 2013/14 of 110,000 STRV, but it reflects a return to normal refiner re-export balance activity after last year's unusual USDA exchange of sugar owned by its Commodity Credit Corporation (CCC) for program-related export credits. With high-tier tariff imports forecast at 10,000 STRV, total 2014/15 imports are forecast at 3.093 million STRV.

The USDA expects sugar exports to total 250,000 STRV. This level is the same as that estimated for 2013/14, excluding a one-time large export not expected to be repeated. Most U.S. sugar exports go to Mexico for use in their sugar-product export program IMMEX (Industria Manufacturera, Maquiladora y de Servicios de Exportación).

U.S. Sugar: Deliveries and Ending Stocks

Sugar deliveries for human consumption continue their strong pace in 2013/14. Deliveries for the first 6 months total 5.599 million STRV, about 1.3 percent greater than last year's corresponding period total. Cane sugar deliveries continue their strong performance at 2.977 million STRV, up 5.7 percent compared with last year and about a half percentage point above the current Sugar and Sweetener Outlook forecast of a 5.1-percent year-over-year increase. Beet sugar deliveries are only 1.9 percent below last year's pace but above the 3.5 percent reduction forecast by the Sugar and Sweetener Outlook. Although direct consumption imports (DCI) by non-reporters to USDA's *Sweetener Market Data* (SMD) are down 10.5 percent compared with last year, these deliveries display considerable month-to-month volatility. All these data imply no change to USDA's 2013/14 deliveries for human consumption of 11.600 million STRV.

Ending stocks for 2013/14 are estimated as the difference between total supply (13.972 million STRV) and total use (12.376 million STRV) for 1.596 million STRV. The 2013/14 stocks-to-use ratio is projected at 12.9 percent, reduced from last month's 13.0 percent.

For 2014/15, the USDA expects a 100,000 STRV increase in deliveries for human consumption, for a total forecast of 11.700 million STRV. Deliveries to sugar-containing product manufacturers for export at 100,000 STRV and to polyhydric alcohol manufacturers at 15,000 STRV are at the same levels as 2013/14. Deliveries to livestock feed manufacturers are projected at 20,000 STRV. Unlike 2013/14, there are no CCC-owned sugar deliveries to either ethanol producers or to livestock feed manufacturers.

Ending stocks for 2014/15 are projected at 1.099 million STRV. The implied ending stocks-to-use ratio is 9.1 percent. Although very early, this low stocks-to-use level points to tight market conditions in 2014/15.

Mexico Sugar and High Fructose Corn Syrup

The USDA made no changes to 2013/14 Mexico sugar supply and use (table 7). The USDA still estimates Mexico sugar production at 6.350 million mt. In analysis similar to that detailed last month, the Sugar and Sweetener Outlook concludes that there is doubt regarding the ability to harvest all area estimated by Mexico's *Comite Nacional Para El Desarrollo Sustentable de la Caña de Azucar* (Conadesuca) to be harvested. Conadesuca estimates that 836,197 hectares will be harvested, but stochastic analysis by the Sugar and Sweetener Outlook implies 795,170 hectares. The Conadesuca estimates production at 6.471 million mt, whereas Outlook analysis implies 6.144 million mt, with a large standard deviation of 217,000 mt. Given Conadesuca's assurances that all is on track to realize its estimate, the USDA did not change its estimate from last month, given that it is only 0.95 standard deviation above the 6.144 million mt point estimate.

The USDA projects 2014/15 Mexico sugar production at 6.500 million mt. This forecast is highly tentative and is based on analysis by the Foreign Agricultural Service (FAS) post in Mexico and its contacts with sources in the Mexican sugar industry. Area and yield should be about the same as 2013/14 and normal weather conditions are assumed.

The USDA forecasts imports for 2014/15 at 226,000 mt. All but 10,000 mt are assumed to be destined for Mexico's IMMEX program, and most imports are assumed to be sourced from the United States. Total deliveries to the IMMEX program are forecast at 384,000 mt, the same level as 2013/14. The amount not imported for IMMEX comes from domestic production in Mexico.

Table 7 -- Mexico sugar supply and use, 2012/13 - 2013/14 and projected 2014/15, May 2014

Items	2012/13	2013/14	2014/15
1,000 metric tons, actual weight			
Beginning Stocks	966	1,460	947
Production	6,975	6,350	6,500
Imports	217	226	226
Imports for consumption	9	10	10
Imports for sugar-containing product exports (IMMEX) 1/	207	216	216
Total supply	8,157	8,036	7,674
Disappearance			
Human consumption	4,287	4,306	4,306
For sugar-containing product exports (IMMEX)	384	384	384
Statistical adjustment	53	0	0
Total	4,724	4,690	4,690
Exports	1,973	2,399	2,036
Exports to the United States & Puerto Rico	1,818	1,579	1,217
Exports to other countries	155	820	820
Total Use	6,697	7,089	6,726
Ending Stocks	1,460	947	947
1,000 metric tons, raw value			
Beginning stocks	1,024	1,548	1,004
Production	7,393	6,731	6,890
Imports	230	240	240
Imports for consumption	10	11	11
Imports for sugar-containing product exports (IMMEX)	220	229	229
Total supply	8,646	8,519	8,134
Disappearance			
Human consumption	4,544	4,564	4,564
For sugar-containing product exports (IMMEX)	407	407	407
Statistical adjustment	56	0	0
Total	5,007	4,971	4,971
Exports	2,091	2,543	2,159
Exports to the United States & Puerto Rico	1,927	1,674	1,290
Exports to other countries	164	869	869
Total use	7,099	7,515	7,130
Ending stocks	1,548	1,004	1,004
Stocks-to-human consumption (percent)	34.1	22.0	22.0
Stocks-to-use (percent)	21.8	13.4	14.1
High Fructose Corn Syrup (HFCS) consumption (dry weight)	1,567	1,360	1,419

Source: USDA, WASDE and ERS, Sugar and Sweeteners Outlook; Conadesuca.

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

Sugar deliveries for human consumption have totaled 2.054 million mt, about 20,000 mt more than through the same period last year. The USDA continues to estimate 2013/14 sugar consumption at 4.306 million mt and also forecasts 2014/15 consumption at that same level. The USDA believes that combined sugar and high fructose corn syrup (HFCS) per capita sweetener consumption will be the same in 2014/15 as is estimated for 2013/14; that is, 48.34 kilograms. Because sugar consumption is held constant, increased consumption due to population growth is applied to HFCS. Its consumption level is forecast at 1.420 million mt, dry weight. This projection represents growth of about 60,000 mt.

Ending stocks for both 2013/14 and 2014/15 are set at 22.0 percent of domestic sugar consumption. For 2014/15, the 22.0 percent represents the safe amount for available supply through the start of the next harvest cycle starting in November. The export forecast is calculated as a residual and is set at 2.036 million mt. This forecast is 362,800 mt lower than that estimated for 2013/14.

The USDA did not change its estimate of 2013/14 exports but did increase the share destined for the U.S. market by 85,583 mt (or 100,000 STRV). The reallocation caused estimates to third country markets to decrease to 820,000 mt. Although Conadesuca believes that these exports will total 1.190 million mt (table 8), the USDA believes that this export pace cannot be sustained through the end of 2013/14 and a goodly portion will take place in 2014/15. The same sort of port and infrastructure constraints limiting third-country exports are assumed for 2014/15 new crop exports. Third-country exports for 2014/15 are capped at 820,000 mt, implying exports to the United States at 1.216 million mt (1.421 million STRV).

Conadesuca's Sugar and HFCS Supply and Use Balances

In March 2014, Conadesuca published its latest balance for 2013/14. Table 8 shows the balance and compares it with the USDA May balance. From an accounting perspective, the primary difference is that Conadesuca excludes IMMEX components. Their belief is that sugar in IMMEX is not intended for domestic consumption and therefore is not necessary for inclusion. The one exception is that deliveries into IMMEX from domestic production are counted but are listed as an export, even though these will not show up in official export trade statistics.

There are differences in levels of supply and use estimates between Conadesuca and the USDA. Production has already been discussed. Conadesuca estimates less sugar for consumption but more for exports to the United States and third-countries. A drawing down of stocks is an important component in Conadesuca's prediction of more exports. As discussed above, the USDA believes that Mexico is constrained in its ability to export all that it intends before the end of September.

Table 9 shows a complete Conadesuca accounting of sugar and HFCS supply and use balances for 2008/09 – 2012/13. The top panel shows sugar balances divided into estandar and refinado components. The middle panel shows HFCS, and the bottom shows combined sugar and HFCS. In the bottom panel, refinado sugar and HFCS are added together because their use is more closely substitutable than with estandar. Figures 1 – 4 illustrate some of the dynamics occurring over the period.

Table 8 -- Comparison of USDA and Conadesuca supply and use estimates for 2013/14 Mexico sugar

2013/14 Market year (Oct/Sept)	May 2014 WASDE	Current Conadesuca (4/2014)
	1,000 metric tons, actual weight	
Beginning Stocks	1,460	1,460
Production	6,350	6,484
Imports	226	10
Imports for consumption	10	10
Imports for sugar-containing product exports (IMMEX) 2/	216	-
Total Supply	8,037	7,955
Disappearance	4,690	4,269
Human consumption	4,306	4,269
For sugar-containing product exports (IMMEX) 3/	384	-
Statistical adjustment		-
Exports	2,399	2,954
Exports to the United States & Puerto Rico 4/	1,580	1,646
Exports to other countries 4/	820	1,190
Domestic production for IMMEX 3/	-	118
Total Use	7,090	7,223
Ending Stocks	947	731
Stocks-to-Human Cons. (percent)	22.0	17.1
Stocks-to-Use (percent)	13.4	10.1
High Fructose Corn Syrup (HFCS) Consumption (dry weight)	1,360	1,492

Source: USDA, WASDE and ERS, Sugar and Sweeteners Outlook; Conadesuca.

1/ Forecast

2/ IMMEX = Industria Manufacturera, Maquiladora y de Servicios de Exportación; Conadesuca does not incorporate IMMEX sugar supply-use balance in its national sugar supply-use balance.

3/ Conadesuca classifies IMMEX deliveries from domestic production as an export. In the table, the Sugar and Sweetener Outlook classifies total IMMEX deliveries, domestic and imported, under disappearance, following the USDA practice.

