

EMBASSY OF INDIA, BEIJING

**Market Research on
Increasing Export Value of
Indian Chilli to China and
Third Countries**

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Chapter One Chilli Industry Policy and Standard System in China

1.1 Chilli Industry Policy

1.1.1 Agricultural Products Processing Policy Promotes Development of Chilli Processing Industry

Chilli, as one of the six major crops¹ that changed the world's modern civilization, has been introduced into China for more than 400 years since the late Ming Dynasty. In recent years, China has become a big country of chilli planting, processing and consumption. The planting area has exceeded 2 million hectares, and the annual output of fresh chilli has exceeded 60 million tons, with an output value of more than 200 billion yuan. In China, the planting area, output value and planting profit of chilli are among those of the top three vegetable crops, and chilli industry has become a pillar industry in many regions.

The vigorous development of China's chilli industry is inseparable from the strong support of industrial policies.

In 2016, the General Office of the State Council issued the "Opinions on Further Promoting the Development of Agricultural Processing Industry" to "promote the agricultural product processing industry from quantity growth to quality improvement, elements drive toward innovation drive and scattered layout to cluster development, improve the agricultural products processing industry and the policy support system, and promote the sustainable, stable and sound development of agricultural processing industry". In recent years, under the guidance of the "Opinions", the chilli processing industry has focused on building high-quality special raw material bases and strengthening the comprehensive utilization of chilli seeds and other by-products.

In 2018, the Ministry of Agriculture and Rural Affairs and other 15 government departments jointly issued the "Circular on Policies and Measures to Promote the

¹ The other five crops are: potato, corn, tobacco, rubber and cocoa

High Quality Development of Deep Processing of Agricultural Products" to "optimize the structure of agricultural products processing industry and promote the distribution of capacity for deep processing of agricultural products into functional areas for grain production, protection areas for the production of important agricultural products, areas with advantages for featured agricultural products, demonstration areas for modern agriculture and modern agricultural industrial parks." For deep processing of chilli, more and more investment projects are concentrated in featured agricultural products advantage areas and modern agricultural industrial parks. For example, the "Jize Chilli Advantage Area with Products with Chinese Characteristics" in Jize County, Hebei Province has attracted the leading chilli enterprises such as Jize Tianxiahong Chilli Co., Ltd. and Jize County Xiangjunfu Condiments Co., Ltd.

In December 2021, the Ministry of Agriculture and Rural Affairs issued the "14th Five-Year Plan for the Development of Science and Technology in Agriculture Industry and Rural Areas". In terms of agricultural products processing technology, it proposed to "realize the diversified development, multi-level utilization and multi-link value adding of agricultural products and develop intelligent processing technology and equipment for agricultural products". Chilli is the characteristic cash crop of many provinces in China. In terms of primary processing, the process of dried chilli grading, pedicel removing, classification and packaging will develop towards the direction of industrialization and intellectualization. In the field of deep processing, the processors shall increase product added value and develop the potential functions of chilli, such as the use of capsaicin in food, medicine, military, marine fields and the application of carotenoids and hypoglycemic constituent--glucosidase inhibitor in medical field.

1.1.2 Guizhou and Chongqing Have Introduced Policies to Support Chilli

Industry

Guizhou Province

According to "The 14th Five-Year Plan for National Economic and Social Development of Guizhou Province and the Outline of Its Long-term Goals in 2035" (hereinafter referred to as "Guizhou 14th Five-year Plan", Guizhou Province will "vigorously develop the chilli-based characteristic condiment industry, accelerate the planting of improved chilli varieties and the promotion of advanced planting

technics, stabilize the annual chilli planting area at more than 5 million mu so as to realize the upgrading from a big chilli province to a strong chilli province, promote the construction of Laoganma High-Quality Chilli Industrial Park, and establish the Guizhou Zunyi International Chilli Expo.” The "Guizhou 14th Five-year Plan" also sets the development goal of chilli processing output value of 25 billion yuan and chilli output of 6.5 million tons.

In 2021, the “Development Plan of Ecological Characteristic Food Industry in Guizhou Province during the 14th Five-Year Plan Period” was issued, which mentioned that it was necessary to "further strengthen and refine the condiment processing industry mainly based on chilli and promote the development and promotion of new products such as fermented chilli, compound chilli sauce and chilli snack food ". The plan also proposes the goal of "output value of chilli based condiments reaching 35 billion yuan, building one 10-billion-yuan grade enterprise, two 1-billion-yuan grade enterprises and five 100-million-yuan grade enterprises by 2025".

Zunyi City, as an important city of chilli industry in Guizhou Province, has also introduced relevant support policies. In 2019, for example, Zunyi City formulated the “Policies and Measures to Support the Construction of the World Chilli Processing Trade Cluster” to speed up the construction of the World Chilli Processing Trade Cluster and enhance the comprehensive strength of the chilli industry in Zunyi City. It proposes to focus on building "one center and two wings" chilli processing trade cluster, support "Lao Gan Ma" and other key enterprises to grow bigger and stronger, introduce quality and strong enterprises, provide relevant resources and financial support in terms of chilli processing equipment, sites and other aspects, and guarantee the supply of raw materials for chilli processing.

Chongqing Municipality

“The 14th Five-Year Plan for the Development of Chongqing Agricultural Products Processing Industry (2021-2025)” proposes to "develop the potential of chilli and other flavorings in deep processing of daily chemicals, healthcare and medical fields, promote the diversification and refinement of flavorings processed products and promote the intensive production, standardization and brand development of special condiments such as hotpot condiment and compound condiment”.

“The 14th Five-Year Plan for the Development of Chongqing Agricultural Products Processing Industry (2021-2025)” also put forward the layout of the chilli industry,

hot pot industry and condiment industry. It proposes to "strengthen the construction of production bases of chilli and other flavorings and build a processing base of 450,000 mu, establish Chongqing Hot Pot Raw Materials and Condiments Distribution Center, build a national famous hot pot industry distribution center centering on Qijiang Food Park, and achieve condiment output value of about 8 billion yuan by 2025".

1.1.3 The "New International Land-Sea Trade Corridor in Western China" to Further Promote Import of Indian Dried Chilli

In 2019, the National Development and Reform Commission issued the “Master Plan for New International Land-Sea Trade Corridor in Western China”, which proposes to build Chongqing-Guiyang-Nanning-Beibu Gulf marine outfall corridor, Chongqing-Huaihua-Liuzhou- Beibu Gulf marine outfall corridor and Chengdu-Luzhou (Yibin)-Baise- Beibu Gulf marine outfall corridor to form the main land-sea corridors in western China. In 2021, the “Implementation Plan for Promoting High-Quality Construction of New International Land-Sea Trade Corridor in Western China during the 14th Five-Year Plan Period” was officially released. According to the plan, the New International Land-Sea Trade Corridor which are economical, efficient, convenient, green and safe will be established by 2025. The logistics and operation center will run efficiently; the regional unified market will be initially founded; multi-modal transport 'single order system' will make new progress; logistics efficiency will be improved with the upgrading of



facilitation.

Photo Source: "Master Plan for New International Land-Sea Trade Corridor in Western China"

Fig 1-1, Geographical Location of the New International Land-Sea Trade Corridor in Western China

Compared with the traditional route of "Qingdao port -- road transportation – mid-west China", the time spent and transportation cost of Indian chilli imported along the route of "Beibu Gulf port -- railway transportation – mid-west China" will be significantly reduced. Therefore, Chongqing established the first "Indian Chilli Transaction Platform" and distribution center relying on the New International Land-Sea Trade Corridor in 2020. After the construction is completed, it is expected to trade 50,000 tons of Indian chilli per year, with a transaction value of 1 billion yuan, and the platform will be able to effectively meet the demand of the huge catering and food processing industry in the western region.

1.2 Chilli Related Standards

China's chilli standards mainly focus on three types of chilli products: primary processed chilli products (dried chilli, chilli powder, etc.), chilli spices (chilli oil and chilli sauce) and deep processed chilli products (capsanthin and capsicum oleoresin). The standards for the three categories of chilli products can be divided into national standards, agricultural standards, commercial standards, import and export industry standards and local standards. All kinds of standards specify the sensory index, physical and chemical index, quality grade, commodity grade, inspection methods and other requirements of chilli related products.

Table 1-1 Standards of Chilli and Chilli Products in China

Type of Standard	Name	Standard Number	Key Items and Application Scope	Date of Issue	Effective Date
National Standard	Chilli (whole or powdered)	GB/T 30382-2013/ISO972 : 1997	<ul style="list-style-type: none"> This standard specifies the technical requirements, test methods, packaging and marking of chilli (whole or powder). This standard applies to the quality assessment and trade of chillies (whole or powdered) as described in 4.1. 	Dec 2013	Jun 2014
	Fried Pepper Sauce	GB/T20293-2006	<ul style="list-style-type: none"> This standard specifies the technical requirements, test methods and label requirements of fried pepper sauce. This standard applies to the production, sale and supervision and inspection of Fried pepper sauce. 	Jul 2006	Dec 2006
	Chilli Powder	GB/T23183-2009	<ul style="list-style-type: none"> This standard specifies the technical requirements, test methods, inspection rules and requirements for marking, packaging, transportation and storage of chilli powder. This standard applies to chilli powder as defined in 3.1 and does not apply to flavored chilli powder. 	Apr 2009	Oct 2009
National Food Safety Standard	Capsanthin	GB 28314-2012	<ul style="list-style-type: none"> This standard applies to food additive—capsanthin, made from <i>Capsicum annuum L.</i> through extraction, filtration, concentration and capsicum oleoresin removal process. 	Nov 2015	May 2016
	Capsicum Oleoresin	GB 28314-2012	<ul style="list-style-type: none"> This standard applies to food additive—capsicum oleoresin, made from <i>Capsicum annuum L.</i> through deep processing. 	Apr 2012	Jun 2012

	Dried Red Chilli Quality Grading	NY/T 3610-2020	<ul style="list-style-type: none"> ● This standard specifies terms and definitions, requirements, inspection methods, marking, labeling, packaging, transportation and storage of dried red chilli. ● This standard applies to the quality classification of the same variety of dried chilli. 	Mar 2020	Jul 2020
Agricultural Standard	Chilli Sauce	NY/T 1070-2006	<ul style="list-style-type: none"> ● This standard specifies the definition, requirements, test methods, inspection rules, marking, labeling, packaging, transportation and storage of chilli sauce products. ● This standard is applicable to chilli sauce processed from fresh or dried chilli. 	Jul 2006	Oct 2006
	Green Food--Chilli Products	NY/T 1711-2020	<ul style="list-style-type: none"> ● This standard specifies terms and definitions, requirements, inspection rules, labelling, packaging, transportation and storage of green food--chilli products. ● This standard applies to green food --chilli products, not chilli oil. 	Aug 2020	Jan 2021
Commercial Standard	Regulation on Dried Red Chilli Circulation	SB/T 10967-2013	<ul style="list-style-type: none"> ● This standard specifies the basic requirements of commodity quality, commodity grade, packaging, labeling and circulation process of dried red chilli. ● This standard applies to the operation and management of the circulation of dried red chilli (with and without pedicel), also applicable to other kinds of dried chillies. 	Apr 2013	Nov 2013

	Chilli Oil	SB/T 11192-2017	<ul style="list-style-type: none"> ● This standard specifies the terms and definitions, technical requirements, test methods, inspection rules, packaging, labeling, transportation and storage of chilli oil products. ● This standard applies to products as defined in 3. 	Jan 2017	Oct 2017
Standard for Import & Export	Inspection Rules for Dried Chilli Products Export	SN/T 0231-2015	<ul style="list-style-type: none"> ● This standard specifies the definition, sampling, inspection methods and determination of results of dried chilli products for export. ● This standard is applicable to the inspection of all kinds of export dried chilli products, such as dried chilli, diced chilli, chilli powder, etc. 	May 2015	Jan 2016
	Guizhou Dried Chilli Part 1: Dried Pod Chilli	DB52/T 978.1-2020	<ul style="list-style-type: none"> ● This standard specifies the definition, quality index, grading requirements, inspection methods, packaging, storage and transportation requirements of dried pod chilli. ● This standard is applicable to the production and management of pod chilli (cone, finger or ball shaped) in Guizhou Province. 	Aug 2020	Aug 2020
Local Standard	Guizhou Dried Chilli Part 2: Dried Line Pepper	DB52/T 978.2-2020	<ul style="list-style-type: none"> ● This standard specifies the definition, quality index, grading requirements, inspection methods, packaging, storage and transportation requirements of dried line pepper. ● This standard is applicable to the production and management of dried line pepper (with smooth or wrinkled peel) in Guizhou Province. 	Aug 2020	Aug 2020
	Guizhou Chilli	DB52/T 977-2014	<ul style="list-style-type: none"> ● This standard specifies the product quality, packaging and marking, 	Oct 2014	Nov 2014

storage and transportation requirements, test methods and inspection rules of chilli.

- This standard applies to the fresh chillies in Guizhou Province, including 4 varieties of *Capsicum frutescens L.*(*syn.cannuum L.*), namely var.cerasiforme Bailey, var.conoides Bailey, var.fasccuclatum Bailey and var.longrum Bailey.
-

Chapter Two Chilli Planting in China

2.1 Chilli Production Generally Stable in China

China chilli industry has been developing very fast and has bred more than 1,000 new chilli varieties to meet market demand in different periods. The experts have developed efficient green production technology for chilli planting to supply markets of early spring, late autumn, high altitude and tropical winter. In 2000, China has realized stable supply of fresh chillies. Since 2000, chilli processing has been developing in high speed, and chilli deep processing enterprises represented by Laogganma in Guizhou Province and Chenguang Biotech Group in Hebei Province rose rapidly, leading the continuous development of China chilli industry.

According to the statistics of the National Technical System of Bulk Vegetable Industry, the chilli planting area in China in 2017 was 2,130,000 ha, accounting for 9.3% of the vegetable planting area, with chilli output of about 64,000,000 tons, accounting for 7.8% of the vegetable output; the output value of chilli was 250 billion yuan, accounting for 11.4% of the vegetable output value.

According to FAO data², in 2020, the planting area of chilli for fresh use in the mainland of China was 735,000 ha; the yield was 16,650,000 tons; the yield per unit area was 22.7 tons/ha. From 2000 to 2020, the CAGR³ of the output was 2.9%. Since 2016, the planting area and output in China have been basically stable, with almost no growth.

² FAO and China's agricultural department have different statistical standards (FAO data does not include sweet chilli data), leading to a large difference in data.

³ Compound Annual Growth Rate

According to the research of National Chilli Industry System and statistics of China Chilli Network (<http://www.e658.cn>), there are currently 24 provinces and regions in China producing chillies for dried use; the planting area of chilli for dried use in China in 2021 was 780,000 ha, down about 15% from 2020, with the output of about 2.06 million tons, down 45.9% from 2020.

In China, the most planted dried-use chillies are small chillies, which cover about 70% of the total dried-use chilli planting area. In July 2021, Henan Province, the main producing area of small chillies, was hit by heavy rain, which caused a large area of damage to small chilli growth, leading to a serious reduction in dried-use chilli output and even no harvest for the season. Subsequently, at the end of August and September, Shandong and Henan Provinces were affected by rainfall, resulting in a great impact on the quality of the growth of dried-use chillies in new season.

Table 2-1 Production of Small Chilli in China, 2018-2021

Year	2018	2019	2020	2021
Planting Area (1000 ha)	374	484	563	466
Yield (kg/ha)	3,000	3,750	4,125	2,625
Production Quantity (1000 tons)	1,123	1,814.8	2,431	1,223.6

Due to the increase in dried-use chilli price in 2018, the planting area of dried-use chilli has expanded significantly since then, leading to an increase in output. However, the adverse weather, continuous cropping obstacles and epidemic diseases since 2018 resulted in big decline in dried-use chilli production capacity (per unit yield).

Table 2-2 The Yield of Pod chilli in The Major Production Area of China, unit:kg/ha

Region	Normal Year	2018	2019	2020	2021
Jinxiang County, Shandong Province	4,500-5,250	3,150-3,675	3,750-4,500	3,000-3,750	About 3,000
Wucheng County, Shandong Province	2,625-3,375	1,875-2,400	2,625-3,750	About 3,750	2,625-3,375
Linying County, Hehan Province	3,750-4,500	2,475-3,000	3,000-3,750	2,250-3,000	3,000-3,375
Zhecheng County, Henan Province	3,375-4,125	2,400-2,925	3,000-3,750	3,000-3,375	About 3,750

Juye County, Shandong Province	4,500-6,000	3,375-4,200	3,750-4,500	4,500-6,000	3,375-3,750
Linfen County, Shanxi Province	3,750-4,500	2,625-3,375	3,000-4,125	3,750-4,500	-
Zhoukou City, Henan Province	3,375-4,500	2,625-3,375	2,625-3,750	4,500-3,750	-
Xian County, Hebei Province	2,250-3,000	1,575-2,025	3,000-3,750	2,625-3,375	-

Note: Pod chilli is a kind of small chilli, and small chilli producing areas in north China mainly plants pod chilli.

In 2021, China saw a sharp year-on-year drop of 15% in planting area of dried-use chillies. In addition, labor shortage and high cost are major problems in China chilli production. In general, natural disasters and labor shortage in producing areas leads to decreased profit and affects chilli production in China.

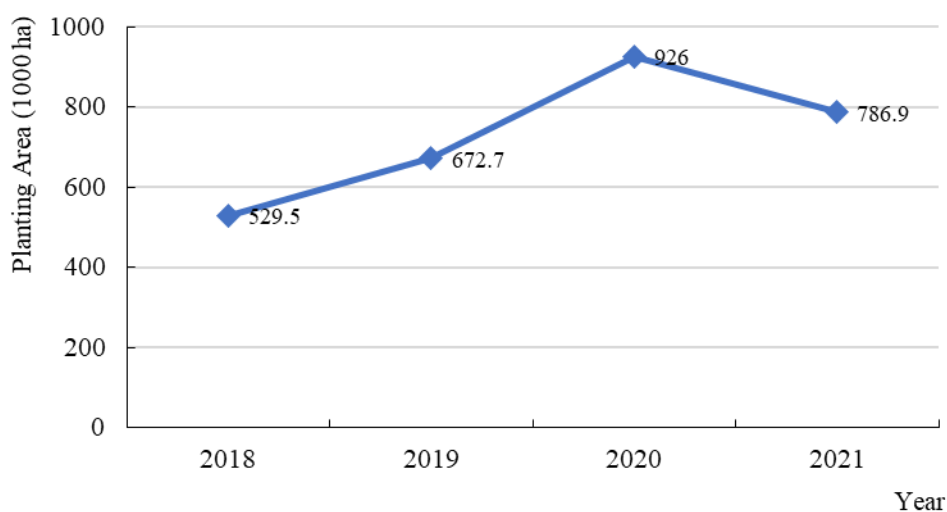


Fig 2-3 The Changes of Planting Area of Chilli for Dried Use in China, 2018-2021

2.2 Chilli Producing Areas Widely Distributed in China

Chilli is widely grown in China, from Hainan Island in the southernmost part of the country to the high latitudes in northeast China and Xinjiang in the west.



Fig 2-4, Distribution of Main Chilli Producing Areas in China

After years of planting and improvement of planting technology, China's chilli production has been rapidly moving to the advantage production areas. According to the environmental advantages, planting modes and planting habits, the chilli planting areas in China can be divided into six major advantage regions, including the hot dishes favored region represented by Yunnan, Guizhou and Sichuan, the producing region of chilli for processing use represented by Shandong and Henan, the high-latitude summer and autumn chilli producing region represented by Inner Mongolia, Heilongjiang, Jilin and Liaoning, the high-altitude summer and autumn chilli producing region represented by Gansu and Ningxia, the winter chilli producing region in south China represented by Guangdong and Fujian and the winter greenhouse chilli planting region represented by Shandong, Liaoning and Anhui.

