

# **Production of Starch Sugar in China 2016–2020**

**The Third Edition**

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## Executive summary

China saw steady development in starch sugar industry in recent years. The capacity and output of liquid starch sugar has increased steadily during 2016–2020. In 2020, the total capacity was added up to 14,916,000 t/a from 12,225,000 t/a in 2016, seeing at a CAGR of 5.10%; and the total output reached 9,053,600 tonnes, from 7,291,200 tonnes in 2016, seeing at a CAGR of 5.56%.

### Growth highlights:

- The national output of maltose syrup increased at a CAGR of 11.43% in 2016–2019, up from 1,390,000 tonnes in 2016 to 1,923,000 tonnes in 2019.
- In 2016–2019, China's capacity of glucose syrup sustained steady growth, and in 2020, it jumped by 11.42% year on year to 3,025,000 t/a in 2020.
- The output of high fructose corn syrup (HFCS) in China rose at a CAGR of 8.58% in 2016–2018, reaching 4,512,000 tonnes in 2018.
- Slight growth in the capacity of maltodextrin in China was seen from 2018 to 2020, with a CAGR of 2.17%.

Prices of most starch sugars fell in 2016 due to falling prices of corn and other raw materials. However, prices have recovered after Jan. 2017, as prices of raw material corn and corn starch kept at high level, which drove up production cost of starch sugars. Prices rose rapidly in H2 2020 and ended the year with the highest level in the past five years.

## **Introduction and methodology**

### **Introduction**

This report presents the development of starch sugar industry in China from 2016 to 2020, together with the production situation of maltose syrup, glucose syrup, high fructose corn syrup (HFCS) and maltodextrin, which are main starch sugars across the market. It attaches importance to the following parts:

- Review of hot spots in China's starch sugar industry, 2018–2020
- Capacity and output of major starch sugars in China, 2016–2020
- Major producers and distribution of major starch sugars in China, 2016–2020
- Monthly ex-works price of major starch sugars in China, 2016–2020

### **Methodology and source**

The report is based on data sourced by diverse methods, which are listed as follows:

#### **- Desk research**

Desk research includes access to published magazines, journals, government statistics, industry statistics, customs statistics, association seminars as well as information on the Internet. Much work has gone into the compilation and analysis of the information obtained. When necessary, information has been checked and discussed internally related to market structure and performance characteristics, such as key producers, key end users, production levels, demand from end users.

#### **- Telephone interview**

CCM has conducted extensive telephone interviews with major participants in the industry in order to research the starch sugar market in China.

The interviewees include the following groups:

- Key producers
- Key traders
- Associations involved
- Industry experts

#### **- Network search**

CCM employs network to contact industry participants by using B2B websites and software.

#### **- Data processing and presentation**

The data collected and compiled was variously sourced from:

- CCM's database
- Published articles from periodicals, magazines, journals and third-party databases
- Statistics from governments and international institutes
- Telephone interviews with domestic producers, joint ventures, service suppliers and government agencies
- Third-party data providers
- Customs statistics

The data has been combined and cross-checked to ensure that this report is as accurate and methodologically sound as possible. Throughout the process, a series of discussions were held within CCM to systematically analyse the data and draw appropriate conclusions.

### - Unit and abbreviation

RMB: currency unit in China, also called Yuan  
USD: currency unit in the US, also called US dollar  
tonne: equals to metric ton in this report  
t/a: tonne/annual or tonne/year  
/t: per tonne  
CAGR: compound annual growth rate

Table USD/CNY exchange rate, 2016–2020

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Yearly average
2016	6.5527	6.5311	6.5064	6.4762	6.5315	6.5874	6.6774	6.6474	6.6715	6.7442	6.8375	6.9182	6.6425
2017	6.8918	6.8713	6.8932	6.8845	6.8827	6.8019	6.7772	6.7148	6.5909	6.6493	6.6300	6.6067	6.7662
2018	6.5079	6.3045	6.3352	6.2764	6.3670	6.4078	6.6157	6.8293	6.8347	6.8957	6.9670	6.9431	6.6070
2019	6.8482	6.7081	6.6957	6.7193	6.7344	6.8896	6.8716	6.8938	7.0883	7.0726	7.0437	7.0262	6.8826
2020	6.9614	6.9249	6.9811	7.0771	7.0690	7.1315	7.0710	6.9980	6.8498	6.7796	6.7050	6.5921	6.9284

Source: The People's Bank of China

## 1 Overview

As high-quality sweetener, starch sugars are more widely used than the traditional sweet additive white sugar. They can be used in food industry, and in pharmaceutical and chemical industries, too. Starch sugars, mainly including maltose syrup, glucose syrup, high fructose corn syrup (HFCS) and maltodextrin, have seen their consumption fields expand and played an increasingly important role in domestic market in recent years.

Starch sugar, as strong competitor of white sugar, has advantages of low sweetness, no side effects and low price. The largest downstream field of glucose syrup is food industry, which accounts for about 60% of the total domestic consumption. Major downstream fields of maltose syrup and HFCS are beer and sugary beverages. Yet with people paying more attention to health, the consumption of sugar continues decreasing. Thus affected, starch sugars saw unimproved demand from downstream sectors (sugary food industry, pharmaceutical industry, etc.) in recent years, and oversupply ensued.

Starch sugar industry in China has seemingly nearly reached a plateau, developing at a relatively slow speed, which is mainly due to the policy impact (environmental protection for corn deep processing industry, etc.), overcapacity and saturated consumption. In the past five years, some small and weak companies left the industry, but some others saw a future here and joined the competition.

But still, the challenges may push forward the development and innovation of the production and process technology, which would improve the quality, enrich the varieties, and enlarge the application of starch sugar products.

## 2 Hot spots of starch sugar industry in China, 2018–2020

### Governmental Direction

**On 3 July, 2018**, China's cabinet released a three-year action plan on air pollution control, solidifying a timetable and roadmap for improving air quality. Efforts would be focused on areas including the Beijing-Tianjin-Hebei region and neighboring areas, the Yangtze River Delta, and the Fenhe and Weihe river plains. These areas were home to many producers of starch sugar and sweeteners.

The three-year action plan would see a tougher enforcement thanks to the clearer arrangement of responsibilities. Hence, related enterprises would have to increase investment in environmental protection in order to meet the higher standards.

**On 24 Sept., 2018**, China started to levy additional tariffs of either 10% or 5% on 5,207 items of US exports that were worth USD60 billion. Since 24 Sept., 2018, 10% additional tariffs had been imposed on some starch sugar products, including glucose and syrup with a low fructose content (HS 17023000), chemically pure fructose (HS 17025000) and other fructose and syrup (HS 17026000).

**On 9 May, 2019**, the US government declared to add tariffs on USD200 billion worth of Chinese products from 10% to 25%. As a countermeasure to this provocation, Ministry of Finance of the People's Republic of China announced on 13 May, 2019 that the Customs Tariff Commission of the State Council had decided to add more taxes on USD60 billion worth of US goods that had been under higher tariff rates. However, those with 5% tariffs would not be influenced.

Thus, tariffs on glucose and syrup with low fructose content (HS 17023000), chemically pure fructose (HS 17025000) mounted from 10% to 25%. The tariff adjustment would have great effect on chemically pure fructose due to large imports from the US. In 2018, China imported 497 tonnes of chemically pure fructose from the US, accounting for 22.9% of China's total imports of this category.

**On Feb. 17, 2020**, the Tariff Commission of The State Council issued a notice "To carry out the elimination of market-based procurement of goods subject to additional tariffs on the US". By the eliminating system, Chinese enterprises can apply for exemption from additional tariffs on qualified imports purchased from the US in accordance with the principles of marketization and commercialization. Imports that are eligible for this policy include corn, wheat, soybeans, sorghum, DDGS, and modified ethanol, etc.

### Market Dynamics

**On 4 July, 2018**, New Francisco Biotechnology Corporation Limited announced the approval of its construction of a new GMP plant. With a construction period of 12 months, the plant was expected to be put into operation in Aug. 2019. After completion, it would be capable to produce 25,000 tonnes of starch sugar, 10,000 tonnes of galactooligosaccharides (GOS) and 2,000 tonnes of fructooligosaccharide (FOS) per year. As of Dec. 2020, this project was still under construction.

