

China Agricultural Outlook

(2016—2025)

Highlights

Market Early Warning Expert Committee of
Ministry of Agriculture
April 2016

Market Early Warning Expert Committee of Ministry of Agriculture

Director :

Qu Dongyu, Vice Minister and Researcher, Ministry of Agriculture (MOA)

Deputy Director :

Tang Huajun, Deputy President and Academician, Chinese Academy of Agricultural Sciences (CAAS)

Tang Ke, Director General, Department of Market and Economic Information, MOA

Macro Team :

Liu Xiaonan, Deputy Director General, Department of Economy and Trade, National Development and Reform Commission (NDRC)

Wang Xintong, Division Director, Agriculture Division, Agricultural Economy Division, NDRC

Lu Zhengmin, Director, Circulation Industry Promotion Center, Ministry of Commerce (MOFCOM)

Wang Xiaohui, Director, China National Grain and Oils Information Center

He Junwei, Deputy Director General, Department of Sectoral Policy and Law, MOA

Diao Xinyu, Deputy Counsel, Department of Market and Economic Information, MOA

Chen Zhangquan, Deputy Director General, Department of Development and Planning, MOA

Pan Wenbo, Deputy Director General, Department of Crop Production, MOA

Yang Zhenhai, Deputy Director General, Department of Animal Production, MOA

Liu Xinzhong, Deputy Counsel, Fisheries Bureau, MOA

Sun Dongsheng, Deputy Director and Researcher, Institute of Agricultural Economics and Development, CAAS

Sun Tan, Director and Researcher, Agriculture Information Institute, CAAS

Song Hongyuan, Director and Researcher, Rural Economy Research Center, MOA

Zhang Xingwang, Director, Information Center, MOA

Ni Hongxing, Director and Researcher, Agricultural Trade Promotion Center, MOA

Technology Group: (in the order of the number of strokes in surnames)

Yu Leng, Professor, Antai College of Economics and Management, Shanghai Jiao Tong University

Zhu Xinkai, Scholar of the Changjiang Scholars Program and Distinguished Professor, Renmin University of China

Xu Shiwei, Researcher, Agriculture Information Institute, CAAS

Du Weicheng, Deputy Director and Researcher, Information Center, MOA

Li Guoxiang, Researcher, Rural Development Institute, Chinese Academy of Social Sciences (CASS)

Yang Jun, School of Economics and Management, University of International Business and Economics

Yu Difei, President, China National Agricultural Development Group Co., Ltd

Wu Laping, Professor, School of Economics and Management, China Agricultural University

Qin Fu, Professor, Institute of Agricultural Economics and Development, CAAS

Xu Hongyuan, Deputy Director and Researcher, Agricultural Trade Promotion Center, MOA

Guo Yongtian, Deputy Director and Researcher, Rural Economy Research Center, MOA

Huang Hanquan, Director and Researcher, Industrial Economy Institute, Academy of Macroeconomic Research, NDRC

Dong Chunping, General Manager, Chengdu Branch, China Grain Reserves Corporation

Secretary General:

Xu Shiwei, Researcher, Agriculture Information Institute, CAAS

Deputy Secretary General:

Diao Xinyu, Deputy Counsel, Department of Market and Economic Information, MOA

Zhou Guomin, Deputy Director, Agriculture Information Institute, CAAS

Foreword

Since 2014, China, drawing upon the experience and practices of countries with mature market economy to guide market expectation, has convened the China Agricultural Outlook Conference and released the China Agricultural Outlook Report for three consecutive years; in particular, the China Agricultural Outlook (2015 – 2024) released in the name of the Market Early Warning Expert Committee, Ministry of Agriculture in 2015 has provided important reference for domestic market players and relevant sectors regarding adjusting the expectation of agricultural market. The year 2016 marks the opening of the 13th Five-Year Plan (FYP) period and is also the key stage for supply-side structural reforms in agriculture. The further improvement of the system of China agricultural outlook and the release of the China Agricultural Outlook (2016 – 2025) is an important measure to implement a range of important development strategies and arrangements, including Several Opinions of the Central Committee of CPC and the State Council on Promoting the Reform of Price Mechanism, Several Opinions of the CPC Central Committee and the State Council on the Implementation of New Concepts on the Development and the Acceleration of the Agricultural Modernization for the Realization of Moderate Prosperity in All Respects, Guidance of the State Council on Advancing the Internet Plus Initiative and Circular of the State Council on Printing and Issuing the Action Outline for Promoting Big Data Development, and is of crucial importance to review the 12th FYP period and plan for agricultural development in the 13th FYP period.

The basic conclusion of the China Agricultural Outlook (2016 – 2025) is the baseline projection made by experts and relevant sectors, adopting the China Agricultural Monitoring and Early-warning System (CAMES) developed by the Agricultural Monitoring and Early-warning Team of Agricultural Information Institute of CAAS, on the basis of the China Agricultural Outlook (2015 – 2024), taking into consideration developments of market, policy, climate and macroeconomics of the previous year, and based on specific assumptions of macroeconomics, agricultural policies, climate conditions, innovation of science and technology, resource endowment and changes of international markets. Baseline data mainly comes from statistics released by China statistics

departments and the agricultural market monitoring data released by agricultural departments, and also includes field investigation data accumulated by relevant research institutions. The China Agricultural Outlook (2016 – 2025), in particular, reviewed the situation of agricultural market in China during the 12th FYP period, made projections on the features and trend of the operation of China’s agricultural market during the 13th FYP period, thus will provide important reference for the development and implementation of the new FYP.

The Market Early Warning Expert Committee of MOA reviewed and approved the basic conclusion of the China Agricultural Outlook (2016 – 2025). The Committee is composed of experts and academicians from the following entities: Department of Agricultural Economy, NDRC, Department of Economy and Trade, NDRC, Academy of Macroeconomic Research, NDRC, Circulation Industry Promotion Center, MOFCOM, China National Grain and Oils Information Center, Renmin University of China, Chinese Academy of Social Sciences (CASS), University of International Business and Economics, Shanghai Jiao Tong University, Department of Sectoral Policy and Law, MOA, Department of Market and Economic Information, MOA, Department of Development and Planning, MOA, Department of Crop Production, MOA, Department of Animal Production, MOA, Fisheries Bureau, MOA, Rural Economy Research Center, MOA, Information Center, MOA, Agricultural Trade Promotion Center, MOA, Institute of Agricultural Economics and Development, CAAS, and Agriculture Information Institute, CAAS. Experts of the system of industrial technologies of modern agriculture have made important contributions to the Outlook Report in terms of the provision of data and the discussion and revision of Outlook conclusions.

Every chapter of the China Agricultural Outlook (2016 – 2025) has been based on years of study of product analysts and the distillation of their hard work and wisdom. To be specific, Chapter 1 Overview is authored by Li Ganqiong; Chapter 2 Cereals is written by rice analysts, Peng Chao, Zhang Huan and Gao Qiang, wheat analyst Cao Hui and corn analysts Xu Weiping and Xi Yinsheng; Chapter 3 Oilseeds and Oilseed Products is written by soybean analysts Yin Ruifeng and Xu Xuegao, oilseed analysts Zhang Wenli and Li Songlin; Chapter 4 Cotton is authored by cotton analysts Zhai Xueling and Li Xiang; Chapter 5 Sugar is edited by sugar analysts Xu Xue, Ma Kai and Ma Guangxia; Chapter 6 Vegetables is authored by vegetable analysts Li Huishang, Kong Fantao and Wang Shengwei; Chapter 7 Fruits is edited by fruit analysts Zhao Junye and Wu Jie; Chapter 8 Meat is authored by pork analysts Zhu Zengyong and Zhang

Xuebiao, poultry analysts Zhang Li and Zhu Haibo and beef and mutton analysts Qu Chunhong and Si Zhizhi; Chapter 9 Poultry Eggs is written by poultry egg analysts Li Zhemin, Li Ganqiong and Zhang Chao; Chapter 10 Dairy is edited by dairy analysts Wang Dongjie and Dong Xiaoxia; Chapter 11 Aquatic Products is authored by aquatic product analysts Shen Chen, Liu Jingjing and Zhang Jingyi; and Chapter 12 Feed is written by feed analysts Zhang Qiao and Tao Sha.

All staff of the Agriculture Information Institute, CAAS, led by Director Sun Tan has provided strong guarantee for the high-quality performance and smooth completion of Outlook activities for 2016. China Agricultural Monitoring and Early-warning Innovation Team led by Researcher Xu Shiwei as Chief Scientist has provided basic data system and CAMES model simulation and predication technology. Team members, including Li Ganqiong, Pan Yuehong, Zhang Yongen, Zhang Yumei, Wu Jianzhai, Wang Shengwei, Wang Dongjie, Chen Wei, Zhuang Jiayu, Liu Jijia, Zhang Chao, Ren Yufeng, Li Yanni and Wang Yu, have done tremendous concrete and detailed work such as data calculation, report revision and Chinese-English translation. The China Agricultural Science and Technology Press has made efforts in type-setting and printing.

The release of the China Agricultural Outlook (2016 – 2025), after the China Agricultural Outlook (2015 – 2024), by the Market Early Warning Expert Committee, MOA, signifies the fledgling of agricultural outlook activities in China and the steady and solid development of the system of global agricultural survey and analysis in China. Since market situation analysis should not only be based on the latest information of agriculture and related sectors, and market demand and supply is susceptible to uncertainties of climate, politics and policy, the China Agricultural Outlook (2016 – 2025) could making mistakes in its predications. We will gradually explore the establishment of mechanism for the analysis and assessment of predication deviations so as to provide more accurate information for users. We sincerely invite domestic and foreign colleagues to provide valuable opinions for improving our future studies.

Market Early Warning Expert Committee of Ministry of Agriculture
April 2016

Summary

The year 2016 marks the opening of the 13th FYP period and is also an important year to implement the new concept of development and advance supply-side structural reform in agriculture. The China Agricultural Outlook (2016 – 2025) released this year reviewed the production, consumption, price and trade of major agricultural products in China, including grain, cotton, oilseeds, sugar, vegetables, fruits, meats, poultry eggs, dairy, aquatic products and feeds, and made predictions into the future 10 years and the 13th FYP period.

1. Review of the operation of agricultural market in China during the 12th FYP period

The 12th FYP period is a remarkable five-year in China's agricultural development. Against the intrinsically complex international situations and the daunting task of domestic market regulation to meet growing consumption, cope with the rising cost and control multiple risks, China has managed to reap bumper harvests for years in a row, increase farmers' income constantly, maintaining supply and demand balance and ushering modern agricultural development into a new era. The main features are as follows:

First, constant growth of output of major agricultural products. The output of grain, meats, vegetables, fruits and aquatic products grew by 2.6% , 1.7% , 3.9% , 5.4% and 4.5% respectively annually, compared with that of 3.2% , 2.7% , 2.9% , 5.8% and 4.0% during the 11th FYP period. In addition, the output of soybean, cotton and oilseeds declined to varying degrees.

Second, significantly slowed down growth of price of most agricultural products. The price of wheat, corn, soybean and oilseeds grew by 3.4% , 0.2% , 2.5% and 7.5% respectively annually, 3.3, 8.3, 8.5 and 3.0 percentage points lower than the 11th FYP period; the annual growth rate of the price of pork, milk and vegetables was 5.7% , 3.6% and 3.0% respectively, 1.6, 7.2 and 9.0 percentage points lower than the 11th FYP period.

Third, constant and rapid growth of the production cost of agricultural products. Driven by the significantly rising cost of laborers, material input and land, the annual

growth rate of the production cost per mu of rice, wheat and corn was 11.3%, 11.8% and 13.9% respectively, 2.0, 2.0 and 3.8 percentage points higher than the 11th FYP period.

Fourth, prominent inversion between domestic and international prices of agricultural products. Domestic market price (wholesale price or CIF) of major agricultural products has been generally higher than the CIF price after tax of imported foreign products. To be specific, price inversion for sugar and cotton started from October 2011, that of wheat and soybean started from 2012 and that of rice and corn started from 2013. After the reform of cotton target price in 2014, domestic price declined rapidly, the situation of price inversion was therefore rapidly eased.