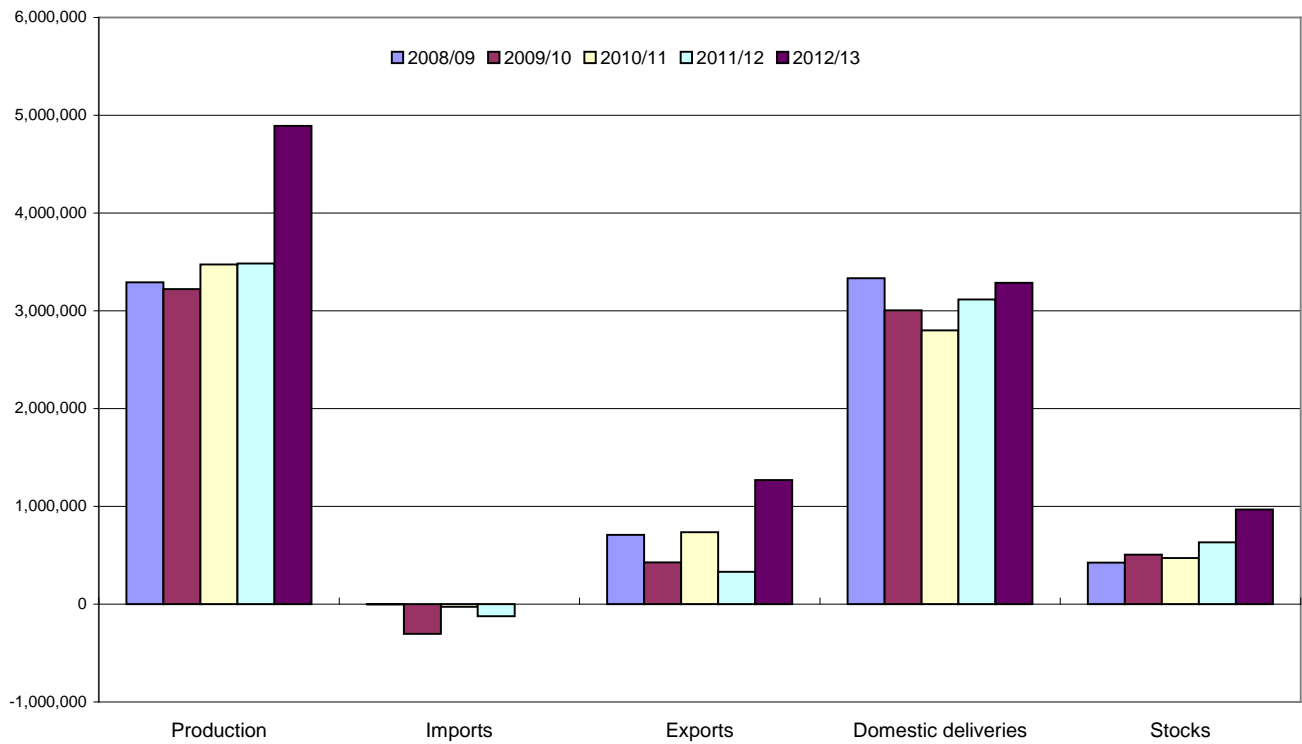
4/ Conadesuca exports to destinations cover only exports by Mexican processors. The destinations of other enterprise exports is not specified.

Table 9 -- Conadesuca Mexico sweetener supply and use balance, by type of sugar and high fructose corn syrup (HFCS), 2008/09-2012/13.

	2008/09	2009/10	2010/11	2011/12	2012/13	2008/09	2009/10	2010/11	2011/12	2012/13	2008/09	2009/10	2010/11	2011/12	2012/13
	<u>1,000 metric tons</u>					<u>1,000 metric tons</u>					<u>1,000 metric tons</u>				
	<u>Estándar</u>					<u>Refinado</u>					<u>Total: Sugar</u>				
Beginning stocks	1,172	425	505	472	632	692	162	413	288	333	1,864	588	918	760	966
Production	3,292	3,223	3,475	3,483	4,890	1,671	1,603	1,708	1,565	2,084	4,962	4,826	5,184	5,048	6,975
Intra-factory exchanges		-15					14					0			
Imports	3	304	26	123	1	32	306	81	114	8	35	610	107	236	9
Outside duty/quota	-	0	4	6	1	-	10	7	20	8	-	11	10	25	9
Subject to duty/quota	-	261	22	117	0	-	294	75	94	0	-	556	97	211	0
Other imports	-	43				-	1				-	44	0	0	0
Total supply	4,467	3,938	4,006	4,078	5,524	2,394	2,085	2,203	1,966	2,426	6,862	6,023	6,209	6,045	7,950
Exports	709	427	735	330	1,270	572	324	764	611	932	1,281	751	1,499	941	2,203
Factory exports	701	350	640	320	1,266	481	192	638	447	899	1,182	542	1,278	767	2,166
United States and Puerto Rico	387	340	609	288	1,157	255	113	549	375	689	642	453	1,158	662	1,846
Other countries	18	1	9	0	71	1	4	0	0	81	19	5	9	0	152
IMMEX	82	8	22	32	38	169	74	89	72	129	251	82	111	104	168
Temporary	213	0				56	1				270	2	0	0	0
Exports by others	9	77	95	10	4	90	132	126	164	33	99	210	221	175	37
United States and Puerto Rico	-	77	87	10	3	-	132	125	164	31	-	209	212	174	34
Other countries	-	0	8	0	1	-	0	1	0	3	-	0	9	0	3
Domestic deliveries	3,333	3,005	2,799	3,116	3,286	1,660	1,349	1,151	1,022	1,001	4,993	4,354	3,950	4,138	4,287
Factory deliveries	3,329	2,744	2,773	2,993	3,285	1,629	1,043	1,070	908	993	4,958	3,786	3,843	3,902	4,277
Domestic sales from production	-	2,701	2,773	2,993	3,285	-	1,043	1,070	908	993	-	3,743	3,843	3,902	4,277
Other	-	43				-	0				-	43	0	0	0
Importer deliveries	3	261	26	123	1	32	306	81	114	8	35	567	107	236	9
Outside duty/quota	-	0	4	6	1	-	10	7	20	8	-	11	10	25	9
Subject to duty/quota	-	261	22	117		-	294	75	94		-	556	97	211	0
Other imports	-	0	0	0		-	1	0	0		-	1	0	0	0
Total use	4,042	3,432	3,534	3,446	4,556	2,232	1,673	1,915	1,633	1,933	6,274	5,105	5,449	5,079	6,489
Ending stocks	425	505	472	632	968	162	413	288	333	493	588	918	760	966	1,460
Source: Conadesuca.															
						<u>HFCS</u>					<u>Total: HFCS</u>				
Beginning stocks						0	0	0	0	0	0	0	0	0	0
Production						362	463	467	477	494	362	463	467	477	494
Miscellaneous adjustment															
Imports						329	975	1,192	1,283	1,105	329	975	1,192	1,283	1,105
Total supply						691	1,438	1,659	1,760	1,599	691	1,438	1,659	1,760	1,599
Exports						12	20	24	25	32	12	20	24	25	32
Domestic deliveries						679	1,418	1,635	1,735	1,567	679	1,418	1,635	1,735	1,567
Total use						691	1,438	1,659	1,760	1,599	691	1,438	1,659	1,760	1,599
Ending stocks						0	0	0	0	0	0	0	0	0	0
						<u>Refinado and HFCS</u>					<u>Total: Sugar and HFCS</u>				
Beginning stocks	1,172	425	505	472	632	692	162	413	288	333	1,864	588	918	760	966
Production	3,292	3,223	3,475	3,483	4,890	2,032	2,066	2,175	2,042	2,579	5,324	5,289	5,650	5,525	7,469
Miscellaneous adjustment	0	-15	0	0	0	0	14	0	0	0	0	0	0	0	0
Imports	3	304	26	123	1	361	1,281	1,274	1,397	1,114	364	1,585	1,300	1,519	1,115
Total supply	4,467	3,938	4,006	4,078	5,524	3,085	3,524	3,862	3,726	4,025	7,553	7,461	7,868	7,804	9,549
Exports	709	427	735	330	1,270	584	345	788	636	965	1,294	772	1,523	966	2,235
Domestic deliveries	3,333	3,005	2,799	3,116	3,286	2,339	2,766	2,786	2,757	2,568	5,671	5,771	5,585	5,873	5,854
Total use	4,042	3,432	3,534	3,446	4,556	2,923	3,111	3,574	3,393	3,533	6,965	6,543	7,108	6,839	8,089
Ending stocks	425	505	472	632	968	162	413	288	333	493	588	918	760	966	1,460
Source: Comité Nacional Para El Desarrollo Sustentable de la Caña de Azúcar (Conadesuca).															

