# Chapter 6

Sugar

#### **Market situation**

The world sugar market continues to experience considerable price volatility. The world indicator price for raw sugar witnessed a succession of peaks and downward corrections in 2010 before soaring to a 30-year high of USD 36.08 cts/lb (USD 795.4/t) in February 2011. Market fundamentals driving volatile prices were large global sugar deficits in the previous two seasons and adverse weather in a number of countries that reduced the size of the expected rebound in production to higher prices (Figure 6.1). World sugar stocks, which had already been drawn down, fell to their lowest level in 20 years in 2010-11, supporting higher as well as more volatile market prices.

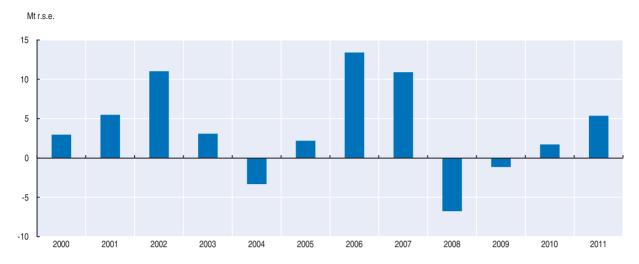
International sugar prices are expected to ease back over the remainder of 2011 and into 2011/12, as production responds around the world to recent high prices and the global balance moves into a larger surplus that allows the start of stock rebuilding.

# **Projection highlights**

- The raw sugar price (Intercontinental Exchange No. 11 spot, fob, Caribbean ports) in nominal terms is projected at nearly USD 408/t (USD 18.5 c/lb.) in 2020-21. This is lower than the historical peak at the start of the Outlook, but prices are expected to remain on a higher plateau and to average higher in real terms (when adjusted for inflation) over the projection period, when compared with the last decade. White sugar prices (Euronet, Liffe, Contract No, 407, London) follow a similar pattern and are projected to reach USD 508/t (USD 23cts/lb.) in 2020-21, with the white sugar premium narrowing with higher export volumes to average above USD 90/t over the coming decade (Figure 6.2).
- Brazil's sugar production, as one of the lowest cost sugar producers with considerable capacity to expand sugar cane area on a large scale, along with the projected growth in ethanol production, will be key determinants of global sugar production, which is projected to reach over 209 Mt in 2020-21. Government policies that intervene in sugar markets, and production cycles in some major cane producing countries of Asia, will continue to influence world sugar production and price volatility over the longer term. World sugar consumption is expected to grow at a lower average rate over the longer term in response to higher prices to reach 207 Mt in 2020-21.
- Stocks should rebuild in the near term, but the stocks-to-use ratio is expected to average lower over the coming decade than in the previous ten years, providing support for higher prices (Figure 6.3).

Figure 6.1. World sugar balance moves into surplus

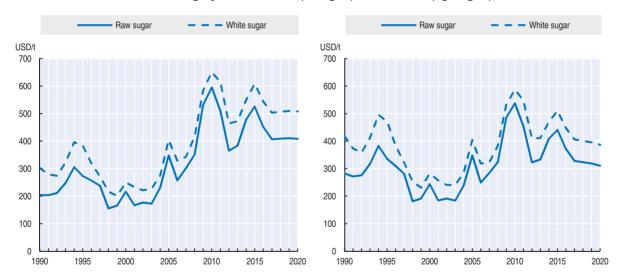
World sugar production less consumption



Source: OECD and FAO Secretariats.

StatLink http://dx.doi.org/10.1787/888932426885

Figure 6.2. World prices to decline but to remain on a higher plateau Evolution of world sugar prices in nominal (left figure) and real terms (right figure) to 2020<sup>1</sup>



Notes: Raw sugar world price: ICE Inc. No. 11, f.o.b., bulk spot price, October/September. Refined sugar price: White Sugar Futures Contracts, No. 407, Euronext market, Liffe, London, October/September.

1. Real sugar prices are nominal world prices deflated by the US GDP deflator (2005 = 1).

Source: OECD and FAO Secretariats.