Fifth, rapid growth of import of major agricultural products. Driven by domestic and foreign price difference during the 12th FYP period, the import of rice, wheat and corn increased from 569,000 tons, 1.258 million tons and 1.7525 million tons in 2011 to 3.377 million tons, 3.007 million tons and 4.73 million tons in 2015. Sugar import increased from 2.919 million tons in 2011 to 4.846 million tons in 2015. Soybean import increased from 52.634 million tons in 2011 to 81.741 million tons in 2015.

Sixth, growing pressure to maintain sustained and steady agricultural development. Given the tighter double constraints of agricultural resource conditions and ecological environment, the shrinking gap between the cost and market price of agricultural products, and the absence of consumption indication from the supply-demand balance of agricultural products, the major task for steady agricultural development is to give full play to the role of market mechanism, innovate for the approaches of agricultural management, advance supply-side structural reform in agriculture, so as to determine production with sales and guide production with consumption.

2. Market outlook of major agricultural products in China in 2016 and during the 13th FYP period

The CPC Central Committee and the State Council attaches great importance to the development of agriculture and rural economy. The 5th Plenary Session of the 18th CPC Central Committee has adopted the Recommendations of the CPC Central Committee for the Formulation of the 13th FYP for National Economic and Social Development, which specified the need to advance agricultural modernization, build modern agricultural industrial system, production system and operation system, enhance the quality, efficiency and competitiveness of agriculture and embark on the path of agricultural modernization featuring efficient production, safe products, resource conservation and

environment friendliness. Looking into the 13th FYP period and guided by the new concept of innovative, coordinated, green, open and shared development, the Chinese agriculture will accelerate the transformation of engines for development, optimize structure and change the model, so as to constantly improve the quality, efficiency and competitiveness of agriculture. Based on China's latest policy and plan, macroeconomic situation, climate change, the advancement of agricultural technology, international market and other factors, this report made predications on the following main features of China's agricultural market in 2016 and the 13th FYP period.

Basic balance between supply and demand for rice and wheat and absolute security for food grain. Thanks to the implementation of the food crop production strategy based on farmland management and technological application, China's food producing capacity has been further improved and could fully meet the target of basic self-sufficiency of cereals and absolute security of food grain. It is forecast that the rice cultivation area will remain stable with slight expansion, and the production and consumption will reach 208.99 million tons and 208.03 million tons in 2016; and the wheat cultivation area will remain stable with a slight decline, and the production and consumption will reach 130.10 million tons and 120.27 million tons respectively. During the 13th FYP period, the supply-side structural reform focusing on the optimization of product structure, quality improvement, cost saving and efficiency gains, will deliver substantial results; rice production will remain stable and consumption will continue to grow; it is forecast that the total production and consumption of rice in the five years will reach 1.038 billion tons and 1.034 billion tons; the cultivation area will remain stable with slight decline, and the relaxed supply-demand situation will become basically balanced; it is forecast that the total production and consumption of wheat within the five years will reach 659 million tons and 655 million tons respectively.

Substantial downward adjustment of corn cultivation area and effective release of stock pressure. With the adjustment of corn structure in the sickle-shaped major corn producing region, corn cultivation area will be substantially reduced in the future five years, which will effectively address the problem of periodic oversupply and significantly reduce corn stock. In 2016, after the smooth implementation of targets for reducing corn acreage, the area sown to corn in China is predicated to reduce by 3.1%. To be specific, the area reduction in provinces in the sickle-shaped region will exceed 15 million mu, and the cultivation area for the whole year will be 554 million mu (36.95 million hectares), marking the first decline of corn acreage in the recent decade; corn production is forecast to be 215.17 million tons, down by 4.2% over 2015. During the

13th FYP period, corn cultivation area is forecast to decline substantially by 1.8% annually and down to 34.41 million hectares by 2020; and the production will be reduced to 205.67 million tons; during the same period, industrial and feed consumption of corn will grow rapidly, and is forecast to grow at an annual rate of 3.0%; therefore, by the end of the 13th FYP period (2020), the total corn consumption will climb to 221.92 million tons, which will ease stock pressure and return the right of corn pricing to the market.

Recovery and growth of oilseed production and significantly slowed down soybean import. Affected by the policy adjustment of oilseed purchase, the production data of oilseeds in 2016 is adjusted downward compared with the forecast in 2015; both the cultivation area and production of peanut and soybean will grow and the cultivation area and production of oilseeds will shrink significantly. It is forecast that the soybean area will recover and grow to 103.20 million mu (6.88 million hectares) in 2016, and the production will reach 12.03 million tons, registering a year on year growth of 3.6%. During the 13th FYP period, due to technological advancement and the adjustment of cultivation structure, oilseed production will grow steadily, while the annual growth rate of soybean import will decline from 11.6% during the 12th FYP period to the 1.0% during the 13th FYP period. It is forecast that oilseed production will reach 49.70 million tons by the end of the 13th FYP period (2020); oilseed import will reach 91.93 million tons and that of soybean will reach 85.56 million tons.

Remarkably shrunk cotton demand and continuously tight sugar supply and demand situation. Affected by the declining relative efficiency and the rising production cost, the area and production of cotton in China both demonstrate downward trends. In 2016, the projected cotton area and production will reach 51.99 million mu (3.466 million hectares) and 5.157 million tons, down by 8.8% and 8.0% over 2015; the consumption will be 7.158 million tons, a year on year drop of 2.7%; the import will reach 1.001 million tons, a year on year decline of 31.1%. During the 13th FYP period, the pattern of cotton production in China will continue to be adjusted, with further concentration in cotton producing region in Xinjiang and further shrinkage in cotton producing region in the Yangtze River and Yellow River valleys; consumption will remain at a low level. It is predicated that by 2020, cotton consumption will decline to 7.079 million tons, down by 3.8% over 2015; import will be 1.121 million tons, down by 22.8% over 2015. Dampened by the continuous sluggish sugar price, sugar farmers' margin has been declining for years; it is therefore predicated that China's sugar crop cultivation area and sugar production will decline by 8.2% and 14.8% respectively

in 2016. During the 13th FYP period, the cultivation of sugarcane will further concentrate in advantageous producing regions in Guangxi and Yunnan and sugar beet production will further concentrate in competitive producing regions in Xinjiang and Inner Mongolia. There is a trend for the further shrinkage of area of sugar crop cultivation, the constant increase of consumption and ever expansion of import. It is forecast that the total production, total demand and gap of sugar will be 48.93 million tons, 80.13 million tons and 31.20 million tons.

Steady growth of vegetables, fruits, eggs and fisheries production and sustained active international trade. Compared with the previous ten years, the growth of the output of vegetables, fruits, eggs and aquatic products will slow down significantly. And the production in 2016 is predicated to be 774 million tons, 275 million tons, 30.2220 million tons and 68.0541 million tons respectively, a year on year increase of 0.63% , 1.4% , 0.8% and 1.7% . During the 13th FYP period, the output will grow at an annual rate of 0.44% , 1.37% , 0.9% and 1.3% respectively and is predicated to reach 788 million tons, 292 million tons, 31.4266 million tons and 71.8009 million tons. In terms of trade, the export position of traditional competitive agricultural products will continue to be maintained. And it is predicated that by the end of the 13th FYP period (2020), the export of vegetables, fruits and aquatic products will reach 11.25 million tons, 5.6 million tons and 3.9525 million tons.

Meat and dairy consumption overtaking production and drastically increased import. Due to the impact of population growth, rising income and accelerated urbanization rate, the meat and dairy consumption of urban residents in China will maintain rapid growth. It is predicated that the total production, total consumption and import of pork, beef, mutton and poultry in 2016 will reach 84.60 million tons, 85.94 million tons and 2.01 million tons, a year and year increase of 0.07% , 0.2% and 6.9% . Given the impact of the exit of small-and medium-sized operators and the slowed down expansion of large-scale animal farm, it is forecast that dairy production will reach 38.79 million tons, a year on year decline of 0.3% , and the consumption and import will reach 51.82 million tons and 12.95 million tons, a year on year growth of 3.4% and 16.6% respectively. During the 13th FYP period, the total production, consumption and import of pork, beef, mutton and poultry will reach 438.56 million tons, 442.56 million tons and 10.28 million tons; and the total production, demand and import of dairy products will reach 202.93 million tons, 273.76 million tons and 71.51 million tons respectively.

3. Development trend of China's agricultural market in the future ten years

In the future ten years, China will continue advancing agricultural modernization in a steady manner; the quality and efficiency of agricultural development will be significantly improved; the interaction and integration with global agriculture will be remarkably strengthened; and the transformation and upgrading of the consumption pattern of agricultural products will be accelerated. The development trend of China's agricultural market in the future ten years will mainly include the following.

First, the producing region of agricultural products will be more concentrated; large-scale operation will enjoy accelerated development; and the feature of local production and nationwide supply will be more prominent. It is predicated that during the 13th FYP period, China's grain producing region will further concentrate towards the north part of China; grain output of major producing provinces will account for nearly 80% of the total national production by 2020. Cotton cultivation will be shifted towards inland cotton producing region in the northwest, particularly towards Xinjiang. Cotton production in Xinjiang may account for around 80% of the country's total by 2020. Pig farming will be shifted to major grain producing regions in an accelerated manner. Pork output in the central and northeast part of China is projected to account for 40% of the country's total and the proportion of the southwest will drop to below 20%. Six competitive vegetable producing regions will be further consolidated, namely winter and spring vegetables in the heat region in the southern and southwest part of China, winter and spring vegetables in the Yangtze River valley, summer and autumn vegetables on the loess plateau, summer and autumn vegetables in the Yunnan and Guizhou plateau, summer and autumn vegetables in the high-latitude region in the north and protected vegetable production in the Yellow River, Huai River and Hai River valley and the Pan Bohai sea. In addition, with government's intensified efforts to support large-scale operation, 50% of major agricultural products will be produced by new types of agricultural operators by 2025. With the concentration of production towards competitive regions and the development of large-scale operation, and given the further development of urbanization, the feature of local and specialized agricultural production and nationwide balanced supply will become more prominent, thus will put forward higher requirements on the distribution of agricultural products and will require more market guidance.

Second, agricultural consumption will maintain rigid growth, the consumption

pattern will be upgraded in an accelerated manner and the requirements for diversified and brand products will be more prominent. Taking into comprehensive consideration the implementation of the two-child policy, the accelerated urbanization, poverty alleviation in rural areas and the rising income of residents, we predict that during the 13th FYP period, the total consumption of rice, wheat, edible oil, sugar, meat, dairy products and aquatic products will grow by 43 million tons, 16 million tons, 8.11 million tons, 9.55 million tons, 27.28 million tons, 110 million tons and 44 million tons respectively over the 12th FYP period. Meanwhile, the rising income level will drive the rapid upgrading of the consumption pattern. Urban and rural residents will require more diversified, high quality and brand agricultural products. Brand grain products will be more valued in consumption, therefore the demand for special-purpose varieties and their products will grow; nutrition, health and safety will be more valued for the consumption of animal, poultry and aquatic products, and the demand for processed products will grow significantly; the consumption of fruits and vegetables will increase and the consumption of certified products will increase; in terms of textile consumption, the demand for high quality cotton will grow significantly. Looking into 2020 – 2025, driven by population and income growth, China's consumption of agricultural products will demonstrate the features of growing quantity, upgraded structure and strong guiding role to agricultural production.

Third, there are growing structural changes in the cost of agricultural production and drivers for cost increase, domestic and international price of agricultural products are moving at a low level. During the 13th FYP period, the cost of agricultural production will rise steadily in China, and the cost structure will be changed tremendously. In addition to the continuous rigid increase of the cost of material inputs, laborers and land, the cost of IPM, the maintenance of modern farming facilities, waste treatment, the processing, packaging, sales and brand building of agricultural products will grow significantly. Meanwhile, in the future 5-10 years, global economy will remain in slow recovery; the international price of agricultural commodities will remain sluggish; the price chained reaction between international and domestic markets will be significantly enhanced, as a result, domestic price will generally move at a low level. To be specific, the price of rice and wheat is expected to remain basically stable; corn price may drop first and then recover given the pressure of re-modeling, restructuring and de-stocking; the linkage between the price of cotton, oil and sugar with the international market will be closer; the price of vegetable oil and cotton will fluctuate following the international price. Domestic and international sugar price is expected to recovery slowly; the price of

aquatic products will rise in fluctuation and obvious seasonal fluctuation is possible; beef and mutton price will remain at a high level.