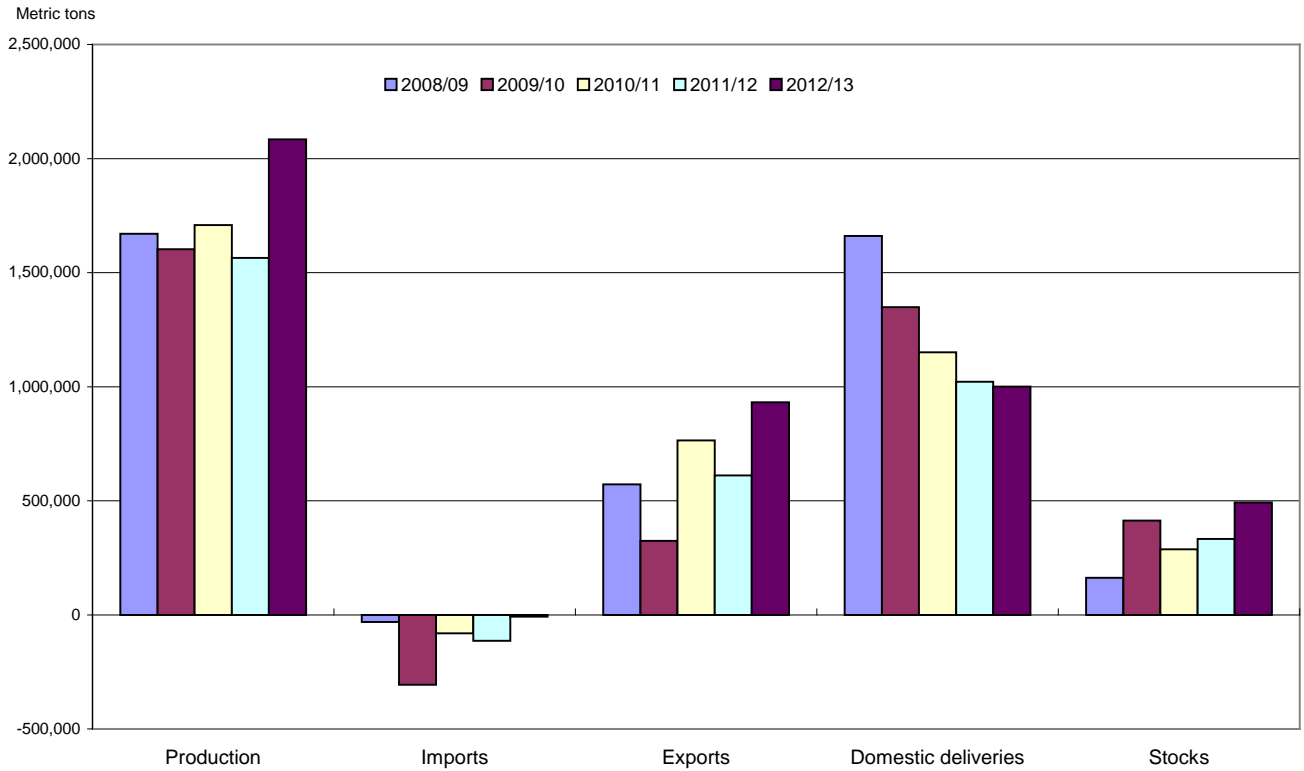
Figure 1
Mexico estandar sugar, supply and use, 2008/09-2012/13

Metric tons



Source: Conadesuca.

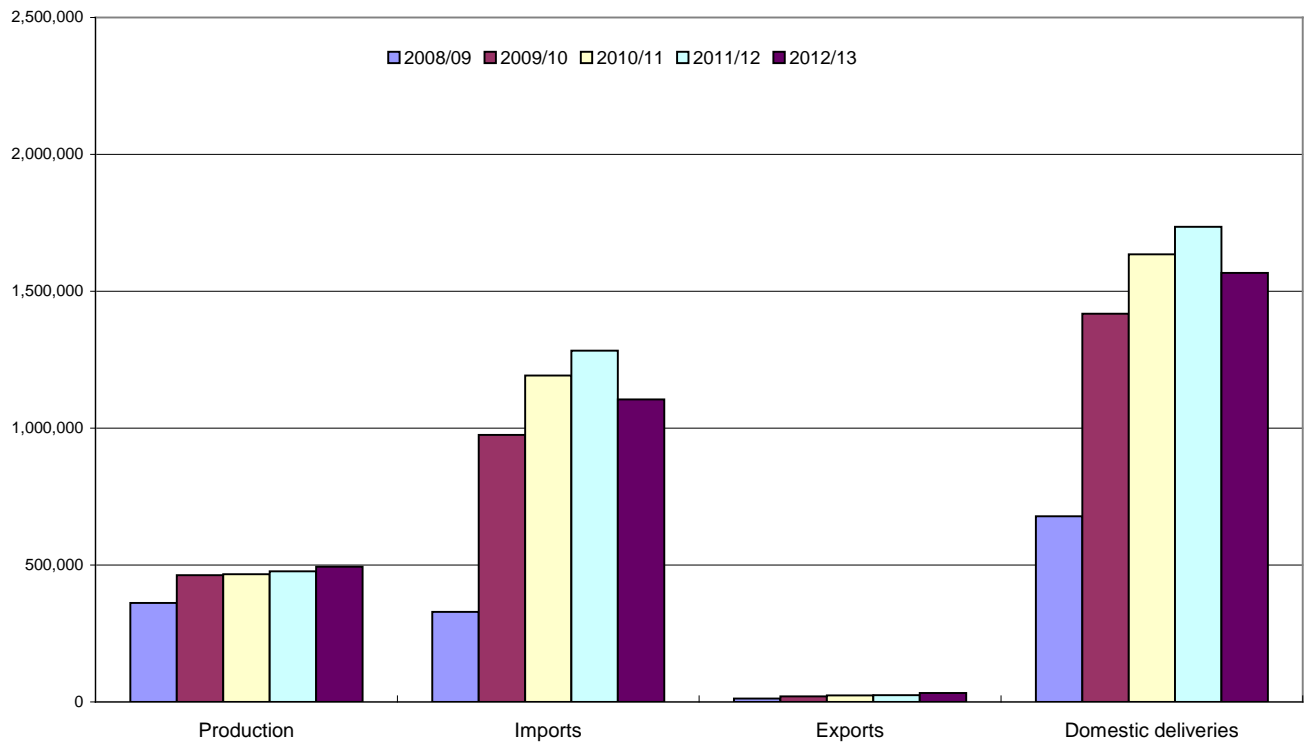
Figure 2
Mexico refined sugar, supply and use, 2008/09-2012/13



Source: Conadesuca.

Figure 3
Mexico high fructose corn syrup, supply and use, 2008/09-2012/13

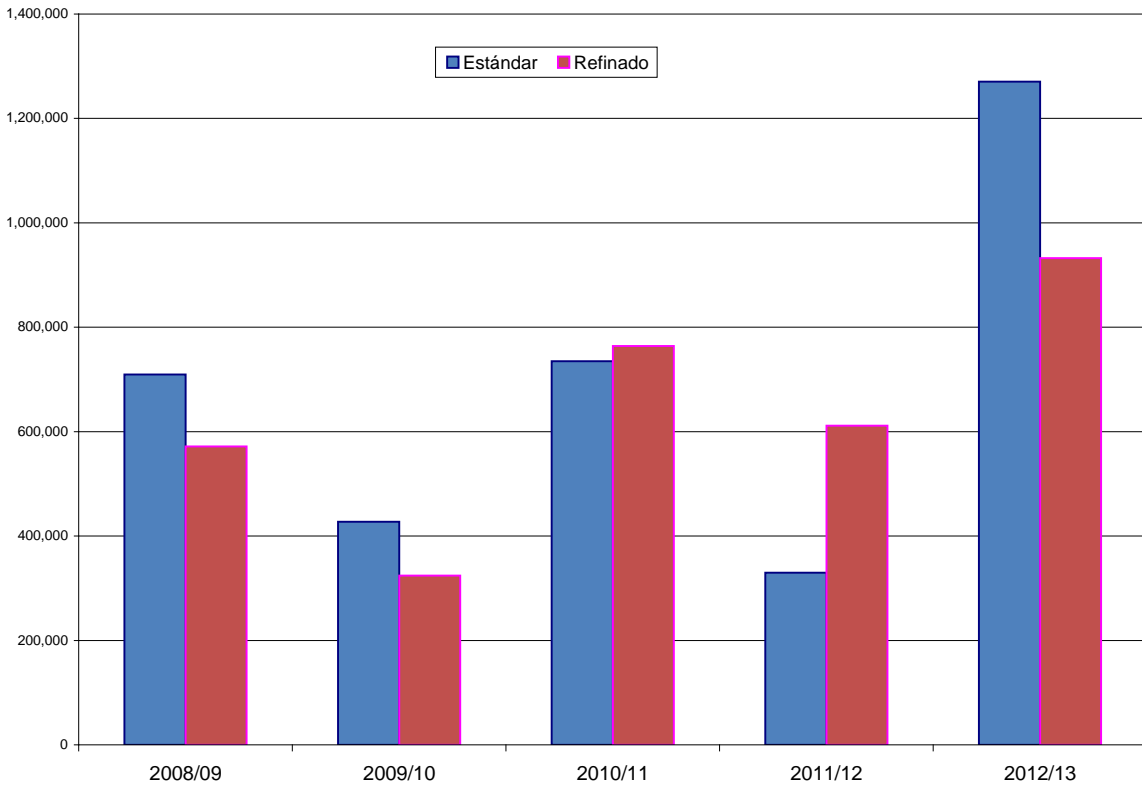
Metric tons



Source: Conadesuca.

Figure 4
Mexico sugar exports, 2008/09-2012/13, by type of sugar

Metric tons - sugar, HFCS: dry wt



Source: Conadesuca.

World Sugar and High Fructose Syrup Production Costs: 2001/02-2012/13

LMC International provides estimates of world sugar and high fructose syrup (HFS) costs of production.¹ The data go back to 1979/80 and extend through 2012/13. Field, factory, and administrative costs are detailed for 35 beet producing countries and for 61 cane producing countries. HFS production costs are presented for 18 countries.² Costs of production for regions within certain important producing countries are presented as well. These countries include the United States, Mexico, Brazil, China, Thailand, and South Africa, among others. Articles in *Sugar and Sweetener Outlook* of the Economic Research Service (ERS) have previously described data through 2009/10. This report updates the earlier articles.

Competitiveness Analysis and Costs of Production

Analysis of competitiveness in global sugar/sweetener markets is complicated by the fact that markets are generally characterized by domestic and trade-related policy distortions that make it difficult to discern the underlying competitive position of individual market participants. Competitiveness of sugar/sweetener producers reflects many different factors—relative resource endowments and agroclimatic conditions, socioeconomic conditions, the impact of macroeconomic policies, sector-specific policies, infrastructure, and supporting institutions. One approach to a comparative economic analysis of competitiveness is the evaluation of production costs associated with farm-level production, processing, transportation, and marketing.