**On 19 July, 2018**, Qiqihar Longjiang Fufeng Biotechnology Co., Ltd. had started to install production equipment for the second phase of its corn deep-processing project, with some production lines to be put into production in late Aug. 2018.

About the corn deep-processing project:

- First phase: went into production in Dec. 2017, with three production lines included—a 300,000 t/a corn feed production line, a 100,000 t/a threonine production line, and a 200,000 t/a crystalline glucose production line.
- Second phase: construction started in April 2018 and it was capable to produce 200,000 t/a of lysine, 400,000 t/a of crystalline glucose, and 300,000 t/a of corn feed (by-product).
- Third phase: 500,000 t/a of citric acid and 200,000 t/a of threonine would be produced.

As of June 2021, the second phase of this project had been completed, and the third phase was still under construction.

**On 30 Nov., 2018**, Xiwang Group Co., Ltd. (Xiwang Group) held the second Corn Fructose Food Application Promotion convened in Zouping County, Shandong Province. During the conference, Xiwang Group declared that it planned to increase its corn fructose production capacity by 500,000 tonnes per year within five years (2018–2023).

**On 16 Dec., 2018**, Wuhan COFCO Food Technology Co., Ltd. officially started the invitation of bids for the decoration and purchase of equipment of the lab of its 480 t/d HFCS project. The project was scheduled to be finished in Jan. 2019 with a total investment of USD32.35 million (RMB224.58 million). This project was put into trial operation in June 2019.

**On 8 March, 2019**, Heilongjiang Haotian Corn Development Co., Ltd. announced the completion of the starch sugar project with a capacity of 150,000 t/a. It was an expansion project, located in Suihua City of Heilongjiang Province, covering an area of 420,000 m<sup>2</sup> with a total investment of USD22.40 million (RMB150 million). The construction scale is 150,000 t/a starch sugar, including 100,000 t/a maltose syrup and 50,000 t/a F55 HFCS.

**On 25 June, 2019**, Zhaoqing High-Tech Network issued a public notice on the acceptance of EIA report for Zhaoqing Huanfa Bio-technology Co., Ltd.'s expansion project. According to the announcement, the total investment of this project was USD51.08 million (RMB351 million). New construction was conducted in Zhaoqing City, Guangdong Province. After completion, the annual yield of HFCS was expected to be increased by 10,000 tonnes. The project was re-approved in August 2021, and the original construction content was adjusted to retain 10,000 t/a of HFCS while expanding 100,000 t/a glucose syrup. The expansion was completed in 2021.

**On 31 July, 2019**, Heilongjiang Jinxiang Biochemical Co., Ltd., subordinate to Xiamen Xiangyu Group Corporation, held a commissioning ceremony for the 1.5 million t/a of corn deep processing project in Suihua City, Heilongjiang Province. The total investment of this project reached USD582.11 million (RMB4 billion). After completion, it was expected to produce 1.5 million t/a corn, 700,000 t/a crystallized glucose, 300,000 t/a sugar for fermentation, 100,000 t/a threonine and 10,000 t/a tryptophan.

**On 29 May, 2020**, Global Sweeteners Holdings Limited issued a statement to update the status of production suspension for its subsidiaries.

According to the announcement,

- At upstream business, the company decided to suspend the production of Jinzhou Yuancheng Biochemical Technology Co., Ltd. (Jinzhou Yuancheng), due to significantly decreasing prices of upstream products caused by the COVID-19 and the government's intention to increase food reserves.
- For downstream business, the suspension of upstream operations of Changchun Dacheng Biotechnology Development Co., Ltd. (Dacheng Biotechnology) and Jinzhou Yuancheng led to the interruption of corn starch supply, resulting in a shortage of raw materials for downstream production. Besides, the northeastern China's sweetener market continued to be depressed from Q1 2020. In order to be cost-effective, the company decided to continue to suspend downstream operations of Changchun Dihao Foodstuff Development Co., Ltd. and Jinzhou Dacheng Food Development Co., Ltd.

**On 12 June, 2020**, Cargill Bio-Chemical Co., Ltd. announced that its 2 million t/a corn intensive-processing project was put into trial operation. With a total investment of USD318.65 million (RMB2 billion), this project started construction in April 2018 and was predicted to develop an ability to produce 300,000 t/a corn starch, 300,000 t/a HFCS, 200,000 t/a high-maltose syrup, 200,000 t/a sugar alcohol and 60,000 t/a spray-dried products.

**On 21 July, 2020**, Guangzhou Shuangqiao Co., Ltd. released the EIA report of 1 million t/a starch sugar series products project. According to the report, the project would be built into two phases with a total investment of USD137.04 million (RMB900 million) and was scheduled to start production in Dec. 2021. The construction scale of the project was as



below:

- Phase I: starch sugar's capacity would reach 600,000 t/a (100,000 t/a maltose syrup for beer, 200,000 t/a glucose syrup and 300,000 t/a HFCS);
- Phase II: starch sugar's capacity would reach 1 million t/a (100,000 t/a maltose syrup for beer, 200,000 t/a glucose syrup and 700,000 t/a HFCS).

### **Company Development**

**On 19 March, 2018**, Yufeng Industry Group (Yufeng Group) announced the commissioning of its 400,000 t/a HFCS project. With construction kicking off on 1 Sept., 2017, this project was invested with altogether USD78.92 million (RMB500 million) and located in Xingtai City, Hebei Province.

Yufeng Group, founded in 2000, is situated in Hebei Province. It is a domestic agricultural industrialization leader, with a focus on corn planting guidance, corn purchase & storage, and corn processing & deep-processing. It is capable to process 2.60 million tonnes of corn per year.

**On 24 Oct., 2019**, the Shanghai Clearing House (SCH) announced that it had not received the payment of funds with interest for the first issue of short-term financing coupons in 2018 from Xiwang Group Co., Ltd., which was declared a bond default. On 19 Sept., 2019, Xiwang Group was listed as the executor, exposing the company's capital crisis. As of 30 June, 2019, the total debt of the company was as high as USD4.47 billion (RMB30.69 billion). Xiwang Group is mainly engaged in corn deep processing and special steel industries. Its products include fructose, food and pharmaceutical grade glucose, HFCS, sodium gluconate, maltodextrin and corn oil.

**On 22 August, 2020**, Baolingbao Biology Co., Ltd. (Baolingbao) released its 2020 semi-annual report, with a total operating revenue of RMB1 billion, up 17% year on year. According to the report, starch sugar was Baolingbao's major source of income and the revenue of its major businesses were as below:

- HFCS: USD28.93 million (RMB190 million), down 5% year on year, 19% of the total revenue;
- Other starch sugar: USD29.69 million (RMB195 million), up 38% year on year, 19% of the total;
- Erythritol: USD31.82 million (RMB209 million), up 37% year on year, 21% of the total;
- Functional sugar: USD26.65 million (RMB175 million), up 23% year on year, 17% of the total;

Baolingbao is a high-tech enterprise involving in the R&D, production and sales of biological sugar in China. Its products mainly include starch sugar and erythritol. In addition, in Nov. 2019, the newly built 100,000 t/a HFCS project of Baolingbao was put into operation, achieving the capacity of 400,000 t/a.

**On 8 April, 2020**, China Starch Holdings Limited (China Starch) released its 2019 annual report, with a total revenue of USD0.98 billion (RMB6.75 billion) in 2019, up by 33% year on year.

China Starch's main business situation was as follows:

- Due to the completion of the corn starch production project of Shouguang Golden Corn Biotechnology Co., Ltd. in H2 2019, the capacity of corn starch and its by-products increased from 2.4 million t/a to 3 million t/a, and the total sales volume rose significantly compared to last year.
- In 2019, the company's starch sugar revenue was USD49.40 million (RMB340 million), up by 6% YoY. Affected by the domestic oversupply, the prices of starch sugar were still dominated by customers despite rising costs.