# Market trends and prospects

#### **Prices**

World sugar prices are projected to decline from historical highs at the start of the Outlook, but to remain on an elevated plateau and to average higher in real terms to 2020-21, compared with the past decade. The margin between raw and white sugar – the white premium – is expected to decline from the high level in 2010 and then to average above USD 90/t over the projection period, reflecting increased sales of white sugar by some traditional sugar exporters and from new destination refineries in the Middle East and Africa.

World sugar prices are expected to follow a wave pattern over the projection period, similar to the past decade, as a result of a continuation of government policies that intervene in sugar markets in many countries and production cycles in Asia, particularly in India, that cause large, periodic swings in trade between imports and exports. As a consequence, world prices are projected to fall to a trough in 2012-13 as production peaks in India and rises in other countries and additional exports are placed on (or lower imports are drawn from) the world market. Subsequently, the cycle in India enters the down phase leading to a shortfall in production and the need for large imports to meet consumption needs that boost the world price in 2015-16. The upturn in the cycle then recommences leading to a further drop in world prices in 2017-18 and so on.

Brazil, as the leading sugar producer and dominant global trading nation, has attained the status of a "price setter" on the world market with international sugar prices usually correlated with its relatively low production costs. Sugar production costs in Brazil, along with those of other major exporters of Australia and Thailand, have increased in recent times with the appreciation of their currencies against the US dollar. The size of the annual sugar cane crop in Brazil, together with its allocation between ethanol and sugar production are key factors underlying the projection of international sugar prices to 2020-21. Sugar production in Brazil is expected to continue to account for less than 50% of its enormous sugarcane harvest which should approach 1 bt by the close of the decade.

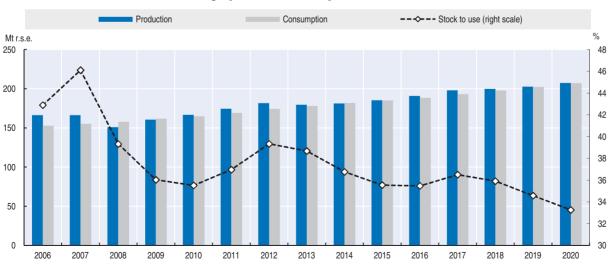


Figure 6.3. **Global stocks-to-use to rise in near term and then decline**Evolution of world sugar production, consumption and stock-to-use ratio to 2020

Source: OECD and FAO Secretariats.

#### Production and use of sugar

Sugar crops in many parts of the world are projected to expand in response to rising demand for sugar and other uses and relatively high market prices. World sugar production is expected to increase by 50 Mt to reach over 209 Mt in 2020-21. The bulk of the additional sugar production will come from the developing countries and the main burden of growth will continue to fall on Brazil. Brazil has expanded production rapidly in the past two decades, but a slowdown in investment in new mills occurred after the financial crisis of 2008, slowing overall growth in following years. The recent surge in sugar prices has improved profitability and should trigger additional investment to come on stream within the decade, with output rising by around 11 Mt to nearly 50 Mt by 2020-21.

India, the second largest global producer and the world's leading consumer, is expected to boost production substantially to 32 Mt of sugar per year, on average, in the coming decade, or some 50% higher than in 2008-10, when production fell sharply. Annual sugar output will continue to be subject to periodic large swings in response to the longstanding production cycle (Figure 6.4). Some other countries of Asia, such as China and Pakistan, are also expected to continue to experience milder forms of production cycles, which contribute to fluctuations in production and their import volumes. Outside this group, an expansion drive underway in Thailand is expected to continue as investment projects currently in the pipeline come on stream, lifting production to around 8.7 Mt by 2020-21, and maintaining its position as the world's third largest producer.

Production Imports --->--- Raw sugar world price (right hand scale) Mt r.s.e. '000 INR/t Source: OECD and FAO Secretariats

Figure 6.4. **India's production cycle to influence world prices**Evolution of India's sugar production, consumption and imports to 2020

In contrast, to the expansion trends in the developing world, the traditional sugar industries in a number of developed countries are expected to witness static or lower production over the coming decade. For instance, in the European Union quota based sugar production has declined with policy reform and is expected to stabilise around 13.4 Mt wse (14.4 Mt rse), with a continuation of existing production quotas, to equilibrate the domestic market in a context of stable consumption, a fixed volume of subsidised exports and projected higher imports. Some additional out-of-quota sugar beet production is expected

to arise over the projection period for use in ethanol production and the chemical industry. Production of sugar in the United States is expected to show little growth and to remain well below the 85% minimum allotment level of the 2008 FCE Act. US producers are expected to focus on improving their sugar margins by cutting costs and essentially leaving Mexico to fill the expanding gap between stable production and higher US consumption requirements.