Production cost estimates and cross-country comparisons serve a number of goals. They typically form the basis for comparing competitiveness in production and aid in the calculation of government support to sugar/sweetener industries in many countries. In addition, trends in production costs can be compared with long-term trends in world prices to evaluate the viability of production in markets that may be liberalized. Cost-of-production estimates are also useful in analyzing the consequences for sugar and sweetener industries of changing government support, as well as of the formation of regional preferential trading areas such as the North American Free Trade Agreement (NAFTA) and the Dominican Republic-Central American Free Trade Area (CAFTA/DR). Finally, information on the contribution of particular cost components to total production and marketing costs can be used to interpret the impact of various factors such as changing exchange rates or input prices on production incentives in different countries—all supporting decisions on production, investment, and policy alternatives and guiding expectations of future market developments

¹ LMC International's *Sugar and HFS Production Costs* is copyrighted and results for specific countries or regions may not be quoted or published without prior approval of LMC International. For detailed information regarding LMC International services, contact: LMC International, 1841 Broadway, New York, NY, 10023. Tel: 202-586-2427, info@lmc-ny.com.

² See the box at the end of this report, "LMC International Engineering Cost Approach," for a description of LMC International's methodology for estimating cost of production in countries/regions.

Despite the usefulness of production costs, however, there are many limitations in their use. For instance, the LMC data refer to estimated, averaged costs within individual countries or regions. Economists generally argue that marginal costs are more relevant in predicting supply response changes due to changes in output prices, government support, and input prices. Knowledge of industry structures and the specific production technologies in use are also necessary for predicting supply response changes when underlying price and cost variables change.

Trends in World Sweeteners and Costs of Production

In their cost-of-production database, LMC International includes most, but not all, countries that produce sugar and high fructose sweetener (HFS). Table A-1 shows a listing of those countries by type of sweetener produced—cane sugar, beet sugar, and HFS. The table also shows how the ERS Sugar and Sweetener Outlook classifies countries within each production category. For cane sugar, countries are classified as: low-cost, Cyclical Asia, Asia and Oceania, Latin America, NAFTA, and Africa. Regional groupings exclude countries that are classified as either “low-cost” or “Cyclical Asia.” Beet sugar and HFS are each split between low-cost producers and higher cost producers.

Figure A-1 shows each category’s share of total world sweetener production for 2010/11 through 2012/13. Most sweetener production is concentrated among low-cost producers, especially in Brazil. Brazil is divided into two producing areas: the Center/South (C/S) region, where most Brazilian sugarcane is grown, and the North/Northeast (N/NE). The N/NE is the location of traditional Brazilian sugarcane production, whereas the C/S is where almost all Brazilian sugarcane production growth has occurred within the last 20 years. The development of fuel ethanol from sugarcane has been largely responsible the expansion of C/S sugarcane area.

Besides Brazil, the low-cost category includes producers in Latin America (Colombia, El Salvador, Guatemala, Nicaragua, Paraguay, and Peru), Asia and Oceania (Australia and Thailand), and Africa (Ethiopia, Malawi, South Africa, Swaziland, and Zambia). Cyclical Asia includes China, India, and Pakistan. Production in these countries is volatile, with frequent year-to-year sugar trade fluctuations. The NAFTA region comprises the United States and Mexico.

In the LMC International dataset, sweetener production has grown 49.7 percent, from about 156.9 million metric tons (mt) in 2001/02 to 224.6 million in 2012/13 (fig. A-2). Cane sugar, measured in white value, grew 66.9 percent over the period to 175.1 million mt, about 61 million mt more than in 2000/01. Most of this production gain, about 60 percent, occurred in Center/South Brazil. Cane sugar’s share of combined sweetener production rose from 73 percent in 2001/02 to 78 percent in 2012/13. Beet sugar production increased only 8.1 percent over the period, mostly due to significant production reductions in the European Union after its sugar reform, which started in 2005. The beet share of combined sweetener production decreased from 19.2 percent in 2001/02 to 15.9 percent in 2012/13. HFS production rose 18.1 percent over the period.

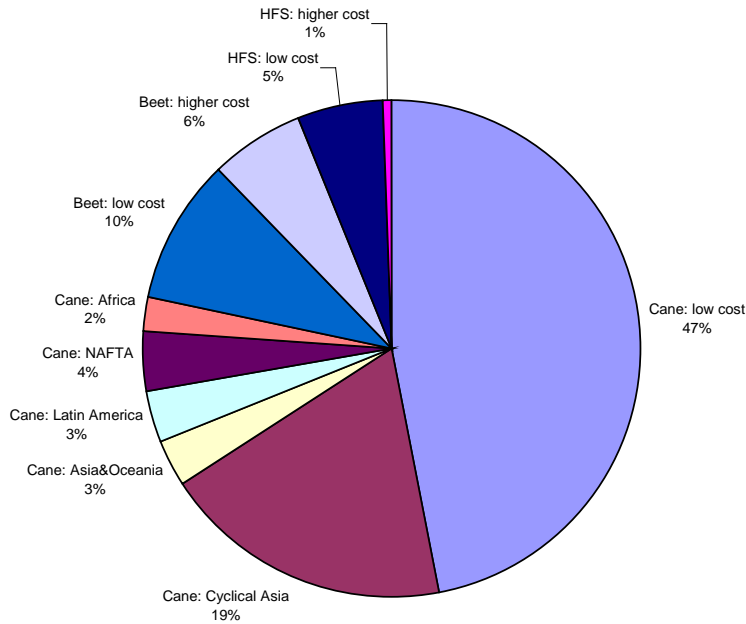
Table A-1 -- Sweetener cost categories and classification of sweetener producers on regional basis

Cane sugar						Beet sugar			High fructose syrup	
Low cost	Cyclical Asia	Asia&Oceania	Latin America	NAFTA	Africa	Low cost	Higher cost	Low cost	Higher cost	
Australia	China	Bangladesh	Argentina	Mexico	Burundi	Austria	Bulgaria	Argentina	Finland	
Brazil (C.S.)	India	Fiji	Barbados	United States	Cameroon	Belarus	Canada	Belgium	France	
Brazil (N.E.)	Pakistan	Indonesia	Belize		Congo	Belgium	China	China	Greece	
Colombia		Iran	Bolivia		Congo DR	Chile	Croatia	Canada	Japan	
El Salvador		Japan	Cuba		Côte d'Ivoire	Denmark	Czech Republic	China	Netherlands	
Ethiopia		Papua New Guinea	Dominican Republic		Egypt	Egypt	Finland	Egypt	South Korea	
Guatemala		Philippines	Ecuador		Kenya	France	Greece	Hungary	Turkey	
Malawi		Sri Lanka	Guadeloupe		Madagascar	Germany	Hungary	Italy	United Kingdom (UK)	
Nicaragua		Taiwan	Guyana		Mauritius	Netherlands	Ireland	Mexico		
Paraguay		Vietnam	Honduras		Morocco	Poland	Italy	Poland		
Peru			Jamaica		Mozambique	Republic of Serbia	Japan	Slovakia		
South Africa			Panama		Senegal	Spain	Latvia	Spain		
Swaziland			St Kitts		Sudan	Sweden	Lithuania	Taiwan		
Thailand			Trinidad		Tanzania	United Kingdom	Moldova	United States		
Zambia			Venezuela		Uganda	United States	Morocco			
					Zimbabwe		Romania			
							Russia			
							Slovakia			
							Switzerland			
							Syria			
							Tunisia			
							Turkey			
							Ukraine			
							Uruguay			

Source: ERS, Sugar and Sweetener Outlook.

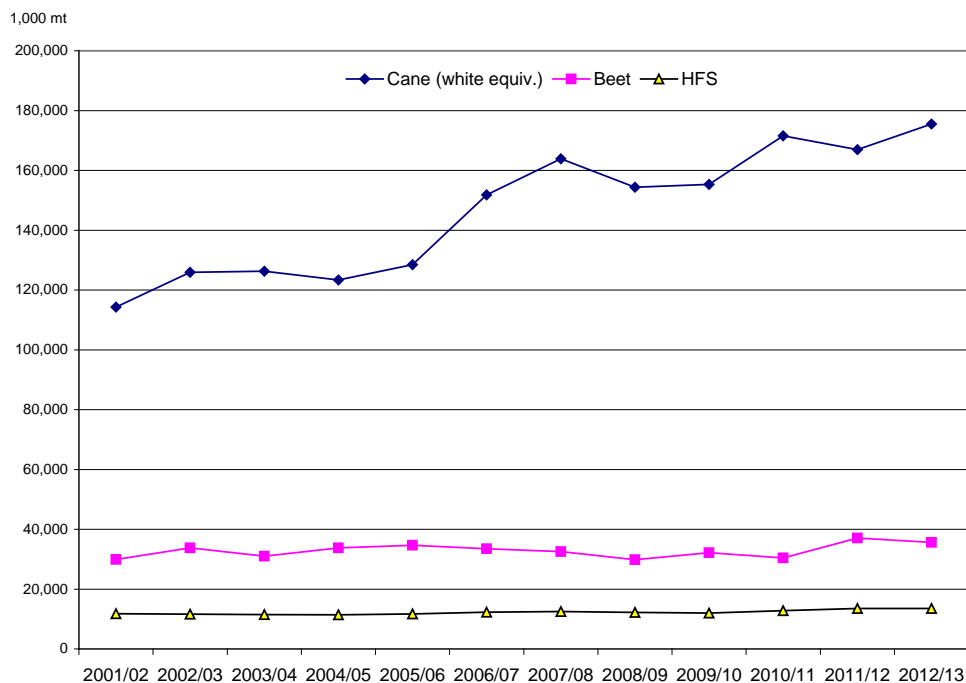
Figure A-1
Average sweetener production - 2010/11-2012/13

Average sweetener production = 219.0 million mt, white value equiv.



Source: LMC International.

Figure A-2
World sweetener production in LMC International cost of production dataset, 2001/02-2012/13



Source: LMC International.