**On 29 Dec., 2020**, Weifang Shengtai Medicine Co., Ltd. (Weifang Shengtai)'s technical renovation project of corn starch production line was publicised for environmental protection acceptance. With an investment of USD12.78 million (RMB83.95 million), the project started

trial production in Sept. 2020. After technical renovation, the final production capacity of the whole project would reach 500,000 t/a of starch (including 450,000 t/a edible corn starch, 25,000 t/a medical corn starch, 25,000 t/a medical dextrin) and 183,400 t/a of by-products.

Weifang Shengtai was founded on Feb. 2004 by the American company Shengtai Holding Inc., with a registered capital of USD15 million. The business scope of the company covers active pharmaceutical ingredients (glucose, anhydrous glucose, oral glucose), pharmaceutical excipients (corn starch, dextrin, soluble starch); starch sugar (glucose, glucose syrup, dextrose monohydrate, edible solid glucose), by-products (corn germ, corn gluten meal, corn germ meal), etc.

### **Import and Export Hindrance**

**In early Feb. 2018**, some trade sources and government officials in the Philippines claimed that its beverage producers would replace imported high fructose corn syrup (HFCS) with locally-produced white sugar, which was intended to help avoid the high import duties on sweetener substitutes. Since 1 Jan., 2018, the Philippines had levied USD0.12/L (PHP6/L) on the sugar enriched beverages and USD0.23/L (PHP12/L) on other sweetener (such as HFCS) enriched beverages.

Since 2016, the Philippines had started importing HFCS from China. Its imports that year reached 235,000 tonnes. In 2017, the Philippines were the largest destination to the China made HFCS: it imported a total of 290,000 tonnes of HFCS, making up nearly half of the national figure. In this context, the blocking of HFCS imports would have great impact on the Chinese HFCS business.

### 3 Maltose syrup

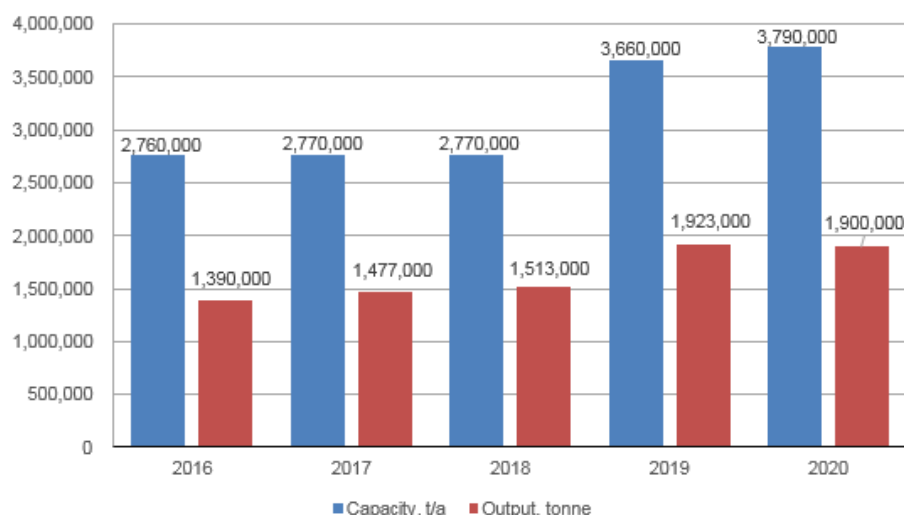
#### 3.1 Capacity and output of maltose syrup in China, 2016–2020

The capacity of maltose syrup in China was quite stable during 2016–2018 but jumped by 32.13% year on year to 3,660,000 t/a in 2019. During this period, some small companies left the industry, while some big players jumped in and invested in the business, seeing high profits and promising future. In 2020, despite the aftermath of COVID-19, the capacity of maltose syrup increased by 3.55% year on year to 3,790,000 t/a. But this year, some small enterprises closed down or went bankrupt due to difficulties in cash flow.

Demand for maltose syrup has been increasing since 2017 due to the huge price difference between white sugar and starch sugar. The output of maltose syrup increased from 1,390,000 tonnes in 2016 to 1,923,000 tonnes in 2019, at a CAGR of 11.43%. The output of maltose syrup in 2020 totalled 1,900,000 tonnes, down 1.20% year on year.

Maltose syrup's downstream industries are relatively fixed, such as beer, confectionery and pastry. With the expansion of high-end beer consumption in the past two years, the demand for low-end beer produced with maltose syrup has been slowly decreasing. Confectionery and pastry products are also gradually catering to the low-sugar market. As a result, demand for maltose syrup is unlikely to improve.

Figure 3.1-1 Capacity and output of maltose syrup in China, 2016–2020



Source: CCM

#### 3.2 Major producers of maltose syrup in China, 2016–2020

There were over 21 active producers of maltose syrup in China in 2020, most of which maintained an operating rate of over 50%.

Heilongjiang Haotian Corn Development Co., Ltd. (Heilongjiang Haotian), Yishui Dadi Corn Development Co., Ltd. (Yishui Dadi) and Chengwu Dadi Corn Development Co., Ltd. (Chengwu Dadi) are subsidiaries of Zhucheng Xingmao Corn Development Co., Ltd. (Zhucheng Xingmao). In 2020, their total capacity of maltose syrup was 500,000 t/a, ranking the first in China.

Global Sweeteners Holdings Limited (Global Sweeteners) was the second largest maltose syrup producer in 2020, with a capacity of 360,000 t/a. However, due to the suspension of most of the group's production facilities in Jinzhou and Xinglongshan production bases, the output in 2020 was 130,000 tonnes, down about 18.75% compared to that in 2019.

Shandong Bigtree Dreyfus Special Meals Food Co., Ltd. (Shandong Bigtree), a new but major player (in terms of capacity), had set up 250,000 t/a new production lines of maltose syrup and put them into production in 2019. Another new comer, Shandong Hengren Industry and Trade Co., Ltd., put its 200,000 t/a maltose syrup facilities into commercial use in 2019.

Shuangqiao (Hubei) Co., Ltd., one of the subsidiaries of Guangzhou Shuangqiao Co., Ltd. (Guangzhou Shuangqiao), completed the technological transformation project of maltose syrup in 2020, increasing its capacity to 210,000 t/a.

Cargill Bio-Chemical's 2 million t/a corn intensive-processing project began commissioning in June 2020, increasing the capacity to 200,000 t/a.