Fourth, integration and interaction between domestic and international agriculture will be strengthened, and agricultural import may witness both increase of varieties and sources. In the future ten years, China will pay more attention to the balanced use of domestic and foreign resources and markets, and the overall scale of agricultural trade will further expand. During the 13th FYP period, in particular, with the acceleration of a range of multilateral and bilateral free trade areas (FTA) between China and ASEAN, Singapore, New Zealand, Chili, ROK and Australia and the development of the Belt and Road Initiative, the resource-intensive import source countries of oilseeds, fruits, meats and dairy products will expand from the traditional Americas, Australia, Southeast Asian countries to Central Asia, Australia and European countries, and the landscape of double increases of varieties and sources will be shaped. It is predicated that by 2025, China's corn import, soybean import, sugar import and dairy product (raw milk equivalent) import will reach 2 million tons, 88.64 million tons, 8.49 million tons and 18.80 million tons respectively; the export of traditionally competitive agricultural products such as vegetables and fruits will continue to grow; and the export of vegetables and fruits will reach 12.42 million tons and 6.50 million tons, 21.9% and 53.7% over 2015. The export of aquatic products will decline first and then recover, yet the extent of fluctuation is limited, with basically stable total quantity. The annual import of aquatic products will be maintained at above 4 million tons and will continue leading the whole world.

Table of Contents

Chapter 1	Overview	1
1.1	Environment of macroeconomic and social development in the future ten years	2
1.1.1	China's economy maintains mid to high growth rate	2
1.1.2	Chinese population will continue to grow	5
1.1.3	CIP will show a trend of mild increase	9
1.1.4	Crude oil price will be low in the beginning and high in the end	11
1.1.5	The income of urban and rural residents continues to grow	13
1.1.6	The RMB exchange rate will be steadily weakened	15
1.2	China's agricultural development situations in the future ten years and during the 13th FYP period	16
1.2.1	China's agricultural development amidst rare opportunities	16
1.2.2	Major challenges for agricultural development in China	17
1.2.3	Arduous tasks for agricultural development in China	18
	References	19
Chapter 2	Cereals	21
2.1	Rice	22
2.1.1	General outlook	22
2.1.2	Production outlook	23
2.1.3	Consumption outlook	24
2.1.4	Trade outlook	27
2.1.5	Price outlook	28
2.2	Wheat	28
2.2.1	General outlook	29
2.2.2	Production outlook	30
2.2.3	Consumption outlook	31
2.2.4	Trade outlook	32

2. 2. 5	Price outlook	33
2. 3	Corn	33
2. 3. 1	General outlook	34
2. 3. 2	Production outlook	35
2. 3. 3	Consumption outlook	37
2. 3. 4	Trade outlook	40
2. 3. 5	Price outlook	40
Chapter 3	Oil	41
3. 1	Soybean	42
3. 1. 1	General outlook	42
3. 1. 2	Production outlook	43
3. 1. 3	Consumption outlook	44
3. 1. 4	Trade outlook	46
3. 1. 5	Price outlook	46
3. 2	Oilseeds and oilseed products	47
3. 2. 1	General outlook	49
3. 2. 2	Production outlook	51
3. 2. 3	Consumption outlook	52
3. 2. 4	Trade outlook	53
3. 2. 5	Price outlook	53
Chapter 4	Cotton	55
4. 1	General outlook	56
4. 2	Production outlook	58
4. 3	Consumption outlook	60
4. 4	Trade outlook	61
4. 5	Price outlook	62
Chapter 5	Sugar	65
5. 1	General outlook	66
5. 2	Production outlook	67
5. 3	Consumption outlook	69
5. 4	Trade outlook	70
5. 5	Price outlook	71
Chapter 6	Vegetables	73
6. 1	General outlook	75

6.2	Production outlook	77
6.3	Consumption outlook	79
6.4	Trade outlook	81
6.5	Price outlook	82
Chapter 7	Fruits	85
7.1	General outlook	86
7.2	Production outlook	87
7.3	Consumption outlook	90
7.4	Trade outlook	92
7.5	Price outlook	93
Chapter 8	Meats	95
8.1	Pork	96
8.1.1	General outlook	96
8.1.2	Production outlook	98
8.1.3	Consumption outlook	100
8.1.4	Trade outlook	101
8.1.5	Price outlook	102
8.2	Poultry	103
8.2.1	General outlook	104
8.2.2	Production outlook	105
8.2.3	Consumption outlook	107
8.2.4	Trade outlook	108
8.2.5	Price outlook	109
8.3	Beef and mutton	110
8.3.1	General outlook	110
8.3.2	Production outlook	112
8.3.3	Consumption outlook	114
8.3.4	Trade outlook	115
8.3.5	Price outlook	115
Chapter 9	Poultry eggs	117
9.1	General outlook	119
9.2	Production outlook	120
9.3	Consumption outlook	121
9.4	Trade outlook	123

9.5	Price outlook	124
Chapter 10 Dairy		125
10.1	General outlook	126
10.2	Production outlook	127
10.3	Consumption outlook	129
10.4	Trade outlook	131
10.5	Price outlook	132
Chapter 11 Aquatic products		135
11.1	General outlook	136
11.2	Production outlook	138
11.2.1	Accelerated transition of development pattern and slow increase in output	138
11.2.2	Decreasing output from capture fisheries	139
11.2.3	Slower increase in the output from aquaculture	140
11.3	Consumption outlook	141
11.3.1	Growing direct dietary consumption per capita and narrowing urban-rural gap	141
11.3.2	Rising proportion of the consumption of processed products	143
11.4	Trade outlook	144
11.4.1	Export volume	144
11.4.2	Import volume	144
11.5	Price outlook	144
Chapter 12 Feed		147
12.1	General outlook	148
12.2	Production outlook	149
12.3	Consumption outlook	152
12.4	Price outlook	154
Annex: Supply-demand balance sheet of major agricultural commodities		155

Chapter 1

Overview

The basic conclusion of the China Agricultural Outlook (2016 – 2025) is mainly based on the latest baseline predication of the China Agricultural Monitoring and Early-warning System (CAMES), taking into comprehensive consideration of analysis and judgment of experts. The report provided outlook of the production, consumption, price and trade of major agricultural products in the future ten years, particularly for the 13th FYP period, including 18 products, namely, rice, wheat, corn, oilseeds and oilseed products (soybean, peanut, rape seeds and oilseeds and oilseed products), cotton, sugar, vegetables, fruits, pork, poultry, beef, mutton, poultry, dairy products, aquatic products and feeds. This chapter focus on the environment of macroeconomic and social development of the mid-to long-term outlook of China's agricultural market and the basic judgment of China's agricultural development trend in the future ten years.

1.1 Environment of macroeconomic and social development in the future ten years

The macroeconomic and policy assumption of the CAMES baseline predication for this year mainly includes: China's economy maintains mid to high growth rate; income of urban and rural residents continue to grow rapidly; population continue to grow, with the number of laborers remains stable yet with a slight drop; urbanization rate according to household registration continues to grow, with residents' pattern of consumption upgrades rapidly; CPI increases mildly with RMB exchange rate remaining stable with trend for depreciation; international oil price fluctuates obviously in the short run and will drop first and then rise; agricultural policy continues to be improved and engines for agricultural development become stronger^[1].

1.1.1 China's economy maintains mid to high growth rate

Global economy will recover amidst deep adjustment and improve slowly during the Outlook period. World economy stumbled in 2015. According to the estimate of the United Nations (UN), the growth rate of the world economy in 2015 was 2.4% , 0.2 percentage points lower than 2014; to be specific, the economic growth rate of developing countries and the economies in transition dropped to the lowest level since the world economic crisis in 2008^[2]. In the short run, global economy will face many cyclical and structural headwinds, including the sustained uncertainty of macro economy, declining commodity price and reduced trade flow, upward fluctuation of foreign exchange and liquidity, slowed down growth of investment and productivity,

continued divorce between financial market and the real economy; it is predicated that the global economy will improve slowly in the future three years. According to the forecast of the UN, WB, IMF, OECD, USDA, among others^[2-6], the world economy will grow at 2.9% – 3.4% in 2016 and 3.1% – 3.6% in 2017 (Figure 1-1). Economic growth of developing economies will improve mildly, and is predicated to be at 4.3% and 4.8% in 2016 and 2017 respectively. Economic growth of developed economies will accelerate, and is predicated to reach 2.2% in 2016, exceeding 2.0% for the first time since 2010; the economic growth is predicated to accelerate and reach 2.3% in 2017. The economic growth of the US and EU will reach 2.6% and 2.0% in 2016 and 2.8% and 2.2% in 2017. In the long run, the world economy will recover in deep adjustment, against many enabling conditions, such as the world multi-polarization, economic globalization, cultural diversity, IT application, the new emerging round of science and technology revolution and industrial reform, deepening reform of the global governance system and the rising economic strength of developing countries, as well as the many unfavorable constraints, such as lack of momentum behind the growth of global economy and trade, rising protectionism, complicated geopolitical relationships and the intricate traditional safety threats and non-traditional safety threats, the world economy will show a trend of low-speed growth in the future ten years, with an annual growth rate of around 3.0% for 2016 – 2025.

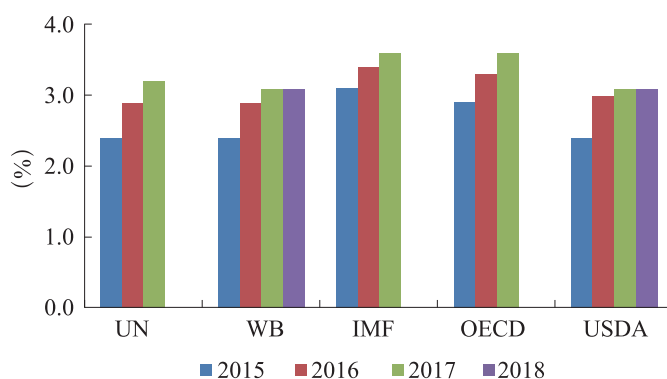


Figure 1-1 World economic growth 2015 – 2018

Source: 1. the World Economic Situation and Prospects 2016 issued by the United Nations Department of Economic and Social Affairs in January 2016, world economic growth weighed by GDP based on the foreign exchange method; 2. Global Economic Outlook launched by the World Bank (WB) in January 2016, world economic growth weighed by GDP based on the foreign exchange method; 3. World Economic Outlook launched by the International Monetary Fund (IMF) in January 2016, world economic growth weighed based on the PPP method; 4. OECD Economic Outlook launched in November 2015, world economic growth weighed by GDP based on PPP method; 5. Agricultural Outlook 2016 – 2025 launched by the USDA in February 2016.

With quality improvement, efficiency gains and upgrading, China's economy will maintain a mid to high growth rate. The current Outlook Report assumes that China's economy will grow at an annual rate of 6.3% during 2016–2025, 3.3 percentage points lower than the 9.6% over the previous 10 years (Figure 1-2) and will be stabilized at around 6.0% by 2025. Such assumption is mainly based on the following facts: first, the Chinese government endeavors to lead the New Normal with new concepts of economic development. On 5 December 2014, the meeting of the Political Bureau of the Central Committee put forward for the first time that the Chinese economic development had entered into a new normal. In December 2014, the Central Economic Work Conference elaborated for the first time nine features of the New Normal. In October 2015, the 5th Plenary Session of the 18th CPC Central Committee put forward the concept of innovated, coordinated, green, open and shared development, and map out plans for national economic and social development during the 13th FYP period guided by such new concepts. China's economy could still make a big difference in the important strategic period of opportunities and boasts great potential. The mode of economic development will be changed at a faster pace, and new engine of growth will play a bigger role. Yet China is still faced with the problem of imbalanced, uncoordinated and unsustainable development. Second, relevant domestic and foreign institutions forecast that the bottom line of expected economic growth rate in China is above 6.0% for the 13th FYP period. Aiming for the strategic objective of building a moderately prosperous society in all respects, the CPC and the government have explicitly put forward the bottom line of 6.5% of economic growth in the 13th FYP for National Economic and Social Development. The Chinese Academy of Sciences (CAS), Chinese Academy of Social Sciences (CASS) and the Renmin University of China among others predicate that China's GDP growth rate will reach 6.6%–6.7% in 2016. According to the survey of the Economy & Nation Weekly, 64.65% of economists believe that the potential growth rate of China's economy during the 13th FYP period will be maintained at 6.1%–7%; 15.15% of economists believe in a range of 5.1%–6% and another 15.15% of economists believe in a range of 7.1%–8%. According to the forecast of the UN, WB, IMF and OECD among others, China's GDP growth will be at 6.3%–6.7% for 2016 and 6.0%–6.5% for 2017 (Figure 1-3). Third, relevant domestic and foreign institutions forecast that China's economic growth rate will reach 5%–6% in the future ten years. The study of the Development Research Center (DRC) of the State Council shows that China's potential economic growth rate will be at around 6.2% in the future ten years. The Agricultural Outlook 2016–2025 launched by the USDA in February 2016

assumes that China's economy will grow at an annual rate of 5.3% in the future ten years.