Table 2-3 Distribution of Six Advantage Chilli Planting Regions and Chilli Varieties

Advantage Region	Range	Main Chilli Varieties and Uses	Supply Period
Hot Dishes Favored Region	Hunan, Guizhou, Yunnan, Sichuan, Jiangxi, Hubei, Chongqing	Mainly pod chilli, line pepper, pickled chilli and cow-horn chilli, for fresh consumption or processing	Jun-Nov
Region of Chilli for Processing Use	Henan, Hebei, Xinjiang, Shanxi, Shandong	Mainly pod chilli, line pepper and goat-horn chilli, for dried chilli, capsanthin or pickled chilli processing	-
High-Latitude Summer and Autumn Chilli Producing Region	Hebei, Inner Mongolia, Heilongjiang, Jilin, Liaoning	Mainly sweet pepper, cow-horn chilli and line pepper, for fresh consumption; Beijing Red and Yidu Red for processing	Jun-Oct
High-Altitude (1,000 Meters) Summer and Autumn Chilli Producing Region	Gansu, Ningxia, Shaanxi, Shanxi in northwest China, Hubei and Hunan in Wuling mountains area	Mainly cow-horn chilli, goat-horn chilli, line pepper, small amount of pod chilli, pickled chilli, sweet pepper; mainly for fresh consumption, small amount for drying	Jun-Sep
Winter Chilli Producing Region	Hainan, Guangdong, Guangxi, Yunnan, Fujian	Mainly cow-horn chilli, line pepper, pickled chilli and sweet chilli, mainly for fresh consumption	Nov-Apr
Winter Greenhouse Chilli Planting Region	Shandong, Hebei, Anhui, Liaoning	Mainly sweet pepper, cow-horn chilli, pickled chilli, mainly for fresh consumption	Nov-Mar

2.3 Chilli Producing Areas Divided into Little Chilli and Big Chilli Producing Areas

In recent years, the main producing areas of dried chilli in China have gradually moved to other regions. With the adjustment of agricultural industrial structure and the change of market demand, the main producing areas of dried chilli have moved from the southwest region and the middle and upper reaches of the Yangtze River to the regions where people are not addicted to hot dishes, such as Hebei, Henan, Xinjiang, Inner Mongolia, Gansu, etc. Due to the factors of production cost and

benefits, the dried chilli industry has been moving to economically underdeveloped areas. For example, the planting area of chilli for dried use has shrank in Shandong and Fujian and has expanded in Xinjiang, Gansu and Inner Mongolia, forming dried chilli producing regions in northwest, southwest, north and southeast China with different characteristics. North China and southwest China are dominated by small chilli production, while northwest and northeast China are dominated by big chilli production.



Fig 2-5 Distribution of Main Producing Regions of Dried Chilli

In the producing regions in north China and southwest China mainly grow pod chilli⁴. In north China, the pod chilli production is featured in low pungency degree and high output; the chillies are usually sowed in late April and harvested in October. In southwest China, the pod chilli production is featured in high pungency degree, high oil content and high dry matter content; the chillies need to be harvested for several times, which requires high costs for labor, while the chilli output is relatively low.

In southwest China, the chilli production cost is 12,000 ~ 15,000 yuan/ha higher in

⁴ Table 2-2 capsicum cultivars from north China and southwest China is one of pod chilli.

that in other producing regions, and the chilli price is also about twice as expensive as in other producing regions. Due to the limited output of chilli for dried use and the price factor, the local chilli products producers have to purchase a large amount of dried chilli from other producing regions, on one hand, to reduce the processing cost, and on the other hand, to blend with the local raw materials with high pungency degree, so as to meet the demand of more consumer groups.

In northwest and northeast producing regions, the dried chilli raw materials mainly include Beijing Red, Yidu Red and American Red chillies. These chillies are processed into diced chilli and chilli powder for retail and catering industry and are also the raw materials for deep processing for extracts. The production of capsaanthin and other extracts requires a low price of raw materials and a long supply time. Xinjiang and Inner Mongolia have the advantages of large area with sparse population, suitable climate and low production cost, which are conducive to the planting the raw materials. These areas have great advantages as raw material producing areas for chilli deep processing.

Table 2-4 Chilli Production in Advantage Planting Regions of Chilli for Dried Use in 2021

Advantage Region		Planting Area (1000 ha)	Product Type	Chilli Varieties	
Small Chilli	Southwest Producing Region	Guizhou	122.2	Fried pepper sauce, dried chilli	pod chilli, line pepper
		Sichuan	50	chilli sauce, dried chilli	pod chilli, Erjintiao
		Chongqing	20	chilli sauce, dried chilli	pod chilli
		Yunnan	62	dried chilli	Qiubei chilli
	North China Producing Region	Henan	147	dried chilli	pod chilli
		Hebei	38	dried chilli	pod chilli
		Shandong	72	dried chilli	pod chilli, line pepper, Yidu Red
Big Chilli	Northeast Producing Region	Inner Mongolia, Liaoning,	92	dried chilli	Beijing Red

		Jilin			
Northwest Producing Region	Xinjiang	97	dried chilli	line pepper, Yidu Red	
			capsanthin	Xinjiang iron chilli, American Red, Honglong 13	
	Shanxi, Gansu, Shaanxi	115	dried chilli, chilli powder, chilli sauce	Beijing Red, line pepper	
			capsanthin	American Red	

2.4 “Two Belts & Five Areas” Chilli Producing Structure in Guizhou

Chilli industry plays an important role in agricultural economy of Guizhou Province. The advantaged geographical location, good environment and suitable climate provide a guarantee for chilli growth. Guizhou Province has rich chilli varieties, including line pepper, screw pepper, finger shaped pod chilli, horn chilli, cherry chilli, cone shaped chilli, bell pepper and industrial use chillies.

In 2020, the chilli planting area in Guizhou Province was 363,000 ha, with output of 7.24 million tons and output value of 24.2 billion yuan, respectively up 15.2%, 46.6% and 69.2% from the end of the 12th five-year plan period, with output, processing quantity and sales ranking first in China. Guizhou has also become the only province in China with chilli planting area of more than 5 million mu. In 2021, the chilli planting area in Guizhou Province was 381,000 ha, with output of 7.78 million tons and output value of 27.1 billion yuan, respectively up 4.8%, 8.7% and 12% year on year; the large-scale standardized bases covered a total area of 137,000 ha.

Now the 48 key counties of chilli industry in Guizhou, such as Bozhou, Suiyang, Dafang and Weng’an, have formed a "two belts and five areas" pattern: the north industrial belt of processing-use chilli (north Guizhou-east Guizhou producing area, northwest Guizhou producing area) and the south industrial belt of chilli for fresh consumption (central Guizhou red chilli producing area, south Guizhou-east Guizhou producing area of chilli for fresh use and dried use, southern valley green pepper producing area).

The north Guizhou producing area of processing-use chilli covers an area of more than 200,000 ha. The north Guizhou-east Guizhou processing-use chilli producing area mainly plants local pod chillies, such as Qinla, Layan, Zunla, Zunjiao and Yanjiao. The northwest Guizhou producing area of processing-use chilli mainly plants line pepper, such as Dafang screw pepper and Bijie line pepper. The south producing area of fresh-use chilli covers an area of 135,000 ha and mainly plants special line pepper for fresh use and processing.

The north Guizhou producing area of processing-use chilli covers 66.3%, 64.8% and 63.5% of the total chilli planting area, chilli output and output value in Guizhou Province. The south Guizhou producing area of fresh-use chilli covers 31.7%, 32.6% and 34%⁵ of the total chilli planting area, chilli output and output value in Guizhou Province. The production areas in the province have achieved differentiated development, not only giving full play to the climate advantages of different areas in the north and south, but also realizing year-round chilli supply in the province, making the production layout more reasonable.

Table 2-5 Chilli Planting Areas in Guizhou Province

Producing Area	Planting Area (1000 ha)	Output (1000 tons)
North Guizhou Processing-Use Chilli Producing Area	167	3,450
Northwest Guizhou Processing-Use Chilli Producing Area	60	1,242
Central Guizhou Fresh-Use Red Pepper Producing Area	33	683
South Guizhou-East Guizhou Fresh and Dried Use Chilli Producing Area	74	1,532
Southern Valley Green Pepper Producing Area	28	580

Data Source: BOABC's estimation basing on public data.

⁵ Data for 2019

Chapter Three Chilli Processing in China

Chilli processing can be divided into primary processing and fine processing. Chilli processing extends chilli industry chain and accelerates the development of chilli industry.

3.1 Primary Processing of Chilli

3.1.1 Primary Processing Mainly Conducted in Chilli Producing Areas

The primary processing of chilli mainly includes classification and packaging, pre-cooling storage and preservation, drying, pickling, etc. The primary processing of dried chilli includes natural or artificial drying, pedicel removing, air-cure, grading, cutting and grinding for dried whole chilli, diced chilli, sliced chilli, chilli powder or crushed chilli.



Fig 3-1 Primary Processing Products of Dried-Use Chilli (from left to right, sliced chilli, diced chilli, chilli powder)

Due to the high transportation cost and easy transport loss of fresh chilli, the primary processing of dried-use chilli is generally conducted in the producing areas in China, and the primary processing of dried-use chilli is mainly concentrated in the producing regions, such as Guizhou, Henan, Shanxi, Shandong and Inner Mongolia.



Fig 3-2 Distribution of Dried-Use Chilli Processing Enterprises

The primary processed dried-use chilli products are mainly sold to catering enterprises, food processing enterprises and individual consumers and can be consumed directly or further processed.

3.1.2 Primary Processing Enterprises (Cooperatives) Are Large in Number and Small in Scale

The primary processing of dried-use chilli requires simple equipment, small investment and simple technology, so there are a large number of primary processing enterprises of dried-use chilli in China. In the meantime, the primary processing is generally dominated by professional farmer cooperatives and purchasers. For example, Shandong, Guizhou and Henan respectively owns more than 1,000 professional chilli related farmer cooperatives, and these provinces are also important regions for primary chilli processing.

Table 3-1 Number of Chilli Related Farmer Cooperatives in Main Producing Provinces

No.	Province	Number of Cooperatives	No.	Province	Number of Cooperatives
1	Shandong	1,159	8	Chongqing	244
2	Guizhou	1,110	9	Sichuan	231
3	Henan	1,049	10	Inner Mongolia	220
4	Yunnan	761	11	Xinjiang	212
5	Shanxi	334	12	Hunan	209
6	Gansu	314	13	Anhui	131
7	Shaanxi	266	14	Jiangxi	91

Data Source: TianYanCha.com

In China, the chilli primary processing enterprises (cooperatives) are large in number and small in scale. Data shows that the number of chilli-related cooperatives in Shandong, Guizhou, Henan, Yunnan and Shanxi was respectively 366, 166, 322, 88 and 48 with registered capital of at least 3 million yuan, accounting for 31.6%, 15%, 30.7%, 11.6% and 14.4% of the total number of chilli related farmer cooperatives in the province.



Fig 3-3 Registered Capital of Chilli Related Farmer Cooperatives in Main Producing Provinces

In China, many provinces plant chilli, but the level of intensive producing is low, and the chillies are of wide varieties, making it hard to see large primary chilli processing enterprises in most provinces.

Xinjiang has a large land area, and the dried-use chilli intensive farming level is high. At the same time, Xinjiang has a long sunshine duration, and the chilli varieties suitable for capsaicin production are mainly concentrated in Xinjiang. Therefore, large enterprises integrating chilli breeding, planting, processing and sales formed in Xinjiang, represented by Xinjiang Tianjiao Hong'an Agricultural Science and Technology Co., Ltd.

3.1.3 Chilli Processing Technics in China

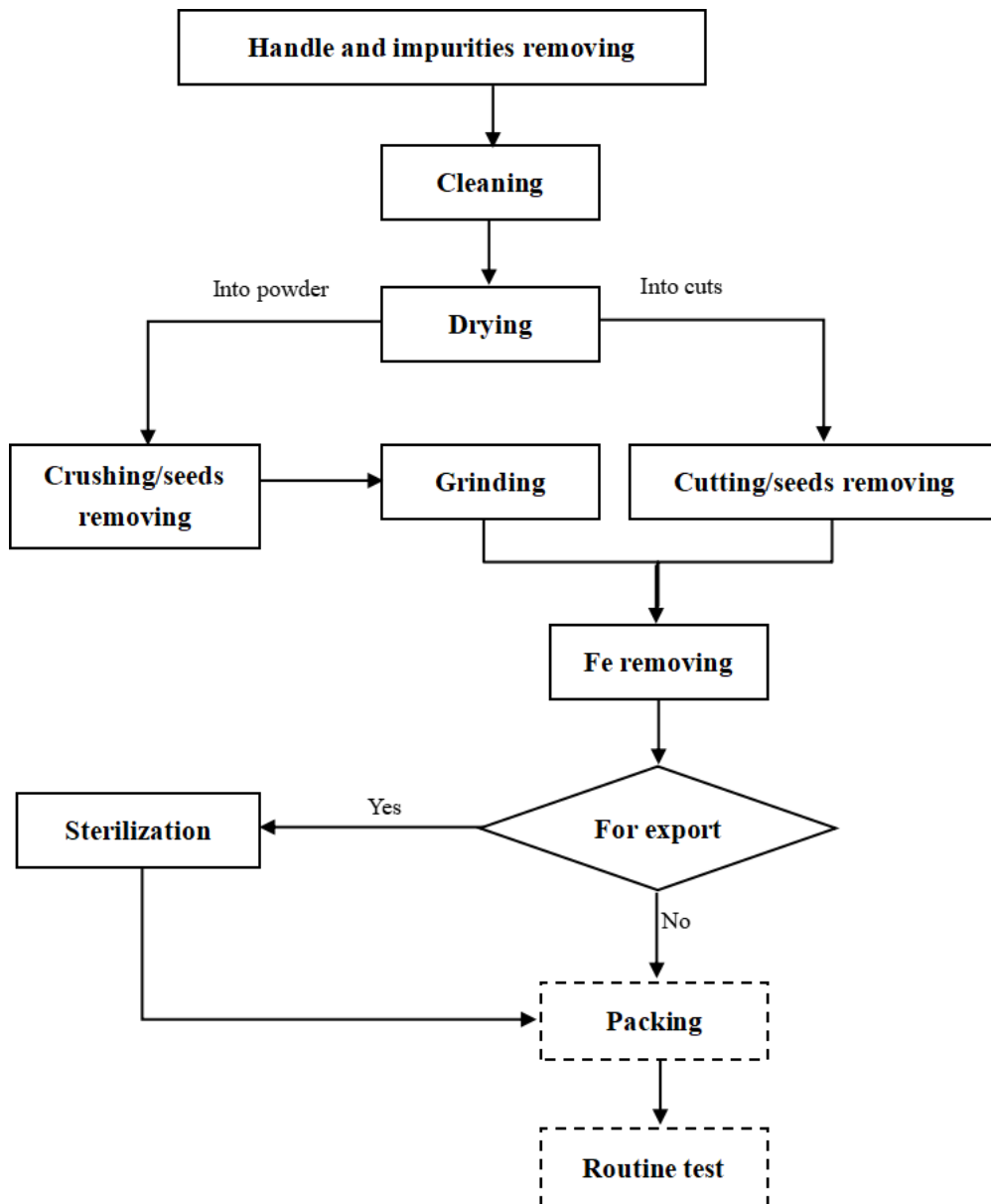


Fig 3-4 Chart Chilli Powder/Cuts Processing Flow

Chilli powder/cuts processing steps:

- ① Handle and impurities removing: Handles and impurities of dried chilli were removed by scissoring machine and sorting machine, and stalks and moldy chilli are removed by manual selection.
- ② Cleaning: Dried chillies are put into the dry cleaning machine to remove impurities and dust on the surface of chillies. The cleaning equipment should have the characteristics of high cleaning rate, good quality and high automation.
- ③ Drying: The temperature shall be well controlled, because high temperature will cause loss of color value¹. According to the Chinese standard of Chilli (whole or powder) (GB/T 30382-2013), the moisture of dried chilli/powder should be less than or equal to 11%.
- ④ Crushing and seeds removing: Different crushing equipment shall be selected according to required form of the product (chilli powder/cuts). After crushing, skin and seeds shall be separated according to requirement.
- ⑤ Grinding: Chilli powder is processed by grinding machine, and the fineness requirement determines how many times to grind.
- ⑥ Fe removing: Fe powder and other metal powder produced in the process of chilli crushing/grinding can be removed by metal separator.
- ⑦ Sterilization: Generally, there are three ways of sterilization -- steam sterilization, microwave sterilization and radiation sterilization. Radiation sterilization can not be used on chilli products exported to the European Union and Japan. Steam sterilization may be insufficient. Therefore, microwave sterilization is mainly used in chilli processing in China.
- ⑧ Packing: The final product will be packaged in intensive production or for export. For supply to restaurants, chilli powder will not be packaged formally.
- ⑨ Routine test: Inspection items in the domestic market include sensory, moisture,

total ash, acid insoluble ash, grinding fineness, net content, etc. According to the Chinese standard of Chilli Powder (GB/T 23183-2009), the total ash content of chilli powder shall be less than 10%, the acid insoluble ash content shall be less than 1.6%, and the fineness of grinding (0.2mm aperture) shall be less than 2.5%. Export inspection follows the Inspection Procedures for Export of Dried Chilli Products (SN/T 0231-2015). In addition to the above items, there are also spiciness value index, capsaicin determination, aflatoxin test, Sudanic red test, pesticide and heavy metal residue test, sulfur dioxide test and microbial test. Chilli powder/cuts for supply to restaurants is not subject to delivery inspection.

In China, chilli processing is conducted in factories or family workshops. For factories, chillies are processed in large quantity and with standard production and strict tests; different species of chillies will not be mixed in processing; the final products are mainly sold to supermarkets, large catering enterprises, food companies, etc. For family workshops, the customers are mainly wholesale market vendors and small restaurants; the output is small, and the processing flow is simple; products are mainly produced according to customers' specific requirements; sometimes two or more species of chillies will be mixed together for rich flavor and good pungency degree. The wholesale market vendors mainly sell processed chilli products to small restaurants and household consumers. Some small restaurants buy chilli powder products and mix them together to meet their own needs.

A further step – sterilization will be conducted on grinded chilli if it is not for domestic sales but for export. The specific quality requirements are different according to the inspection and quarantine requirements of the export destination country and the specific needs of customers.

3.1.4 Introduction to key primary processing enterprise--Tianjiao

Hong'an

Xinjiang Tianjiao Hong'an Agricultural Science and Technology Co., Ltd. (hereinafter referred to as Tianjiao Hong'an) was founded in 2010 with a registered capital of 58.4 million yuan. It is an integrated agricultural enterprise involving chilli breeding, chilli planting, purchasing, processing and sales.

The company is located in Shihezi National Agricultural Science and Technology Park. It has invested 230 mu of R&D and test bases in Xinjiang, Shandong and Hainan and has built 15,000 mu of demonstration bases with total assets of about

200 million yuan.

Tianjiao Hong'an's chilli breeding business started in the 1990's through its subsidiary named Xinjiang Hong'an Seed Co., Ltd. After over 20 years' development, the seed company has developed many new processing-use chilli varieties including Hong'an 6, Hong'an 8, Honglong 13, Honglong 18 and Honglong 23, which has quickly become the main varieties in chilli producing regions in China. By now, 17 chilli varieties of the company have registered at the Ministry of Agriculture and Rural Affairs, and Honglong chillies have become a famous brand in the distribution market of dried use chilli in the mainland and Turpan. In recent years, the company's annual seed sales volume was 15-27 tons/year, with annual net profit of 13-20 million yuan.