Growth in World Sweetener Costs of Production

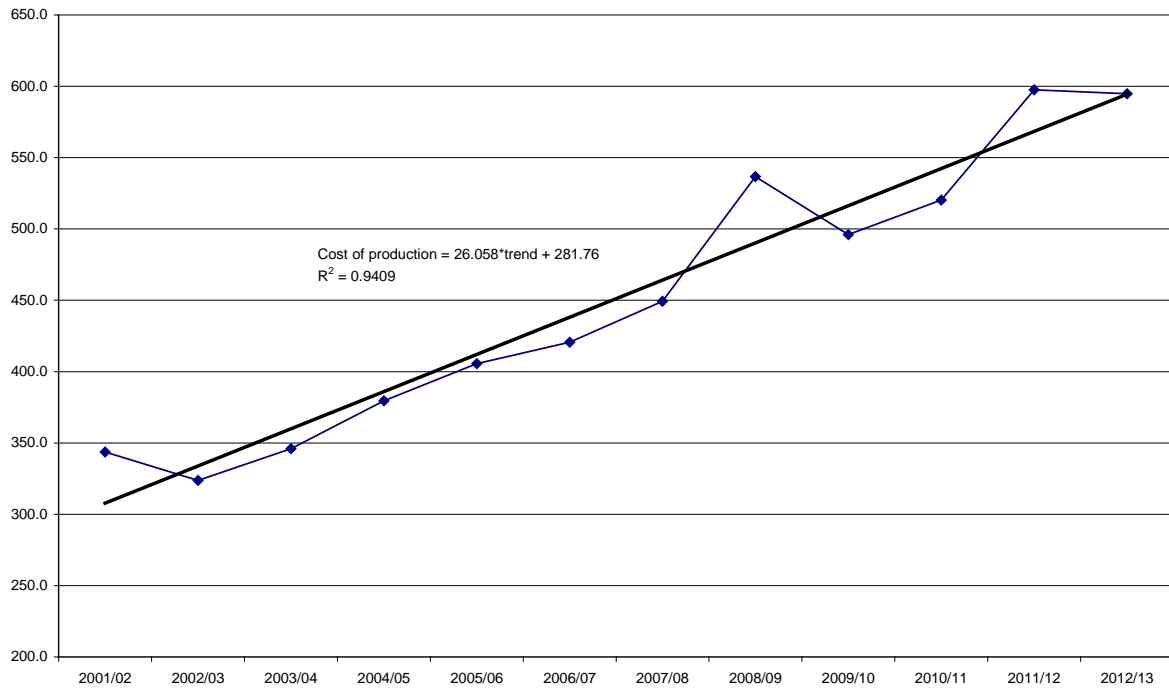
Figure A-3 shows the evolution of sweetener costs of production over the period 2001/02–2012/13. Production costs in the first 3 years averaged about \$338 per mt, but by the final 2 years averaged \$596 per mt, an increase of over 76 percent. The estimated trend indicates a steady rise in costs of about \$26 per mt per year.

Figure A-4 shows the change of each sweetener’s cost relative to its value in 2001/02. Cane sugar’s 2001/02 cost in white value terms is set at 100.0. Beet sugar’s 2000/01 cost is 160.8, meaning that it was 60.8 percent more expensive, on average, to produce beet sugar than cane sugar. The HFS 2001/02 cost is 80.4, indicating that it was 19.6 percent less expensive to produce HFS than cane sugar in 2001/02.

The figure shows sustained sweetener production cost growth from 2002/03 through 2008/09. Relative to 2001/02, cane production costs increased 61.6 percent relative to its 2001/02 value. Similarly, beet costs increased 47.2 percent, and HFS costs increased 82.6 percent. Cost growth moderated substantially in the next 2 years, especially for beet and HFS, but cane and HFS costs increased above 2008/09 levels in 2011/12. Beet costs have been steady for the 4 years since 2008/09, but much lower than the 2008/09 level. Comparing 2012/13 cost levels with those in 2001/02, cane costs are 88.2 percent higher and HFS costs are 112.3 percent higher, while beet costs are only 31.1 percent higher. Relative to 2012/13 cane production costs, beet costs are only

Figure A-3
World average sweetener costs of production - wt. average of cane, beet, and HFS

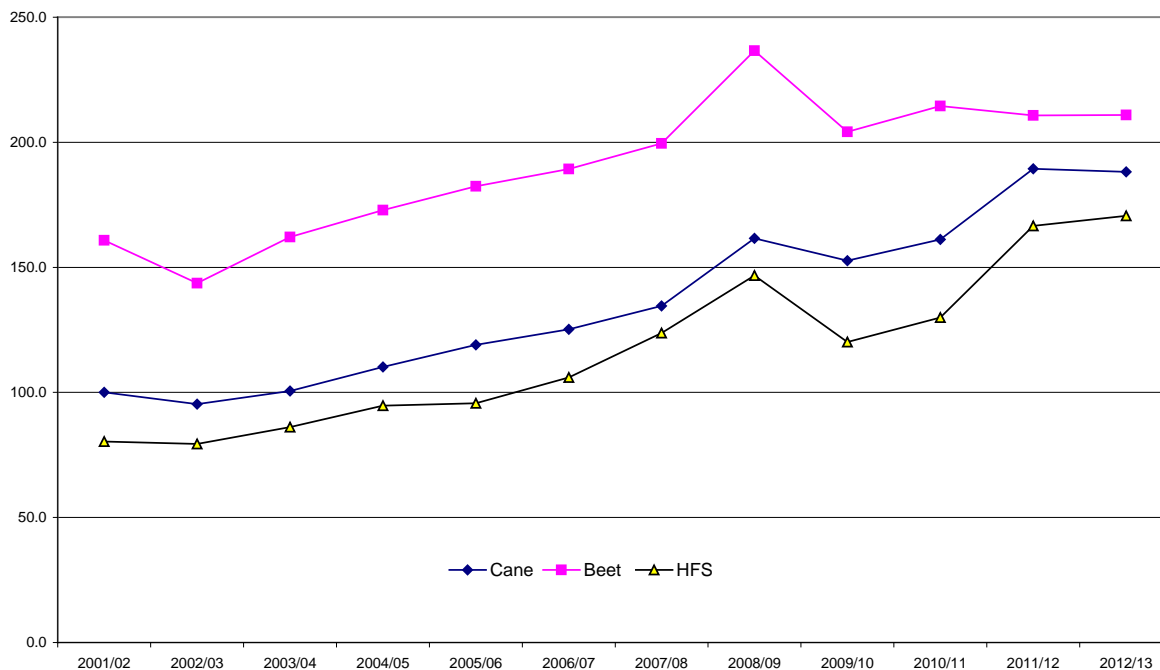
Dollar/mt, white sugar equiv.



Source: LMC International.

Figure A-4
Relative growth in sweetener production costs, 2001/02-2012/13

2001/02 cane cost = 100.



Source: LMC International.

12.1 percent higher (compared with the 60.8 percent in 2001/02) and HFS costs are 9.3 percent lower.

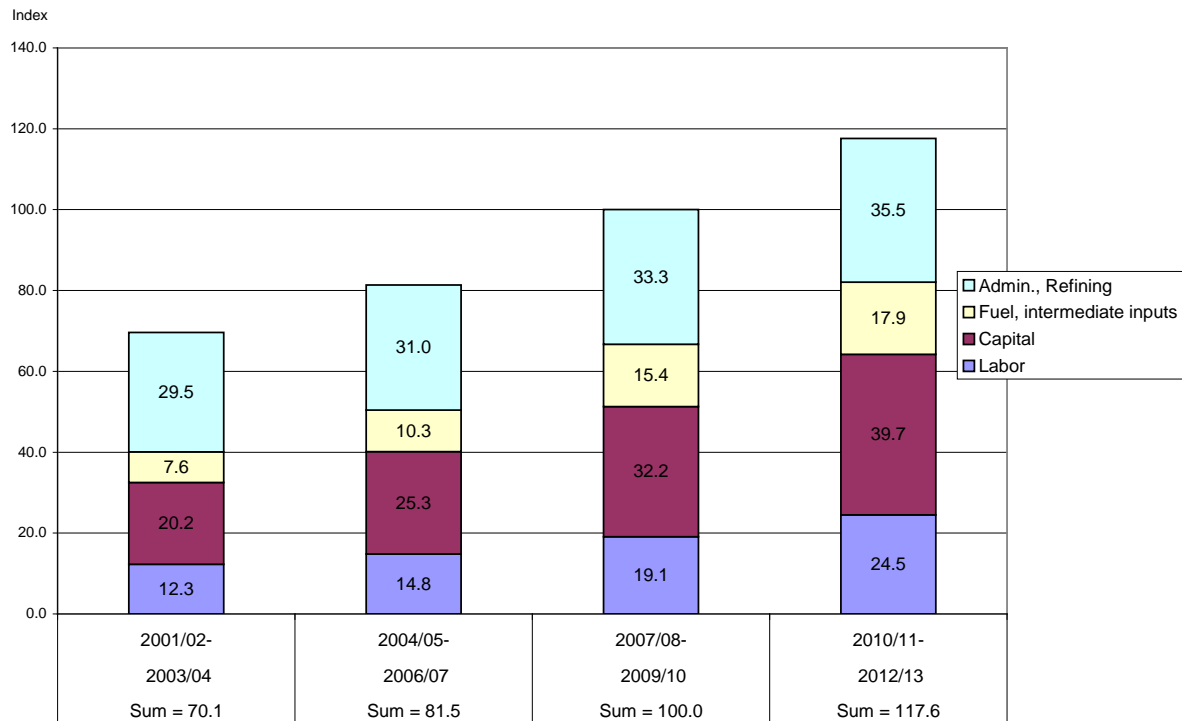
Factor Growth Costs for Sweeteners

LMC International separates cane and beet costs into four factor components: labor, capital, intermediate inputs (e.g., fuel, fertilizer, other chemicals), and administrative costs. Refining costs for raw sugar are set at \$65 per mt and are added to cane sugar's administrative costs to allow for comparing costs of producing refined cane sugar with those of producing refined beet sugar.

Figure A-5 shows cane sugar's cost components for the four 3-year periods spanning 2001/02 through 2012/13. The chart is scaled to show the share percentages for each component of total cane costs relative to the 2007/08–2009/10 total.³ Excepting administrative costs, each of the

³ In figure 5, labor's value is 19.1 for 2007/08–2009/10. This means labor was 19.1 percent of total averaged cane costs for the period. The value increased to 24.5 in 2010/11–2012/13, meaning that labor's share in that period was 24.5 percent of the total averaged cane costs for 2007/08–2009/10. If all components for period intervals are added, the total represents the cost of producing for the period relative to 2007/08–2009/10. The sum of the components for 2010/11–2012/13 is 117.6, meaning that average costs for the period are 17.6 percent higher than the average costs for 2007/08–2009/10.