Table 3.2-1 Production of major producers of maltose syrup in China, 2016–2020

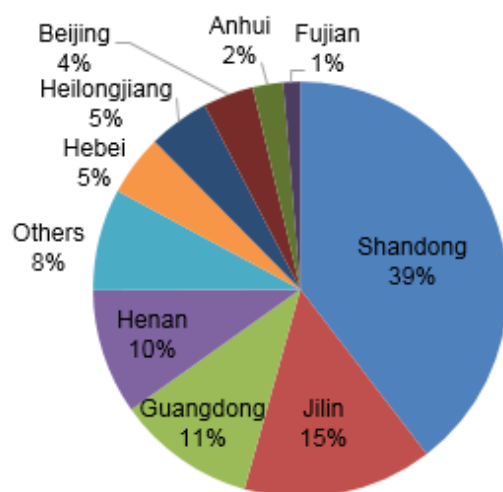
No.	Producer	Abbreviation	Location	Status, 2020	Capacity, t/a					Output, tonne				
					2020	2019	2018	2017	2016	2020	2019	2018	2017	2016
1	Heilongjiang Haotian Corn Development Co., Ltd.	Heilongjiang Haotian	Heilongjiang	Active	180,000	180,000	80,000	80,000	80,000	60,000	65,000	46,000	40,000	40,000
	Yishui Dadi Corn Development Co., Ltd.	Yishui Dadi	Shandong	Active	160,000	160,000	160,000	160,000	160,000	100,000	100,000	90,000	90,000	90,000
	Chengwu Dadi Corn Development Co., Ltd.	Chengwu Dadi	Shandong	Active	160,000	160,000	160,000	160,000	160,000	86,000	100,000	85,000	90,000	90,000
2	Global Sweeteners Holdings Limited	Global Sweeteners	Jilin	Active	360,000	360,000	360,000	360,000	300,000	130,000	160,000	180,000	160,000	150,000
3	Weifang Shengtai Medicine Co., Ltd.	Weifang Shengtai	Shandong	Active	250,000	250,000	250,000	250,000	250,000	120,000	120,000	130,000	120,000	100,000
4	Shandong Bigtree Dreyfus Special Meals Food Co., Ltd.	Shandong Bigtree	Shandong	Active	250,000	250,000	/	/	/	110,000	120,000	/	/	/
5	Guangzhou Shuangqiao Co., Ltd.	Guangzhou Shuangqiao	Guangdong	Active	210,000	10,000	10,000	10,000	10,000	130,000	6,000	6,000	5,000	5,000
6	Shandong Hengren Industry and Trade Co., Ltd.	Shandong Hengren	Shandong	Active	200,000	200,000	/	/	/	140,000	120,000	/	/	/
7	Cargill Bio-Chemical Co., Ltd.	Cargill Bio-Chemical	Jilin	Active	200,000	/	/	/	/	50,000	/	/	/	/
8	Zhaoqing Huanfa Bio-technology Co., Ltd.	Zhaoqing Huanfa	Guangdong	Active	200,000	200,000	200,000	200,000	200,000	120,000	120,000	120,000	120,000	120,000
9	Hebei Derui Starch Co., Ltd.	Hebei Derui	Hebei	Active	180,000	180,000	60,000	60,000	60,000	80,000	100,000	30,000	30,000	30,000
10	Dancheng Caixin Sugar Industry Co., Ltd.	Dancheng Caixin	Henan	Active	170,000	170,000	170,000	170,000	170,000	95,000	95,000	100,000	100,000	90,000
11	Zhucheng Dongxiao Biotechnology Co., Ltd.	Zhucheng Dongxiao	Shandong	Active	170,000	170,000	100,000	100,000	100,000	85,000	85,000	60,000	60,000	50,000
12	Qingyuan Foods Co., Ltd.	Qingyuan Foodstuff	Shandong	Active	150,000	150,000	150,000	150,000	150,000	90,000	90,000	80,000	80,000	80,000
13	China Agri-Industries Holdings Limited	China Agri-Industries	Beijing	Active	150,000	150,000	100,000	100,000	100,000	80,000	75,000	55,000	55,000	55,000
14	Henan Feitian Agricultural Development Co., Ltd.	Henan Feitian	Henan	Active	100,000	100,000	100,000	100,000	100,000	55,000	55,000	60,000	60,000	50,000

No.	Producer	Abbreviation	Location	Status, 2020	Capacity, t/a					Output, tonne				
					2020	2019	2018	2017	2016	2020	2019	2018	2017	2016
15	Luzhou Bio-Chem Technology (Shandong) Co., Ltd.	Luzhou Bio-Chem	Shandong	Active	100,000	100,000	100,000	100,000	100,000	55,000	55,000	55,000	50,000	50,000
16	Mengzhou Golden Corn Co., Ltd.	Mengzhou Golden Corn	Henan	Active	100,000	100,000	100,000	100,000	100,000	50,000	55,000	55,000	50,000	50,000
17	Hefei Jintai Sugar Co., Ltd.	Hefei Jintai	Anhui	Active	90,000	90,000	90,000	90,000	90,000	45,000	45,000	45,000	45,000	40,000
18	Qingzhou Huakang Biotechnology Co., Ltd.	Huakang Biotechnology	Shandong	Active	60,000	60,000	60,000	60,000	60,000	33,000	32,000	35,000	35,000	30,000
19	Jinjiang Jiashun Food Co., Ltd.	Jinjiang Jiashun	Fujian	Active	50,000	50,000	50,000	50,000	/	36,000	32,000	35,000	32,000	/
Others					300,000	570,000	470,000	470,000	570,000	150,000	293,000	246,000	255,000	270,000
<b>Total</b>					<b>3,790,000</b>	<b>3,660,000</b>	<b>2,770,000</b>	<b>2,770,000</b>	<b>2,760,000</b>	<b>1,900,000</b>	<b>1,923,000</b>	<b>1,513,000</b>	<b>1,477,000</b>	<b>1,390,000</b>

Source: CCM

In 2020, Shandong is the leading province in maltose syrup production, whose capacity accounted for 39% of the total in China; this is mainly because producers can save transportation cost of raw material corn in Shandong. In addition, the capacity of maltose syrup in Jilin accounted for 15% of the total, for Global Sweeteners and Cargill Bio-Chemical are located there.

Figure 3.2-1 Share of maltose syrup capacity in China by region, 2020



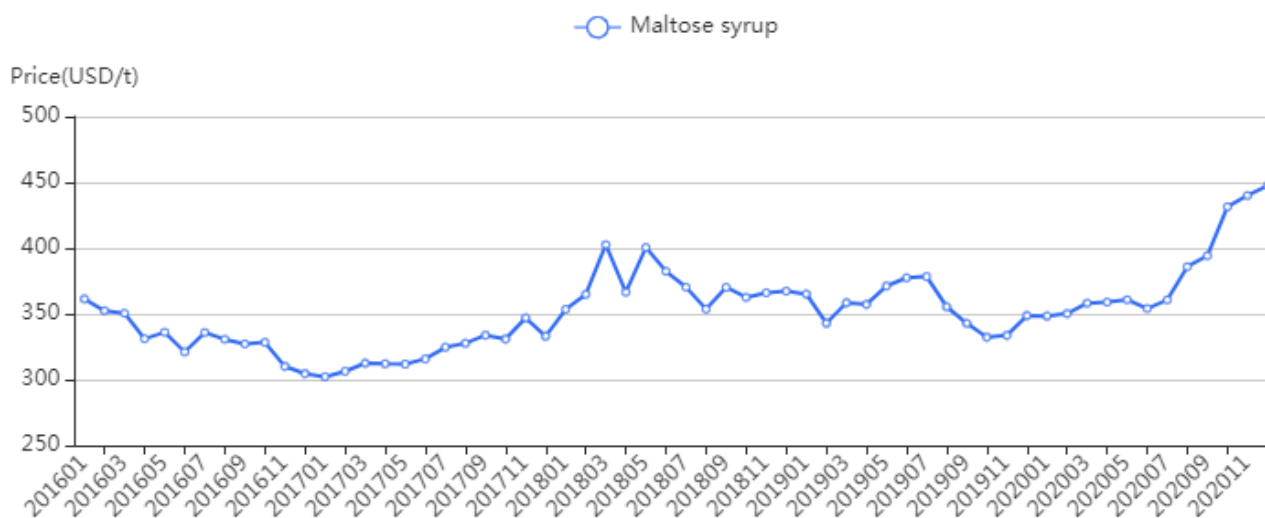
Source: CCM

### 3.3 Monthly ex-works price of maltose syrup in China, 2016–2020

In 2016, the price of maltose syrup in China showed a downward trend due to decreasing price of corn, sluggish demand from downstream industries and oversupply. Since Jan. 2017, as demand recovered and prices of raw materials corn and corn starch kept at a higher level, the price of maltose syrup went back up and hovered around USD370/t during H2 2018–H1 2020.

In H2 2020, the price of maltose syrup rose rapidly with the recovery of raw material prices, and rocketed to USD447.5/t in Dec. 2020.