Assured access to higher prices in the slowly growing US market is expected to encourage some further investment and growth in Mexico's sugar production to 2020-21. The sugar industry in Australia, although devastated by flooding and a cyclone in 2010, is expected to recover in coming years. However, with continuing pressure on land available for sugarcane production, sugar producers will likely focus on higher productivity, based on farm consolidation and improved cane varieties and higher sugar yields, rather than cane area expansion, in lifting output to around 5 Mt in 2020-21. The sugar industry in the Russian Federation has undergone a transformation in recent years and is projected to continue to expand production, under the stimulus of high domestic support measures, to reach nearly 5 Mt by 2020-21.

Global sugar consumption has continued to increase despite the continuing economic difficulties in many developed countries, compounded by the period of high sugar prices and increased volatility. This has slowed sugar use at the start of the Outlook period and slower consumption growth is expected to continue over the longer term as world sugar prices average higher in real terms. Global consumption is projected to grow at 2.2% p.a. to 2020-21, and down from 2.6% p.a. in the previous ten years. The developing countries will continue to experience the strongest growth in sugar consumption, fuelled by rising incomes and populations, although with considerable variation between countries. The sugar deficit regions of Asia and the Far East as well as Africa, will be responsible for most of the expansion in use. In contrast, sugar consumption in many developed countries, with their mature sugar markets, are expected to show little or no growth. Total consumption in these countries is expected to increase from 48Mt to nearly 52 Mt over the projection period. This reflects, among other things, slowing population growth and dietary shifts that are underway as a result of increasing health awareness and concerns with obesity and related health issues.

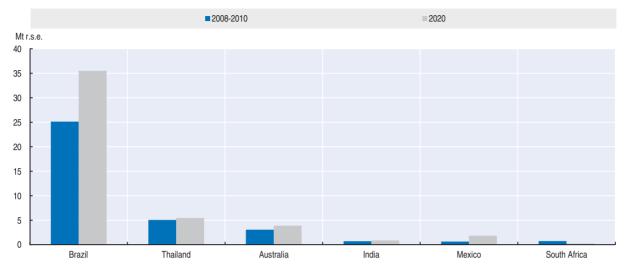
#### Trade

Over the last decade, there have been a number of structural changes affecting the evolution of trade patterns which will continue to influence international sugar transactions in the coming period. These include increased concentration in sugar export trade, with a smaller number of global exporters, and a decline in the volume of white sugar traded internationally (Figure 6.5). The reform of the sugar regime in the European Union led to an abrupt decline in white sugar exports, of the order of 6-7 Mt, as production quotas were progressively reduced below consumption requirements. As a consequence, the EU has switched from a large net exporter of white sugar to a large importer of mainly raw sugar for further refining and sale in the domestic market.

The white sugar trade is expected to recover over the coming years. This will occur as more refined sugar is exported by traditional exporters in response to the high white sugar premium at the start of the Outlook and as new destination refineries in a number of countries in Africa and the Middle East progressively come on stream and begin to export increasing quantities of white sugar to neighbouring countries and regional markets.

Figure 6.5. Sugar exports remain highly concentrated and dominated by Brazil

Comparison of export volumes of leading exporters between 2008-10 and 2020

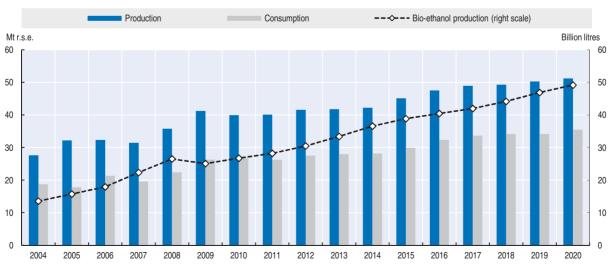


Source: OECD and FAO Secretariats.