Table 3-2 Registered Chilli Varieties of Tianjiao Hong'an

Name	Year of Registration	Use	Features
Honglong 17	2017	Processing	Vitamin C Content:112mg/kg, Capsicum Oleoresin Content: 0.005%,Color Value: 293
Honglong 31	2017	Processing	Vitamin C Content:133mg/kg, Capsicum Oleoresin Content: 0.11%,Color Value: 265
Tianjiao Hongguan	2017	Processing	Vitamin C Content:129mg/kg, Capsicum Oleoresin Content: 0.31%,Color Value: 300
Honglong 18	2017	Processing	Vitamin C Content:135mg/kg, Capsicum Oleoresin Content: 0.001%,Color Value: 410
Honglong 25	2017	Processing	Vitamin C Content:146mg/kg, Capsicum Oleoresin Content: 0.0055%, Color Value270
Honglong 13	2017	Processing	Vitamin C Content:132mg/kg, Capsicum Oleoresin Content: 0.073%,Color Value: 200
Honglong 23	2017	Processing	Vitamin C Content:134mg/kg, Capsicum Oleoresin Content: 0.012%,Color Value: 320
Honglong 16	2017	Processing	Vitamin C Content:121mg/kg, Capsicum Oleoresin Content: 0.002%,Color Value: 323
Honglong 12	2017	Processing	Vitamin C Content:141mg/kg, Capsicum Oleoresin Content: 0.321%,Color Value: 178
Hong'an 6	2017	Processing	Vitamin C Content: 67.4mg/kg, Capsicum Oleoresin Content: 0.127%%,Color Value:200

Hong'an 8	2017	Processing	Vitamin C Content: 287.9mg/kg, Capsicum Oleoresin Content: 0.152%,Color Value:230
Honglong 20	2018	Processing	Vitamin C Content: 118mg/100g, Capsicum Oleoresin Content: 0.066%,Color Value: 231
Honglong 21	2018	Processing	Vitamin C Content: 121mg/100g, Capsicum Oleoresin Content: 0.078%,Color Value: 297
Honglong 24	2018	Processing	Vitamin C Content: 153mg/100g, Capsicum Oleoresin Content: 0.068%,Color Value: 300
Honglong 29	2018	Processing	Vitamin C Content: 162mg/100g, Capsicum Oleoresin Content: 0.065%,Color Value: 233
Dandan 3	2018	Processing (for drying and sauce production)	Vitamin C Content: 149mg/100g, Capsicum Oleoresin Content: 0.074%
Honglong 15	2020	Processing	Vitamin C Content: 105mg/100g, Capsicum Oleoresin Content: 0.198%, Color Value: 217

Tianjiao Hong'an's chilli breeding started from the local line pepper and has gradually brought out new varieties including line pepper, goat-horn chilli, Xinjiang iron chilli, pigment-use chilli and cherry chilli and has finished the whole industrial chain layout. Its chilli varieties have become the leading varieties with their advantages of high yield, high disease resistance, high color value and high pungency degree. The planting area of the company's chilli varieties covers about 30% of the chilli planting area in Xinjiang and has formed three chilli planting bases in Bazhou, Hetian and northern Xinjiang. In the past 20 years, the company has led the chilli planting in Xinjiang to expand from a planting area of 100,000 mu to 1 million mu.

Four subsidiaries of Tianjiao Hong'an involve in chilli primary processing, including Xinjiang Longping High-Tech Hong'an Hejing Chilli Co., Ltd., Xinjiang Longping High-Tech Hong'an Caiwukule Chilli Co., Ltd., Xinjiang Tianjiao Honglong Agricultural Technology Co., Ltd. and Xinjiang Tianjiao Hongguan Food Co., Ltd. The first three companies aggregately own purchase and processing capacity of 40,000 tons/year. The production line of Xinjiang Tianjiao Hongguan Food Co., Ltd. is under construction, with design capacity of more than 10,000 tons/year.

Tianjiao Hong'an involves in the whole industry chain, provides comprehensive services and supports in terms of seed supply, planting standardization and deep

processing and makes important contribution to the regional characteristic industry development in Xinjiang.

Table 3-3 Distribution of Chilli Processing Capacity of Tianjiao Hong'an

Subsidiary	Location	Products	Capacity	Note
Xinjiang Longping High-Tech Hong'an Hejing Chilli Co., Ltd.	Hejing County, Mongolian Autonomous Prefecture of Bayingolin, Xinjiang	crushed chilli, dried chilli, chilli seeds, etc.	10,000 tons/year	
Xinjiang Longping High-Tech Hong'an Caiwukule Chilli Co., Ltd.	Yanqi County, Mongolian Autonomous Prefecture of Bayingolin, Xinjiang	crushed chilli, chilli powder	20,000 tons/year	local customers mainly in Sichuan, Hunan, Hubei, Shandong, Shaanxi and Hebei; export destinations including Spain, France, India and Pakistan
Xinjiang Tianjiao Honglong Agricultural Technology Co., Ltd.	Hejing County, Mongolian Autonomous Prefecture of Bayingolin, Xinjiang	diced chilli, pedicel-removed chilli, etc.	10,000 tons/year	products mainly sold to Chengdu and Chongqing
Xinjiang Tianjiao Hongguan Food Co., Ltd.	Yanqi County, Mongolian Autonomous Prefecture of Bayingolin, Xinjiang	crushed chilli, chilli powder, sliced chilli, chilli rings, capsicum oleoresin, capsanthin	under construction, design capacity more than 10,000 tons/year	products mainly used as hot pot condiments raw materials and food additives

3.2 Chilli Condiments Processing

3.2.1 Chilli Condiments Processing Mainly Concentrates in Guizhou, Hunan, Sichuan and Chongqing

Deep processing of chilli including chilli condiments processing and industrial chilli products processing.

Chilli condiments mainly include fermented chilli, chilli sauce, hot pot condiments, Fried pepper sauce, among which chilli sauce and hot pot condiments are the most processed.

Chilli sauce is a kind of sauce made of chilli and is a very common condiment. The chilli sauce products can be divided into two forms--oil form and water form.

Fried pepper sauce is a spicy blend of cooked oil and chilli that can be eaten directly or used as seasoning, but sometimes it is included in the chilli sauce category.

Hot pot condiment is made from animal fat, vegetable oil, cane sugar, salt, MSG, spiceries and bean sauce according to some certain formula and processing technics.

Chilli condiments are mainly sold to catering enterprises, individual consumers and food processing enterprises.

Table 3-4 Number of Chilli-Related Food Manufacturing Enterprises in Major Provinces

No.	Province	Number of Enterprises	No.	Province	Number of Enterprises
1	Shandong	266	8	Yunnan	53
2	Guizhou	260	9	Jiangxi	52
3	Henan	258	10	Gansu	48
4	Shaanxi	144	11	Shanxi	47
5	Hunan	98	12	Xinjiang	35
6	Anhui	65	13	Chongqing	33
7	Sichuan	62	14	Inner Mongolia	27

Data Source: TianYanCha.com

According to the statistical analysis of the chilli-related food manufacturing enterprises in China, Shandong, Guizhou and Henan have the largest number of these enterprises, but the scale of enterprises in Shandong and Henan is generally small and has not formed an industrial cluster, while Guizhou has a relatively developed chilli condiment processing industry, which has formed an industrial development system which is mainly based on fried pepper sauce and supplemented by fermented chilli condiment, chilli sauce and spicy snacks. As planned, Guizhou will continue to strengthen the chilli industry layout centering in Guiyang and Zunyi with support from Anshun, south Guizhou, Bijie and Tongren during the 14th Five-Year Plan period. Although the number of chilli-related food manufacturing enterprises in Chongqing is relatively small, the scale of these enterprises is relatively big, and Chongqing has formed a chilli industry focusing on hot pot condiments production.

To conclude, China's chilli condiments producing enterprises mainly concentrate in consuming regions, such as Guizhou, Hunan, Sichuan, Chongqing and Yunnan.

3.2.2 Main Chilli Condiments Producing Enterprises

There are a large number of chilli condiment manufacturers in China, most of which are small and medium-sized. Only a limited number of enterprises are well known in local region or over the whole country, and their products are mainly chilli sauce, Fried pepper sauce and hot pot condiments.

Table 3-5 Main Chilli Products (for direct eating) Producers in China

Name	Location	Registered Capital	Main Products
Hubang Food (Wucheng) Co., Ltd.	Dezhou City, Shandong Province	10 million yuan	chilli sauce (Tiger Bang brand, Yingchao brand)
Guiyang Nanming Laoganma Food Co., Ltd.	Guiyang City, Guizhou Province	10 million yuan	Fried pepper sauce, hot pot condiment, spicy pickles (Laoganma brand)
Guizhou Laogandie Foods Co., Ltd.	Guiyang City, Guizhou Province	9.18 million yuan	Fried pepper sauce, hot pot condiment, fermented bean curd (Laogandie brand)
Guizhou Guisanhong Food Co., Ltd.	Zunyi City, Guizhou Province	57.2902 million yuan	Fried pepper sauce, chilli sauce (Lasanniang brand)
Chongqing Dezhuang Industrial (Group) Co., Ltd.	Chongqing Municipality	30 million yuan	hot pot condiment (Morals Village brand)
Chongqing Zhoujunji Hot Pot Food Co., Ltd.	Chongqing Municipality	11 million yuan	hot pot condiment, seasoning (Zhoujunji brand)
Lameizi Food Co., Ltd.	Yiyang City, Hunan Province	84 million yuan	chilli sauce, chilli oil (Lameizi brand)
Sichuan Dandan Pixian Bean Paste Group Co., Ltd.	Chengdu City, Sichuan Province	402 million yuan	bean sauce, seasoning (Dandan brand)

Data Source: Public Information Gathered by BOABC

3.3 Industrial Processing of Chilli

3.3.1 Industrial Chilli Products Processing Concentrated in Xinjiang, Hebei, Henan, Inner Mongolia

Industrial chilli products mainly include capsanthin, capsaicin and capsicum

oleoresin, which are sold to food processing enterprises, pharmaceutical enterprises, cosmetic producers, feed plants and chemical enterprises.

Capsanthin is a natural pigment in powder form or deep red oily liquid form extracted from red chillies. It is widely used in food (compound seasoning, snack food, pickles, etc.), medicine, cosmetics, feed and other industries.

Capsaicin is an extremely spicy vanillin amide alkaloid, which is the active ingredient of red chillies. It is widely used in food, chemical, medicine, military and other industries.

Capsicum oleoresin is extracted with organic solvent after crushing mature chilli fruit. It is a mixture of many substances, mainly composed of capsicum pigments and spicy substances. It has a strong spicy taste and is used to make food seasonings.

At present, there are more than 20 industrial chilli products manufacturing enterprises in China, which mainly produce capsanthin and capsicum oleoresin, and the output of capsaicin is relatively low.

Industrial chilli products manufacturers mainly distribute in raw material producing areas and surrounding areas, mainly because the production of capsanthin and capsicum oleoresin requires low material price and stable chilli supply. Xinjiang, Yunnan and Inner Mongolia have the above advantages. In Yunnan, Guizhou and Chongqing, the raw material supply and price there determines the relatively small number of industrial chilli product manufacturers and their small scale and short processing period. In addition, the production of industrial chilli products is also related to chilli varieties. For example, capsanthin production mainly relies on sweet chillies.

3.3.2 High Market Concentration Ratio, CCGB and TIANJIAO HONGAN Accounting for over 90% of the National Production Capacity

The market concentration ratio of industrial chilli products is very high in China, with CCGB and Tianjiao Hong'an taking a share of above 90% in the domestic production capacity. Some medium and small-sized businesses also produce paprika oleoresin and capsicum oleoresin, but their scale is small with an average production capacity of less than 1,000 tons.

(1) Chen Guang Biotech Group Co., Ltd.

With headquarters located in Quzhou county, Handan city in northern China’s Hebei province, Chen Guang Biotech Group Co., Ltd. (hereafter referred to as CCGB) focuses on the production of natural extracts, including natural pigments, natural spices and essential oils, natural nutritional and medical extracts, oils and proteins. CCGB ranks first or among the top in the world in terms of the production of paprika oleoresin, capsicum oleoresin and lutein, which are three key products of the company.

CCGB’s annual production capacity (converted) of paprika oleoresin and capsicum oleoresin amounted to 13,300 tons, and the annual sales volume exceeded 8,000 tons and 9,000 tons respectively in 2020 and 2021.

Table 3-6 Production Capacity and Sales Volume of Paprika Oleoresin and Capsicum Oleoresin, 2020-2021

Product	Annual Capacity (converted)	Sales Volume in 2020	Sales Volume in 2021
Paprika Oleoresin	13,300 tons	Over 7,300 tons	Over 8,000 tons
Capsicum Oleoresin	—	Over 1,000 tons	Over 1,100 tons

CCGB’s chilli processing business at home is mainly concentrated in Xinjiang and Hebei. Now, it has seven subsidiaries engaged in the extraction of paprika oleoresin and capsicum oleoresin, including five in Xinjiang and two in Handan city of Hebei province. CCGB produces paprika oleoresin mainly at home and capsicum oleoresin in India, where it has two subsidiaries in Andhra Pradesh and Karnataka. Besides, the company has invested in pigment pepper planting and processing projects in Zambia, and planted 2,000 hectares (30,000 mu) of chilli in Sinazonwe in 2021, an increase of about 5.0 times compared with 2020.

Table 3-7 Main Branch Offices and Subsidiaries of CCGB in Chilli Extract Sector

Company Name	Location	Main Business	Shareholding Ratio
Xinjiang Chenguang Natural Pigment Co., Ltd.	Korla, Xinjiang	Production and marketing of paprika oleoresin,capsicum oleoresin and chilli products	100%
Xinjiang Chenxi Capsicum Industry Co., Ltd.	Yanqi County, Bayingol Mongolian Autonomous Prefecture, Xinjiang	Processing and marketing of paprika oleoresin and plant extracts	100%

Chenguang Biotech Group Yanqi Co., Ltd.	Yanqi County, Bayingol Mongolian Autonomous Prefecture, Xinjiang	Production and marketing of food additives, nutritional foods, edible vegetable oils, inulin, and condiments	100%
Xinjiang Chenguang Biotech Co., Ltd.	Tumushuke City, Xinjiang	Cottonseed extracts, paprika oleoresin, lutein and other natural extracts	100%
Chenguang Biotech Group Shache Co., Ltd.	Yarkant County, Xinjiang	Chilli granules, marigold granules	100%
Quzhou Chenguang Plant Extracts Co., Ltd.	Quzhou County, Handan City, Hebei Province	Production and marketing of plant extracts	100%
Chenguang Biotech Group Handan Co., Ltd.	Economic and Technical Development Zone of Handan City, Hebei Province	Food additives, paprika oleoresin, lutein, betanin	100%
Chenguang Biotech (India) Co., Ltd.	Khammam City, Andhra Pradesh, India	Paprika oleoresin, capsicum oleoresin and other natural plant extracts	100%
Chenguang Natural Extracts (India) Co., Ltd.	Karnataka, India	Pigment processing and marketing	100%

(2) Tianjiao Hong'an

Xinjiang Tianjiao Hong'an Agricultural Science and Technology Co., Ltd. (hereafter referred to as Tianjiao Hong'an) not only has strong primary processing capacity of chillies, but also holds a certain position in the production of industrial chilli products.

At present, Tianjiao Hong'an has two deep-processing subsidiaries, who mainly produce paprika oleoresin and capsicum oleoresin, and ranks second in China with a combined capacity of 1,500 tons. In addition, another subsidiary is under construction, and will also produce paprika oleoresin.

Moreover, CCGB is the second largest shareholder of Tianjiao Hong'an, taking a 31.42% stake.

Table 3-8 Major Branch Offices and Subsidiaries of Tianjiao Hong'an in Chilli Extract Sector

Company Name	Location	Main Products	Production Capacity	Remarks
Xinjiang Biotech Co., Ltd.	Shihezi City, Xinjiang	paprika oleoresin, capsicum oleoresin, sweet chilli powder, paprika	A sweet chilli powder production line with production capacity of 5,000 tons A paprika oleoresin production line	Ranks second in the national production and sales chart of paprika oleoresin.

			with production capacity of 500 tons	It's a qualified sweet chilli powder supplier of McCormick
Xinjiang Hong'an Pigment Co., Ltd.	Bayingol Mongolian Autonomous Prefecture, Xinjiang	paprika oleoresin and capsicum oleoresin	1,000 tons of paprika oleoresin (capsicum oleoresin)	Capable of processing 20,000 tons of dried chillies annually
Xinjiang Tianjiao Hongguan Co., Ltd.	Yanqi County, Bayingol Mongolian Autonomous Prefecture, Xinjiang	Chilli powder (crushed), chilli slice, chilli ring, capsicum oleoresin, paprika oleoresin	The subsidiary is under construction, with conservative capacity of more than 10,000 tons	The products are mainly used as ingredients of hotpot condiments and food additives

3.4 Use of Imported Indian Chillies in China

The imported Indian chillies in China are dominated by high SHU varieties, and the imports of stemless S17 chillies account for more than 70% of the total. The capsaicin content of Indian S17 is as high as about 100,000 SHU, which is more than 3 times higher compared with Chinese chillies. Indian chillies can meet the market demand for high SHU chillies in China. However, Indian chillies are mainly cut and powdered and then mixed with local chillies in use, because they are not resistant to cooking and lack fragrance.

It's surveyed that above 80% of the imported Indian chillies are directly used in catering and braised food processing after initial processing (cut and powdered), and the rest part enters the processing field of chilli condiments, such as hotpot condiments, chilli sauce, and chilli oil.

For nearly two years, the purchasing cost of Indian chillies is higher than that of local chillies due to high CIF prices and expenses incurred by logistics and transportation, so manufacturers of industrial chilli products basically don't use Indian chillies.

Table 3-9 The List of Major Industrial Chilli Products Processing Enterprises in China

No.	Company Name	Location	Products	Capacity	Registered Capital ('000 yuan)	Contact Info
1	Chenguang Biotech Group Co., Ltd.	Hebei/Xinjiang	capsanthin, capsicum oleoresin	13,300 tons	168,110	0310-8859031

2	Xinjiang Tianjiao Hong'an Agricultural Science and Technology Co., Ltd.	Shikezi City, Xinjiang	capsanthin, capsicum oleoresin	1,500 tons	63,650	0993-2268262
3	Sichuan Weiyuan Hongyuan Biological Development Co., Ltd.	Neijiang City, Sichuan Province	capsanthin, capsicum oleoresin, capsaicin	370 tons	10,000	15883255250
4	Zhongjing Food Co., Ltd.	Nanyang City, Henan Province	capsicum oleoresin	extraction capacity of various spices more than 1500 tons/year	100,000	0377-69660000
5	Zhengzhou Xuemailon Food Flavor Co., Ltd.	Zhengzhou City, Henan Province	capsicum oleoresin	not disclosed	83,330	0371-62582686
6	Henan Zhongda Hengyuan Biotechnology Co., Ltd.	Linying County, Henan Province	capsanthin	not disclosed	48,640	0395-5658180
7	Qingdao Redstar Chemical Group Natural Pigment Co., Ltd.	Qingdao City, Shandong Province	capsanthin, capsicum oleoresin, chilli ingredients	not disclosed	5,500	0532-84915032
8	Chongqing Bizika Biological & Pharmaceutical Co., Ltd.	Shizhu County, Chongqing	capsaicin, capsanthin	not disclosed	50,000	023-73320118
9	Xinjiang Beizhong Tianhong Biotechnology Co., Ltd.	Tacheng Prefecture, Xinjiang	capsaicin, capsanthin	not disclosed	20,000	18997722986
10	Xinjiang Rainbow Bio-Tech Co., Ltd.	Bayigol Mongolian Autonomous Prefecture, Xinjiang	chilli extract	not disclosed	22,000	0996-6312579
11	Xinjiang Jiyuan Biotechnology Development Co., Ltd.	Bayigol Mongolian Autonomous Prefecture, Xinjiang	capsanthin	not disclosed	10,000	13779656582
12	Ji'an Zhongxiang Natural Plants Co., Ltd.	Ji'an City, Jiangxi Province	capsaicin, capsicum oleoresin	not disclosed	8,900	13879687029
13	Pengshui Changbo Biotechnology Co., Ltd.	Pengshui County, Chongqing	capsanthin	not disclosed	8,000	0536-6326687
14	Xinjiang Zhuocheng Biological Engineering Co., Ltd.	Hetian City, Xinjiang	capsanthin	not disclosed	50,000	13779656582
15	Xinjiang Sinuopu Biological Technology Co., Ltd.	Alaer City, Xinjiang	capsaicin, capsanthin	not disclosed	6,600	15599740001
16	Xinjiang Tianhong	Tacheng Prefecture,	capsaicin, capsanthin	not disclosed	15,000	15199037155

	Biological Technology Co., Ltd.	Xinjiang				
17	Wusu Tianjiaohong Biotechnology Co., Ltd.	Tacheng Prefecture, Xinjiang	capsaicin	not disclosed	20,000	15199037155
18	Tumushuke Hongrun Jiahe Biotechnology Co., Ltd.	Tumushuke City, Xinjiang	capsanthin	not disclosed	280,000	18699863179
19	Xinjiang Huabao Natural Biological Technology Co., Ltd.	Wujiaqu City, Xinjiang	capsanthin, capsicum oleoresin	not disclosed	15,000	18609941181
20	Xinjiang Tekang Biotechnology Co., Ltd.	Korla City, Xinjiang	capsanthin	not disclosed	20,000	0996-2279926
21	Chifeng Fulaite Chemical Co., Ltd.	Chifeng City, Inner Mongolia	capsaicin	not disclosed	16,000	0476-2246578
22	Bozhou Yuhui Natural Products Co., Ltd.	Bozhou City, Anhui Province	capsanthin, capsicum oleoresin, chilli seed oil	not disclosed	3,000	0558-5711951

Chapter Four Analysis of Chilli Circulation in China

4.1 Main Circulation Channels of Chillies in China

The distribution channels of chillies are diversified in China. Dried chillies are mainly sold through wholesale markets, farmer’s markets, e-commerce platforms and supermarkets, and about 90% are distributed through wholesale markets.