Figure A-5
World cane production cost components as percentage of 2007/08-2009/10 total costs, excluding byproduct credits



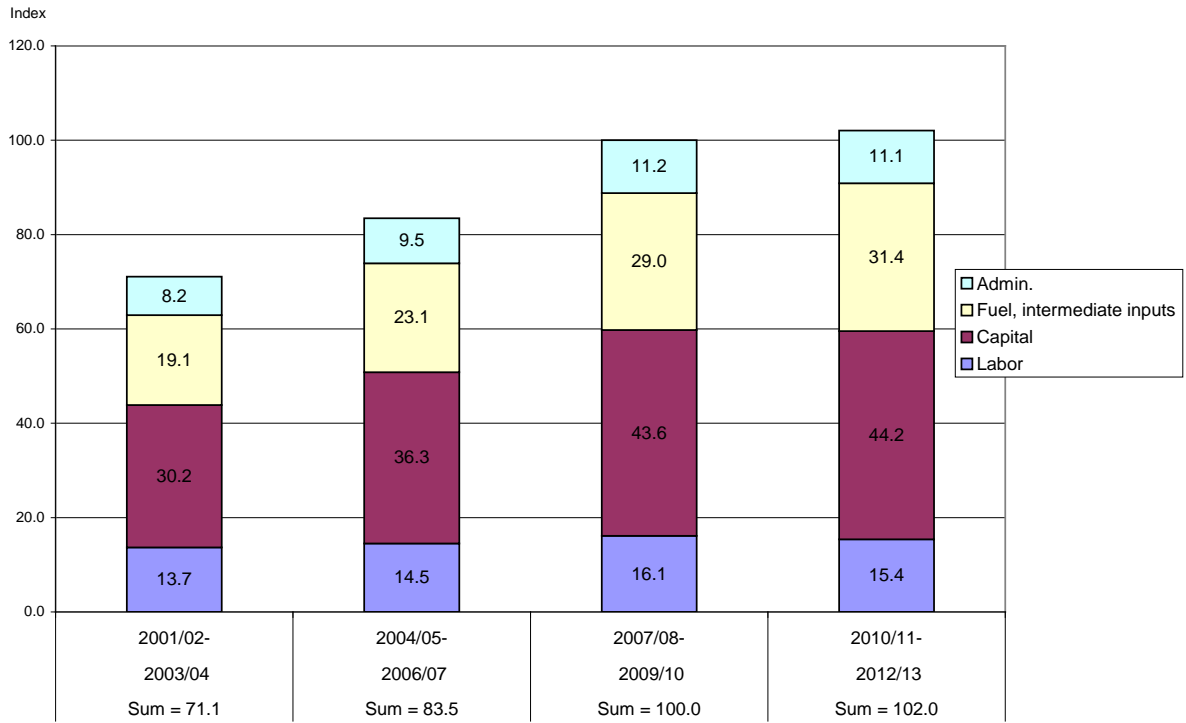
Source: LMC International, Inc.

factor components has been steadily increasing over the entire period. Labor costs increased 20 percent from the first to the second period, then 29 percent to the third and 28 percent to the final 2010/11-2012/13 period. Capital costs have shown a similar pattern. Intermediate input costs have shown somewhat higher percentage increases but some moderation for the last 3-year period.

Figure A-6 shows the factor costs for refined beet sugar. Intermediate input costs and capital costs have a pattern similar to corresponding cane costs through 2009/10 but with substantial moderation for 2010/11-2012/13. Labor cost growth has been consistently lower for beet than for cane over the entire 12-year period. Average beet sugar production costs for 2010/11-2012/13 are only 2 percent higher than the preceding period, showing far less growth than the corresponding 19.6 percent for cane.

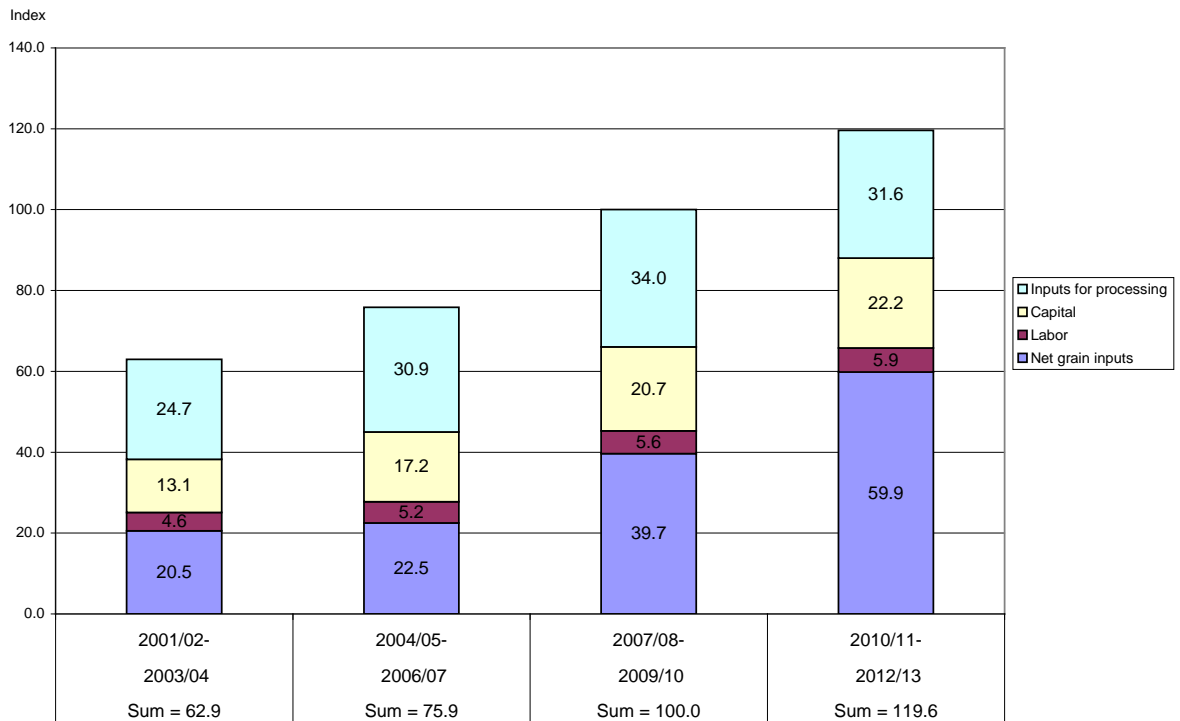
Figure A-7 shows factor costs for HFS. Because the grain feedstock is purchased rather than grown specifically for processing into a sweetener, costs are divided into the factors for processing—labor, capital, and intermediate inputs—and feedstocks costs, the purchasing costs of grains for starch extraction less credits for byproduct sales. The main contributor to increased HFS costs has been increased costs for net grain inputs. These costs increased the most after 2007/08; for the 3-year period 2007/08-2009/10, net grain costs increased 76 percent compared with the previous 3-year period. The costs increased another 51 percent in the latest 3-year period. Net grain input costs were only about 30 percent of total production costs from 2001/02-

Figure A-6
World beet production cost components as percentage of 2007/08-2009/10 total costs, excluding byproduct credits



Source: LMC International, Inc.

Figure A-7
World HFS production cost components as percentage of 2007/08-2009/10 total costs



Source: LMC International, Inc.

2006/07. They increased to about 40 percent during 2007/08–2009/10 and to about 50 percent during 2010/11–2012/13. Processing costs have increased as well, but mainly for capital inputs.

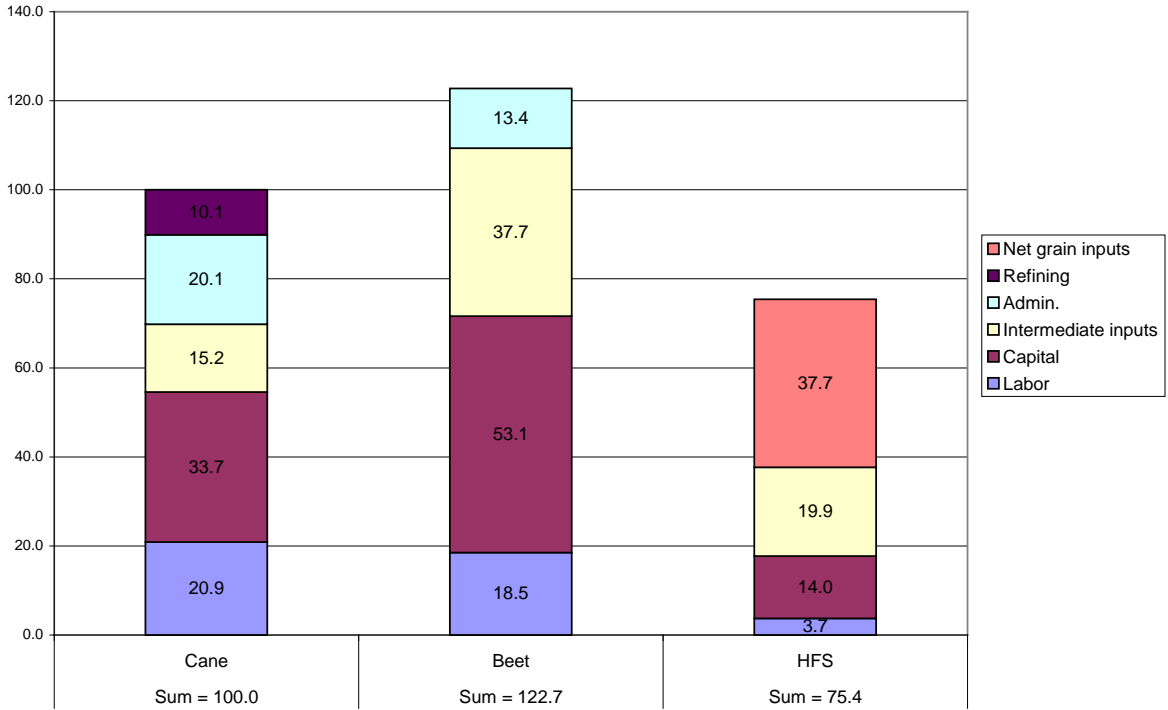
Figure A-8 shows the distribution of 2010/11–2012/13 factor costs across cane, beet, and HFS production. Costs are indexed with reference to cane costs; that is, cane costs sum to 100.0. Beet costs are shown 22.7 percent higher than cane costs, with higher capital and intermediate input costs. Labor costs are about the same. HFS costs average 24.6 percent lower than cane costs. Processing inputs of labor, capital, and intermediate inputs sum to much less than similar factor costs for both cane and beet sugar.