Figure 3.3-1 Monthly ex-works price of 75% maltose syrup in China, 2016–2020



Source: CCM

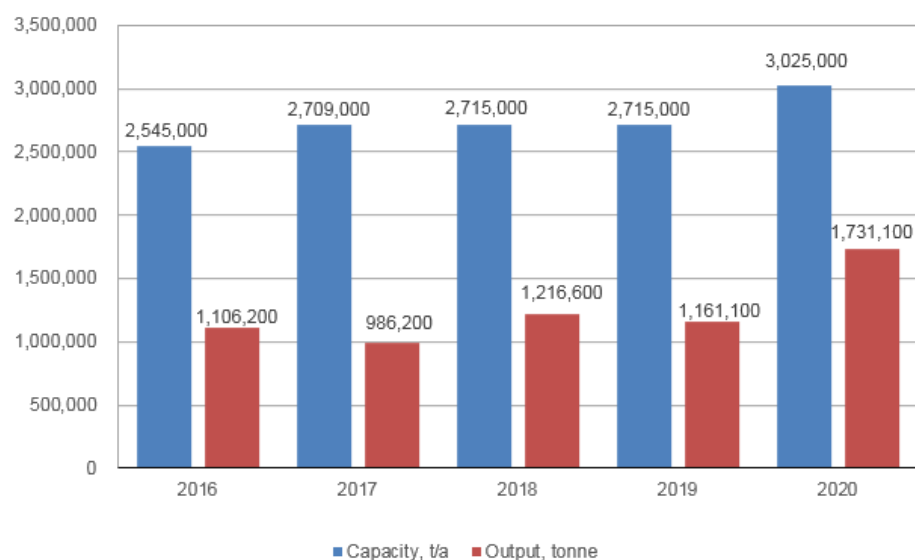
## 4 Glucose syrup

### 4.1 Capacity and output of glucose syrup in China, 2016–2020

In 2016–2018, China's capacity of glucose syrup sustained growth, and the capacity stabilized at 2,715,000 t/a in 2019. In 2020, the capacity of glucose syrup jumped by 11.42% year on year to 3,025,000 t/a. The increase was mainly due to the completion of the 500,000 t/a starch sugar project of Guangzhou Shuangqiao Co., Ltd. in Xiamen City, which went into production in 2020, bringing its glucose syrup production capacity to 880,000 t/a. And Zhucheng Dongxiao Biotechnology Co., Ltd. completed the starch sugar technology upgrading and transformation project in Nov. 2019, increasing the capacity of glucose syrup to 220,000 t/a.

The output of glucose syrup fluctuated slightly during 2016–2019. However, the output of glucose syrup rose significantly to 1,731,000 t/a in 2020, with a yearly increase of 49.09%, mainly driven by downstream demand growth.

Figure 4.1-1 Capacity and output of glucose syrup in China, 2016–2020



Source: CCM

### 4.2 Major producers of glucose syrup in China, 2016–2020

There were over 10 active producers of glucose syrup in China in 2020. This year, the top three manufacturers of glucose syrup were Guangzhou Shuangqiao Co., Ltd., Xiwang Group Co., Ltd. and Global Sweeteners Holdings Limited, with the capacity of 880,000 t/a, 800,000 t/a and 360,000 t/a respectively.

The overall operating rate of glucose syrup was 57.23% in 2020, which was attributed to growing downstream demand, mainly from the food and beverage industry. It is worth noting that nearly 50% of the manufacturers had an operating rate of more than 70%, among which Zhaoqing Huanfa Bio-technology Co., Ltd. and Weifang Shengtai Medicine Co., Ltd. had operating rates of over 80% in 2020.



Table 4.2-1 Production of major producers of glucose syrup in China, 2016–2020

No.	Producer	Abbreviation	Location	Status, 2020	Capacity, t/a					Output, tonne				
					2020	2019	2018	2017	2016	2020	2019	2018	2017	2016
1	Guangzhou Shuangqiao Co., Ltd.	Guangzhou Shuangqiao	Guangdong/Hubei/Chongqing/Fujian	Active	880,000	730,000	730,000	730,000	730,000	530,000	300,000	300,000	200,000	265,000
2	Xiwang Group Co., Ltd.	Xiwang Group	Shandong	Active	800,000	800,000	800,000	800,000	800,000	390,000	270,000	312,800	232,600	398,200
3	Global Sweeteners Holdings Limited	Global Sweeteners	Jilin	Active	360,000	360,000	360,000	360,000	300,000	100,000	160,000	145,000	100,000	90,000
4	Cargill Food Technology Co., Ltd.	Cargill Food Technology	Henan/Zhejiang/Jilin	Active	300,000	300,000	300,000	300,000	200,000	230,000	185,000	200,000	196,000	90,000
5	Zhucheng Dongxiao Biotechnology Co., Ltd.	Zhucheng Dongxiao	Shandong	Active	220,000	/	/	/	/	150,000	/	/	/	/
6	Luzhou Bio-chem Technology Co., Ltd.	Luzhou Bio-chem	Shandong	Active	200,000	200,000	200,000	200,000	200,000	120,000	80,000	85,000	80,000	95,000
7	Zhaoqing Huanfa Biotechnology Co., Ltd.	Zhaoqing Huanfa	Guangdong	Active	100,000	100,000	100,000	100,000	100,000	85,000	50,000	50,000	46,000	60,000
8	Weifang Shengtai Medicine Co., Ltd.	Weifang Shengtai	Shandong	Active	60,000	60,000	60,000	60,000	60,000	50,000	35,000	30,000	36,000	20,000
9	Hefei Jintai Sugar Co., Ltd.	Hefei Jintai	Anhui	Active	50,000	50,000	50,000	50,000	50,000	35,000	25,100	25,000	24,000	25,000
10	Shijiazhuang Huiyuan Starch Co., Ltd.	Shijiazhuang Huiyuan	Hebei	Active	40,000	40,000	40,000	40,000	40,000	29,000	20,000	20,000	20,000	20,000
Others					15,000	75,000	75,000	69,000	65,000	12,100	36,000	48,800	51,600	43,000
<b>Total</b>					<b>3,025,000</b>	<b>2,715,000</b>	<b>2,715,000</b>	<b>2,709,000</b>	<b>2,545,000</b>	<b>1,731,100</b>	<b>1,161,100</b>	<b>1,216,600</b>	<b>986,200</b>	<b>1,106,200</b>

Source: CCM

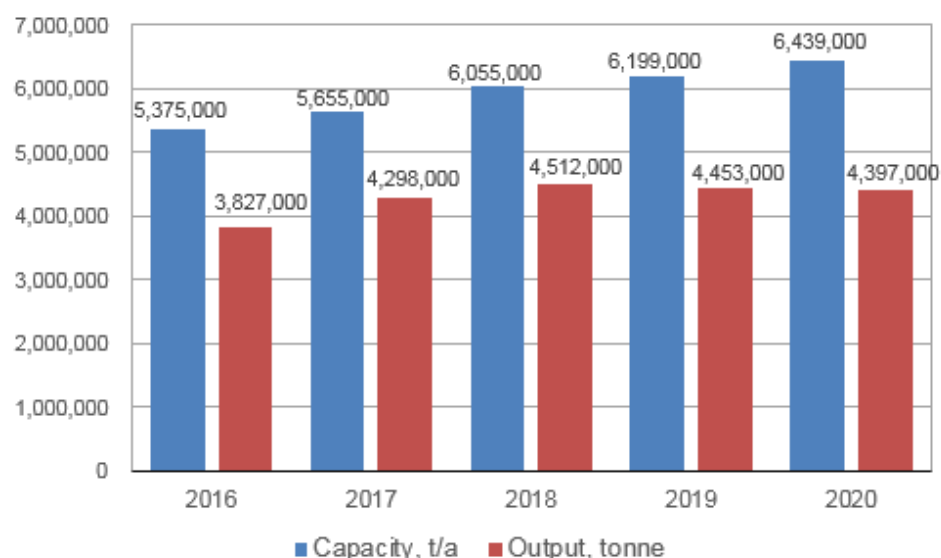
## 5 High fructose corn syrup (HFCS)

### 5.1 Capacity and output of HFCS in China, 2016–2020

From 2016 to 2020, China's high fructose corn syrup (HFCS) capacity grew steadily at a CAGR of 4.62%, reaching 6,439,000 t/a in 2020. In 2017–2018, the average operating rate was around 75%, while it dropped to about 70% in 2019–2020. In general, June to September sees higher rates, and the rest of the year, the rates are low as HFCS is hard to store.

Driven by the downstream demand for HFCS from industries including beverages, liquid nutrition, dairy products, honey and canned products, the output of HFCS rose at a CAGR of 8.58% in 2016–2018, reaching 4,512,000 tonnes in 2018. In 2019, the output decreased following reduced demand as the price declined of white sugar, a substitute to HFCS. In 2020, the downstream demand weakened affected by COVID-19, leading to a decline in HFCS production.