At present, several large chilli wholesale markets have been established in China, with China Chilli Market in Guizhou province, Linying, Neihuang and Zhecheng Chilli Trading Markets in Henan province, and Wucheng, Jinxiang and Jiaozhou Chilli Trading Markets in Shandong province as the seven major ones. In addition to the above-mentioned seven major markets, there are also some wholesale markets in chilli producing areas, but the scale is generally small.

Table 4-1 Major Wholesale Markets of Dried Chillies in China

Wholesale Market Name	Location	Product Variety	Annual Trading Volume	Remarks
China Chilli Market	Xiazi Town, Zunyi City, Guizhou Province	San Ying Chilli, New Generation Chilli (Xin Yi Dai Chilli), Man Tian Xing Chilli, Yanjiao, Bullet Chilli (Zi Dan Tou Chilli), Deng Long Jiao Chilli (Lantern Chilli), ErJingTiao, Indian Chilli, etc.	About 220,000 tons (dried chillies)	China’s largest wholesale market of dry chillies
Linying Chilli Trading Market	Wanggang Town, Linying County, Luohe City, Henan Province	San Ying Chilli, New Generation Chilli (Xin Yi Dai Chilli), Zi Dan Tou Chilli, Indian Chilli, etc.		
Neihuang Chilli Trading Market	Neihuang County, Anyang City, Henan Province	San Ying Chilli, Xin Yi Dai Chilli	More than 200,000 tons (dried and fresh chillies)	Neihuang county has become the largest distribution center of hot pepper in northern China’s Huang-Huai-Hai region, with Neihuang Vegetables and Fruits City as the center of the chilli

				trading market
Zhecheng Chilli Trading Market	Zhecheng County, Shangqiu City, Henan Province	Dominated by local San Ying Chilli, supplemented by other varieties	More than 700,000 tons (dried and fresh chillies)	North China's largest trading market of dried chillies
Wucheng Chilli Trading Market	Wucheng County, Dezhou City, Shandong Province	San Ying Chilli		
Jinxiang Chilli Trading Market	Jinxiang County, Jining City, Shandong Province	San Ying Chilli		
Jiaozhou Chilli Trading Market	Yujia Village, Jiaozhou City, Shandong Province	Whole chilli (fresh and dried), chilli seeds, chilli powder, chilli sauce, etc.	More than 300,000 tons (chillies and processed chilli products)	China's largest chilli processing and export distribution center and the national price information center of chilli trade

4.2 Main Channels for Indian Chillies to Enter China

China's imports of Indian chillies are dominated by traders, and chilli processors rarely import chillies directly. Traders entrust customs clearance agencies to complete the import process of Indian chillies, and then sell chillies at home. Market information was relatively inaccessible and the concentration ratio of chilli import traders was high before 2018, so big traders imported chillies from India and then distributed to domestic medium and small-sized traders. As market information is increasingly transparent, medium and small-sized businesses started directly entrusting customs clearance agencies to import chillies from India, and chilli importers are gradually decentralized.

4.2.1 Qingdao Port is the Main Port for Indian Chillies to Enter China

At present, Indian chillies enter China mainly through the ports of Qingdao, Guangzhou and Qinzhou, with the Qingdao Port as the leading one.

The port of Qingdao is close to the large chilli wholesale market (Jiaozhou chilli trading market), with high route density, developed land transportation, and high degree of supporting facilities, and occupies an important position in chilli imports in China. It's understood that Indian chillies imported through the port of Qingdao account for 70%-80% of the total imports of Indian chillies in China. After arriving at the Qingdao Port, the imported Indian chillies are transported to the major chilli consumption regions in central and southern China by truck or rail.

Indian chillies entering China through the ports of Guangzhou and Huangpu take a share of 5-10% in China's total imports of Indian chillies. Indian chillies arrive in Guangzhou by sea, and then are transported to the major consumption regions in central and southern China by truck or rail.

Indian chillies are also imported through other ports, such as Tianjin, Shanghai and Lianyungang ports, but the share is low.

4.2.2 The New International Land-Sea Trade Corridor in Western China to Be an Important Way for Indian Dried Chillies Entering China

The western region (southwest and west China) is an important dried chilli consuming and importing region. The western region covers about 60% of national chilli consumption, and the huge demand for "spicy food" has led to huge consumption of Indian chillies. Chongqing alone consumes more than 2,000 tons of Indian chillies a month, and the western region consumes more than 10,000 tons/month. In 2021, the western region is recorded to import Indian dried chillies of about 21,900 tons, accounting for 10% of national total.

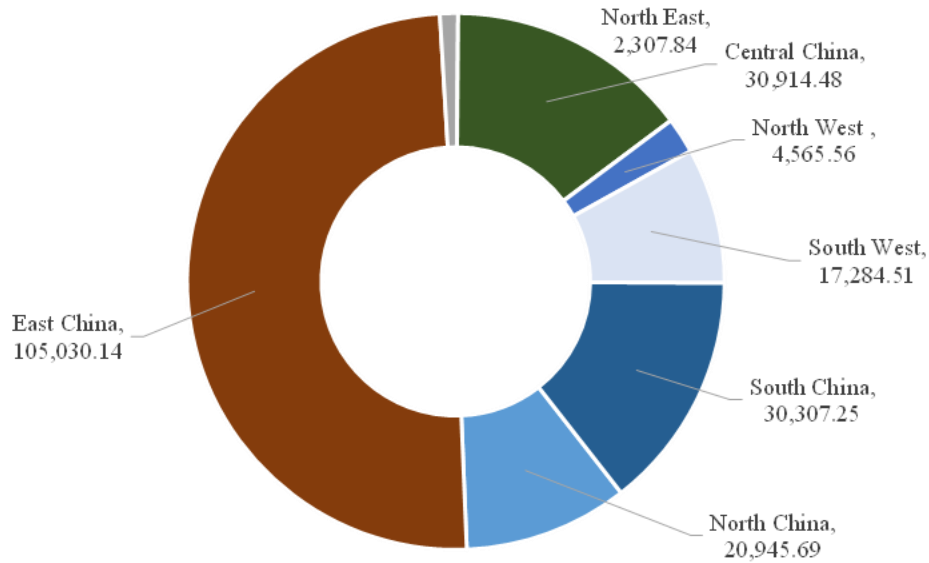


Fig 4-1 Import Data of Dried Chilli from India by Consignee Address in 2021 (GACC)

The new Qinzhou-Chongqing land-sea trade way started springing up at the end of 2020 and the main transportation route is as follows: Indian chillies depart from the port of Chennai in southeastern India to the port of Qinzhou in China’s Guangxi Zhuang Autonomous Region, and then are transported by rail to Chongqing, where the imported chillies are distributed and moved to the surrounding provinces. Compared with the traditional route bypassing eastern China, the new way can reduce transport time by about 7 days, leading a logistic cost saving of at least 2000 yuan per container. It’s estimated that the import volume of Indian chillies through the new land-sea trade way reached 10,000-20,000 tons in 2021, taking a share of about 5-10% in the total imports of Indian chillies. Thanks to improved efficiency of logistics and transport and decreased cost, the annual import volume of Indian chillies through the port of Qinzhou is expected to exceed 50,000 tons.

4.2.3 Wholesale Markets Are the Main Sales Channel of Indian Chillies

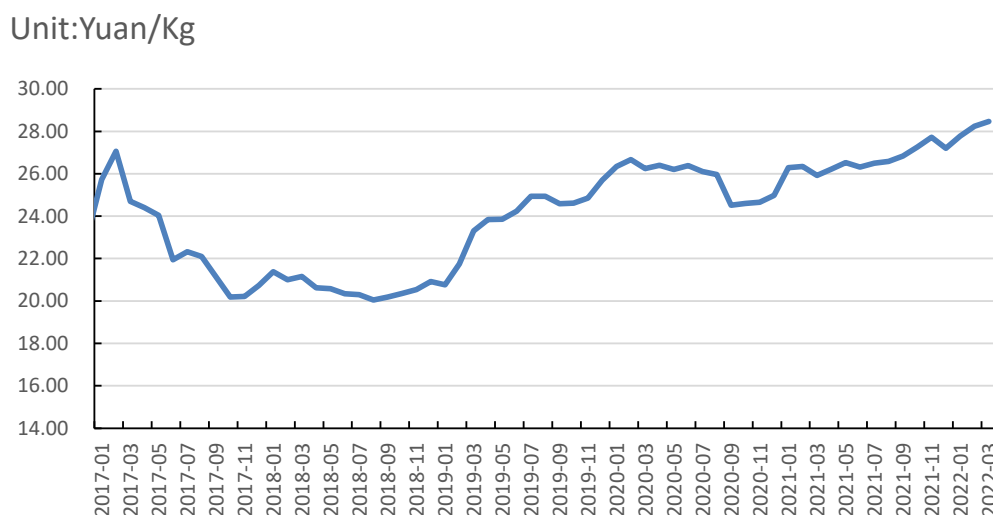
Imported Indian chillies are mainly sold through wholesale markets in China. According to transaction statistics (www.e658.cn) of the seven major domestic chilli wholesale markets in 2021, we calculated that about 64,000 tons of Indian chillies were distributed through these wholesale markets, accounting for 29% of the annual import volume of Indian chillies (excluding materials supplied by the foreign businessmen for processing). The rest of the imported Indian chillies are mostly distributed through medium and small-sized wholesale markets.

4.3 Circulation Prices of Chillies in China

4.3.1 Chilli Prices Fluctuated Upwards in China in Recent Years

From 2017 to 2021, the annual average wholesale prices of dried chillies in China stood at 23 yuan/kg, 20.6 yuan/kg, 24 yuan/kg, 25.8 yuan/kg and 26.6yuan/kg respectively.

From the perspective of the wholesale price of dried chillies at home, the price fell back after reaching a staged peak in the first half of 2017. The overall wholesale price of dried chillies has been rising since the beginning of the second half of 2018. The monthly average wholesale price of dried chillies at home reached 28.5yuan/kg in March 2022.



Data Sources: NDRC

Fig 4-2 Wholesale Price Trends of Chillies in China, 2017-2022

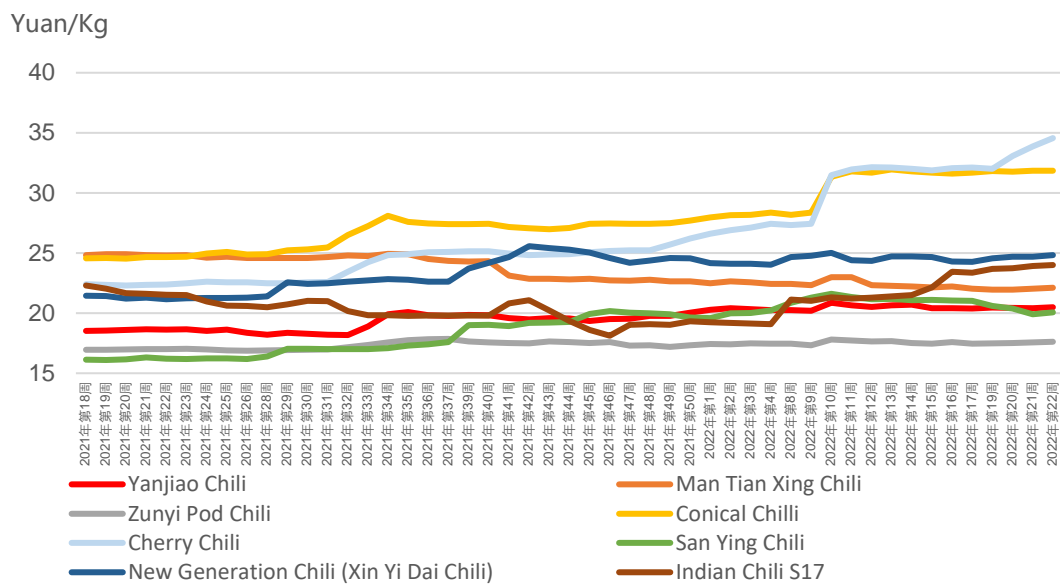
4.3.2 Prices of Indian Chillies Fluctuated Greatly in the Past Two Years

Affected by COVID-19 and the supply-demand relationship over the past two years, the price fluctuation of dried Indian chillies exceeded that of most homegrown chillies. As of the end of May 2022, the wholesale price of Indian S17 chilli reached 24yuan/kg, a year-on-year growth of 11.4%, and remained at a higher level among major chilli varieties.



Data sources: Chilli Index of Xinhua Net

Fig 4-3 Wholesale Price Index Trends of Imported Indian Chillies, 2019-2022



Data sources: Chilli Index of Xinhua Net

Fig 4-4 Comparison of Wholesale Prices between Homegrown Chillies and Imported Indian Chillies, 2021-2022

Chapter Five Analysis of Import Trade of Dried Chillies in China

5.1 Imports of Dried Chillies in China

5.1.1 Permitted Dried Chilli Exporters in China

In 2022, there are 20 countries and regions allowed to export dried chillies to China, including 11 in Asia, two in Africa, three in north and south America, three in Europe, and one in Oceania.

Table 5-1 List of Permitted Dried Chilli Exporters in China, 2022

HS	Product Name	Permitted Exporters (country/region)
0904.2100	Dried fruits of genus Capsicum/Pimenta, not crushed/ground	Asia: Myanmar, Japan, Thailand, Uzbekistan, India, Vietnam Africa: Rwanda North and South America: USA, Peru
0904.2200	Fruits of genus Capsicum/Pimenta, crushed or ground	Asia: Republic of Korea, Malaysia, Japan, Thailand, Turkey, Israel, India, Taiwan China Europe: Austria, Germany, Spain North and South America: USA, Canada, Peru Africa: South Africa Oceania: Australia

Data sources: China Customs

5.1.2 Import Process of Dried Chillies in China

The import process of dried chillies in China mainly includes the following steps: 1. Signing a trade agreement with foreign suppliers; 2. Foreign manufacturers prepare goods; 3. Arranging export declaration after booking cargo space; 4. International shipment of goods and submitting of relevant information to related organizations in China; 5 Customs clearance agencies arrange the clearance after the goods arrive at the port; 6. Issuing of tax bill, and tax payment; 7. The customs releases the goods upon the completion of clearance; 8. The goods are delivered to the warehouse designated by the customer.

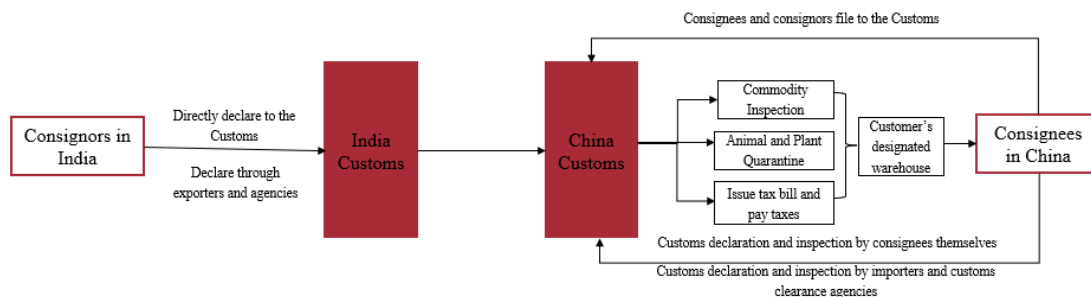


Fig 5-1 Import Flow Chart of Dried Chillies in China

Consignors and exporters mainly need prepare the following documents or materials: Certificate of Origin, Phytosanitary Certificate, Packing List, Invoice, Contract, Bill of Lading, Fumigation Syndrome, and Letter of Credit (L/C).

The documents or materials to be prepared by consignees and importers mainly include: Certificate of Origin, Phytosanitary Certificate, Packing List, Invoice, Contract, Bill of Lading, Fumigation Syndrome, Customs Power of Attorney, Entrust Letter of Inspection, and Inspection Form.

5.1.3 Import Tariff Rates of Dried Chillies in China

Table 5-2 Import Tariff Rates of Dried Chillies in China

HS	Product Name	MFN Tariff Rate	Conventional Tariff Rate	Countries and Regions Where Conventional Tariff Rates Apply	Preferential Tariff Rate	General Tariff Rate
0904.2100 0904.2200	Dried fruits of genus Capsicum/Pimenta, not crushed/ground	20%	0%	ASEAN, Chile, New Zealand, Singapore, Peru, Costa Rica, Iceland, Australia, Georgia, Mauritius, Cambodia, Hong Kong, Macau	0% Favored nation: LD	70%
	Fruits of genus Capsicum/Pimenta, crushed or ground		2%	Switzerland		
			9.3%	Republic of Korea		
			10%	Asia-Pacific Trade Agreement (including India),		

				Pakistan		
			11.8%	Japan		

Data sources: Tariff Commission of the State Council

India and China have not signed a Free Trade Agreement (FTA) yet, but a 10% conventional tariff rate applies to China’s imports of dried Indian chillies (HS: 0904.2100; 0904.2200) according to the relevant provisions of the Asia-Pacific Trade Agreement. In addition, a 9% value-added tax is imposed on dried chillies imported from Indian. Therefore, the composite duty rate on dried chillies from India is:

$$\text{CIF} \times (1+10\%) \times (1+9\%) / \text{CIF} - 1 = 19.9\%.$$

5.1.4 Policies Related to Dried Chilli Import

On 1 January 2022, the “Provisions of the People's Republic of China on the Registration Administration of Overseas Food Production Enterprises” officially came into effect. Eighteen categories of products (meat and meat products, casing, aquatic products, dairy products, bird's nest and bird's nest products, bee products, eggs and egg products, edible oil and oilseeds, stuffed flour-made foods, edible grains, industrial grain milled products and malt, fresh and dehydrated vegetables and dried beans, seasonings, nuts and seeds, dried fruit, unroasted coffee beans and cocoa beans, special dietary food, health-care food) shall be recommended by the competent authority of the source Country Region) for registration at the General Administration of Customs of China. The competent authority shall examine and verify the enterprises they recommend for registration and submit the following application documents to the General Administration of Customs of China after confirming the enterprises meeting the registration requirements: (1) letter of recommendation from the competent authority; (2) enterprise list and application form for enterprise registration; (3) identification documents of the enterprises, if the recommended enterprises meet the requirements of this regulation; (4) the declaration by the competent authority of the source country (region) of recommended enterprises meeting the requirements of this regulation; (5) the examination report by the competent authority of the source country (region) on relevant enterprises.