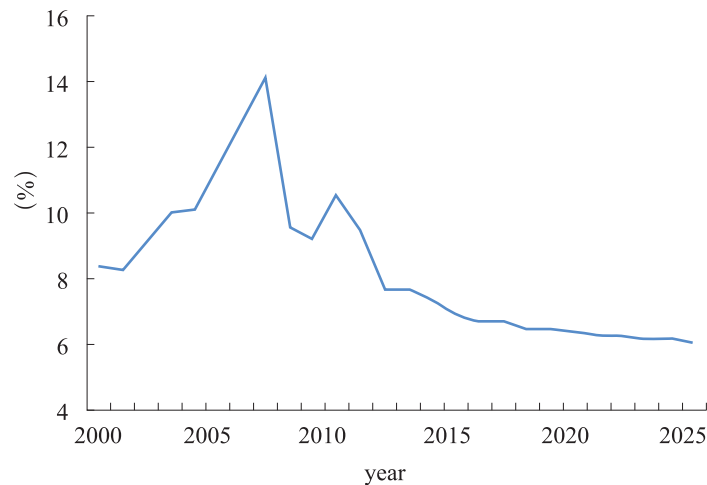


Figure 1-2 China's economic growth rate 2000 – 2025

Source: data for 2000 – 2015 comes from the National Bureau of Statistics (NBS), and data for 2016 – 2025 comes from the CAMES of the Agriculture Information Institute, CAAS.

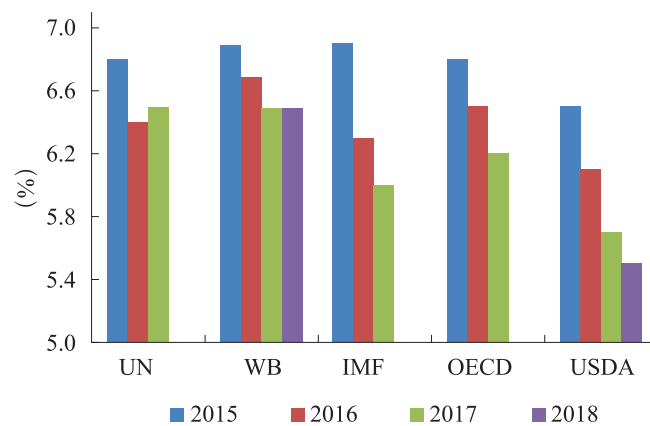


Figure 1-3 China's economic growth rate for 2015 – 2018 issued by international institutions

1.1.2 Chinese population will continue to grow

The world population growth will slow down. According to the UN forecast, the world population growth will slow down during 2016 – 2025, down from an annual 1.21% over the previous ten years to 1.03%; during the outlook period, the population will grow by 792 million and reach around 8.142 billion by 2025^[7]. The world population growth will mainly be driven by Asia and Africa and the expected additional population from Asia and Africa will account for 88.3% of the increment of the world's

population. African population grows the fastest and is predicated to grow at an annual rate of 2.4% in the future ten years, slightly lower than the 2.57% over the past ten years. During the Outlook period, African population will grow by 318 million, the increment of African population will account for 40.1% of the world's total increment. Asian population increment will be the highest, and the Asian population will grow at an annual rate of 0.84% in the future ten years. During the Outlook period, the Asian population increment will reach 381 million, accounting for 48.2% of the world's total increment. In particular, Indian population will grow at an annual rate of 1.09% , up by 151 million during the Outlook period and reach 1.46 billion by 2025; population growth rate in Japan will be negative and the population will drop by around 3.7 million during the Outlook period. Europe will have negative population growth and the population is forecast to drop by 3.5 million in the future ten years, and the Russian population is predicated do fall by 2.25 million. In the Americas, population growth in the US and Brazil will slow down and the annual growth rate in the future ten years will be 0.70% and 0.71% respectively, and the population will grow by 23.31 million and 15.12 million respectively (Figure 1-4).

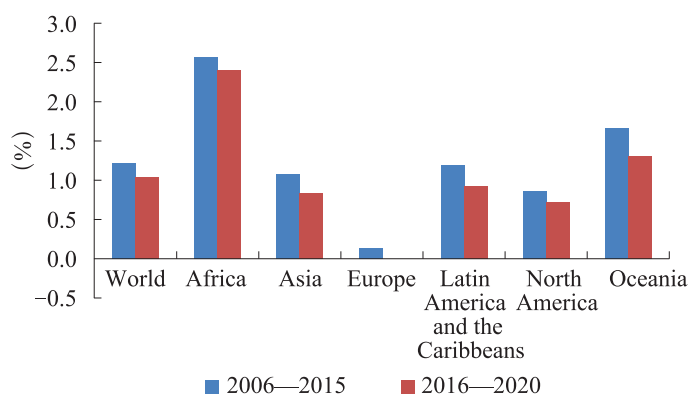


Figure 1-4 World population growth trend

Source: the UN World Population Prospects database

China's population will continue to grow, yet at significantly lower speed. China has begun to comprehensively implement the two-child policy since January 1, 2016. In the future ten years, China's total population (excluding the Hong Kong SAR, Macao SAR and Taiwan province and overseas Chinese) will continue to decline. Due to the overall plummet of birth rate, the population growth will slow down remarkably (Figure 1-5). It is predicated that in the future ten years, China's total population will grow at an annual rate of 0.3% , down by 0.2 percentage point over the previous ten years; during the Outlook period, the total population will grow by 3.0% , and by around 42 million. At

this rate, China's population will reach 1.4 billion by 2020 and 1.42 billion by 2025. Such judgment is mainly based on the following facts: first, China has made timely adjustment to its family planning policy. According to the NBS, after the implementation in 2014 of the two-child policy for couples if either of the parents is an only child, the national birth rate reached 12.37‰, and there were 16.87 million new birth in 2014, 470,000 more than 2013; the birth rate reached 12.07‰ in 2015, and there were 16.55 million new birth in 2015. The universal two-child policy was put into practice officially in 2016. According to relevant estimates, around 86 million child-bearing couples will be affected by this policy, and among them, around 60% are child-bearing women above 35, whose child-bearing intention is lower than women at the peak of the child-bearing age. According to a survey of the NBS in 2014, among non-agriculture women of child-bearing age who has given birth to one child already, 2.95% of them aged 35 and 39 want to have a second child; 0.99% of them aged between 40 – 44 want a second child; and 0.63% of them aged between 45-49 want to do so. Second, China's birth rate will decline significantly. According to the global population statistics, with the improvement of per capita GDP and women's level of education, the total fertility rate will continue with the declining trend. From 1950 to 2015, the total fertility rate of the world and major countries will decline to varying degrees, with China, India, Vietnam and Korea dropping the most. China's total fertility rate dropped from the 5.8 in the 1950s to below 3.0 in the 1980s, and further down to below 2.0 in the mid of the 1990s and stabilized at around 1.5 thereafter. The total fertility rate is less than 30% of that of the peak level. According to the random sampling of the NBS, China's total fertility rate was 1.04, 1.26 and 1.24 in 2011, 2012 and 2013 respectively. According to the forecast of the UN World Population Prospects (Revision 2015), China's total population will grow at an annual rate of 0.39% during the 13th FYP period and the figure will drop to 0.17% during 2020 – 2025.

Urbanization rate based on household registration continues to grow. In the recent ten years, China's urbanization rate has been quickened remarkably. The urbanization rate of resident population increased from 43.0% in 2005 to 56.1% in 2015, registering an annual growth of 1.3 percentage points; during the same period, the urbanization of residents registered as urban has made great headway and the urbanization rate of residents registered as urban exceeded 38% by 2015. In 2015, China had 771.16 million urban residents, a year on year increase of 22 million people; there were 603.46 million rural residents, a year on year drop of 15.2 million. There were 294 million population

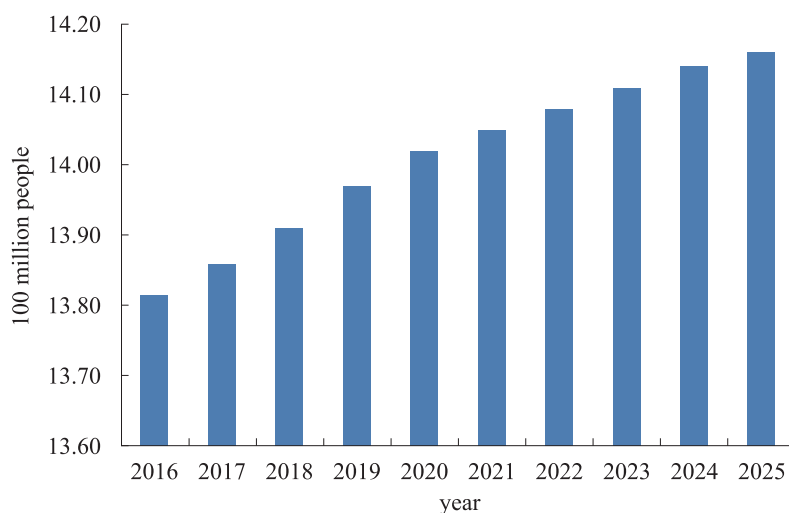


Figure 1-5 China's total population 2016 –2025

Source: CAMES, Agriculture Information Institute, CAAS.

with their place of residence different from their place of household registration and have been away from their place of household registration for over half a year, drop by 3.77 million compared with the end of 2014; among them, 247 million were migrants, down by 5.68 million compared with the end of 2014. According to the requirements of the development objective of the National Guidelines for Developing a New Type of Urbanization (2014 –2020), the urbanization rate of resident population in China shall reach around 60% by 2020, and the urbanization rate based on household registration should reach around 45%; and the gap between the two shall be narrowed by 2 percentage points. The State Council released the Opinions on Advancing Reform of the Household Registration System on 30 July 2015, which put forward that efforts should be made to get around 100 million agricultural population and other resident population registered as urban residents. It is therefore forecast that China's urbanization rate will grow at a rapid pace in the future ten years, and the urbanization rate of resident population and that of population of urban residents will reach 63.4% and 50.6% respectively by 2025, 7 and 12 percentage points higher than 2015 (Figure 1-6).

The number of laborers remains stable with a slight decline and population aging becomes an obvious trend. Over the past ten years, the number of laborers (aged 15 – 64, same below) has been growing at an average annual rate of 0.66%, faster than that of the total population. The number of laborers in China exceeded 1 billion for the first time in 2011, had been growing slowly thereafter, even experienced negative growth in 2014 and is currently stabilized at around 1.005 billion. It is predicated that the number of

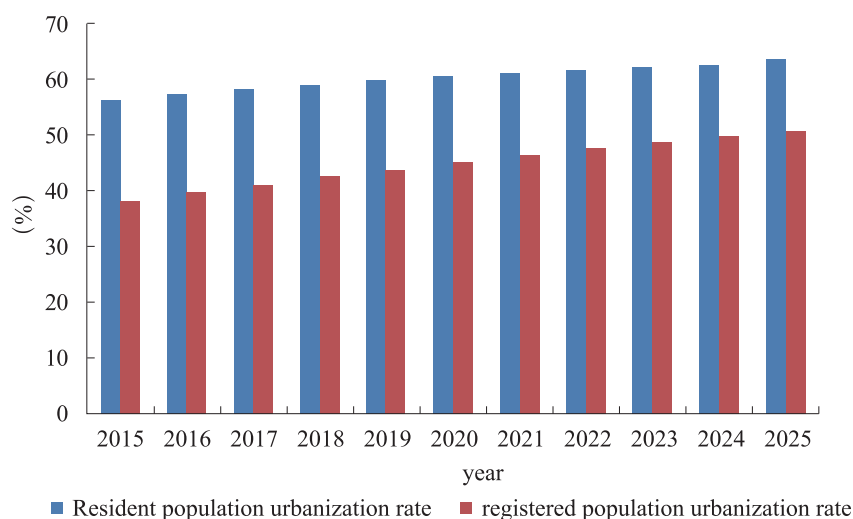


Figure 1-6 Urbanization trend in China 2015 – 2025

Source: CAMES, Agriculture Information Institute, CAAS.