Figure 5.1-1 Capacity and output of high fructose corn syrup in China, 2016–2020



Source: CCM

### 5.2 Major producers of HFCS in China, 2016–2020

There were 18 major active producers of high fructose corn syrup (HFCS) with a capacity over 100,000 t/a in China in 2020. Top five HFCS producers accounted for nearly half of the market share in China. COFCO Limited kept its position as the biggest HFCS manufacturer in China during 2016–2020.

In May 2020, Guangzhou Shuangqiao Co., Ltd.'s 500,000 t/a starch sugar expansion project (including 300,000 t/a glucose syrup, 30,000 t/a 42% HFCS and 170,000 55% HFCS) in Xiamen City was completed and started trial operation, increasing its total HFCS capacity from 440,000 t/a to 520,000 t/a.

In April 2019, COFCO Limited's 480 tonnes/day HFCS project in Wuhan City was completed and put into production, bringing the capacity from 864,000 t/a to 1,008,000 t/a. To gain more market shares, Baolingbao Biology Co., Ltd. finished the 100,000 t/a HFCS project in Dec. 2019, expanding the capacity from 300,000 t/a to 400,000 t/a.

Hebei Yufeng Fecula & Sugar Industry Co., Ltd. set up 400,000 t/a new production lines of HFCS in 2018. Moreover, seeing better profits of HFCS, Anhui Yuansen Biotechnology Co., Ltd. set up new HFCS production lines with a capacity of 150,000 t/a and put into commercial since 2017.

Table 5.2-1 Production of major producers of high fructose corn syrup in China, 2016–2020

No.	Producer	Abbreviation	Location	Status, 2020	Capacity, t/a					Output, tonne				
					2020	2019	2018	2017	2016	2020	2019	2018	2017	2016
1	COFCO Limited	COFCO	Hubei/Shanghai/Jilin/Sichuan	Active	1,008,000	1,008,000	864,000	864,000	864,000	759,000	740,000	684,000	666,500	642,500
2	Cargill Food Technology Co., Ltd.	Cargill Food Technology	Henan/Tianjing/Jilin/Zhejiang	Active	941,000	761,000	761,000	761,000	761,000	614,000	576,000	591,000	585,000	553,000
3	Guangzhou Shuangqiao Co., Ltd.	Guangzhou Shuangqiao	Guangdong/Hubei/Chongqing/Fujian	Active	520,000	440,000	440,000	440,000	440,000	371,000	320,000	319,000	327,000	274,000
4	Scents Holdings Company Limited	Scents Limited	Shandong	Active	450,000	450,000	450,000	450,000	450,000	380,000	430,000	445,000	445,000	442,500
5	Hebei Yufeng Fecula & Sugar Industry Co., Ltd.	Hebei Yufeng	Hebei	Active	400,000	400,000	400,000	/	/	220,000	200,000	180,000	/	/
6	Baolingbao Biology Co., Ltd.	Baolingbao	Shandong	Active	400,000	300,000	300,000	300,000	300,000	210,000	204,000	229,000	224,000	182,000
7	Luzhou Bio-chem Technology Co., Ltd.	Luzhou Bio-chem	Shandong	Active	360,000	360,000	360,000	360,000	300,000	265,000	270,000	272,000	270,000	219,000
8	Pinqing Biotechnology Co., Ltd.	Pinqing Biotechnology	Jiangsu/Anhui	Active	300,000	300,000	300,000	300,000	120,000	200,000	216,000	222,000	219,000	88,500
9	Dongguan Yihai Kerry Syral Starch Technology Co., Ltd.	Yihai Kerry	Guangdong	Active	240,000	240,000	240,000	240,000	240,000	177,000	175,000	178,000	177,000	176,000
10	Zhaoqing Huanfa Biotechnology Co., Ltd.	Zhaoqing Huanfa	Guangdong/Anhui	Active	220,000	220,000	220,000	220,000	220,000	163,000	163,000	166,000	165,000	161,000
11	Global Sweeteners Holdings Limited	Global Sweeteners	Jilin	Active	220,000	220,000	220,000	220,000	220,000	85,000	108,000	120,000	112,000	90,000

No.	Producer	Abbreviation	Location	Status, 2020	Capacity, t/a					Output, tonne				
					2020	2019	2018	2017	2016	2020	2019	2018	2017	2016
12	Zhejiang Tianzi Co., Ltd.	Zhejiang Tianzi	Zhejiang	Active	200,000	200,000	200,000	200,000	200,000	145,000	145,000	147,000	146,000	144,000
13	Wuhan Runhua Biotechnology Co., Ltd.	Wuhan Runhua	Hubei	Active	200,000	200,000	200,000	200,000	200,000	145,000	146,000	148,000	147,000	145,000
14	Shandong Fukuan Biological Engineering Co., Ltd.	Shandong Fukuan	Shandong	Active	150,000	150,000	150,000	150,000	150,000	110,000	112,000	114,000	113,000	110,000
15	Anhui Yuansen Biotechnology Co., Ltd.	Anhui Yuansen	Anhui	Active	150,000	150,000	150,000	150,000	/	109,000	112,000	115,000	113,000	/
16	Samyang Genex Food (Qinhuangdao) Co., Ltd.	Qinhuangdao Samyang	Hebei	Active	100,000	100,000	100,000	100,000	100,000	65,000	74,000	77,000	75,000	70,000
17	Zhejiang Huakang Pharmaceutical Co., Ltd.	Zhejiang Huakang	Zhejiang	Active	100,000	100,000	100,000	100,000	100,000	93,000	95,000	97,000	107,500	110,000
18	Henan Feitian Agricultural Development Co., Ltd.	Henan Feitian	Henan	Active	100,000	100,000	100,000	100,000	100,000	70,000	67,000	69,000	68,000	67,000
Others					380,000	500,000	500,000	500,000	610,000	216,000	300,000	339,000	338,000	352,500
<b>Total</b>					<b>6,439,000</b>	<b>6,199,000</b>	<b>6,055,000</b>	<b>5,655,000</b>	<b>5,375,000</b>	<b>4,397,000</b>	<b>4,453,000</b>	<b>4,512,000</b>	<b>4,298,000</b>	<b>3,827,000</b>

Source: CCM

### 5.3 Monthly ex-works price of HFCS in China, 2016–2020

The ex-works price of HFCS dropped continuously from 2016 to early 2017, bottoming out at USD309.36/t in Jan. 2017, down 20.95% year on year.

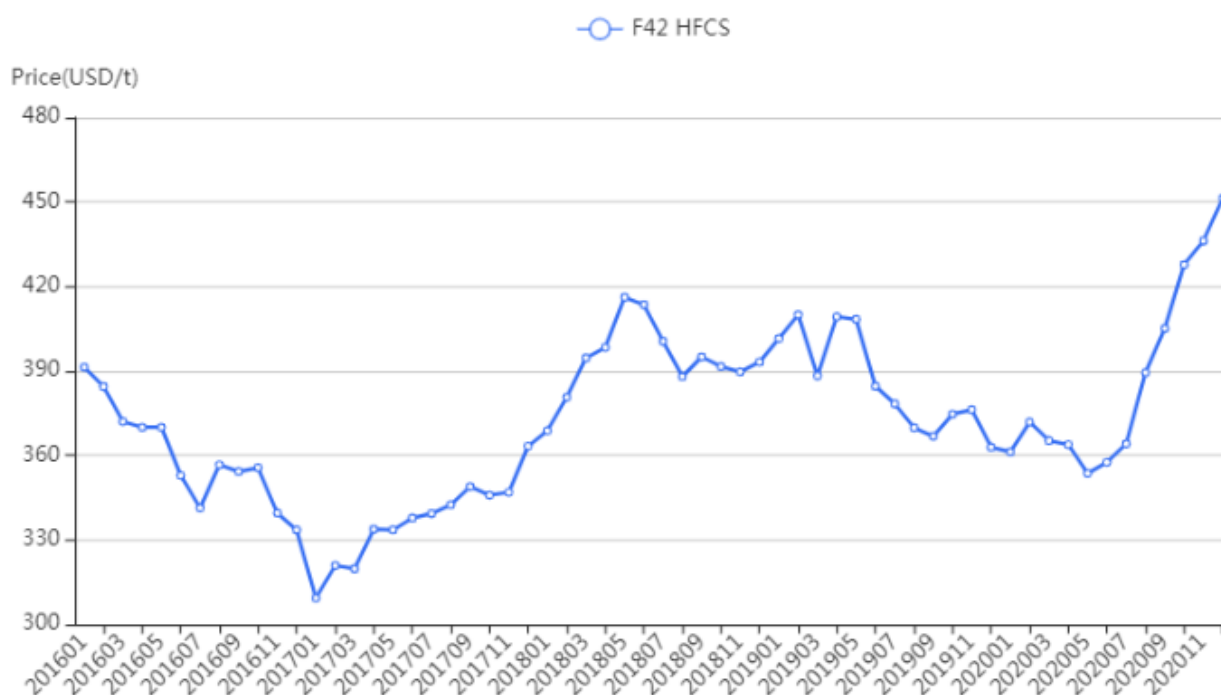
The price decrease of HFCS was mainly due to the falling price of the main raw material corn since July 2015, leading to the decline in production cost of HFCS. Besides, compared with other new sweeteners, the market share of HFCS didn't increase a lot, which mainly covers sugar-containing food and drinks, though the price of white sugar has increased continually since H2 2015.