Products not included in the above 18 categories shall apply for registration to the

General Administration of Customs of China by themselves or by an authorized agent and submit the following documents: (1) enterprise registration application; (2) identification documents of the enterprises, such as business licenses issued by the competent authorities of the source countries (regions); (3) the declaration by enterprises of commitment to meet the requirements of this regulation.

The application for registration of an enterprise shall include the name of the enterprise, the country (region) where the enterprise is located, the address of the production site, the legal representative, the contact person, the contact information, the registration number approved by the competent authority of the country (region) where the enterprise is located, the category of food for registration, the type of production and the production capacity, etc.

The period of validity of registration for overseas food production enterprises approved to be registered in China is 5 years, and the process of registration is shown below:

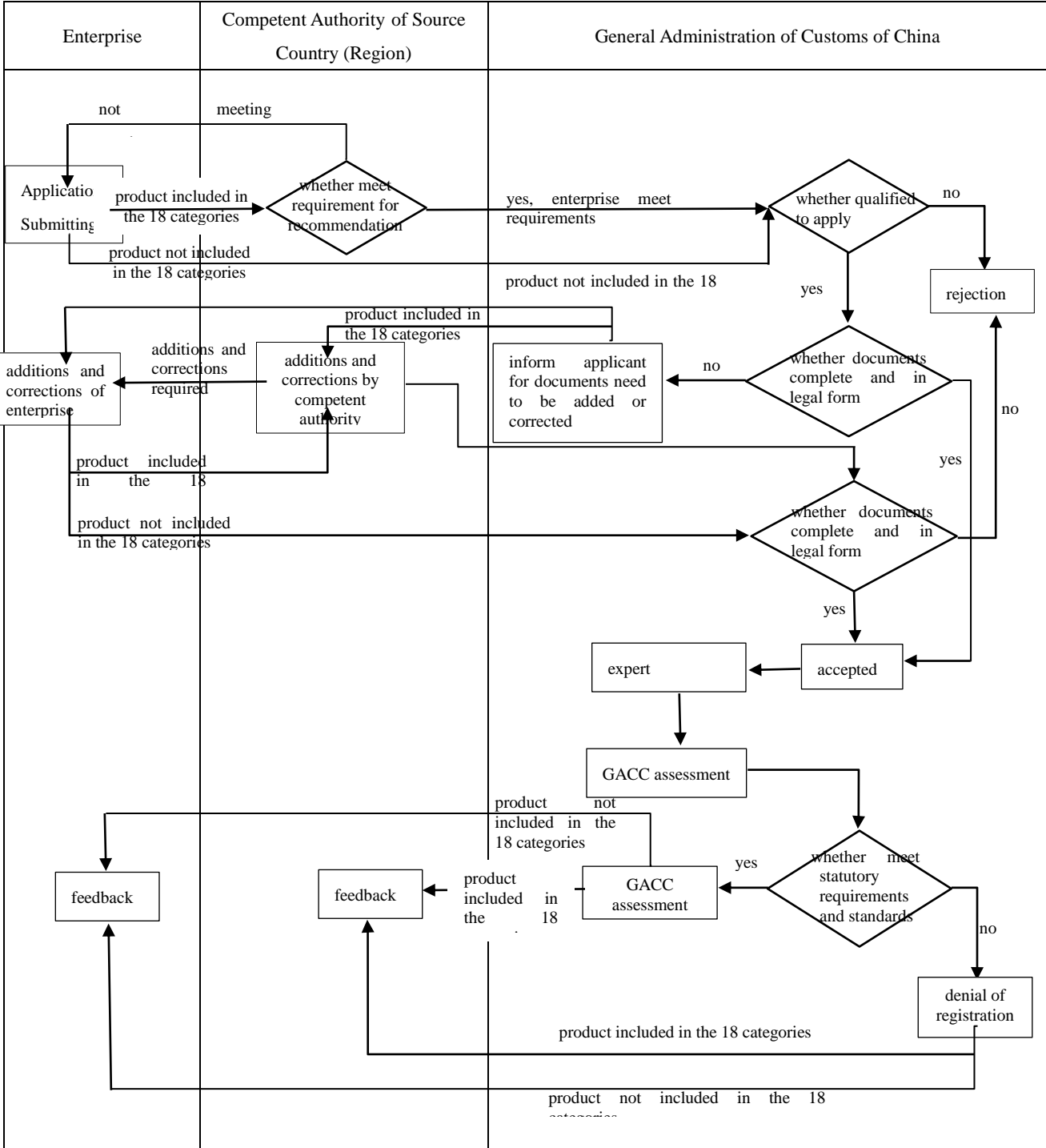


Fig 5-2 Registration Process of Overseas Food Producers at GACC

The “Administrative Measures of the People's Republic of China on Import and Export Food Safety” came into effect on 1 January 2022. Enterprises and traders engaged in the production and marketing of imported and exported food shall abide by these Measures. The Customs shall exercise supervision and administration over the producers and traders of imported and exported food and the safety of imported

and exported food. Overseas exporters or agents who export food to China shall put on record with the General Administration of Customs of China, and food importers shall put on record with the customs of where they are located. Overseas exporters or agents or food importers shall be responsible for the authenticity and validity of the documents provided.

5.1.5 China's Imports of Dried Chillies Showed an Upward Trend

Since 2012, the dried chilli imports of China (HS: 09042100, 09042200) decreased firstly and then increased. From 2012 to 2016, China's dried chilli imports decreased significantly from 19,000 tons to 1,600 tons, with a CAGR of -46.2%. The decrease of China's dried chilli imports indicates that the degree of dependence on imported dried chilli has reduced, and the production capacity of dried chilli in China has expanded. The improvement of China's chilli breeding ability has resulted in improved chilli quality and enriched chilli varieties. Since 2017, China's dried chilli imports have resumed growth, with 70,700 tons imported that year, a 3.8 times year-on-year increase. In 2018, the import volume increased by 9.6 times year-on-year to 81,800 tons. From 2017 to 2021, the CAGR was 132.2%.

Since 2017, China's dried chilli imports through customs has increased significantly, because dried chilli output in China continued to decline, and the supply gap needs to be filled through import. In 2017, both the planting area and output of chillies in China declined. In 2018, the extreme weather resulted in further reduction of dried-use chilli output in China, especially in Shandong Province, and the domestic supply shortage pushed up import demand. From 2019 to 2020, although the output of dried chilli in China recovered, the supply gap caused by big demand still needs to be filled by import, resulting in big chilli import volume in 2019 and 2020. In 2021, the planting area and output of chilli in China further shrank, leading to a new high in dried chilli imports in 2021.

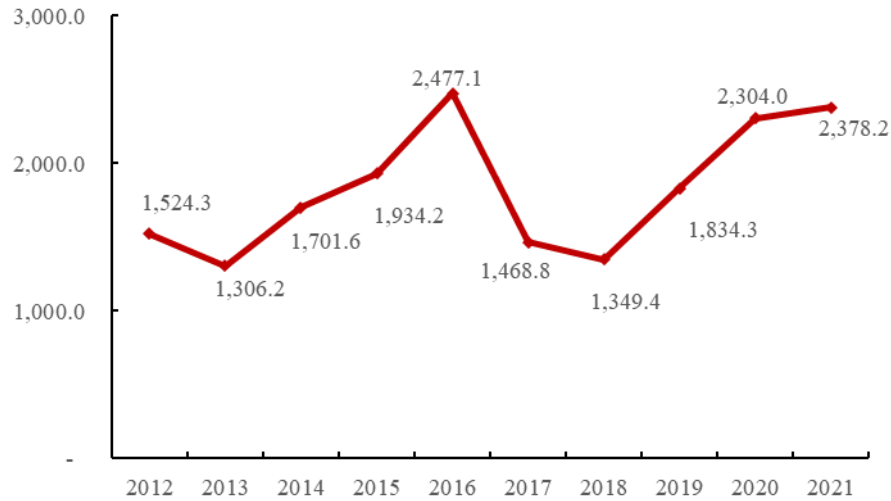
Table5-3 The Import Volume and The Import Value of Dried Chillies in China, 2012-2021

Year	HS:090421	HS:090422	Total	Value	Price
	(Tons)	(Tons)	(Tons)	(1,000 \$)	(\$/Tone)
2012	17,432.7	1,597.9	19,030.6	29,007.7	1,524.3
2013	3,592.8	624.4	4,217.2	5,508.5	1,306.2
2014	2,929.6	326.9	3,256.4	5,541.0	1,701.6
2015	2,572.3	417.7	2,990.1	5,783.5	1,934.2
2016	896.5	703.7	1,600.2	5,231.2	3,269.1
2017	6,986.3	702.2	7,688.6	11,293.2	1,468.8
2018	81,365.9	445.3	81,811.3	110,395.9	1,349.4
2019	168,281.3	356.5	168,637.8	309,338.7	1,834.3
2020	167,604.5	572.6	168,177.0	387,485.6	2,304.0
2021	222,352.5	1,045.2	223,397.7	513,479.1	2,298.5

Data Resource: UN Comtrade

The import price of dried chillies averaged USD 2,378/ton in 2021, a year-on-year growth of 3.2%.

China's import prices of dried chillies fluctuated upwards. The annual average import price stood at USD2,378/ton in 2021, surging by 56% from USD1,524/ton in 2012. Between 2012 and 2021, the lowest annual average price was USD1,306/ton, while the highest one reached USD2,477/ton, showing a great fluctuation.



Data Resource: China Customs

Fig 5-3 Average Import Prices of Dried Chillies in China, 2012-2021

5.1.3 India's Position in China's Imports of Dried Chillies

India is the world's largest producer and exporter of dried chilli. According to FAO statistics, India's output of “chillies and peppers, dry” has accounted for more than 38.5% of global output in the past 10 years and reached 1.702 million tons in 2020, accounting for 40.9% of global output; India's exports of “chillies and peppers, dry” remained above 43% of global exports, with 513,000 tons or 50.4% in 2020.

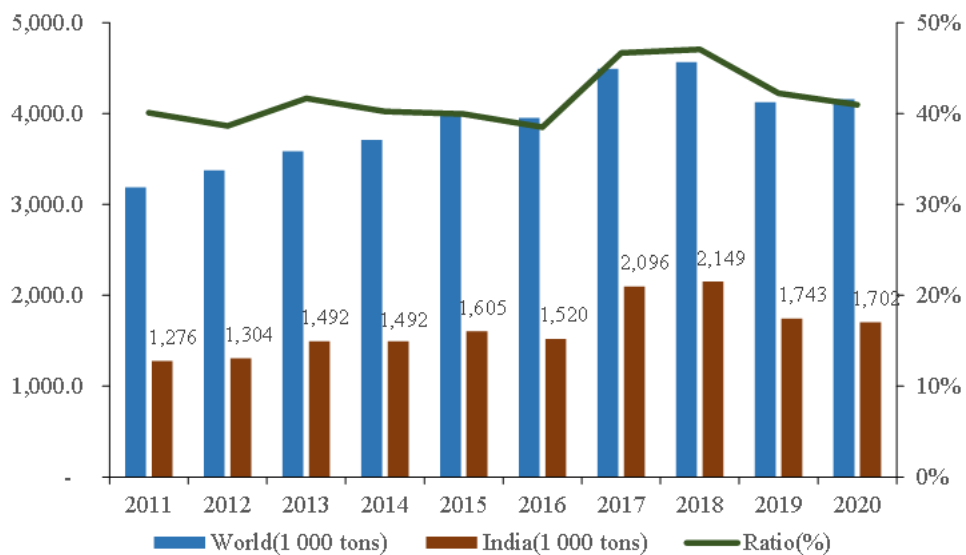


Fig5-4 The Production Quantity of Dried Chillies in The World and India, 2011-2020

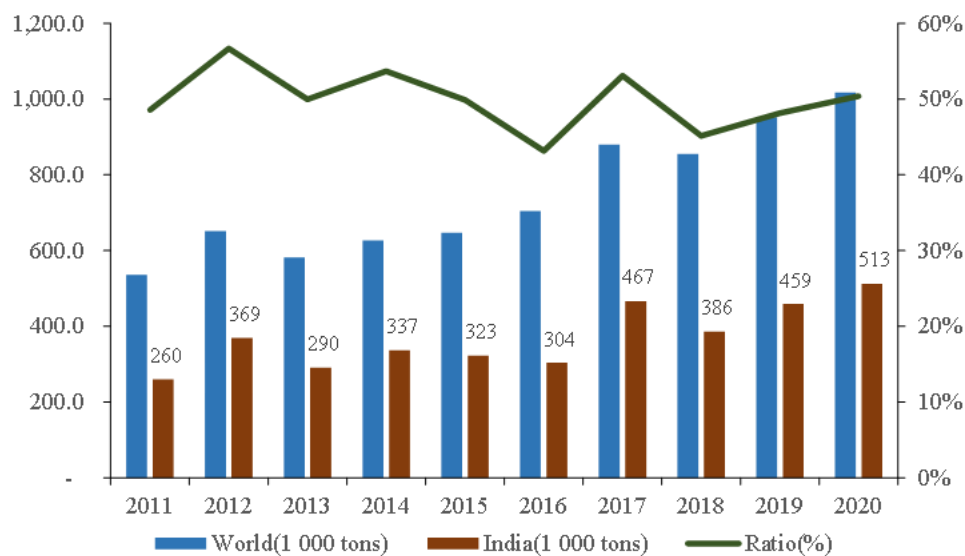


Fig 5-5 The Export Volume of Dried Chillies in The World and India, 2011-2020

China is now the biggest export destination for Indian dried chilli. According to data disclosed by UN Comtrade, China was not on the list of TOP10 destination countries for Indian dried chilli exports from 2014 to 2017. China has become one of the TOP10 countries in 2018 and has been India's biggest export destination for dried chilli for three consecutive years since 2019.

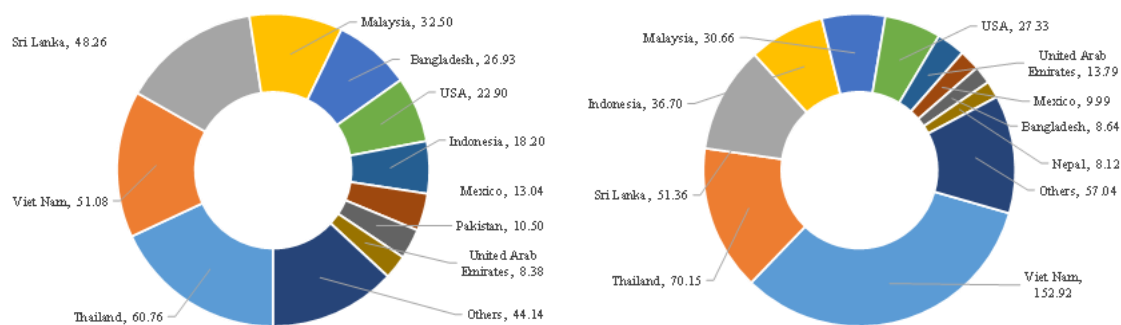


Fig 5-6 Top 10 Destination Countries of India's Exported Dried Chillies in 2014(left) and 2017(right), unit:1,000 tons

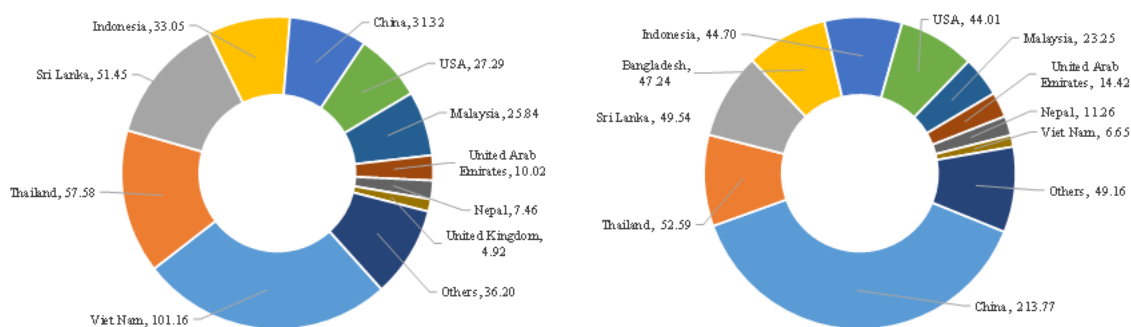


Fig 5-7 Top 10 Destination Countries of India's Exported Dried Chillies in 2019(left) and 2021(right), unit:1,000 tons

India has been China's largest source country of the imported dried chillies for many years. Since 2012, the proportion of India's dried chilli in China dried chilli imports has remained above 85%. In 2016, the proportion was 50%, and India was still the biggest source for China dried chilli import. In 2018, Indian chilli covered 27.5% in China dried chilli imports, and Vietnam was the largest import source, accounting for 72% of China dried chilli imports.

Table 5-4 Import Volume, Import Value and Import Price of Dried Indian Chillies, 2012-2021

Year	Volume (Tons)	%In Total	Value (Million \$)	Price (\$/Ton)
2012	18,733.7	98.4%	27.76	1,481.61
2013	3,939.3	93.4%	4.48	1,138.47
2014	2,825.7	86.8%	4.31	1,523.63
2015	2,563.2	85.7%	4.13	1,610.67
2016	799.4	50.0%	2.71	3,394.73
2017	6,785.5	88.3%	8.45	1,245.39
2018	22,496.3	27.5%	37.57	1,670.05
2019	155,783.3	92.4%	291.51	1,871.23
2020	153,172.4	91.1%	361.09	2,357.41
2021	211,355.5	94.6%	491.24	2,324.23

Data Resource: UN Comtrade

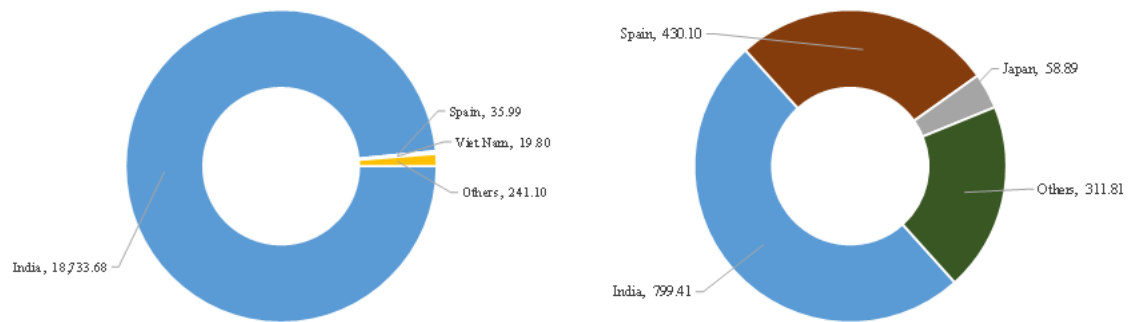


Fig 5-8 The Major Source Countries of China's Imported Dried Chillies in 2012(left) and 2016(right), unit: tons

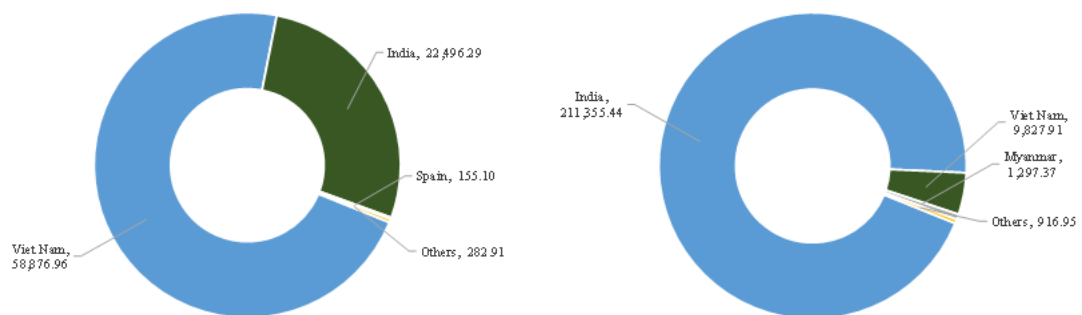


Fig 5-9 The Major Destination Countries of China's Imported Dried Chillies in 2018(left) and 2021(right), unit: tons

From 2012 to 2016, the shrink in China dried chilli import demand led to big decline in China's Indian dried chilli imports, falling from 18,700 tons to 799 tons, with a CAGR of -54.5%.