Chinese laborers will remain stable with a slight decline in the future ten years and peak around 2020. Due to the impact of overall labor supply, population aging has become an obvious trend (Figure 1-7). In 2000, China had around 88 million people at the age of 65 and above, accounting for 7.0% of the total population, up to the international standard of aging society. In 2006 – 2015, population aging in China picked up speed, and the proportion of people at the age of 65 and above accounted for 8.0%, 9.0%, 10.0% and 10.5% respectively in 2007, 2011, 2014 and 2015. The elderly dependency ratio increased from 7.7% in 2005 to around 14.3% in 2015, almost doubled over ten years. It is predicated that in the future ten years, the elderly dependency ratio in China will continue to grow and the total dependency ratio will reach around 44.0% by 2025, and the elderly dependency ratio will be around 20.0%; and there will be over 200 million people aged 65 and above.

1.1.3 CIP will show a trend of mild increase.

In recent years, the global inflation rate has fallen steadily. Due to the decline of oil and commodity price, the global inflation rate in 2015 dropped to the lowest level since 2009. According to the estimate of the UN, the average CPI growth rate of the world was 2.6%. It is predicated that the inflation rate of developing countries will grow mildly in 2016, and the inflation of economies in transition will be higher. However, the deflation risk will continue in developed countries, mainly Japan and the Euro Zone. China's inflation level has been declining for four years in a row; residents CPI grow by 1.4%

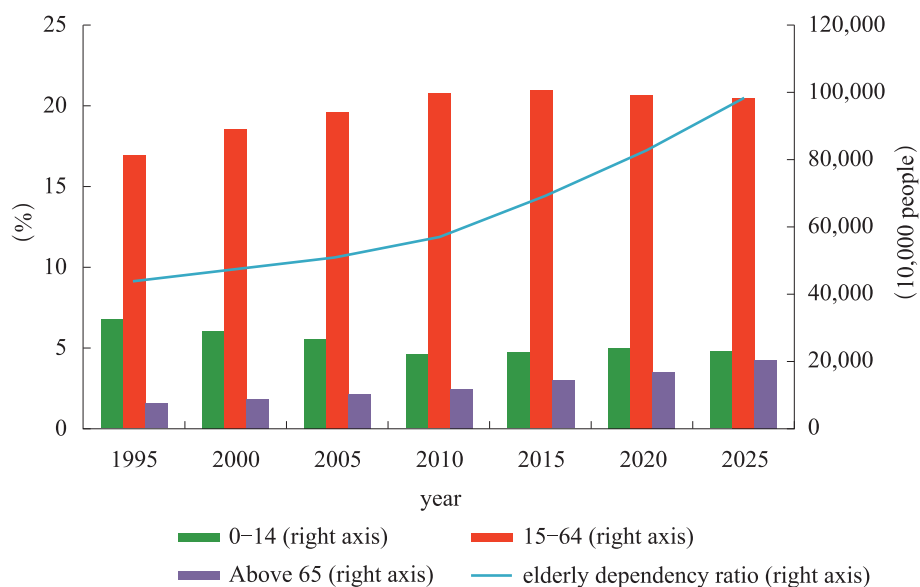


Figure 1-7 Demographic change in China 1995 – 2025

Source: data for 1995 – 2015 comes from the NBS.

year on year in 2015, the lowest since 2010. To be specific, the CPI of food grew year on year by 2.3%, that of tobacco, alcohol and articles up by 2.1%, clothing up by 2.7%, home appliance and maintenance service up by 1.0%, health care and personal articles up by 2.0%, transportation and telecommunication down by 1.7%, recreational, education, cultural products and services up by 1.4%, and housing up by 0.7%.

In the short term, China's CPI will grow steadily. Taking into account the steadily rising consumption demand, the sustainable relaxed monetary environment, the mild increase of real estate price, the implementation of reform of the pricing mechanism, the hovering production cost of enterprises, the recovery of international commodity price and the laggard effect of the monetary policy, most institutions predict that price will continue to grow in China in 2016. According to the People's Bank of China (PBOC), the benchmark forecast of the CPI growth for 2016 is 1.7%, and the year-on-year drop of PPI will be narrowed to 1.8%. According to the study of the research team of the Economic Research Institute of NDRC, given the shifts and changes in international and domestic environments and conditions, the international commodity price will grow mildly and the supply-side labor cost will continue to grow. It is predicated that the overall price will possibly be lower at the beginning of the 13th FYP period and pick up at the end, and the CPI will be maintained at 2.4% – 4.6%. According to the forecast of the Research Center for Forecasting Science of CAS, China's CPI will rise by 1.8% year on year in 2016, and the PPI (Producer Price Index) and PPIRM (Purchasing Price

Index of Raw Material, Fuel and Power) will decline by 4.3% and 5.7% year on year. The National Academy of Economic Strategy of CAS and National Academy of Development and Strategy of Renmin University of China predict that China's CPI will rise by around 1.3% in 2016. According to the survey of the Economy & Nation Weekly, 56.12% of the responding economists believe that China's CPI during the 13th FYP period will be at 2.1% – 3.0% ; 24.49% of economists believe in a range of 1.1% – 2.0% and 17.35% of economists believe in a range of 3.1% – 4.0%. Business.sohu.com predicates that China's CPI will grow by around 1.6% year on year in 2016. This Outlook Report predicts that China's CPI will grow by 1.7% year on year in 2016, and grow by 2.0% – 2.3% during 2017 – 2018.

In the long run, the CPI will be maintained in an appropriate range. The rigid growth of labor and land cost will push up price, and resource price reform and the protection of ecological environment will exert some impact on price rise. This report assumes that the growth of CPI in China for 2019 – 2025 will be higher than that during the initial stage of the Outlook period and be basically maintained at 2.5% – 3.5% (Figure 1-8).

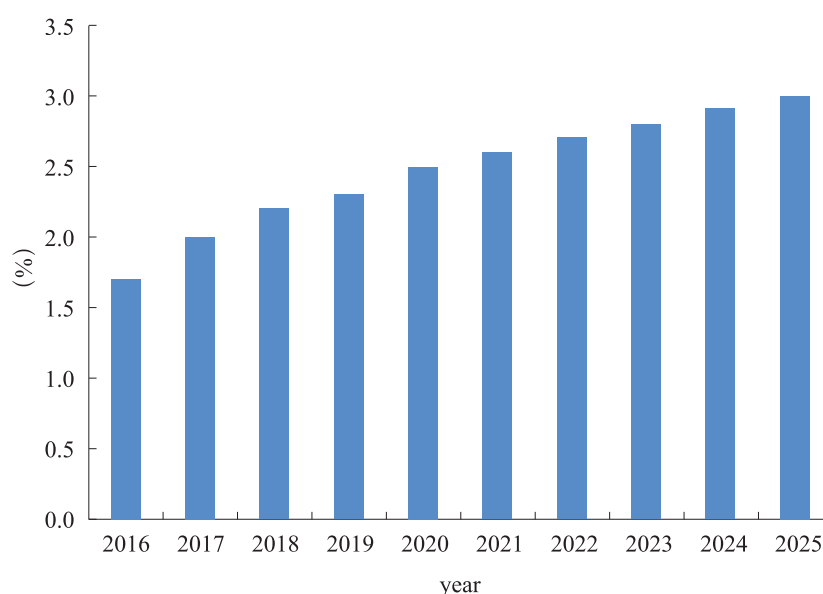


Figure 1-8 CPI of Chinese residents 2016 – 2025

Source: CAMES, Agriculture Information Institute, CAAS.

1.1.4 Crude oil price will be low in the beginning and high in the end.

The international crude oil price will remain at a low level in the beginning of the Outlook period, and will gradually recover and come back to the normal level in the end

(Figure 1-9). With the joint impact of oversupply, high stock level, sluggish demand and USD appreciation, the international oil price 2015 continued with the declining trend of the previous year, and showed big fluctuation in the first half of 2015 and continued heading towards the bottom in the second half of the year. In the early of 2016, the international oil price dropped further. In the short run, the global economy will continue to grow slowly; crude oil demand of emerging countries as the major driving engines will remain weak. Given the oversupply, high stock and USD appreciation, the international oil price is predicated to be moving at a low level and be maintained at USD 30 – 55 per barrel. According to the monthly report of the International Energy Agency (IEA), due to the declining global oil demand and the lifting of sanction on Iran oil, the global crude oil market may become over saturated. The crude oil price may continue heading for the bottom in 2016 and may recover back to USD 50 per barrel by 2020. According to the monthly report of energy outlook issued by the U. S. Energy Information Administration (EIA), the average price of Brent oil and WTI oil will reach USD 40.15 per barrel and USD 38.54 per barrel in 2016, and recover back to USD 50 per barrel and USD 47 per barrel by 2017. The analysis of the Standard Chartered and the Citibank shows that in the future 2-3 years, crude oil price will remain low; the price will be weak in the first half of 2016 and become stronger in the second half; the year-round average price of Brent oil and WTI oil will be USD 52 per barrel and USD 48 per barrel. Adam Longson of Morgan Stanley believes that driven by supply, the current crude oil market price will continue with the downward trend, which will take a long time to diffuse. It is predicated that by the mid of 2016, the oil price will move at around USD 45-50 per barrel and begin to recover to USD 60 – 65 per barrel by the 4th quarter of 2016 and further climb and possibly reach USD 75 per barrel in the early of 2017; crude oil market will become relatively normal and the oil price will be up to USD 85 per barrel by 2018. IMF believes that the growth of energy supply will out pace demand until the first half of 2016, crude oil stock will increase compared with the seasonal average. The price downward pressure will continue. Crude oil price may plummet to USD 20 per barrel and that of WTI oil may drop to USD 20 – 30 per barrel in 2016.

China's oil price will be stable in the beginning and rise mildly at the latter stage. China is an oil importer, its oil foreign reliance is close to 60.0%, and therefore domestic price is highly exposed to the influence of the international market. In 2015, China's crude oil price experienced 25 windows of price adjustment, with 12 downward adjustments, 7 upward adjustments, 4 failed adjustments and 2 delayed adjustments. With the profound changes of the landscape of world oil market, to smooth the relationship between

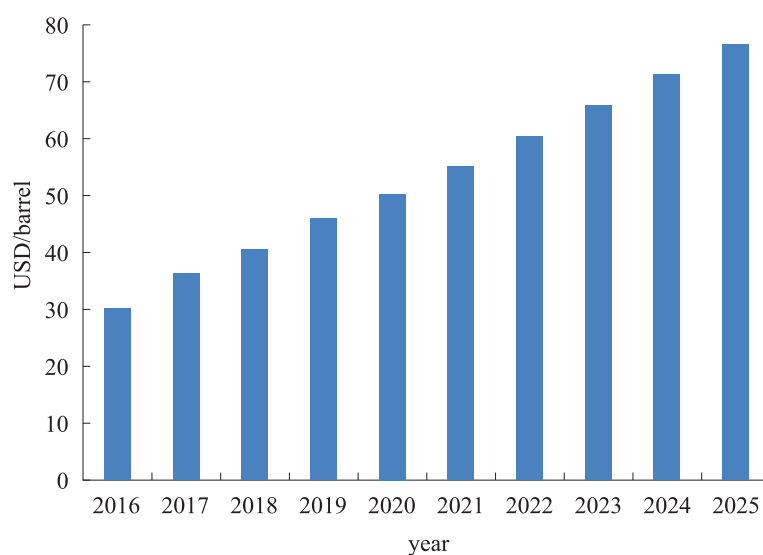


Figure 1-9 International crude oil price 2016 –2025

Source: the world crude oil data comes from the IEA and IMF, and the price is the average of Brent oil, Dubai oil and WTI oil.

domestic and foreign oil price and promote market-based pricing, the NDRC issued the Notice on Further Improving the Pricing Mechanism of Crude Oil Price on 13 January 2013, which identified the floor crude oil price triggering price adjustment, i. e. when the international crude oil price is lower than USD 40 per barrel, the domestic crude oil price will not be adjusted downward. Since in the short run, the international crude oil price will remain low, it is predicated that China’s crude oil price will remain stable in the beginning of the Outlook period. With the demand and supply adjustment and price recovery of the world crude oil, China’s crude oil price will grow mildly in the latter Outlook period.