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Brazil is expected to consolidate its position as the leading global exporter and will account for over 55% of global trade and over 63% of all additional sugar exports by the close of the projection period. While the bulk of Brazil's exports will continue to comprise high quality raw sugar (VHP), which increase to 21 Mt in 2020-21, the composition of trade will also start to favour white sugar shipments which grow by 50% and amount to over 12 Mt, in the same period (Figure 6.6). The growing concentration of global sugar exports is not without risks for sugar users as world export supplies depend increasingly on the growing conditions of a single country. This may be another factor, in addition to

Figure 6.6. **Sugar production and exports to grow in Brazil as ethanol output expands**Evolution of sugar production, exports and ethanol output from sugarcane in Brazil



Source: OECD and FAO Secretariats.

production cycles in Asia, which contributes to future market volatility. A possible counterweight is that a majority of Brazil's sugar cane will continue to be used for ethanol production and many mills have the capacity to produce both sugar and ethanol. Brazil also remains the only exporter that can switch 5-10% of milling capacity between sugar and ethanol production within a year in response to changes in relative profitability between the two end uses. This flexibility should help assure sugar production and export availabilities, when relative prices periodically favour sugar over ethanol production.

In terms of other leading exporters, Thailand plays a unique role in Asia as the only consistent producer of a large sugar surplus and with a natural trade advantage, along with Australia, to service the large and ballooning sugar deficit in that region. Exports from Thailand, which is ranked number two in the world, are projected to grow to around 5.8 Mt by 2020-21, exceeding the 2003 record. In the case of Australia, increased production over the projection period should support exports of around 3.8 Mt by 2020-21. Strong demand for HFCS in Mexico, which is expected to grow to 75% of total sweetener consumption and similar to the situation in the US, will substitute for sugar used in beverage manufactures, releasing surplus sugar for export to the US market. Mexican exports to the preferred US market are projected to exceed 1.8 Mt by 2020-21.

Sugar importers make up a broader, more diversified group of countries (Figure 6.7). A significant development in 2010-11 was that China exceeded for the first time the TRQ of 1.95 Mt established on sugar imports at the time of its entry to the WTO in 1998. Rapid economic growth and urbanisation trends are promoting the industrial use of sugar in food manufacture and preparations. Along with low *per capita* sugar consumption levels of only 11 kg per person in the population at large and tightening government controls on the production and use of artificial sweeteners, these are expected to lead collectively to strong growth in sugar use in China in coming years. Sugar disappearance is projected to grow by over 3% p.a., exceeding the growth of production which is increasingly limited by tightening water availability, and boosting sugar imports to over 5 Mt by 2020-21. This will make China the largest importer exceeding that of the EU, US and the Russian Federation (Figure 6.8).

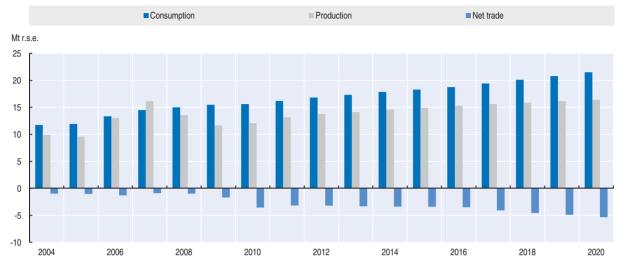
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Figure 6.7. **Sugar importers are more diversified**Comparison of import volumes between 2008-10 and 2020

Source: OECD and FAO Secretariats.

Figure 6.8. China's imports to rise strongly

Evolution of China's sugar production, consumption and imports to 2020

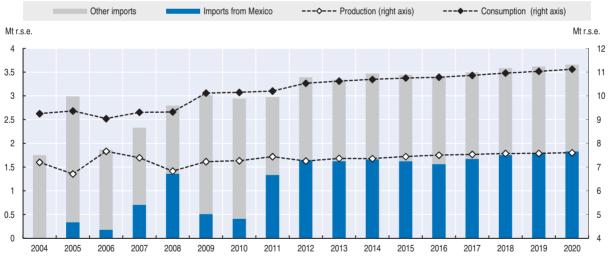


Source: OECD and FAO Secretariats.