From 2017 to 2021, China's dried chilli imports from India increased from 6,800 tons to 211,400 tons with a CAGR of 136.2%. The main reasons for the rapid growth in Indian dried chilli imports include:

1. The Chinese customs has stepped up efforts to crack down on smuggling, allowing more Indian dried chilli to enter the Chinese market in the form of customs import. Previously, a large quantity of Indian dried chilli was firstly exported to Vietnam and then entered China from Vietnam. At the

same time, some Indian dried chilli was smuggled into the Chinese market through trade between border residents and small traders.

2. Indian dried chilli is competitively priced. In the second half of 2018, the decline in chilli output in China caused significant increase in chilli price, while the increase rate of Indian chilli price was relatively low; the narrowed price gap strengthened the cost performance of Indian chilli. In 2019, the price of domestic pod chilli in China was equal to that of Indian chilli, further increasing the cost performance of Indian chilli, leading to a significant increase in Indian dried chilli imports in 2019.

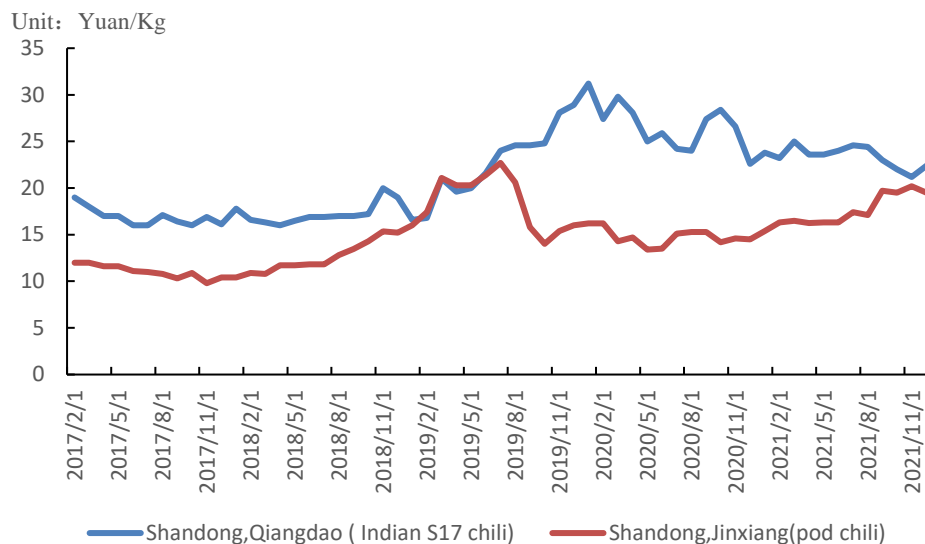


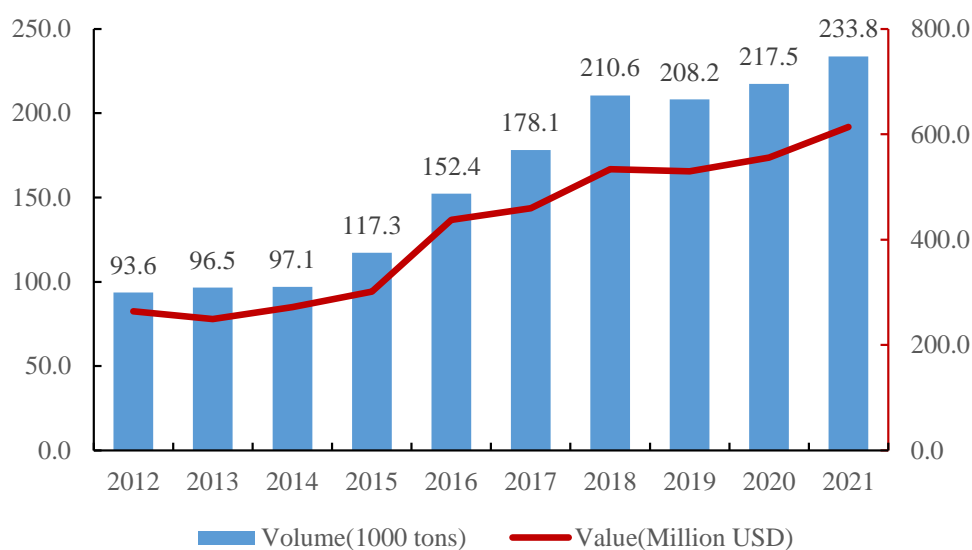
Fig 5-10 Wholesale Price Trends of India Chilli and Jinxiang’s Pod Chilli

5.2 China’s Exports of Dried Chillies

China mainly exports the following chilli related products: (1) primary dried chilli products: unground dried chilli (HS code: 09042100) and ground chilli (HS code: 09042200); (2) condiments with dried chilli as raw material (such as oil chilli and chopped chilli), included in “other condiments” (HS code: 21039090) without independent HS code; (3) deep-processed chilli products, such as capsaicin and capsanthin which are included in “unsaturated chlorinated derivatives of other acyclic hydrocarbons” (HS code: 29032990) in “organic chemicals” item and

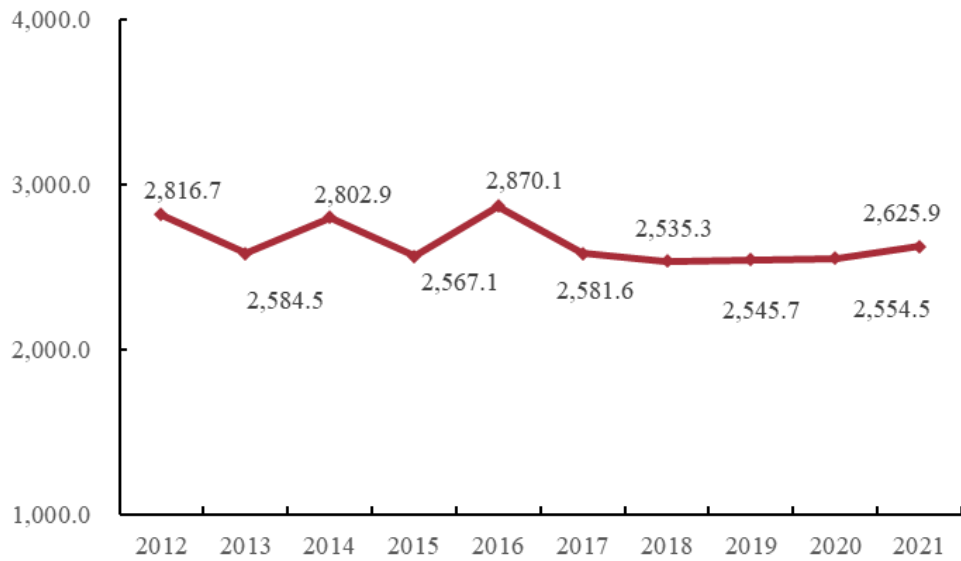
“other plant material coloring materials and products” (HS Code: 32030019)” in “agro-chemical, daily chemical and fine chemical products” item. Therefore, the export data of dried chilli in this report only refer to unground dried chilli and ground chilli.

China’s exports of dries chillies remain stable. The export volume increased from 93,600 tons in 2012 to 233,800 tons in 2021, registering a CAGR of 10.7%. The export value jumped from USD 264 million to USD 614 million, representing a CAGR of 9.8% between 2012 and 2021. The export price rose from USD2,816.7/ton in 2012 to USD2,625.9/ton in 2021, an increase of 6.8%.



Data Resource: China Customs

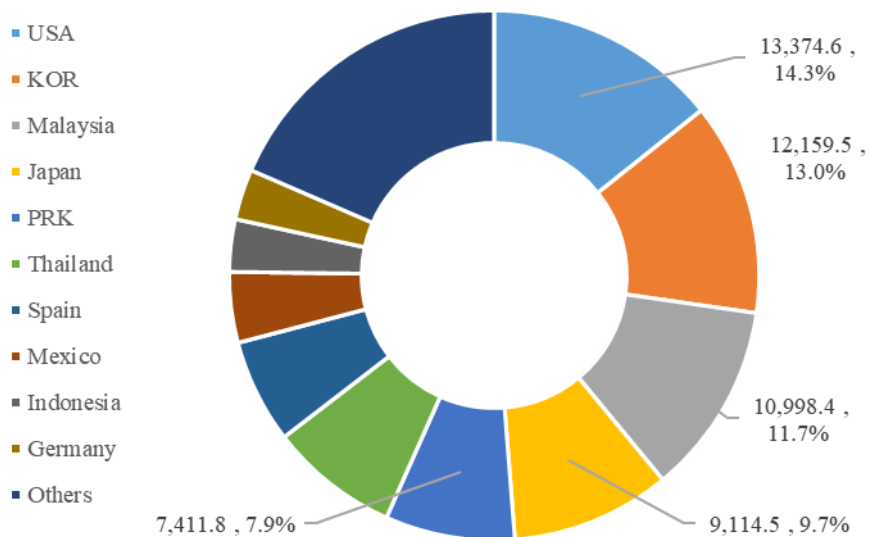
Fig 5-11 China’s Export Volume and Export Value of Dried Chillies, 2012-2021



Data Resource: China Customs

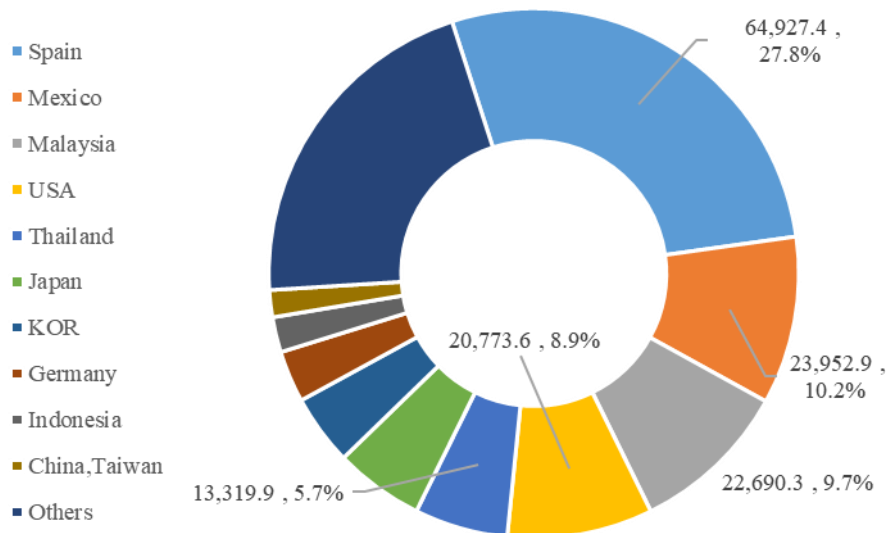
Fig 5-12 China's export Prices of Dried Chillies, 2012-2021

China's export destinations of dried chillies are increasingly diversified. China's top five importers of dries chillies were the USA, the Republic of Korea , Malaysia, Japan and the Democratic People's Republic of Korea (PRK) in 2012, accounting for 56.7% of its total export volume, and the top 10 importers took an 81.5% share. In 2021, the top five export destinations of Chinese chillies were Spain, Mexico, Malaysia, the USA, and Thailand, accounting for 62.3% of China's total exports, and the share for the top 10 importers registered 79%.



Data Sources: China Customs

Figure 5-13 China's Top 10 Export Destinations of Dried Chillies in 2012



Data Sources: China Customs

Fig 5-14 China's Top 10 Export Destinations of Dried Chillies in 2021

In recent years, China's exports of unground chilli have shown a growth trend. From 2019 to 2021, China's exports of ground chilli are 135,000 tons, 163,000 tons and 173,000 tons, accounting for 64.9%, 75% and 74.2% of the total exports of dried chilli respectively. In 2019, Spain, the United States, Japan, Malaysia and South Africa were the top five export destination countries of Chinese ground chilli. In 2020 and 2021, the top five destinations were Spain, the United States, Japan, South Korea and South Africa. In 2021, the top five destinations covered 62.8% of China's ground chilli exports.

The above destination countries take the quality, safety, processing technic and chilli species important. In terms of quality and safety, the EU is concerned about salmonella, sterilization methods and additives; the United States is concerned about salmonella and impurity indicators; Japan pays more attention to aflatoxin content of chilli powder; the content of helatoxins and metallic foreign bodies is highly concerned by South Korea. In terms of processing technic, developed countries have more detailed and strict requirements on the processing of chilli cuts, chilli slices and chilli powder. In addition, different countries also have certain differences in the demand for chilli varieties. For example, Spain and South Korea have a large demand for China's sweet chilli powder, and China's Tianying chilli is an important foreign trade type chilli variety.

5.3 SWOT of Exporting Indian Dried Chilli to China

(1) Strengths

Indian dried-use chilli has the advantages of rich varieties, high quality, high pungency degree and low price, making India the biggest dried chilli exporter in the world. Chilli deep processing industry in India also has advantages over China in terms of industry scale, production capacity, product quality and price.

In addition, the Spices Board of India's strict quality control procedures and mandatory spot checks on exports have made Indian chilli products popular in the international market.

(2) Weaknesses

The investment climate in agricultural industry is inadequate in India. Although the investment environment in India has improved in recent years, there are still some problems, and investment protectionism is also prominent. Chinese enterprises investing in agricultural industry in India has to face strict investment review with complicated and time-consuming procedures which increase investment risks.

(3) Opportunities

With the expansion of chilli demand, China's demand for high pungency degree chilli will also increase. Although the number of domestic varieties of high pungency degree chilli is increasing, the output is still far from meeting the demand in China. China still needs to import a large quantity of high pungency chilli from India (see Chapter 7).

(4) Threats

China is the second largest exporter of dried chilli in the world. China's export of dried chilli has shown a rising trend generally, reaching 234,000 tons in 2021, accounting for 23.1% of global dried chilli exports. At present and for some time to

come, China will be the biggest competitor of India's dried chilli export. Now and for a period of time in the future, China will be India's biggest competitor for dried chilli export.

Besides, although the quality of Indian dried chilli is generally good, India's chilli export still faces quality problems such as excessive pesticide residue, excessive additive content and excessive aflatoxin content, which is one of the main threats affecting the export of Indian dried chilli.

Table 5-5 The Main Enterprise of Dried Chilli trade in China

No.	Company Name	Location	Products/Import & Export	Registered Capital ('000 yuan)	Contact Info
1	Hunan Xiufeng Agriculture Products Trading Co., Ltd.	Changsha City, Hunan Province	Indian chilli and Indian Cumin Import	2,000	0731-85711386
2	Hunan Kuang Laowu Spicy Food Technology Co., Ltd.	Hengyang City, Hunan Province	Indian Chilli S17 and S4 import; Chinese chilli export	10,000	0731-85133878
3	Qingdao Sanjiao Import and Export Co., Ltd.	Qingdao City, Shandong Province	Seasonings, chilli import and export	2,000	0532-87227515
4	Zunyi Hongmanpo Agricultural Development Co., Ltd.	Zunyi City, Guizhou Province	Indian chilli imports for processing chilli spices	40,000	0851-28636328
5	Wanhuohang International Trade (Chongqing) Co., Ltd.	Chongqing Municipality	Dried-chilli wholesale; Indian chilli import	10,000	023-68105988
6	Lajiao Wangzi (Chongqing) Food Co., Ltd.	Chongqing Municipality	Spices supply; Indian chilli import	3,000	023-67857791
7	Shandong Hanlong Import and Export Co., Ltd.	Laizhou City, Shandong Province	Frozen chilli, chilli powder, chilli sauce series, pickled chilli series, hot pot chilli sauce, chilli oil, ready-to-eat chilli peanuts, etc., mainly frozen chilli; processing and export capacity about 10,000 tons/year	30,000	15098533325
8	Qingdao Yongfa Foods Co., Ltd.	Jiaozhou City, Shandong	Frozen pepper, dried chilli, chilli products, etc.; supply volume once accounted for a third of South Korea's frozen chilli imports	50,000	0532-83280566

Table5-6 Notification of Disqualification of Chinese Chilli Products Exported in Past 3 Years

Destination	Product	Problem	Notification Time	Destination	Product	Problem	Notification Time
EU	chilli power	Salmonella	2022/9/13	US	chilli power	Containing, in whole or in part, foul, decayed, decomposed or other unfit substances	2019/4/18
	chilli power	Salmonella	2022/9/6		chilli power	ditto	2019/4/18
	chilli power	Salmonella	2022/9/5		chilli power	ditto	2019/4/16
	chilli power	Unauthorized Color Additives: Sudan 1	2022/8/1		chilli power	Salmonella	2019/4/4
	chilli power	Salmonella	2022/5/30		chilli power	Containing, in whole or in part, foul, decayed, decomposed or other unfit substances	2019/3/27
	chilli power	Salmonella	2021/8/10		chilli power	ditto	2019/3/27
	sweet chilli power	Radiation unlabeled	2021/6/18		chilli power	ditto	2019/3/27
	red chilli power	Salmonella	2021/2/4		chilli power	ditto	2018/12/3
	chilli power	Salmonella	2021/1/20		chilli power	ditto	2018/11/15
	chilli power	Salmonella	2021/1/5		chilli power	ditto	2018/11/15
	chilli power	Salmonella	2020/10/14	Japan	dried chilli powder	aflatoxin	2022/12/5
	chilli power	Salmonella	2020/9/15		chilli power	the content exceeds that specified in item 3 of Article 11	2018/3/5
	chilli power	Salmonella	2020/7/17	South Korea	crushed chilli	Helatoxin A exceeds the limit	2022/11/24
	chilli power	Salmonella	2020/7/15		chilli seed powder	metal foreign body (Fe powder) unqualified	2021/5/26
red chilli power	Salmonella	2020/2/11	chilli seed powder		metal foreign bodies content exceeds the limit	2021/3/26	
chilli power	Unauthorized radiation	2019/8/28	chilli seed powder		metal foreign bodies content exceeds the	2020/8/4	

					limit		
	chilli power	Salmonella	2019/5/15		chilli seed powder	metal foreign bodies content exceeds the limit	2020/5/12
	chilli power	Salmonella	2019/2/21		red chilli powder	metal foreign bodies content exceeds the limit	2020/5/12
	chilli power	Salmonella	2019/1/30		chilli seed powder	metal foreign bodies content exceeds the limit	2020/5/6
	chilli power	Salmonella	2018/5/22		chilli power	metal foreign bodies content exceeds the limit	2020/4/9
	chilli power	Salmonella	2018/5/3		chilli seed powder	metal foreign bodies content exceeds the limit	2020/3/4
	chilli power	Salmonella	2018/4/16		chilli seed powder	metal foreign bodies content exceeds the limit	2020/2/27
US	chilli power	salmonella suspected	2022/5/23		chilli seasoning powder	metal foreign bodies content exceeds the limit	2019/7/17
	chilli power	salmonella suspected	2022/5/6		chilli seasoning powder	metal foreign bodies content exceeds the limit	2019/5/15
	chilli power	salmonella suspected	2022/2/17		chilli seed powder	metal foreign bodies content exceeds the limit	2019/5/1
	chilli power	salmonella suspected	2021/12/10		chilli seed powder	metal foreign bodies content exceeds the limit	2019/3/19
	chilli power	salmonella suspected	2021/8/2		chilli seed powder	metal foreign bodies content exceeds the limit	2019/1/9
	chilli power	Salmonella	2021/2/9		chilli seed powder	metal foreign bodies content exceeds the limit	2018/12/30
	chilli power	Salmonella	2019/12/16		chilli seed powder	metal foreign bodies content exceeds the limit	2018/4/10

Data Source: tbtsp.cn

Chapter Six Analysis of Chilli Markets in China

6.1 Overview of China's Chilli Markets



Fig 6-1 Regional Distribution of Chilli Consumption in China

China is a large producer and consumer of chillies, ranking the world's first in terms of the number of people eating chillies. Now, over 40% of the population or more than 500 million people in China eat spicy food. With people's eating habits changing, the number of spicy eaters will continue to grow in China.