1.1.5 The income of urban and rural residents continues to grow.

With the sustained and rapid increase of farmers’ income, the income gap between urban and rural residents continues to narrow down. In 2015, the per capita disposable income of Chinese residents was RMB 21,966, up by 8.9% over the previous year in nominal term and by 7.4% in real term after adjusting for price factors. To be specific, the per capita disposal income of urban residents reached RMB 31,195 yuan, up by 8.2% over the previous year, and by 6.6% in real term after adjusting for the price factors; the per capita disposal income of rural residents reached RMB 11,422, up by 8.9% over the previous year, and up by 7.5% in real term after adjusting for price factors; the average monthly income of migrant workers reached RMB 3,072, up by

7.2% over the previous year. Rural residents' income has been growing faster than that of urban residents and GDP for six years in a row; in 2015, the urban and rural per capita income ratio was narrowed down to 2.73 : 1 and the Gini coefficient of Chinese residents dropped to 0.462 (Table 1-1)^[8].

Table 1-1 Per capita disposal income of urban and rural residents in China 2005 – 2015

Year	Urban residents (RMB)	Rural residents (RMB)	Income ratio
2005	10 493.00	3 254.90	3.2 : 1
2006	11 759.50	3 587.00	3.3 : 1
2007	13 785.80	4 140.40	3.3 : 1
2008	15 780.80	4 760.60	3.3 : 1
2009	17 174.70	5 153.20	3.3 : 1
2010	19 109.40	5 919.00	3.2 : 1
2011	21 809.80	6 977.30	3.1 : 1
2012	24 564.70	7 916.60	3.1 : 1
2013	26 955.00	8 896.00	3.0 : 1
2014	29 381.00	9 892.00	2.97 : 1
2015	31 195.00	11 422.00	2.73 : 1

Source: NBS.

Note: Income ratio = per capita disposable income of urban residents : per capital disposable income of rural residents

China will become a moderately prosperous society in all respects and move to a stage of development featured by high-income and prosperous life. The Report of the 18th CPC National Congress put forward that by 2020, China's GDP and per capita income of urban and rural residents should double that of 2010 and the ambitious goal of building a moderately prosperous society in all respects will be realized. The report assumes that this goal could be realized if China's economy could maintain a mid to high growth rate (Figure 1-10). It is predicated that the per capita household income of urban residents will reach RMB 56,000 (in nominal term) and the per capital net household income of rural residents will reach RMB 21,500 (in nominal term). The 5th Plenary Session of the 18th CPC Central Committee put forward that poverty will be eradicated in the future five years. China's current poverty eradication standard is RMB 2,300 of annual per capital net income for farmers at constant price of 2010 and RMB 2,800 at the current price of 2014. According to this standard, there were 70.17 million rural poor in China by the end of 2014. Taking into comprehensive consideration the price level and other factors, the yearly updated calculation standards based on the current price, the national poverty eradication standard will be around RMB 4,000 per capital net income by 2020, if adjusted according to an annual growth rate of 6%. In 2011 – 2014, 43.29 million, 23.39 million, 16.50 million and 12.32 million rural poor people were lifted out of poverty. By 2020, 30 million people

could be lifted out of poverty through industrial support, 10 million people through transferred employment and 10 million through relocation and resettlement, so a total of 50 million people could be lifted out of poverty. Another over 20 million poor people partially or fully incapable of labor could be incorporated into subsistence allowance scheme to realize poverty alleviation through social security policy^[9].

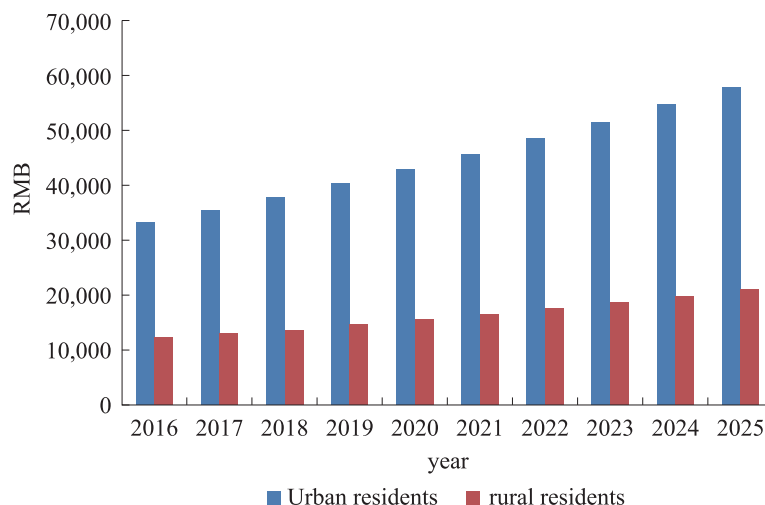


Figure 1-10 Income of urban and rural residents 2016 – 2025

Source: CAMES, Agriculture Information Institute, CAAS.

1.1.6 The RMB exchange rate will be steadily weakened.

USD will continue to be strong in the early stage of the Outlook period and will become weak during the latter stage. In the future ten years, the US may launch the cycle of rising interests, while the Euro Zone and Japan will continue with the relaxed policy; the foreign exchange rate of Euro for USD and JPY for USD will both enter into decreasing channels; currencies of emerging countries will face the risk of further depreciation. In 2015, USD was strong and appreciated constantly; such trend is predicated to be continued in 2017. After that, the USD may face a risk of depreciation, but will remain stronger than the low level in 2011 – 2014. Overall, the USD depreciation over the past ten years had strengthened the competitiveness of US agricultural products on the international market, yet the continuing strengthened USD in the future ten years will enhance the market competitiveness of agricultural products of other countries; however, US will continue enjoying relatively strong competitiveness on the international agricultural market.

The process of RMB marketization and internationalization will be accelerated. On November 30, 2015, the IMF declared to incorporate RMB into the basket of currencies of

the (Special Drawing Right) SDR, which marks a milestone for the internationalization of RMB and the RMB exchange rate will become an important factor deciding on the trajectory of world economy and the direction of capital flow. In the future ten years, China's economy will maintain the mid to high growth rate, and the RMB exchange rate will also adjust constantly with the change of economic expectation. In the short run, given the big downward pressure of domestic economy and the continuous relaxed monetary policy of major economies, there is room for further depreciation of RMB. According to the outlook by relevant institutions on the trend of RMB, RMB will depreciate by 5% – 7% in 2016. According to the HSBC, RMB to USD exchange rate will be depreciated to 1 dollar to 6.7 yuan by the end of 2016; according to the UBS, the exchange rate will be 1 dollar to 7.0 yuan; the Goldman Sachs predicts that the exchange rate will be 1 dollar to 6.6 yuan. In the long run, since China implemented a managed floating foreign exchange rate system adjusted based on market demand and in reference to a basket of currencies since 21 July 2015, the adjustment of RMB exchange rate will be stable and the international position of RMB will be strengthened constantly.

1.2 China's agricultural development situations in the future ten years and during the 13th FYP period

Chinese agricultural Minister Han Changfu pointed on at the National Agricultural Work Conference 2015 that China's agriculture is developing amidst profoundly changed internal and external environments. On the one hand, the foundation of materials, technology and equipment for agricultural development has become more consolidated; the supply of major agricultural products is abundant; new technology, new industry and new business models continue to emerge, providing valuable opportunities; on the other hand, both old and new problems are intertwined and the problem of imbalanced, uncoordinated and unsustainable development becomes more prominent. In the future ten years and during the 13th FYP period, China's agriculture and rural development will start from unprecedentedly high points to accomplish unprecedentedly demanding tasks despite unprecedentedly challenging situations.

1.2.1 China's agricultural development amidst rare opportunities

In 2015, despite the intricate and harsh domestic and international economic situations, China's agriculture and rural economy has maintained sound momentum for development, making great contributions to social and economic development under the

New Normal and becoming the ballast stone and stabilizing factor for social and economic development. China's grain output has been increased for 12 consecutive years, with a total output of 621.43 million tons, 2.4% higher than last year, and the output has been stabilized at above 600 million tons for three years in a row. The abundant production of cotton, oil, sugar, meats, eggs, milk, fruits, vegetables, tea and aquatic products have ensured effective market supply. Looking into the future ten years, in particular the 13th FYP period, China will continue develop its agriculture from a high starting point and be faced with multiple favorable conditions. First, strengthen agriculture as the weak link in across-the-board development and pool energy for new development of agriculture, rural areas and farmers. The 5th Plenary Session of the 18th CPC Central Committee put forward the target of building a moderately prosperous society in all respects and the working measures. In the future period of time, guided by the concept of innovative, coordinated, green, open and shared development, vigorous efforts will be made to advance agricultural modernization. Second, new type of urbanization will be push forward, bringing sustained driving force for agricultural development aided by industrial development and rural development led by urban development. The future ten years will be a phase for accelerated advancement of new type of urbanization. It is predicated that by 2020, around 100 million agricultural population and other resident population will get registered and settle down in urban areas, creating huge market demand for agricultural development and driving force for industrialization and urbanization. Third, the consumption pattern of urban and rural residents will be upgraded in an accelerated manner, adding tremendous driving force for agriculture and rural development. Currently, the five essential demands for food, clothes, houses, transportation and utilities have been satisfied to a certain degree, and the consumption structure is now upgraded towards a new five demands for education, recreation, health, safety and aesthetic enjoyment, thus bringing new opportunities for new industries. Fourth, a new round of technological revolution and industrial reform is emerging, injecting strong vigor to agricultural transformation and upgrading. The implementation of the national strategy of innovation-driven development will further push forward the transformation, restructuring and optimization of the model of agricultural development. Fifth, the unfolding of various rural reforms has provided inexhaustible driving forces for agricultural and rural modernization.

1.2.2 Major challenges for agricultural development in China

China's agricultural development has made tremendous achievements, yet at great cost, such as the reducing farmland, declining farmland quality, over exploration of

groundwater, and serious non-point agricultural pollution; with the tightening constraints of resources and environment, agriculture has come to a state where the transformation of the mode of development is urgently needed. First, supply-side structural reform is urgently needed. China's economic development has entered into a New Normal. Agricultural development is faced with new challenges such as the ceiling price of agricultural products, the rising floor of production cost and the intensified rigid constraints of resources and environments. It is a practical conundrum as for how to accelerate the transformation of the mode of agricultural development, optimize product structure and industrial structure, and enhance the quality and efficiency of agricultural supply system. Second, strengthening the international competitiveness of agriculture is urgently needed. The majority of agricultural commodities in China are under the pressure of domestic price higher than international price. Against the constantly increased import of major agricultural products and the greater impact of international agricultural market, it has become a huge challenge as for how to balance the use of domestic and international markets and resources to enhance China's agricultural competitiveness and win the initiative in the competition on the international market.