Cost Trends in the Field and Factory

Field costs for both cane and beets have increased significantly, but the increase in cane costs has been much greater (fig. A-9). At the beginning of the period, field cane costs averaged \$136.90 per mt, but by the end they averaged 110 percent higher at \$288.20. Although beet field costs are higher than cane field costs, the beet cost growth has been more modest. The average cost was \$250 per mt at the beginning of the period and \$364 per mt at the end, about 46 percent higher. At the beginning, beet field costs were 83 percent higher than corresponding cane costs. At the end, beet costs were only 26 percent higher.

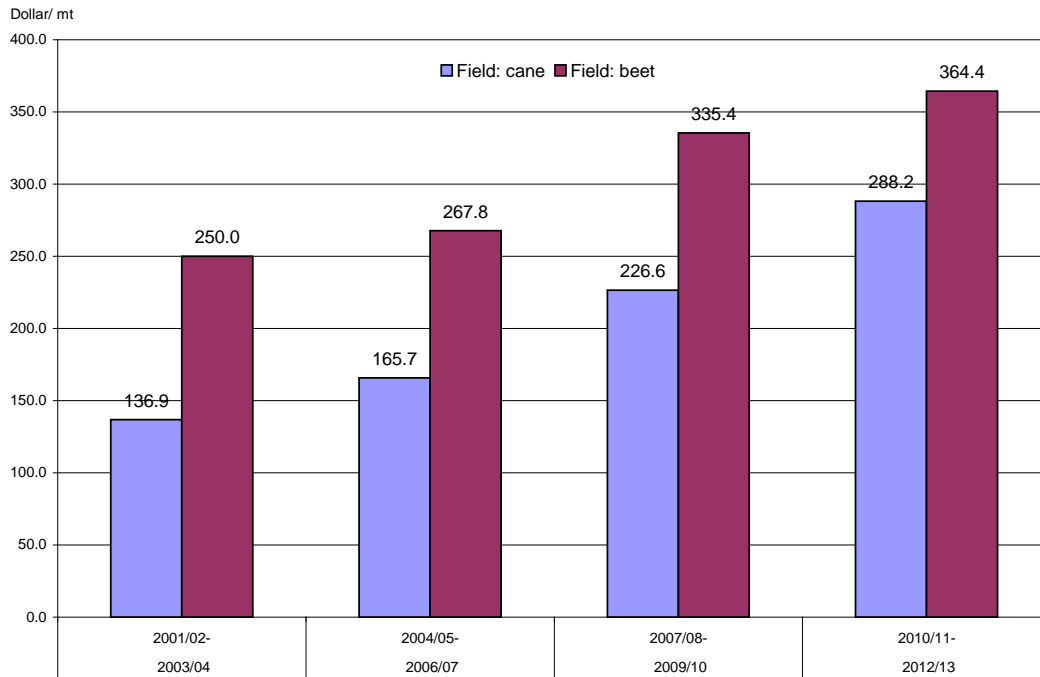
Figure A-8
Comparison of world sweetener production components for 2010/11-2012/13.

Index: cane cost = 100



Source: LMC International.

Figure A-9
World field production costs for sugar



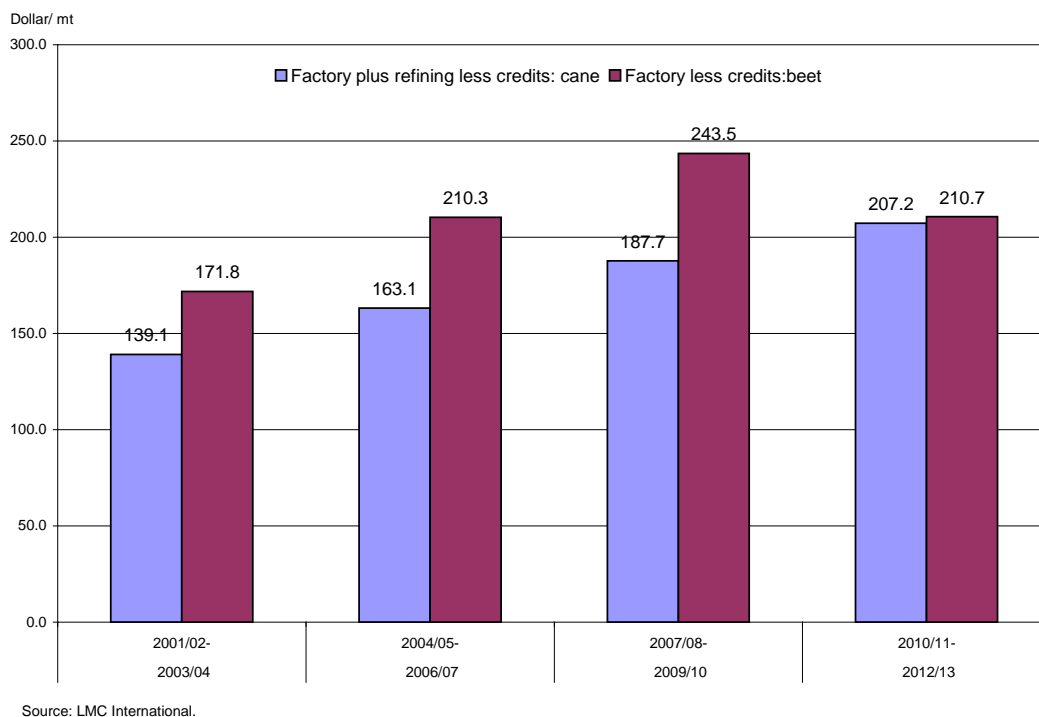
Source: LMC International.

Factory costs have increased for both cane and beet sugar, but the increase for beet costs has been much lower (fig. A-10). Cane costs show a steady increase, while beet factory costs declined in 2011/11–2012/13 relative to their same costs in 2007/08–2009/10. Beet factory costs are only 23 percent higher at the end of the period than at the beginning. Corresponding cane costs, on the other hand, are about 49 percent higher.

Distribution of Sweetener Costs across Product/Region/Cost Groupings

Costs of producing sweeteners differ widely across producing areas. Figure A-11 shows relative production costs averaged over 2010/11–2012/13 across sweetener areas as defined in table 1. The index for the low-cost cane area is set at 100, and all other groupings have cost estimates relative to it. The horizontal axis shows cumulative sweetener production across the groupings, giving an indication of how costs are distributed. HFS from low-cost producers is the lowest cost sweetener for the period, although the quantity produced is relatively low and the unit cost not too much lower than for cane. Next comes low-cost cane sugar, constituted primarily of production from Center/South Brazil. Low-cost beet production is relatively more expensive than either low-cost cane or low-cost HFS production. The low-cost beet sugar producers (mainly the United States and several high-volume European Union countries) have average costs a bit more than 20 percent higher than those of the low-cost cane producers. High-cost beet producers have the highest unit production costs, about 90 percent higher than low-cost cane producers.

Figure A-10
World factory production costs for sugar



Geographically, cane producers in the NAFTA area have lower costs than non-low-cost producers in the other regional groupings.

Table A-2 shows cost ranges for some of the groupings over 2001/02–2012/13. The best indicator of change is the minimum of each of the range classifications. Although costs in all areas have been rising throughout the entire period, the largest changes have taken place since 2007/08. Within the groupings, production costs in the low-cost cane areas have risen the most—average costs in 2010/11-2012/13 are 138 percent higher than in 2001/02–2003/04. For the corresponding period, the weighted world average of cane costs is 69 percent higher. Increases in Cyclical Asia (India, China, and Pakistan) are 116 higher, but costs in the NAFTA area are only 47 percent higher. Beet costs have increased between 47 and 50 percent, and HFS costs have risen 64 percent.

Producers in the Center/South region of Brazil remain among the lowest cost producers in the world. However, for most of the period under observation, the cost competitiveness of C/S sugar has deteriorated. Brazilian costs have been affected by the upward valuation of the Brazilian *real* during much of this period, and, more recently, by difficult financial and economic conditions within Brazil. Figure A-12 shows that compared with other low-cost cane producers, the C/S cost advantage has deteriorated from a 27- to 37-percent advantage during 2001/02–2006/07 to an

Figure A-11
Distribution of sweetener production costs by type of producer, 2010/11 - 2012/13.

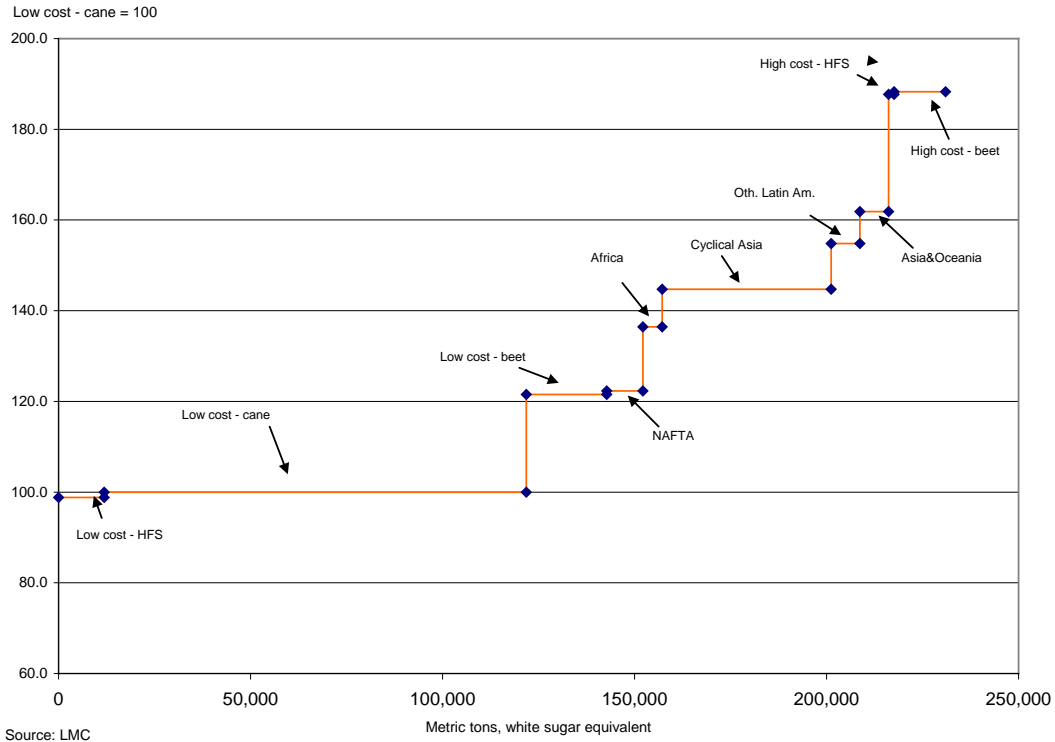


Table A-2 -- Ranges of average costs of producing cane sugar, beet sugar, and high fructose syrup, by select categories of world producers, 2001/02-2012/13.