China's major chilli consumption provinces and municipalities include Hunan, Sichuan, Hubei, Jiangxi, Guizhou, Yunnan, Chongqing, and Shaanxi. The production of chillies in most spicy-loving provinces cannot meet the local consumer demand. Hunan, Sichuan, Jiangxi and Hubei provinces all need to purchase a large amount of chillies from other provinces. Henan and Jiangsu where spicy food is not favored have seen a good growth in chilli production, with a large quantity of chillies available for selling to other provinces. The unbalanced development between the main producing areas and consumption

areas in China has put forward higher requirements for the circulation and processing of chillies, and the processed chilli market has broad prospects.

Table 6-1 Regional Distribution of Chilli Consumption in China

Consumption (1,000 tons)	Province/Autonomous Region/Municipality
≤500	North China: Beijing, Tianjin and Inner Mongolia The Northwest: Ningxia, Qinghai, and Xinjiang The Southwest: Tibet East China: Shanghai South China: Hainan
500-1,000	North China: Hebei and Shanxi The Northwest: Gansu Central China: Henan East China: Zhejiang, Shandong, Fujian
1,000-2,000	The Northeast: Heilongjiang, Jilin, and Liaoning East China: Jiangsu, Anhui South China: Guangxi
2,000-4,000	The Northwest: Shaanxi The Southwest: Yunnan, Guizhou, and Chongqing South China: Guangdong
≥4,000	The Southwest: Sichuan Central China: Hubei and Hunan East China: Jiangxi

Data sources: “Research Report on the Development of China Chilli Industry”, consumption data in 2015

6.2 Major Market Segments of Dried Chillies

As mentioned in the previous chapters of this report, dried chilli products include primarily processed products (dried chilli, chilli slice, chilli powder, chilli granules, etc.), chilli condiments (Fried pepper sauce, chilli sauce, hotpot condiments, etc.), and industrial chilli products (paprika oleoresin, capsaicin, capsicum oleoresin, chilli seed oil and others). The primarily processed products and chilli condiments are oriented towards households, catering, and industrial markets (snack food processing, other food processing,

pharmaceutical manufacturing, and daily chemical manufacturing), while industrial chilli products are mainly geared to the needs of the industrial market.

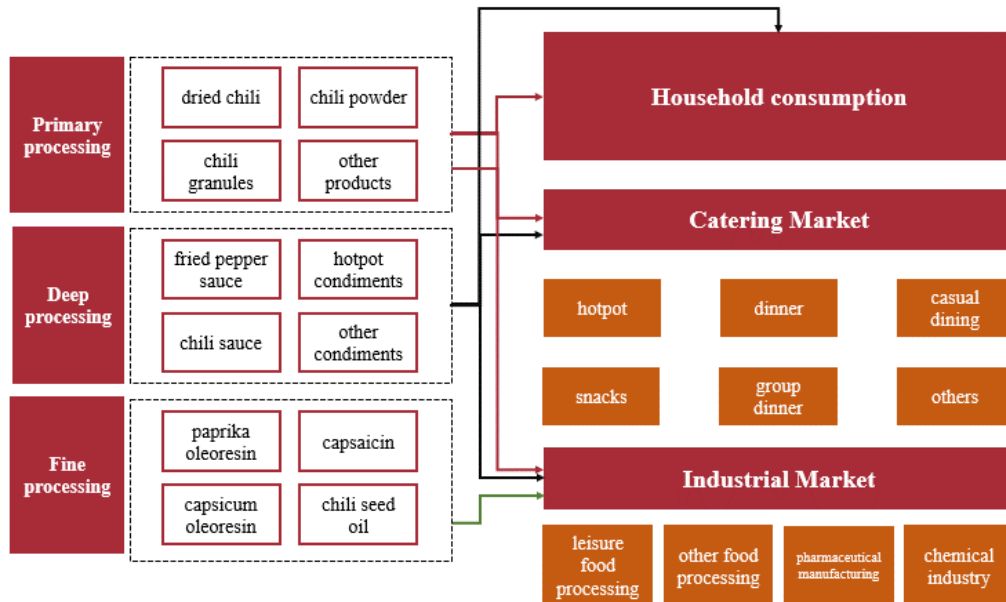
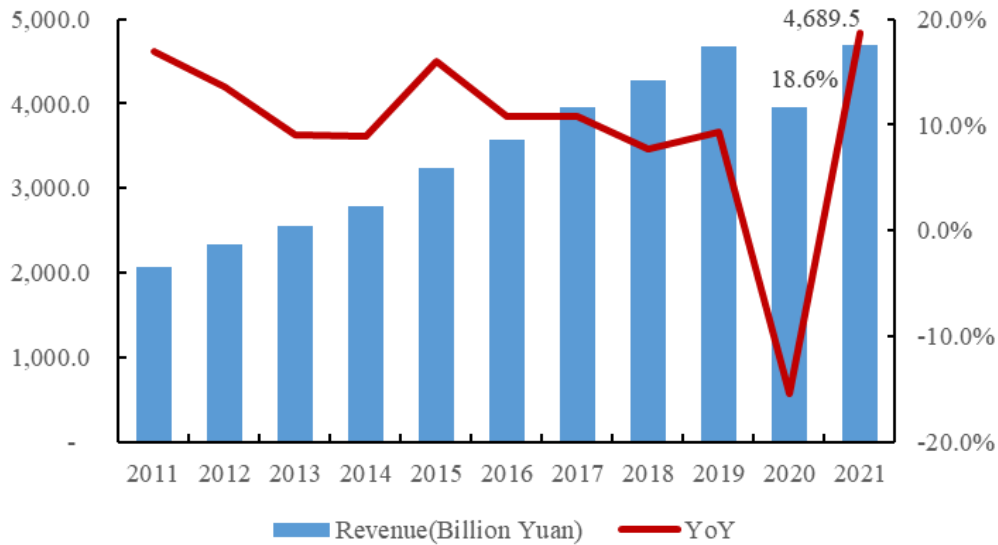


Fig 6-2 Major Market Segments of Dried Chillies in China

6.3 Market Segment One: Catering Industry

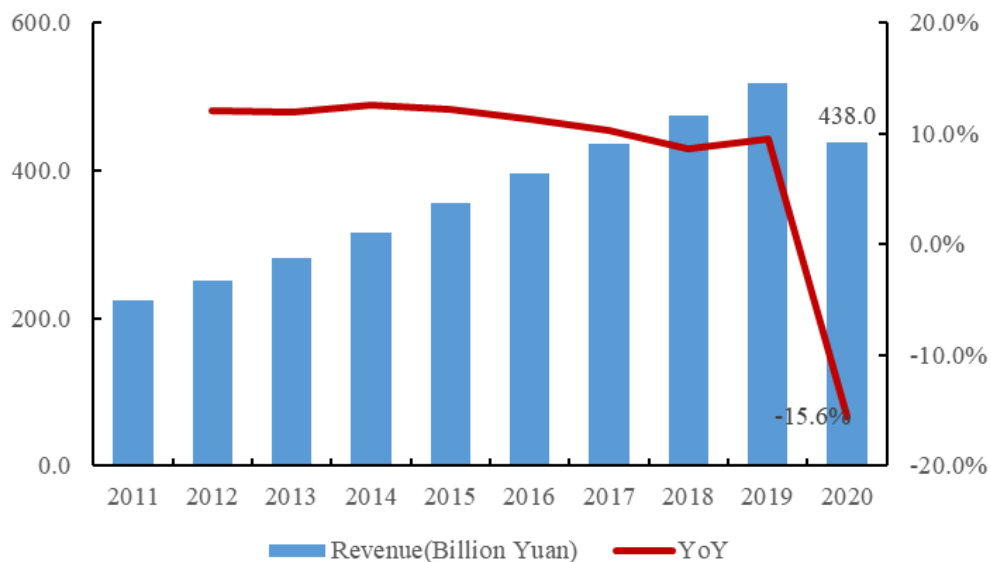
China is big country of catering consumption, showing a steady growth in market size. In recent years, China’s market size of catering industry broke through the 4.0 trillion-yuan mark. Affected the COVID-19 outbreak, the market size dropped to 3.59 trillion yuan in 2020, but it rapidly rebounded to 4.69 trillion yuan in 2021, reflecting strong market resilience. In terms of the growth, China’s catering market registered a CAGR of 8.6% between 2011 and 2021, which was higher compared with the growth of the GDP during the same period.



Data Resource: National Bureau of Statistics, BOABC Analysis

Fig 6-3 Market Size of Catering Industry in China, 2011-2021

Hot pot is the largest segment of China’s catering industry, accounting for above 10% of the total catering market. Taking hot pot as an example, the spicy taste is increasingly favored by more and more consumers. China’s market size of hot pot plunged to 438.0 billion yuan in 2020 due to the pandemic, but the CAGR of this sector still registered 7.7% in the past decade.

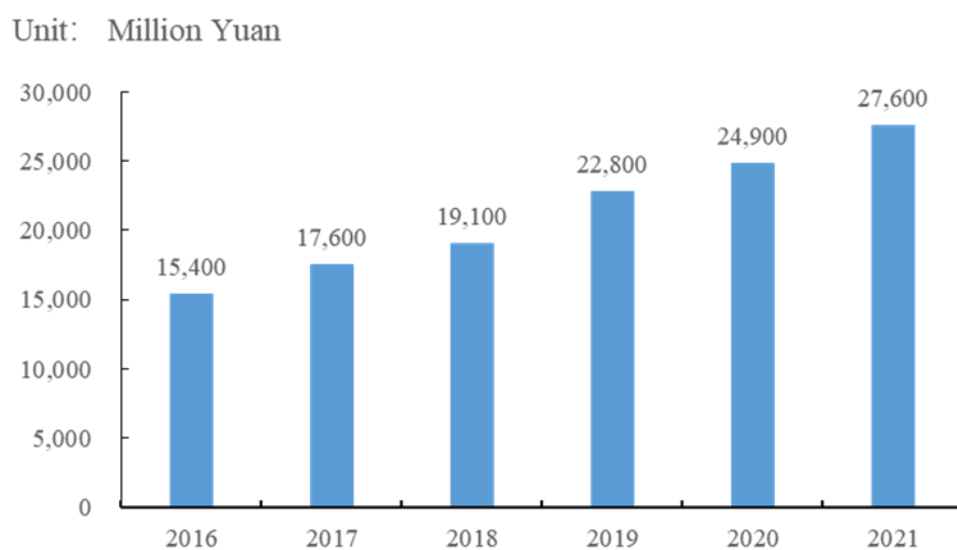


Data Resource: BOABC Analysis

Fig 6-4 Market Size of Hotpot Sector in China, 2011-2021

Dried chilli and related products such as chilli powder and chilli sauce are the

ingredients of hotpot condiments and dipping sauce. China's market size of hotpot condiments reached about 27.6 billion yuan in 2021, registering a CAGR of 10.2% from 2016 to 2021. In recent years, the consumer group of spicy food is expanding, and Sichuan noodles in chilli sauce, Chuanchuanxiang (refers to a spicy hot snack), Chongqing spicy noodles, wonton soup in hot and spicy sauce, Maoxuewang (a dish of boiled blood curd and other stuff with spicy sauce) and other spicy delicacies are more in line the aesthetic trend and consumption experience of young consumers, and spicy food eaters born after 1990s are increasing.



Data Resource: National Bureau of Statistics, BOABC Analysis

Fig 6-5 Market Size of Hotpot Condiments in China, 2016-2021

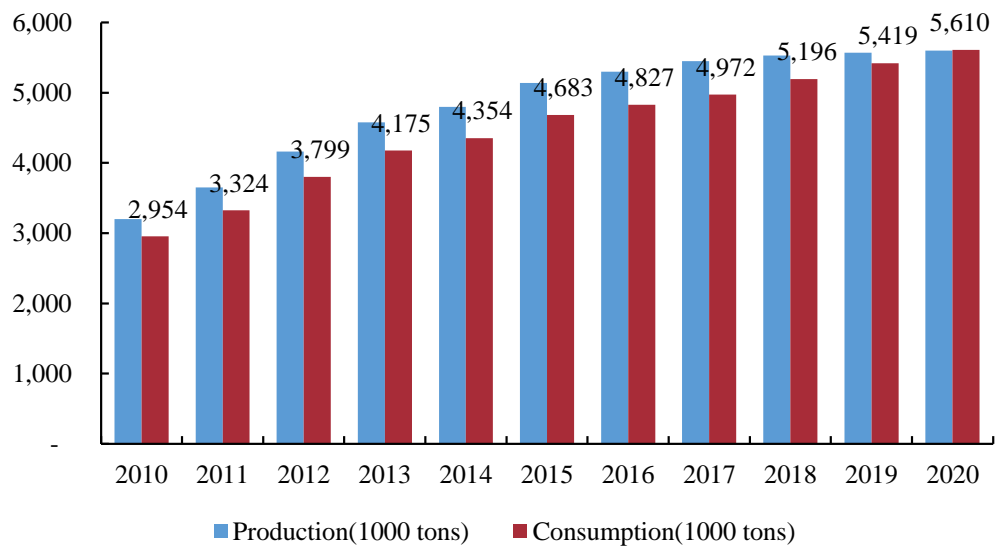
6.4 Segment Market Two: Chilli Sauce Consumption

Chilli sauce is a compound seasoning with vegetables or meat, aquatic products, spices, oil and salt as main ingredients. The flavor of chilli sauce changes with ingredients, processing technology and fermentation time. Chilli sauce is a favorite accompaniment to meals among Chinese consumers, and famous chilli sauce brands include “Lao Gan Ma”, “Fun Ye”, “Tiger Bang Chilli Sauce” and others.

Thanks to low entry barriers and bright market prospects, China's production of chilli sauce increased rapidly in recent years, and grew from 3.20 million tons in 2010 to 5.60 million tons in 2020, registering a growth of 75% during the

reporting ten years.

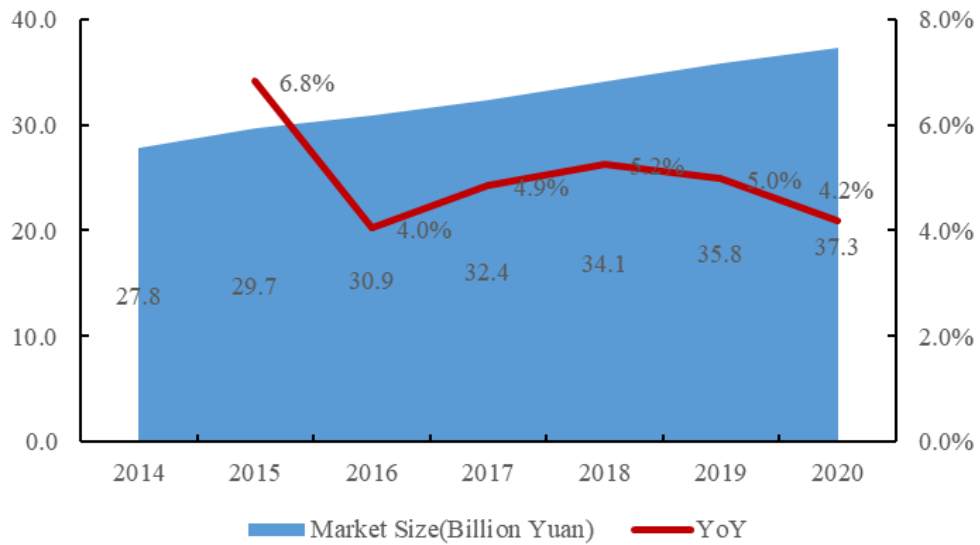
China's consumption of chilli sauce showed a steady upward trend, but the growth has slowed down. The CAGR of consumption registered 9.7% between 2010 and 2015, and then dropped to 3.8% during the period from 2016 to 2020. China's consumption of chilli sauce stood at 5.61 million tons in 2020, up 3.5% year on year.



Data Resource: National Bureau of Statistics, BOABC Analysis

Fig 6-6 China's Production and Consumption of Chilli Sauce, 2010-2020

China's market size of chilli sauce increased to 37.3 billion yuan in 2020 from about 27.8 billion yuan in 2014, representing a CAGR of about 5% between 2014 to 2020. Based on this growth rate, the market size is expected to break through 40.0 billion yuan in 2022. With the improvement of Chinese residents' consumption level, the demand for chilli sauce will continue to increase, and chilli sauce sector will have a broad space for development.



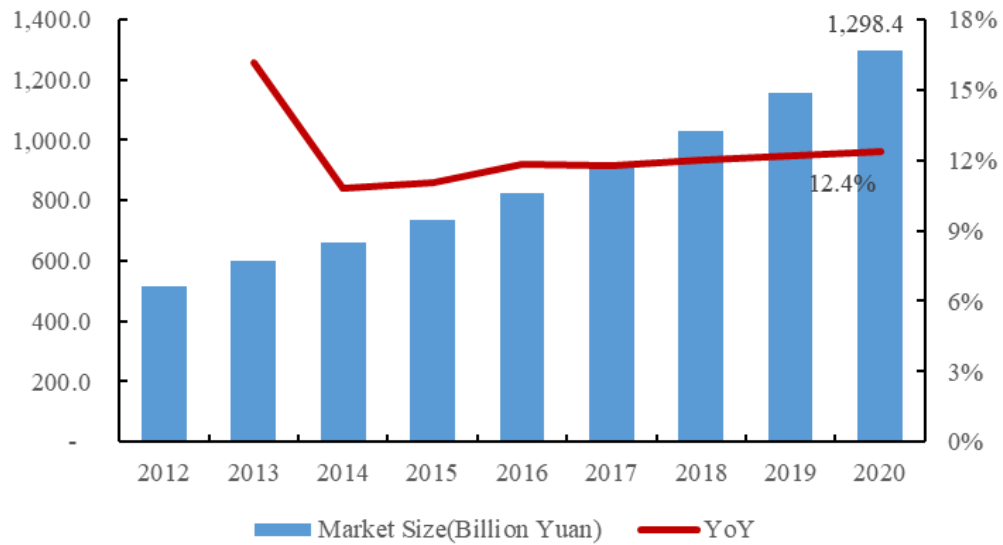
Data Resource: BOABC Analysis

Fig 6-7 Market Size of Chilli Sauce in China, 2014-2020

6.5 Segment Market Three: Spicy Snack Food

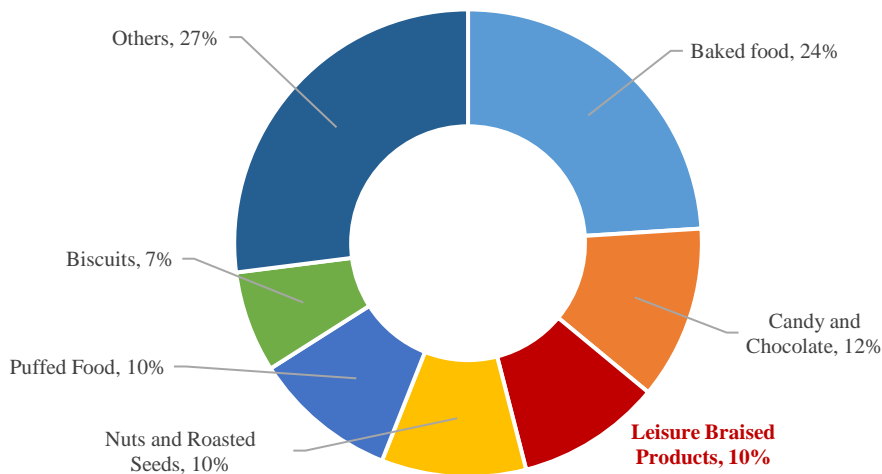
Spicy snack food has become a hot spot in China's snack food market in recent years, and chicken feet with pickled peppers, crayfish, spicy tofu, spicy gluten, spicy duck neck and others are highly sought after by consumers.