1. 2. 3 Arduous tasks for agricultural development in China

In the future period of time, China will face an arduous task for agricultural development, which is mainly reflected as follows: first, fully enhance the capacity to ensure the supply of grains and other major agricultural products. During the 13th FYP period, we will make sure basic self-sufficiency of cereals and absolute security of food grains. At the level of strategy, China will stick to the food crop production strategy based on farmland management and technological application; at the level of tactics, China will focus on the development of major grain producing regions, functional regions for food production and reserve regions for the production of important agricultural products; advance the development of farmland irrigation and drainage systems, land management, improvement of low-and mid-yielding farmland and high quality farmland, so that China could ensure food security by relying on itself. Second, fully improve the leading role of various forms of operation of moderate scale. Efforts should be made to guide the development of various forms of operation of moderate scale, nurture new types of players of agricultural operation, improve agricultural social service system and enhance the degree of intensification and organization of agriculture. Third, fully improve agricultural technology and equipment. China should strengthen R&D of key technologies for modern seed industry, smart agriculture, and agricultural machinery and equipment; breakthroughs should be

made in a range of major varieties/breeds, common key technologies and modern equipment that are leading the world, could support and lead modern agricultural development and with revolutionary influence on the transformation and upgrading of agriculture in China. China should try to complete a new round of updating of major crops by 2020; agricultural science and technology will contribute to over 60% of agricultural advancement and the comprehensive mechanization rate of ploughing, sowing and harvesting of crops will reach above 68%. Fourth, fully enhance the efficiency of agricultural production and operation. Efforts should be made to push forward cost saving and efficiency gains of agriculture, implement brand agricultural strategy, development efficient and quality agricultural products, extend the agricultural industrial chain and value chain, develop agriculture sharing economy, and enhance the productivity, land yield and resource use efficiency. Fifth, fully improve the quality and safety of agricultural products. Attention should be given to both production and management. Efforts should be made on standardized production and law enforcement and supervision. China should accelerate the development of supervision and traceability systems, expand the coverage of random sampling, so that by 2020, the prominent problem of the quality and safety of agricultural products could be effectively addressed and the the quality and safety could be improved. Sixth, fully enhance the level of sustainable agricultural development. We should grasp the historical opportunities of the improvement of agricultural productivity and the sufficient agricultural supply, strengthen the protection of agricultural resources and environment treatment, fight against non-point agricultural pollution and vigorously develop ecologically sound and circular agriculture. Efforts will be made to address the key problems of non-point agricultural pollution and environment pollution and shape a pattern of modern agricultural development featured by coordinated production, life and ecology.

References

- [1] Xu Shi-wei, Li Gan-qiong, Li Zhe-min. China Agricultural Outlook for 2015 – 2024 Based on China Agricultural Monitoring and Early-warning System (CAMES) [J]. *Journal of Integrative Agriculture*. 2015, 14 (9): 1889-1902.
- [2] Unites Nations. World Population Prospect (2015 Revision). New York. 2015.
- [3] United Nations. World Economic Situation and Prospects 2016. 2016-1.
- [4] World Bank. Global Economic Prospects. 2016-1.
- [5] OECD. Economic Outlook (No. 98). 2015-11.
- [6] International Monetary Fund (IMF). World Economic Outlook. 2016-1.
- [7] USDA. USDA Agricultural Projections to 2025. 2016-2.
- [8] National Bureau of Statistics. Steady improvement of national economic performance in 2015 [EB/OL].

- (2016-01-19) [2016-02-28]. http://www.stats.gov.cn/tjsj/zxfb/201601/t20160119_1306083.html.
- [9] Recommendations of the CPC Central Committee for the Formulation of the 13th FYP for National Economic and Social Development [R]. 2015-11.
- [10] Statements by Chinese agricultural Minister Han Changfu at the National Agricultural Work Conference 2015 [R]. 2015-12.

Chapter 2

Cereals

2.1 Rice

Rice is a staple food in China –60% of Chinese eat rice every day. Rice production witnessed steady growth since the twelfth five-year period, exceeding 200 million tons in 2011 and reaching 208.245 million tons in 2015. Rice consumption grows with population expansion. Driven by growing demand and favorable policies, rice price has been rising steadily, with rice and hulled rice wholesale price up by 5.3% and 5.1% annually in respective. Rice import began to surge in 2012 due to price gap between domestic and international markets, amounting to 11.80 million tons over the past 5 years. In the thirteenth five-year period, China will increase food production by enhancing land use efficiency and adopting new technologies, thus ensuring basic self-sufficiency for cereals and absolute sufficiency for staple food. In the next 10 years including the thirteenth five-year period, rice production will maintain stable growth. Supply-side reform featuring improved variety mix and quality, as well as cost-saving and efficiency gains will generate momentum, consumption will continue growing, trade may stay at certain scale, while market price may be affected by policy change. Similar to the conclusions in the 2015 outlook, rice production will remain stable in 2016, consumption will have slight increase, and net import will remain for trade. In specific, rice production will reach 208.99 million tons in 2016, equivalent rice consumption 145.62 million tons, and net import 2.44 million tons. By the end of the thirteenth five-year period, rice production will be around 205.07 million tons, equivalent rice consumption 148.01 million tons, and net import 2.92 million tons. By 2025, rice production will be around 206.03 million tons, equivalent rice consumption 150.29 million tons, and net import 2.93 million tons.

2.1.1 General outlook

Rice production will remain stable in the next 10 years, enabling absolute security.

Production will remain stable. In the next 10 years, as rice growing area will slightly decrease while yield may increase, total production will remain stable. Estimation shows that rice production will reach 208.99 million tons in 2016 (equivalent to 146.29 million tons of hulled rice), 205.07 million tons in 2020 (equivalent to 143.55 million tons of hulled rice), and 206.03 million tons in 2025 (equivalent to 144.22 million tons of hulled rice) Rice growing area will slightly decrease. Rice growing area will slightly increase to 30.25 million hectares in 2016, but then decrease to 29.482 million hectares

by end of the thirteenth five-year period, and further down to 29.442 million hectares by 2025. In general, rice production will maintain at above 200 million tons in the next 10 years—a plateau period for stable development.

Consumption will slightly increase. Rice consumption will slightly increase in the thirteenth five-year period due to multiple reasons—population growth, urbanization progress, and poverty alleviation in the countryside, etc. Estimation shows that rice consumption will reach 145.62 million tons in 2016 and 148.01 million tons by 2020. Rice consumption will keep growing in the next decade, and reach 150.29 million tons by 2025. It is estimated that food consumption of rice will slightly increase, feed consumption will slightly decrease while industrial consumption will increase largely in 2016. Seed consumption will remain stable, while waste and losses may slightly increase. During the outlook period, food consumption will keep growing, feed and processing consumption will slightly increase, seed consumption will mildly decrease, waste and losses may slightly increase, leading to increase in total consumption.

Trade will remain stable. Rice import will remain largely stable in the thirteenth five-year period, due to adequate domestic supply, limited trade volume in global market and solid rice stock. Estimation shows that net import of rice will be around 2.44 million tons, 2.92 million tons and 2.93 million tons in 2016, 2020 and 2025 in respective.

Price may diverge. Reform measures such as market-based pricing and separating pricing from subsidizing may have consequences over rice price. Upgraded consumption pattern will increase demand for premium quality rice, driving price up. Price for common quality rice may go down in certain stages due to impact from import and global market. Rice price may vary among products and brands in the thirteenth five-year period—price will go up substantively for premium quality rice, and slightly increase for common quality products.

2.1.2 Production outlook

Rice growing area will slightly decrease. Estimation shows that rice growing area will slightly increase to 30.25 million hectares in 2016 before decrease to 29.53 million hectares in 2020 and 29.44 million hectares in 2025, down by 0.3% annually (Figure 2-1). Given irreversible growth of rice production cost and gloomy prospect for economic return, multiple cropping index in southern China will go down. As supply-side structural reform in agricultural sector will deepen in the thirteenth five-year period, corn production may be ceased in some areas in the northeast; where conditions permit, some areas will be converted to rice farms; at the same time, rice growing area will be scaled down in

ecological restoration regions in southern China, leading to slight decrease in rice growing area.

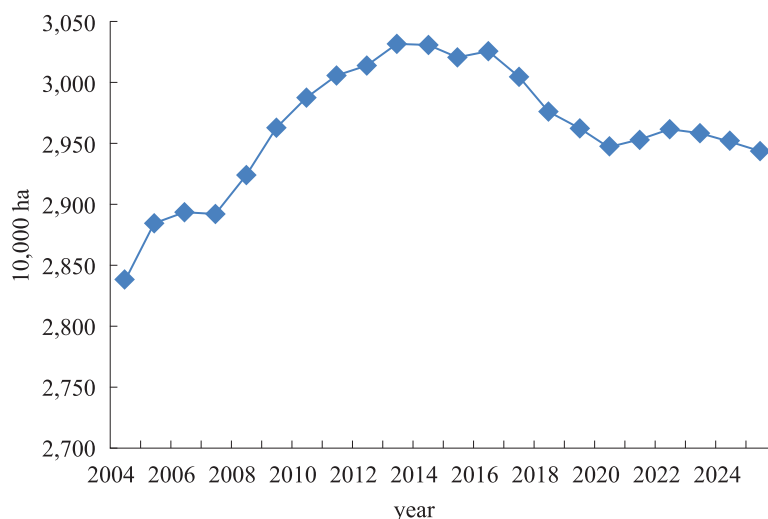


Figure 2-1 Rice sowing area in China, 2004 – 2025

Source: data for 2004 – 2015 is from National Bureau of Statistics, data for 2016 – 2025 is forecast data.

Yield will keep increasing. Estimation shows that rice yield will be 6700 kg/ha in 2016, 6971 kg/ha in 2020, and 7038 kg/ha in 2025, up by 0.2% annually (Figure 2-2). With more robust system for agricultural R&D, extension and service delivery in future, variety improvement will make greater contribution. Chinese scientists set a world record on rice yield (1067.5 kg/mu) in Gejiu Demonstration Base on Super Hybrid Rice, indicating strong potential for yield increase. In the thirteenth five-year period, technological innovation & advancement and extension of improved variety will continue making critical contribution to rice yield increase, which maybe be 0.2% annually.

Total production will remain stable. During the outlook period, as rice growing area will slightly decrease while yield may increase, total production will remain stable. Estimation shows that rice production will reach 208.99 million tons in 2016 (equivalent to 146.29 million tons of hulled rice), 205.07 million tons in 2020 (equivalent to 143.55 million tons of hulled rice), and 206.03 million tons in 2025 (equivalent to 144.22 million tons of hulled rice) (Figure 2-3). In general, rice production will maintain at above 200 million tons in the next 10 years—a plateau period for stable development.

2.1.3 Consumption outlook

Consumption demand will grow. Demand for agricultural products will grow in an

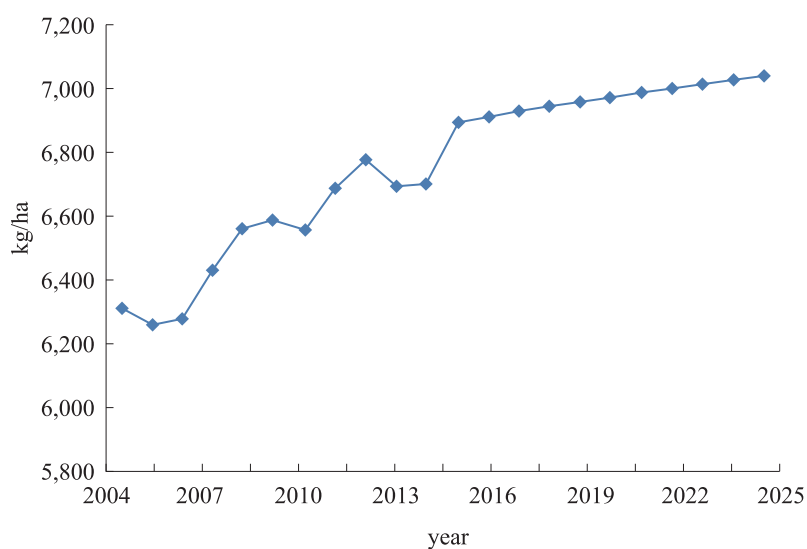


Figure 2-2 Rice yield in China, 2004 – 2025

Source: data for 2004 – 2015 is from National Bureau of Statistics, data for 2016 – 2025 is forecast data.

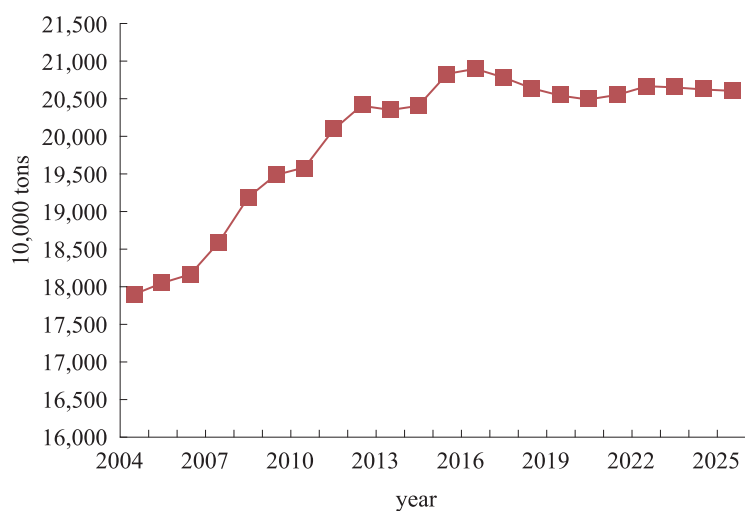


Figure 2-3 Total rice production, 2004 – 2025

irreversible manner, due to population growth, rising share of urban population, higher level of consumption, and expanded industrial use. Rice demand will slightly increase in the next 10 years, up by around 0.3% annually. Estimation shows that rice consumption will be 145.62 million tons in 2016 (up by 0.3%), 148.01 million tons in 2020, and 150.29 million tons in 2025 (Figure 2-4).