StatLink http://dx.doi.org/10.1787/888932427018

Figure 6.9. Higher US consumption fed by rising Mexican imports

Evolution of US sugar production, consumption and imports to 2020



Source: OECD and FAO Secretariats.

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High world sugar prices at the onset of the Outlook period and declining internal prices with sugar policy reform have made the European Union a less attractive destination for preferential exports from LDC countries under the EBA initiative and Economic Partnership Agreements. As world prices recede, the EU as an assured market will likely become an attractive destination once more for many of these countries, although ongoing problems with infrastructure and technology adoption could constrain some LDC countries from exploiting fully their export opportunities. The United States sugar market remains

heavily insulated from the world market with prohibitive tariffs and safeguard measures on imports in excess of minimum TRQ volumes. With duty-free and unrestricted imports expected to grow from Mexico under NAFTA over the coming decade, US imports under its WTO TRQ and other trade agreements are projected to be maintained at minimum levels. Total US imports are projected to reach 3.6 Mt in 2020-21, and are not assumed to trigger the Feedstock Flexibility Program (FFP) under the FCE Act for converting excess sugar supplies to ethanol in order to maintain domestic sugar prices above support levels (Figure 6.9). For its part, Mexico is expected to backfill periodically from the world market to assure its domestic consumption requirements and exports in periods of lower production. Finally, imports of the Russian Federation, which historically had been a leading destination for white sugar, before switching in the early 1990s to raw sugar imports for domestic processing, are projected to decline to around 1 Mt in 2020-21, as expanding domestic production and stable consumption lead to further import substitution

#### Main issues and uncertainties

The medium term sugar projections discussed in this chapter are a conditional scenario of likely market developments based on economic, policy and normal weather assumptions. Should any of these assumptions change, the resulting set of sugar projections would also be different. For the international sugar market a number of major uncertainties remain. In the light of the relatively tight world market situation at the beginning of the Outlook period with stocks at 20 year lows, any major production disruptions in the main producing countries of Brazil and India, could radically change the market outlook in the near term, igniting further bouts of high volatility and prolonging the period of high world sugar prices.

Another issue is whether the recent high prices and improved profitability could lead to a repetition of over investment in sugar production capacity in major sugarcane producing countries. This has been a feature of past periods of high prices in countries where sugar production is based on the perennial sugarcane crop. Sugarcane with multi-year harvests (ratoons) associated with one planting is the dominant source of sugar today. This characteristic can go a long way to explaining the history of world sugar prices – short price spikes, followed by longer periods of low and depressed prices until steady consumption growth eventually erodes the production surplus.

The world sugar market has undergone a number of reforms and structural changes over the past decade. Nonetheless, it remains heavily distorted by government policy interventions that contribute to high price volatility. Changes in domestic support policies and border measures, such as the imposition of export restrictions, have a major bearing on trade volumes and international prices. Other uncertainties are future policy choices for sugar in the European Union and the sugar provisions of forthcoming US Farm Bills. Changes in oil and energy prices and their implications for the share of sugarcane dedicated as a feedstock for ethanol production, particularly in Brazil, will also influence the market.

#### Box 6.1. India: The role of policies in the sugar production cycle

The international sugar market remains one of the most volatile of all commodity markets. One of the contributory factors to this volatility is policy-induced production swings among some Asian countries, particularly India. A longstanding feature of the sugar market in India is the cyclical nature of production, where 2-3 years of surplus are followed by 2-3 years of deficit. In recent years, the cycle has been more pronounced, with larger swings in production and trade. After an increase in 2006/07 to 30.1 Mt, 33% over the record 2002/03 crop, sugar output declined to 15.2 Mt in 2008/09 and is currently estimated at 28 Mt for 2010/11. Trade generally follows a similar trend, with imports exceeding 2 Mt during the deficit phase of the cycle, replaced by large exports during the surplus phase. Weather patterns of course are a key factor as sugarcane yields are greatly affected by the level of rainfall, notably during the critical monsoon season. But, domestic sugar polices amplify the cycle through their effect on incentives along the sugar value chain, including for farmers and sugar factories.