China's market size of snack food reached about 1.3 trillion yuan in 2020, jumping by 12.4% year on year, breaking through the one trillion-yuan barrier. The market size of leisure braised products accounted for about 10% of the total size of snack food, registering 100 billion yuan.



Data Resource: BOABC Analysis

Fig 6-8, Market Size of Snack Food in China, 2012-2020



Data Resource: BOABC Analysis

Fig 6-9, Market Share of Snack Food by Variety

Spicy snack food has a long-life cycle. Large amounts of dried chillies and chilli products are used in the processing and manufacturing of snack food, especially leisure braised products. The popular period of chicken feet with pickled peppers and spicy gluten is long, and some products catch on permanently.

Students and office white-collar workers are the main consumers of snack food. Chicken feet with pickled peppers, Zhouheiya (spicy duck products), spicy crayfish and spicy gluten are sought after by students and office workers. Spicy snacks are not only a good accompaniment for parties and chats, but also can relieve their stress after work.

6.6 Development Potential of Chilli Markets in China

Spicy consumer group will continue to expand. With the spicy food culture spreading in China, the chilli market is forecast to maintain high growth, and the consumer group in non-spicy areas will increase rapidly. The traditional areas of avoiding spicy food and liking a light diet, such as Guangdong, Shanghai and Zhejiang, have gradually changed to areas eating light spicy food, and China's spicy consumer groups are expected to expand continuously.

Industrial demand for chillies will rise steadily. For example, capsaicin can be used as biopesticide to kill most pests. Paprika oleoresin is widely applied in food industry for coloring aquatic products, cakes, canned foods, beverages and others. Capsicum oleoresin can be used for making food seasoning. Capsaicin can be used in pharmaceutical manufacturing. Chilli seed oil is widely used in health products, food, edible blending oil and other sectors.

Chapter Seven Opportunities for Importers of Indian Chillies to Further Expand Market in China

7.1 China Always Has a Demand for High SHU Chillies

China's chilli market will maintain the momentum of booming development amid the prevention and control measures for COVID-19, consumption upgrading and increasing household income, and spicy food eaters will continue to increase. With the expansion of the market size of spicy catering represented by hot pot, spicy snacks and spicy condiments, the demand for intensively processed chilli products such as chilli extracts will steadily increase.

The demand for high SHU chillies will also rise with the booming of the overall chilli consumption market in China. Although there are increasing varieties of high SHU chillies in China, they are far from meeting the demand. Therefore, to import high SHU chillies from India still has huge market potential.

From the perspective of food consumption in catering, chillies are a must in Sichuan cuisine, Hunan cuisine and others of China's eight major cuisines, and hot pot, spicy incense pot, spicy hot pot and other spicy food delight the people's taste buds. Spicy food is inseparable from chillies, and Indian chillies are the first choice for spicy Chinese dishes. The outbreak and the recurrence of COVID-19 have had a heavy impact on China's catering industry. If the pandemic is effectively contained and the impact on the Chinese consumer market is minimized in the future, China's demand for Indian chillies in the catering industry will further increase.

In addition, the sales of spicy snacks such as spicy duck neck and spicy gluten, as well as condiments like chilli sauce, will also increase steadily. The production and processing of these foods and condiments also need use the low-cost and high SHU Indian chillies.

Indian companies dominate the world's intensive processing of chillies, but their production costs are relatively high sometimes. The business mode usually adopted by some well-known Indian companies (such as Synthite, Koncor and Akay) is to buy finished or semi-finished products from China for deep processing and then sell them to high-end customers to maintain their customer base and market position.

7.2. Market Potential of Indian Chilli in China

7.2.1 Chilli Primary Processing and Industrial Chilli Products Still Have Market Expansion Potential in China

(1) Dried Chilli

The market size of catering industry has exceeded 4 trillion yuan in China, and spicy food's popularity is still growing. Demand for high pungency degree chilli from market segments such as hot pot consumption and leisure food production is also increasing. When domestic chilli supply does not meet the high pungency requirement on chilli from catering industry, Indian chilli is still the best choice. The quality of dried whole chilli can be identified directly by sensory means, and the usage of dried whole chilli is flexible and diverse. If the imported dried whole chilli can maintain high cost performance, it will still be the most important type of imported chilli, and the import volume will keep growing.

(2) Primary Processing Products Such as Chilli Cuts and Chilli Powder

Indian chilli is mainly consumed in form of chilli cuts and powder for catering industry consumption in China. The labor cost is lower in India than that in China, so the processing cost and transportation cost are lower in India than those in China. Therefore, Indian chilli cuts and chilli powder are competitive in China market, with potential in market size expansion, and Indian chilli export volume to China is expected to exceed 10,000 tons/year. Since it is more difficult to identify the quality of chilli cuts and chilli powder than identifying the quality of dried whole chilli, it is important to guarantee the product quality. In the meantime, Indian enterprises should communicate frequently with Chinese traders and develop products more suitable for the Chinese market according to customers' different requirements on the length and fineness of chilli cuts and chilli powder.

(3) Deep Processing Products Such as Capsanthin and Capsicum Oleoresin

Capsanthin is a natural food color, which is safer and more popular with consumers than artificial colors. Chilli extracts such as capsicum oleoresin to replace spicy raw materials is conducive to improving the degree of standardization and reduce production cost for catering enterprises and prepared dishes producers. In addition, capsanthin and capsicum oleoresin can also be used in fields of medicine, feed,

chemistry and cosmetics with broad market prospects.

In China, the thriving catering industry has been increasing its demand for capsanthin and capsicum oleoresin year by year, so do some other industries. It is expected that India's capsanthin and capsicum oleoresin exports to China will maintain a high growth rate in the future, but the export volume is not expected to exceed 10,000 tons due to the small unit consumption volume.

7.2.2 Difficulty for Indian Chilli Condiments to Develop Market in China

In China, chilli condiments mainly include fermented chilli, chilli sauce, hot pot condiment and oil chilli. On one hand, China's chilli condiment market is mature and has sufficient production capacity, and there is no demand gap, so it is difficult for imported products to enter the Chinese market. On the other hand, Chinese people has different chilli consuming habits from Indian people; Indian enterprises are not familiar with the tastes of Chinese residents, and the production techniques and some of the raw materials are difficult to copy completely from China; China's customs supervision policy on food is more complicated than that on agricultural products. In conclusion, it is difficult for Indian chilli condiments to develop market in China.

7.3 Export Opportunities for Chinese Dried Chillies and Related Products

In 2021, China exported 173,000 tons of Fruits of genus Capsicum/Pimenta, crushed or ground (HS:09042200) and 60,000 tons of Dried fruits of genus Capsicum/Pimenta, not crushed/ground (HS:09042100), creating export value of USD 460 million and USD150 million respectively. In the reporting period, China's export volume of chilli products totaled 233,000 tons, including 17,000 tons processed with imported materials.

According to BOABC's interviews with traders, some enterprises in Qingdao city of Shandong province imported chillies from India in the form of processing trade with imported materials. In this case, import tariff and value-added tax are temporarily exempted, and the finished products are re-exported to a third country (If the finished products are sold at home, the import tariff and value-added tax need be repaid.). Considering that imported Indian chillies have a certain impact on the dried chilli market at home, processing trade with imported materials can be used to avoid

the impact. Therefore, with the expansion of China's export market of dried chillies in the future, Chinese processors can raise their purchase volume of Indian chillies through processing trade with imported materials.

In addition, chilli condiments (chilli sauce, bean sauce, etc.) and capsicum oleoresin produced in China are partly sold to the international market. In the future, with the expansion of the international market, the demand for Indian high SHU chillies will also increase.

Chapter Eight Advice for Related Parties in India

8.1 Advice for Indian Chilli Exporters to China

The chilli traders surveyed by BOABC generally hold the following views: Under the current circumstances, the market demand for Indian chillies is decreasing as their competitiveness is declining. Besides, China has been developing and promoting high SHU chilli varieties, which definitely will replace some Indian chillies.

Based on the above status quo, we make the following suggestions for Indian chilli exporters to further improve the competitiveness of Indian chillies in the Chinese market.

8.1.1 Strengthen Quality Management

To improve the quality and appear of chillies exported. The quality of chilli products is directly related to the sales in China. According to the feedback of chilli traders, there is still room for improvement in the appearance of imported Indian chillies, and they suggest strengthening technical management in chilli planting, harvesting and drying to improve product appearance.

(1) Reducing Proportion of Discolored Pods

The discolored pods is mainly caused by three reasons: Frist, climate and environment changes and diseases, such as anthracnose and lacking of phosphorus, potassium or boron; too high or too low temperature is also easy to cause discolored pods when chilli growth is in coloring stage; Second, the damage during harvest, such as tearing when picking chilli, will lead to uneven color; Third, improper drying and storage, such as encountering long-period low temperature and rainfall when drying chilli, poor ventilation in haze weather or poor ventilation and permeability during storage, will also result in uneven color.

According to China's "Dried Red Chilli Quality Classification", the proportion of discolored chilli shall not exceed 2% for the top-grade chilli and shall not exceed 4% for first-class chilli, and this proportion for Indian chilli is relatively high.

Therefore, we advise Indian traders that: first, they can help farmers to avoid uneven color on chilli through contract farming or providing technical guidance; second, they could screen out discolored chilli by technical means such as introducing the color sorters; the color sorting and impurity removing technology is also in active developing in China, with nine related patents approved as of August 2022.

(2) To Lower Breakage Rate.

The interviewed traders said that the breakage rate of Indian chillies is high. The high breakage rate is mainly due to the frequent turning of the chilli during the drying process, resulting in the splitting of the chilli. Chinese importers usually require the proportions of both broken chilli and loose seeds to be less than 1%, but in practice there are excesses.

Therefore, we suggest Indian traders to pay attention to quality management in chilli purchase and perform fine operations in the drying process. In China, oven drying for chilli has been adopted by more and more enterprises. As of August 2022, 58 patents related to chilli drying have been approved in China, and we suggest Indian traders to take oven drying as one of the mainstream chilli drying methods in India.

(3) Introducing Processing Equipment to Guarantee Product Quality

In order to guarantee the quality of dried chilli, Indian traders could introduce processing equipment for different indicators. For example, they could introduce color sorters to screen out discolored pods, musty chillies, spotted chillies and chillies with handles or caps, introduce stone removal machine and dry-cleaning machine to remove impurities such as dust and stones and introduce grading device for grading the size and shape of chillies.

(4) Optimizing the Quality Classification Standard of Dried Chilli

We suggest Indian traders to optimize standards related to dried chillies in terms of size, brightness, color and pungency together with professional organizations in the industry, so as to meet the Chinese market demand for different grades of chilli, especially the high pungency variety S17 with large demand in China.

(5) Promoting the Standardization of Crushed or Ground Chilli in India (HS: 09042200)

Most of the chillies China imports from India need secondary processing (crushed or ground chillies). As the expansion of spicy food consumption, the demand and requirement for crushed or ground chilli in the Chinese market, especially in fields of food production and chain catering industry, will further increase. Therefore, it is suggested that Indian traders should take the advantage of low labor costs, introduce processing equipment and establish standards for crushed or ground chilli in terms of pungency, color and particle size, with proper supervision by relevant departments.

8.1.2 Improve the Standardization of Chilli Cultivation

There is always a demand for high SHU chillies in the Chinese market for the lack of such products. In addition, the pungency degree of imported Indian chillies has been reducing, which will in a certain extent affect Chinese importers' enthusiasm and the sales condition of Indian chillies in China.

It is suggested that traders should deepen cooperation with farmers to guarantee the pungency of chillies through good variety chilli planting and elimination of degenerate varieties and encourage farmers to maintain the unity of fertilization, pesticide application and irrigation to improve the degree of product standardization.

8.1.3 Try to Stabilize Product Prices

China's imports of Indian chillies hit a record high in 2021. However, due to various factors, the import price of Indian chillies fluctuated greatly, with the change rate far exceeding that of homegrown chillies, resulting in heavy losses to some importers. In terms of chilli supply, Indian exporters could achieve stable cooperation with Chinese importers through signing frame agreement. More reasonable pricing methods can also be explored. For example, CIF price can be considered as one of the ways for price settlement to reduce the loss of Chinese and Indian traders caused by the sharp fluctuations of chilli price during transportation. We also recommend that local Indian chilli associations, such as chilli import and export associations and Indian Andhra Chilli Association, establish regular communication mechanisms with Chinese chilli traders or associations and jointly study the future price trend for a timely risk avoidance.

8.1.4 Improve Business Reputation of Exporters

The Chinese enterprises attach great importance to the reputation of their partners. If the partner has a good business reputation, it means to some extent that the products are less likely to adulterate.

Individual Indian exporters are suggested to guarantee product quality to avoid adulteration and strengthen industry self-discipline. For the domestic chilli export associations of India, they could try to establish a black and white list system to recommend white list companies to Chinese importers.

8.2 Advice to Indian Government on Promoting Dried Chilli Export to China

8.2.1 Enhance the communication with Chinese government in order to gain better preferential policies

To actively communicate with relevant Chinese government departments (Ministry of Commerce, General Administration of Customs, etc.) to promote the reduction of import tariffs on Indian chilli and shorten customs clearance time by signing trade agreements.

8.2.2 To Increase Financial Support for Chilli Production in Main Producing Areas

The yield and quality of chilli are greatly affected by the climate in India, which leads to the fluctuation of chilli price; the chilli price is an important factor affecting the import of Indian chilli to China. Therefore, the Indian government needs to give certain financial support to the chilli production in the main producing areas in terms of agricultural infrastructure, means of production and pest control, so as to guarantee the yield and quality of chilli and reduce the loss of farmers. For example, they could build irrigation facilities, provide certain financial subsidies or low-interest loans in terms of seeds, pesticides and fertilizers and set up monitoring systems for the prevention and control of climate disasters, diseases and pests to reduce the loss of chilli production.

8.2.3 To Provide Technical Guidance for Chilli Planting and Processing

The government of India may provide technical guidance for chilli planting and processing in major chilli producing areas through joint efforts with scientific research institutions or relevant technical personnel to improve chilli yield and quality and processing techniques. In terms of chilli planting, they could employ technical personnel in chilli planting and plant protection to provide technical guidance and stabilize the per unit yield and quality of chilli through planting management. In terms of chilli processing, they could encourage local research institutions to provide guidance in chilli processing to avoid the loss caused by improper operation, especially in chilli drying and crushing.

8.2.4 To Support and Encourage the Development of Chilli Related Machinery and Equipment Industries

To improve the mechanization and technical level of primary processing such as picking, drying, handle removing, as well as deep processing such as capsanthin and capsicum oleoresin extraction by encouraging local equipment manufacturers to develop new equipment or actively introducing relevant equipment from China.

8.2.5 To Promote Long-Term Cooperation between Chinese and Indian Traders and Indian Chilli Growers

China has a high demand for high-pungency chillies, and the market size is still expanding. But the excessive price fluctuations of Indian chillies since 2021 have caused huge losses to Chinese importers. In 2022, the high price of Indian chilli also brought pressure on Chinese importers, resulting in a year-on-year decline in chilli imports in the first half of the year. Therefore, it is suggested that the Indian government issue relevant policies to promote the long-term cooperation between Chinese and Indian traders and chilli growers, especially the cooperation among Chinese traders with extensive and stable sales channels, Indian traders with stable supply channels and big chilli growers. They could establish a long-term cooperative relationship through with contract farming. The government could provide preferential policies such as deposit reduction, tax reduction, planting subsidy and agricultural insurance to the three parties. At the same time, scientific price fluctuation management plan could be set up to protect the basic interests of the three parties.

8.3 Advice to Promoting India's Export of Ground Chilli to Other Countries

Ground chilli is an important chilli product in China. Based on the situation of China, BOABC suggests that: first, the Indian government shall communicate with the government of the destination country on related policy and well manage the chilli products producing companies to well control the product quality according to the inspection and quarantine requirements from the destination country; second, the Indian exporters shall actively communicate with the importers of destination country to better understand the market demand and select required chilli varieties and produce the products needed by market; third, the Indian chilli industry shall improve ground chilli processing technic through independent research and development or technology introduction to improve product quality.

8.4 Advice to Indian Government on attracting investment from Chinese companies

Based on the interviews with traders and processors, we summarize and sort out the following suggestions for the government of India to attract Chinese companies to invest in chilli industry in India.

8.4.1 Necessary Supports from Related Departments Such as Ministry of Commerce and Industry

When Chinese-funded enterprises invest, construct and operate dried chilli production projects in India, local government departments such as Ministry of Commerce and Industry and tax bureau can provide necessary supports, timely understand the development and operation of these enterprises and solve the problems encountered by these Chinese-funded enterprises. Taking the Ministry of Commerce and Industry as an example, it can provide support to Chinese enterprises in terms of policies and promotion measures on import and export of dried chilli and approving Foreign Direct Investment (FDI).

8.4.2 Local State Governments Shall Fully Implement Policy of Investment Promotion

When Chinese companies invest in states such as Andhra Pradesh, a major producing region for dried chilli, local governments can offer direct investment refund and tax incentives. Direct investment refund refers to that local state governments directly return financial funds to enterprises according to their actual investment. Tax incentives refers to the commitment of the local state government to exempt the state-level goods and services tax on the products sold in the state within a certain period of time.

8.4.3 Facilitate Visa Application for Employees of Chinese Enterprises

India is very strict on the work visa. It is extremely difficult for ordinary engineers and technicians to obtain a work visa of India, and the situation is worse for ordinary workers to enter India. It also takes a long time to apply the work visa. We suggest that relevant departments in India (embassies and consulates, Indian Ministry of Labor, etc.) facilitate visa application for employees of Chinese funded dried chilli processing enterprises and shorten the application approval period.

8.4.4 Facilitate Purchase of Real Estate by Chinese Enterprises

When the subsidiaries and branches of Chinese enterprises purchase real estate (including land and houses) in India, they need to obtain approval from relevant Indian authorities (such as the Reserve Bank of India). The purchase of land or houses faces complex procedures and takes a long time, and costs are difficult to control, which to some extent affects the enthusiasm of Chinese enterprises to invest in India. Currently, most Chinese enterprises in India choose to rent houses and land. We suggest relevant Indian departments to facilitate Chinese enterprises' purchase of real estate in India.

8.4.5 Help Chinese Enterprises Deal with Relationship with Indian Government, Parliament and Labor Unions

Chinese enterprises should establish a good relationship with not only the economic departments in the central government of India but also the functional departments of the local state governments where the enterprises are located and actively understand the laws, regulations and policy trends of the central and local governments of India to ensure their operation in compliance with the laws

regulations. At the same time, Chinese enterprises can also convey their legitimate concerns and interests to the Indian legislature and keep abreast of the latest developments in foreign investment and industrial policies. In addition, Chinese enterprises should be cautious about labor-capital relationship in India and maintain close and smooth communication with regional and industrial labor unions.

In the communication between Chinese enterprises and competent authorities, parliament and labor unions, we suggest that the Indian side provide necessary assistance and support to help Chinese enterprises integrate into the local chilli industry development system as soon as possible.