Price of HFCS then started rebounding as the prices of raw material corn and corn starch were high which raised HFCS production cost. The price came to a small peak in May 2018 at USD416.21/t.

However, the price saw a generally downward trend in 2019 due to unimproved downstream demand and oversupply in the market, even in the peak season (July–Sept.).

Starting in May 2020, the price of HFCS continued to rise due to the rising corn price, and peaked at USD451.30/t in Dec. 2020.

Figure 5.3-1 Monthly ex-works price of high fructose corn syrup (F42 HFCS) in China, 2016–2020



Source: CCM

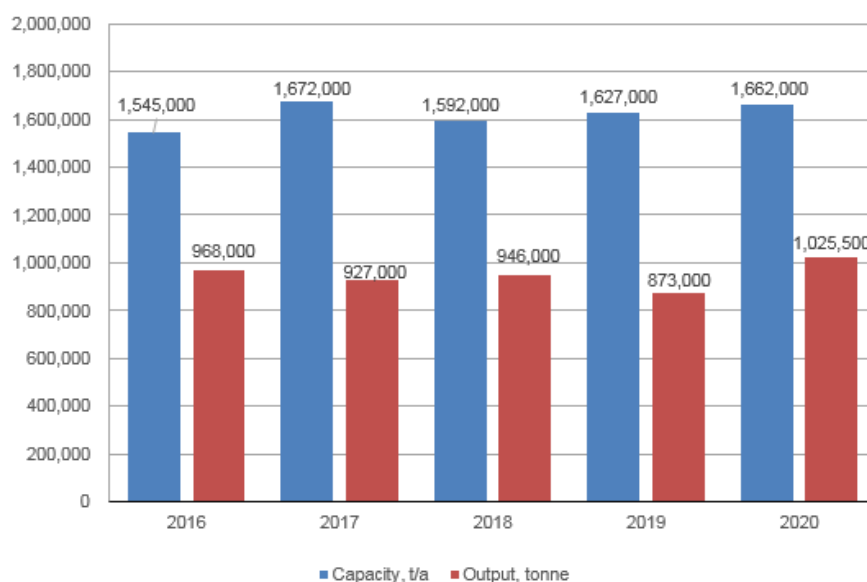
## 6 Maltodextrin

### 6.1 Capacity and output of maltodextrin in China, 2016–2020

In 2017, the capacity of maltodextrin in China was 1,672,000 t/a, up by 8.22% year on year. The increase was mainly because Qinhuangdao Lihua Starch Co., Ltd. (Qinhuangdao Lihua) completed the expansion of capacity of 100,000 t/a, and Qinhuangdao Pengyuan Starch Co., Ltd. (Qinhuangdao Pengyuan) expanded its capacity to 50,000 t/a. However, the capacity reduced to 1,592,000 t/a in 2018 as weak companies exited the market due to sluggish downstream demand and risks of losses. Besides, the falling price of raw material corn in peak season failed to support the price of maltodextrin, which led to profit reduction and thus held back willingness to expand production. The capacity of maltodextrin in China increased steadily during 2018–2019 and reached 1,662,000 tonnes in 2020, at a CAGR of 2.17%.

In 2020, the output of maltodextrin increased by 17.47% year on year to 1,025,500 tonnes in China. Compared with 2019, domestic maltodextrin exports improved in 2020, and prices of raw material corn rose continuously, bringing in good profitability, thus driving up the operating rate. The operating rate of maltodextrin increased from 53.66% in 2019 to 61.70% in 2020.

Figure 6.1-1 Capacity and output of maltodextrin in China, 2016–2020



Source: CCM

### 6.2 Major producers of maltodextrin in China, 2016–2020

There were over 24 maltodextrin producers in China in 2020.

Zhucheng Xingmao was the biggest maltodextrin manufacturer in China during 2016–2020, with a capacity of 260,000 t/a in 2020. Qinhuangdao Lihua Starch Co., Ltd. had a capacity of 200,000 t/a, and Mengzhou Golden Corn Co., Ltd. had a capacity of 165,000 t/a, ranking second and third respectively.

Table 6.2-1 Production of major producers of maltodextrin in China, 2016–2020

No.	Producer	Abbreviation	Location	Status, 2020	Capacity, t/a					Output, tonne				
					2020	2019	2018	2017	2016	2020	2019	2018	2017	2016
1	Heilongjiang Haotian Corn Development Co., Ltd.	Heilongjiang Haotian	Heilongjiang	Active	100,000	100,000	100,000	100,000	100,000	65,000	60,000	65,000	50,000	65,000
	Yishui Dadi Corn Development Co., Ltd.	Yishui Dadi	Shandong	Active	70,000	70,000	50,000	50,000	50,000	45,000	40,000	35,000	25,000	35,000
	Chengwu Dadi Corn Development Co., Ltd.	Chengwu Dadi	Shandong	Active	60,000	60,000	60,000	60,000	60,000	38,000	28,000	35,000	30,000	40,000
	Heilongjiang Longfeng Corn Development Co., Ltd.	Heilongjiang Longfeng	Heilongjiang	Active	30,000	/	/	/	/	18,000	/	/	/	/
2	Qinhuangdao Lihua Starch Co., Ltd.	Qinhuangdao Lihua	Hebei	Active	200,000	200,000	200,000	200,000	100,000	110,000	70,000	100,000	70,000	70,000
3	Mengzhou Golden Corn Co., Ltd.	Mengzhou Golden Corn	Henan	Active	165,000	165,000	165,000	165,000	165,000	100,000	90,000	85,000	90,000	110,000
4	Zhucheng Dongxiao Biotechnology Co., Ltd.	Dongxiao Biotechnology	Shandong	Active	160,000	160,000	50,000	50,000	50,000	95,000	85,000	25,000	25,000	30,000
5	Xiwang Pharmaceutical Co., Ltd.	Xiwang Pharmaceutical	Shandong	Active	120,000	120,000	120,000	120,000	120,000	65,000	65,000	85,000	65,000	65,000
7	Henan Feitian Agricultural Development Co., Ltd.	Henan Feitian	Henan	Active	100,000	100,000	100,000	100,000	100,000	75,000	60,000	50,000	70,000	70,000
6	Luzhou Bio-chem Technology Co., Ltd.	Luzhou Bio-chem	Shandong	Active	100,000	100,000	100,000	100,000	100,000	55,000	45,000	50,000	45,000	45,000
8	Cargill Bio-Chemical Co., Ltd.	Cargill Bio-Chemical	Jilin	Active	90,000	90,000	90,000	90,000	90,000	63,000	60,000	60,000	60,000	60,000
9	Zhaoqing Huanfa Biotechnology Co., Ltd.	Zhaoqing Huanfa	Guangdong	Active	80,000	80,000	80,000	80,000	80,000	55,000	45,000	50,000	45,000	45,000
10	Qingzhou Huakang Biotechnology Co., Ltd.	Huakang Biotechnology	Shandong	Active	60,000	60,000	60,000	60,000	60,000	35,000	35,000	35,000	35,000	35,000
11	COFCO Bio-Chemical Energy (Gongzhuling) Co., Ltd.	COFCO Bio-Chemical Energy	Jilin	Active	50,000	50,000	50,000	50,000	50,000	35,000	30,000	35,000	37,000	38,000