There are four broad areas of public intervention that regulate the sugar market in India. First, both the Central and the State Governments set a price support for sugarcane. In general, the Central Government announces a price level, referred to as the statuary minimum price for sugar (SMP),\* at which sugar factories are legally required to pay farmers for their sugarcane. The SMP is then raised by State Governments to account for differences notably in productivity and transportation cost. The second area of intervention is through restrictions on sugar quantities to be sold on the market, as well as imposing on the sugar factories a so-called sugar levy, by which they are required to sell at below market price to the public distribution centres. In addition, the government regulates sugar trade via export limitations and marketing restrictions, such as limits on private stockholdings.

Initially, the government introduced these polices to sustain the income of sugarcane farmers while at the same time protecting consumers from sugar price inflation. Reconciling these objectives is a challenge as fixed sugarcane prices are disconnected from the relatively marketbased sugar prices. In the years of surplus production, sugar factories are caught in a price-cost squeeze with low sugar prices and relatively elevated fixed sugarcane costs. As sugar mills struggle to pay farmers at the obligatory price, growers eventually substitute alternative crops for sugarcane. As cane area is reduced and input use on standing cane is reduced, cane production falls significantly - this corresponds to the trough of the cycle. The downfall in production shifts the sugar balance into the deficit phase and provides an upward support to sugar prices. Eventually, sugar factories become solvent and begin to repay arrears to growers. As the incidence of default declines, sugarcane cultivation becomes attractive once more, shifting the domestic sugar balance into the upside phase of the cycle. Hence, the accumulation of arrears, brought about by a lack of instantaneous alignment between sugarcane and sugar prices, is causing, to a great extent, the cyclical nature of sugar production in India. Further, inelastic supply in the short-run, because of the perennial nature of sugarcane, means that farmers cannot adjust quickly to the realities of the market, hence prolonging the upside and downside phases of the cycle.

Against a backdrop of recurrent large swings in production, sugar demand in India has been growing steadily at about 4% per year over the past 10 years. Therefore, the domestic production and consumption balance moves from periods of surpluses and deficits, leading to often significant changes in the trade position. For instance, in 2007/08, exports reached 4.7 Mt (9.7% of world exports), but in 2009/10, these were replaced by imports of about 4 Mt (7% of world imports). These changes in trade channel the swings in domestic production to the international sugar markets, contributing to its volatility, especially during periods of global market tightness.

### Box 6.1. India: The role of policies in the sugar production cycle

The potential for expanding sugar production in India exists and can be fully exploited if adjustments were introduced to ensure a market driven relationship between sugar and sugarcane prices. Also, relaxing some of the existing measures, such as the monthly releases, could provide sugar factories with some cash flow flexibility. The use and valorisation of sugarcane by-products, such as ethanol, electric power, and other derivatives, can cushion against low sugar prices and other market risks. Clearly, the liberalisation of the sugar industry can only be undertaken within the context of broader domestic reforms, because of the linkages on both demand and supply sides that prevail in agricultural commodity markets.

\* Beginning 2009/10, the SMP was replaced by the concept of Fair and Remunerative Price (FRP), which takes into account "reasonable margins" for growers of sugarcane.

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International Sugar Organization, Quarterly Market Outlook, (2011), Mecas (11)02, February 2011, London.

# ANNEX 6.A

# Statistical tables: Sugar

6.A.1. Wor	ld sugar projections	http://dx.doi.org/10.1787/888932427987
Tables availab	le online:	
6.A.2.1. Sug	ar projections (in raw sugar equivalent):	
prod	luction and trade	http://dx.doi.org/10.1787/888932428006
6.A.2.2. Suga	ar projections (in raw sugar equivalent):	
cons	sumption, per capita	http://dx.doi.org/10.1787/888932428025
6.A.3. Mair	n policy assumptions for sugar markets	http://dx.doi.org/10.1787/888932428044