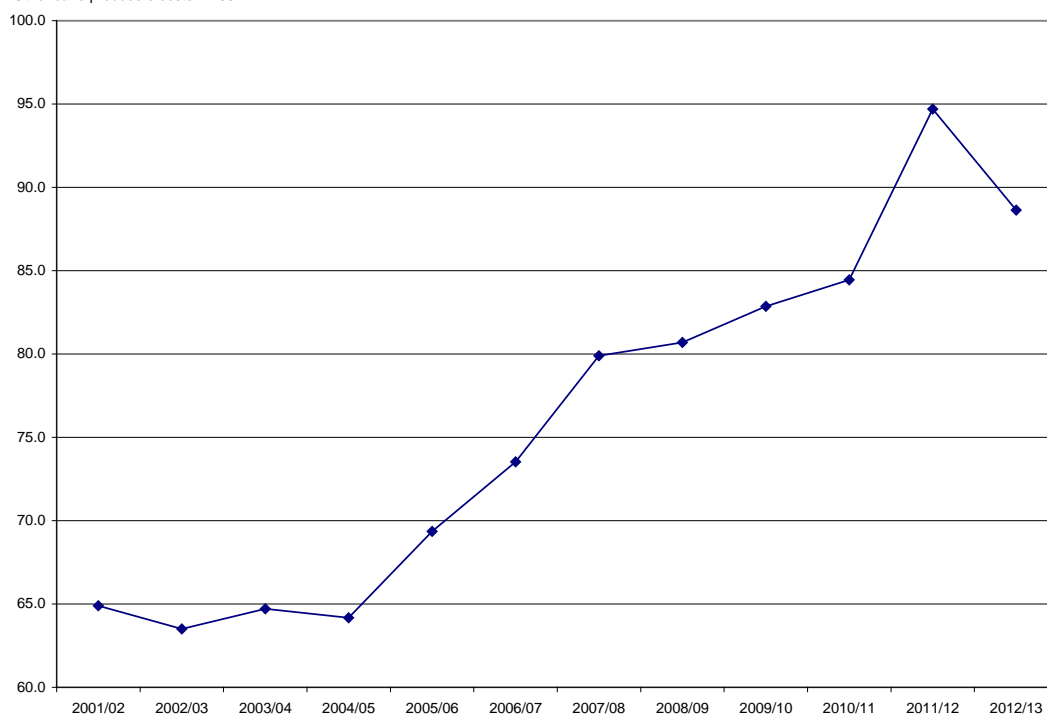
	2001/02-2003/04		2004/05-2006/07		2007/08-2009/10		2010/11-2012/13	
	Min	Max	Min	Max	Min	Max	Min	Max
Dollars/mt								
Cane sugar (white sugar equiv.)								
Low cost producers	127.5	327.8	164.8	372.8	258.5	447.6	303.5	494.6
NAFTA area	290.6	315.3	303.7	431.1	395.0	516.8	425.8	527.1
Cyclical Asia	219.7	373.9	288.4	533.3	326.5	711.1	476.0	812.6
Weighted world average	297.4	313.7	343.7	390.4	419.8	503.9	502.6	590.6
Beet sugar								
Low cost producers	278.4	824.1	313.7	678.2	356.0	806.6	418.5	667.1
Weighted world average	448.1	505.6	539.2	590.5	622.4	738.1	657.3	669.0
HFS								
Weighted world average	247.6	268.6	295.3	330.6	374.8	457.7	405.2	532.1

Source: LMC International.

average 20-percent advantage in 2007/08–2009/10 and an average 11-percent advantage in 2010/11–2012/13.

Figure A-12
Brazilian cane sugar production costs relative to all other low cost cane producers

Other cane producers costs = 100



Source: LMC International.

Concluding Summary

This report has summarized sugar and high fructose syrup cost developments over the period 2001/02–2012/13, based on a review of extensive production cost estimates undertaken by the international consultancy LMC International.

Sugar and HFS are produced worldwide under varying cost and technological conditions. Both products are processed in factories from raw agricultural products. HFS is generally less expensive to produce but is strongly affected by changes in prices of purchased grain inputs, especially corn. Sugar is processed from the primary crops sugarcane and sugarbeets. Sugarcane is produced in regions with tropical and subtropical climates, and sugarbeets tend to be produced in regions with more temperate climate conditions. Both primary crops are highly perishable, meaning that they must be processed soon after harvest and close to where they were grown. Because there is no identifiable market for either crop (due to the perishability), the cost of producing both cane and beet sugar includes the field cost of producing sugarcane and sugarbeets in addition to the costs of processing.

There have been substantial increases in costs of producing sweeteners. Average costs for world cane sugar production, white value (which includes the cost of refining), increased 69 percent; beet sugar production costs increased 48 percent; and HFS production costs increased 64 percent.

For cane sugar, the overall increases resulted from increased costs of labor, capital, and intermediate inputs, both in the field and factory. Increases in beet sugar production centered on increases in field operations, with capital and intermediate input costs rising the most. Increased efficiencies in beet sugar factories have moderated the rise in overall beet sugar costs. HFS costs have varied proportionally with the cost of purchased feedstocks, mainly corn.

Appendix

LMC International Engineering Cost Approach

LMC International bases its production cost estimates on an engineering cost approach. The approach starts with a detailed listing of inputs used to produce and process cane and beet sugar. For each physical factor input, a local price is attached to calculate the value. At the aggregate level, cost is measured across the two dimensions of factor use and operational level. The computations account for the physical input factors of labor, machinery, fuel, chemicals, and fertilizers used in alternative technologies in field, factory, and administrative operations, according to the schema:

Factors Operations	Labor	Capital	Fuel, chemicals, fertilizers	Overhead	Byproduct credits
Field	X	X	X		
Factory	X	X	X		-X
Administrative				X	

A separate set of engineering cost models is used for the manufacture of HFS.

On a more detailed level, LMC International separates out distinct processes for production operations. For example, sugarcane farming is divided into land preparation, cane planting, cultivation, fertilizer application, weed control, disease control, irrigation, cane cutting, cane loading, and cane transportation. Associated with each of these processes is a set of possible technologies. For cultivation, there are manual and mechanical alternative technology sets. In all cases, the technological alternatives range from those that are extremely labor-intensive to those that are highly capital-intensive. The engineering approach recognizes that it is common to find capital-intensive techniques being used alongside small-producer labor-intensive techniques. A process model is, therefore, a hybrid accounting of how a particular stage of production takes place in a particular country or region. The engineering approach requires a detailed understanding of production and processing methods in actual use in a country or region.

LMC International treats processing costs similarly. For cane, this covers all costs from the initial arrival of sugarcane to the delivery of raw sugar through to bulk storage at the mill. For beets, these costs account for everything through the delivery of refined white sugar to storage at the factory. For both cane and beets, all byproduct credits from the sale of molasses, beet pulp, and like products are applied against factory costs as a convention. This results in factory costs that are typically lower than field costs. (Because LMC International reports these credits as a separate item in its tables, it is possible to see how costs would be affected if they were attributed in some other way.) As with field costs, factory cost estimates are divided into their labor, capital, and fuel and chemical components. The effects of economies of scale, including the length of the processing season, are accounted for in estimating processing costs. The third stage of cost estimates is of administrative and overhead costs that cannot be adequately included solely as a field or factory expense.

The data are reported in terms of U.S. dollars, using official exchange rates.⁴ It is possible, therefore, for a country to become a low-cost producer by a depreciation of its currency and to become the opposite when its currency appreciates. (Although not reported here, LMC International uses various deflators when reporting country estimates in order to give a clearer picture of changing costs.) Capital costs are estimated on the basis of replacement costs. Real interest rates are used in the valuation of capital, and capital gains are excluded from revenue calculations. Because the benefits of capital goods investment flow over a number of years, using current exchange rates may bias depreciation charges. LMC International instead links the cost of capital to the U.S. index of capital goods prices, denominated in U.S. dollars.

The ideal way for tracking land costs is to attach value to the land in its next alternative use, i.e., its opportunity cost. This procedure is more easily followed for sugarbeets, where there are almost always returns from the cultivation of cereals and other crops. Information from land rental systems can be used to attach a value to land use. Where this procedure may prove difficult, costs associated with obtaining land suitable for sugarcane cultivation is treated as a separate production process.

HFS costs are calculated somewhat differently. Unlike for sugar, the purchase of the raw agricultural product (e.g., corn in most countries) is represented as a factory cost. The close links between growers and processors that typify the sugar industry are largely absent in relations between grain farmers and corn wet-millers. For that reason the cost of producing corn or the alternative feedstock is not included in the analysis as is the cost of growing beets and cane.

The process by which HFS is produced provides additional products, including ethanol, corn oil, feed products, starches, related sweeteners, and other chemicals. Because of the joint-product nature of the production process, LMC International tracks HFS production costs at two stages. The first is the processing of corn into a starch slurry. This process is common to all starch-based products. The second stage is the conversion of the starch slurry into HFS. Byproduct credits are separated out from the costs of processing and applied against corn costs, thereby reducing the net cost of the raw material. Administrative costs are implicitly included in the processing costs, and therefore are not separated out as they are with sugar.

⁴ Except for Cuba and Zimbabwe.