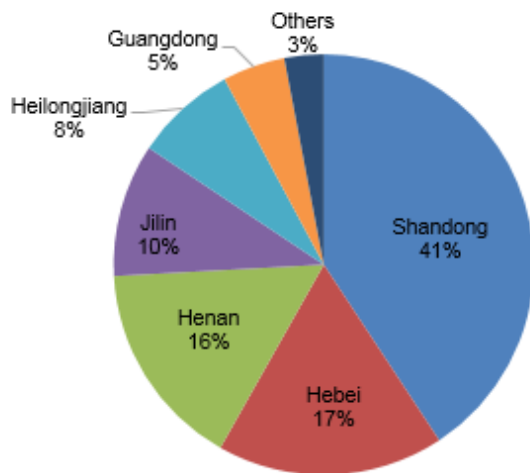
No.	Producer	Abbreviation	Location	Status, 2020	Capacity, t/a					Output, tonne				
					2020	2019	2018	2017	2016	2020	2019	2018	2017	2016
12	Qinhuangdao Pengyuan Starch Co., Ltd.	Qinhuangdao Pengyuan	Hebei	Active	50,000	50,000	50,000	50,000	/	30,000	25,000	25,000	25,000	/
13	Baolingbao Biology Co., Ltd.	Baolingbao	Shandong	Active	35,000	35,000	30,000	30,000	30,000	25,000	25,000	20,000	20,000	20,000
14	Global Sweeteners Holdings Limited	Global Sweeteners	Jilin	Active	30,000	30,000	30,000	30,000	20,000	15,000	22,000	25,000	20,000	19,000
15	Shandong Tianjiao Biotech Co., Ltd.	Shandong Tianjiao	Shandong	Active	20,000	20,000	20,000	20,000	20,000	12,000	12,000	12,000	12,000	12,000
16	Shijiazhuang Zhongcheng Sugar Industry Co., Ltd.	Shijiazhuang Zhongcheng	Hebei	Active	20,000	20,000	20,000	20,000	20,000	12,000	12,000	12,000	12,000	12,000
17	Zhaoxian Youyi Starch Sugar Industry Co., Ltd.	Zhaoxian Youyi	Hebei	Active	20,000	20,000	20,000	20,000	20,000	12,000	12,000	15,000	12,000	12,000
18	Shandong Bigtree Bio-Engineering Co., Ltd.	Shandong Bigtree	Shandong	Active	20,000	20,000	20,000	20,000	20,000	12,000	12,000	12,000	12,000	12,000
19	Qingyuan Food Co., Ltd.	Qingyuan Food	Shandong	Active	12,000	12,000	12,000	12,000	12,000	6,500	6,000	6,000	6,000	6,000
20	Shandong Bailong Chuangyuan Biotechnology Co., Ltd.	Shandong Bailong	Shandong	Active	10,000	10,000	10,000	10,000	10,000	6,000	6,000	6,000	6,000	6,000
21	Shandong Fuxin Biotechnology Co., Ltd.	Shandong Fuxin	Shandong	Active	10,000	10,000	10,000	10,000	10,000	6,000	6,000	6,000	6,000	6,000
Others					50,000	45,000	145,000	225,000	258,000	35,000	22,000	97,000	149,000	155,000
<b>Total</b>					<b>1,662,000</b>	<b>1,627,000</b>	<b>1,592,000</b>	<b>1,672,000</b>	<b>1,545,000</b>	<b>1,025,500</b>	<b>873,000</b>	<b>946,000</b>	<b>927,000</b>	<b>968,000</b>

Note: Zhucheng Xingmao Corn Development Co., Ltd. (Zhucheng Xingmao) is the holding company of Heilongjiang Haotian, Yishui Dadi, Chengwu Dadi and Heilongjiang Longfeng.  
Source: CCM



Shandong Province took up the largest share of maltodextrin capacity in China, as major domestic manufacturers were based here, including Zhucheng Xingmao, Dongxiao Biotechnology, and Xiwang Pharmaceutical. The capacity in Shandong, Hebei and Henan provinces respectively accounted for about 41%, 17% and 16% of the national total in 2020.

Figure 6.2-1 Share of maltodextrin capacity in China by region, 2020



Source:CCM

### 6.3 Monthly ex-works price of maltodextrin in China, 2016–2020

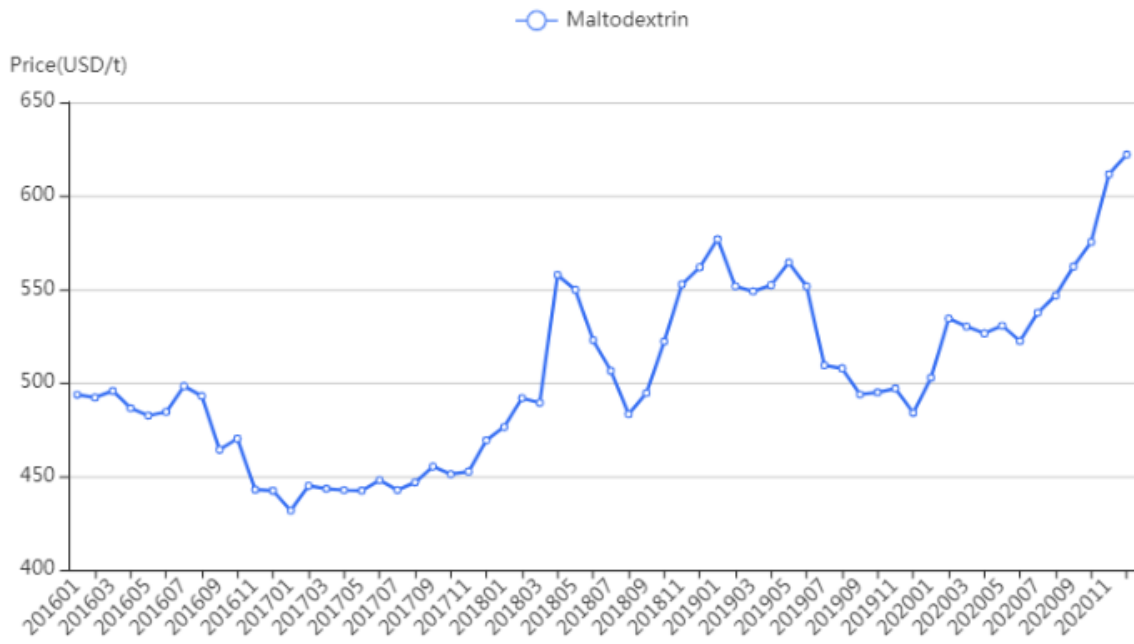
In H2 2016, the ex-works price of maltodextrin in China fell along with the declining price of corn, bottoming at USD431.67/t in Jan. 2017, down 12.55% year on year. During this period, the widespread use of new varieties of sweeteners had led to the decline in demand for maltodextrin. Until the end of 2017, maltodextrin price started rebounding because major producers insisted a higher price even in losses.

As the prices of raw material corn and corn starch were high, which supported the production cost of starch sugar, the average price of maltodextrin in 2018 was USD514.84/t, up by 15.0% over the 2017 average. However, monthly price plummeted continuously after April due to oversupply. From Sept. 2018, maltodextrin price rose again as its export volume increased and up-going price of corn.

In 2019, the price decreased for unimproved downstream demand; the annual average price was USD527.64/t. Although since Sept. some producers had cut production with increasing inventory pressure, no significant change in price was seen.

In 2020, the price of maltodextrin was in an overall uptrend, reaching USD621.96/t in Dec., up by 28.53% year on year. Sales of maltodextrin market maintained a good condition despite continuous price increases of corn. And in the case of high profits, supply of large manufacturers in China tightened, driving up the price.

Figure 6.3-1 Monthly ex-works price of maltodextrin in China, 2016–2020



Source: CCM

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