Table 6.A.1. World sugar projections

Crop year

		Avg 08/09- 10/11est	11/12	12/13	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21
DECD <sup>1</sup>												
SUGAR BEET												
Production	mt	155	145	144	147	149	152	154	156	156	157	157
Biofuel use	mt	17	18	19	20	23	26	28	29	30	30	30
SUGAR CANE												
Production	mt	110	113	116	115	116	118	120	123	126	127	128
SUGAR												
Production	kt rse	36 554	35 104	35 636	36 092	36 259	36 730	37 119	37 664	38 139	38 376	38 576
Consumption	kt rse	43 529	43 860	44 538	44 889	45 140	45 380	45 686	46 019	46 372	46 684	47 039
Closing stocks	kt rse	14 167	12 830	12 179	11 920	11 967	11 988	12 086	12 408	12 798	13 101	13 364
HFCS												
Production	kt	12 734	12 993	12 819	12 885	12 977	13 096	13 199	13 303	13 384	13 492	13 580
Consumption	kt	12 763	12 756	12 604	12 650	12 721	12 811	12 902	12 981	13 018	13 091	13 150
NON-OECD												
SUGAR BEET												
Production	mt	67	75	76	77	78	80	83	85	85	85	86
SUGAR CANE												
Production	mt	1 518	1 546	1 619	1 642	1 686	1 723	1 765	1 828	1 867	1 926	1 981
Biofuel use	mt	340	380	409	444	482	509	538	560	589	630	670
SUGAR												
Production	kt rse	122 370	138 235	144 650	143 366	144 523	147 574	155 712	161 507	163 405	167 358	170 832
Consumption	kt rse	117 928	124 726	129 447	132 633	135 911	138 473	142 984	147 399	151 534	156 011	160 442
Closing stocks	kt rse	45 120	48 087	53 624	54 401	52 669	51 682	54 329	58 343	60 174	61 493	61 740
HFCS												
Production	kt	1 181	1 456	1 495	1 537	1 574	1 611	1 645	1 678	1 708	1 742	1 777
Consumption	kt	1 142	1 547	1 565	1 627	1 684	1 750	1 797	1 855	1 927	1 997	2 061
WORLD												
SUGAR BEET												
Production	mt	221	220	220	224	227	232	237	240	241	242	244
Area	mha	4	4	4	4	4	4	4	5	5	5	5
Yield	t/ha	51	51	51	51	52	52	53	53	53	54	54
Biofuel use	mt	17	18	19	20	23	26	28	29	30	30	30
SUGAR CANE												
Production	mt	1 627	1 659	1 734	1 757	1 802	1 841	1 885	1 951	1 993	2 054	2 109
Area	mha	23	24	25	25	26	26	26	27	28	28	29
Yield	t/ha	69	68	69	69	70	71	71	72	72	73	74
Biofuel use	mt	340	380	409	444	482	509	538	560	589	630	670
SUGAR												
Production	kt rse	158 925	173 339	180 286	179 458	180 783	184 304	192 831	199 170	201 544	205 733	209 408
Consumption	kt rse	161 457	168 586	173 985	177 522	181 051	183 853	188 670	193 418	197 906	202 695	207 481
Closing stocks	kt rse	59 286	60 917	65 802	66 321	64 637	63 671	66 415	70 750	72 972	74 594	75 104
Price, raw sugar <sup>2</sup>	USD/t	492.8	509.5	365.4	383.2	478.8	525.9	451.3	406.6	408.8	410.9	408.1
Price, white sugar <sup>3</sup>	USD/t	550.2	614.2	464.1	472.4	550.1	608.7	543.5	503.3	506.7	509.6	507.8
i iioc, willic suyai	000/1	528.1	011.2	10 1.1	172.4	000.1	000.7	0.0.0	000.0	000.1	000.0	007.0

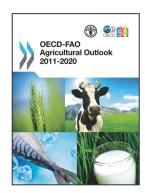
Note: Crop year: Beginning crop marketing year - see the Glossary of Terms for definitions.

 ${\sf rse:raw\;sugar\;equivalent}.$ 

HFCS: High fructose corn syrup

- 1. Excludes Iceland but includes EU6 members that are not members of the OECD (Bulgaria, Cyprus, Latvia, Lithuania, Malta and Romania).
- 2. Raw sugar world price, ICE Inc. No11 f.o.b, bulk price, October/September.
- 3. Refined sugar price, White Sugar Futures Contract No. 407, Euronext market, Liffe, London, Europe, October/September.
- 4. US wholesale list price HFCS-55, October/September.

Source: OECD and FAO Secretariats.



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