Consumption as food will grow at large. It is estimated that rice consumption as food will be 107.47 million tons in 2016 (largely the same with previous year), 108.68 million tons in 2020 and 109.57 million tons in 2025. Driven by more favorable second-

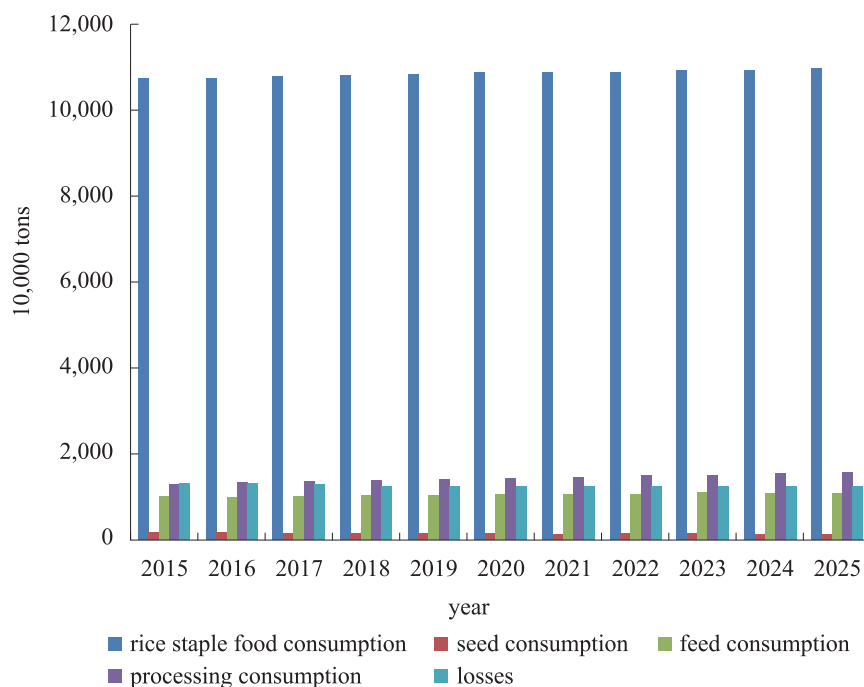


Figure 2-4 Rice consumption in China, 2015 – 2025

child policy, China's population will further grow with bigger margin in the thirteenth five-year period, leading to growth in staple food consumption; at the same time, with 100 million people urbanized and 70 million getting out of poverty, food consumption pattern will be changed, resulting in slight decrease of staple food consumption; on balance, rice consumption as food will keep growing in the next 5 years, though at a slower pace. Total consumption in 5 years is estimated to be 540.58 million tons. Given immense size of population, total rice consumption as food will reach 1.0866 billion tons in 10 years, though per capita consumption will remain stable.

Consumption as feed may slightly increase. Estimation shows that rice consumption as feed will reach 14.28 million tons in 2016 (equivalent to 10 million tons of hulled rice), down by 1.4%, due to replacement by other cheaper feeding materials such as corn. Consumption as feed will be 15.18 million tons in 2020 (equivalent to 10.62 million tons of hulled rice), and 15.76 million tons in 2025 (equivalent to 11.03 million tons of hulled rice). Rice consumption as feed is limited in quantity, mainly in southern provinces. China will intensify reform on price formation mechanism (market pricing, separating pricing from subsidies) for agro-products in the thirteenth five-year period. Raw materials for feed (e.g. corn) may be subject to market price, creating price gap between varieties, and leading to declined consumption of rice as feed. In later stage as rice inventory is facing pressure, some inedible aged grain may be used for feed

production. Given feed structure in the next 5 years, rice consumption as feed will witness slight increase.

Industrial consumption will keep growing. Estimation shows that industrial consumption of hulled rice will reach 13.34 million tons in 2016 (equivalent to 19.05 million rice) (up by 2.5%), 14.52 million tons in 2020 (equivalent to 20.74 million rice), and 15.62 million tons in 2025 (equivalent to 22.31 million tons of rice). As the stock is very big, some aged rice which is not edible as food or feed will be used to produce industrial alcohol. In the meanwhile, economic growth and more sophisticated catering industry will induce demand for premium quality liquor, rice processing products such as rice powder and some snacks, leading to increase in industrial consumption. Total industrial consumption will reach around 69.79 million tons in the next 5 years.

Consumption as seed will mildly decrease. Rice cultivation techniques will improve; on the other hand, growing area will undergo restructuring. It is estimated that seed consumption will mildly decrease. Estimation shows that rice consumption as feed will reach 2.28 million tons in 2016 (equivalent to 1.59 million hulled rice) (similar to that in 2015), 2.22 million tons in 2020 (equivalent to 1.55 million hulled rice), and 2.21 million tons in 2025 (equivalent to 1.55 million tons of hulled rice).

2.1.4 Trade outlook

Rice import will remain largely stable in the next 10 years, due to adequate domestic supply, limited trade volume in global market and solid rice stock in China. Rice is mainly imported from Thailand, Viet Nam, Pakistan, Cambodia, Laos and Myanmar. Media coverage reported that rice trafficking was serious in border regions over the past few years. China will strengthen its efforts to combat rice trafficking, thus curbing illegal sources of import. New development will be seen on rice export in 2016. Export will witness certain increase, while import from southeastern Asia will keep growing; as a result, net import is expected to be 2.44 million tons, lower than that in 2015. China established free trade zones with Laos, Vietnam, Cambodia and Myanmar in 2015, enabling preferential duties on rice import from those countries. Among those, tariff will be reduced to 50% for long-grain rice, and 20% for mid to short-grain rice and broken rice, which will drive continuous growth of rice import. In fact, this trend emerged already in 2015; estimation shows that import volume will maintain the level of 2015 in the outlook period. In terms of export, China will further intensify cooperation with neighboring countries such as Japan and Korea. Some rice may be exported to Africa. On balance, rice trade will maintain net import in the outlook period. As China

intensifies international cooperation, rice trade will maintain net import in the thirteenth five-year period. Estimation shows that net import will be 2.92 million tons in 2020 and 2.93 million tons in 2025.

2.1.5 Price outlook

Rice price will witness mild increase. Rice is an important staple food for the Chinese. Given the size of population in China, rice consumption will grow in an irreversible manner in the foreseeable future; on the other hand, the scope for production increase will be limited due to resource and environmental constraint; adding to the fact that global trade volume of rice is not big, rice price will remain stable in the next 10 years, which might inflate slightly driven by cost and domestic supporting policies. Rice price will be subject to reform in pricing mechanism in the thirteenth five-year period, especially by the timing and level of changes to minimum purchase price policies.

Price may diverge for hulled rice. As they get better off, Chinese people will increase demand for premium quality rice such as green product and organic product. On the other hand, cost keeps growing (labor cost for rice processing, cost for brand cultivation and environmental protection, etc.). It is expected that hulled rice price will vary on products and brands in the next 10 years. Price for premium quality rice will surge, while price for common quality rice will remain stable. Price for hulled rice will be affected by CPI in the thirteenth five-year period. Price in global rice market will also have consequences on domestic price.

2.2 Wheat

Wheat is a major food crop in China, with sowing area and production accounting for 21% of all grains. Wheat is also an important staple food, accounting for about 19% in total grain consumption (author's estimation). Central government launched a series of pro-agriculture policies since the twelfth five-year period, e. g. soil testing and formula fertilizer, high yield food production campaign. Wheat production grows steadily, showing 3 trends. 1) production keeps growing. Wheat production reached 117 million tons in 2011, exceeding 120 million tons in 2012 and 130 million tons in 2013-production growth for 12 years in a row; 2) Yield increase makes important contribution. In the "twelfth five-year" period, wheat production grew by 10.9% while sowing area declined by 0.2%. Yield increase was 11.1%. 3) production is more

concentrated. Contribution of 5 major producing provinces (Henan, Shandong, Hebei, Anhui and Jiangsu) to national wheat production rose to 75.9% in 2014 from 74.5% in 2011. In the next 10 years, production will grow slowly (0.2%) while consumption may grow steadily (1%). Market balance for wheat will shift from sufficient supply to tight balance. Due to corn price decline in 2015 with changing policies on temporary storage of corn, wheat consumption as feed plunged, leading to a more eased supply-demand balance. Estimation shows that wheat production will reach 130.1 million tons in 2016 (down by 0.1%), consumption 120.27 million tons (up by 0.5%), and import 2.74 million tons (down by 0.5%). Domestic price for wheat will remain stable. Wheat supply will remain sufficient in the thirteenth five-year period. By 2020, wheat production will reach 131.91 million tons, consumption 126.3 million tons and import 2.14 million tons. By 2025, wheat production will reach 132.79 million tons (up by 2.0% over 2015), consumption 132.63 million tons (up by 10.8% over 2015) and import 2.54 million tons (down by 7.6% over 2015).

2.2.1 General outlook

Wheat production will maintain stable growth in the next 10 years. Market balance for wheat will shift from sufficient supply to tight balance.

Production will grow slowly. Estimation shows that planting area and total production of wheat will be 24.12 million hectares and 130.1 million tons in 2016, down by 0.1%; planting area will slightly decrease in the thirteenth five-year period, to 24.02 million hectares in 2020 and 23.93 million hectares in 2025 (down by 0.1% annually); wheat production will increase to 131.91 million tons in 2020 and 132.79 million tons in 2025 (up by 2.0% over 2015). Growth margin between 2015 and 2025 will be 0.2% annually, much lower than 2.6% in the past decade.

Consumption will grow steadily. Wheat production will grow steadily in the outlook period. Estimation shows that consumption will reach 120.27 million tons in 2016, 126.3 million tons by end of the thirteenth five-year period, and 132.63 million tons by 2025. Consumption will out-grow production, by 1.0% annually. Among those, consumption as food, feed and for industrial use will keep growing at an annual rate of 0.4%, 3.1% and 3.7% annually; losses and seed consumption will decline by 0.1% annually.

Trade pattern will remain net import. There is no supply shortage in domestic market, but wheat import will continue to enrich varieties. In the next 10 years, wheat import will be around 2 million tons annually. In the same period, wheat export will

remain at around 200,000 tons as there is no such competition edge for China. Net import will continue in the outlook period, which will reach 2.54 million tons in 2025.

2.2.2 Production outlook

Wheat growing area will slightly decrease. In line with government order to optimize agricultural mix, wheat growing area will be reduced in northern China facing severe challenge of underground water over-draft; in the northwest dry farming regions where annual rainfall is less than 300mm, wheat growing area will be reduced as appropriate, while potato and forage growing area may be expanded. In that context, wheat growing area will face downward pressure in the next stage; however, given its position as a major staple food, wheat will not experience dramatic decline in terms of growing area, to attain policy goals of “absolute security of staple food”. In addition, as economic return has been declining for cotton and canola, some farmers shifted to grow wheat, putting an end to a 5-year continuous decline for wheat growing area since 2010. In fact, wheat growing area increased slightly in 2015. Wheat farming is more mechanized, thus saving time and energy, presenting certain competition edge in the context of labor shortage/ Wheat growing area will decrease slightly in the next decade, down to 24.12 million hectares in 2016, 24.02 million hectares in 2020, and 23.93 million hectares in 2025 (by 0.1% annually).

Yield will keep rising. Potential for yield increase could be further tapped. On one hand, yield per mu in Yellow River Delta and Huaihai Region could reach over 800 kg in theory, which is only 400 kg at present, less than half of the theocratic level. Wheat yield also varies in provinces in the same ecological region—yield per mu exceeds 400 kg in Shandong and Henan, 40 kg more than that in Anhui. In some localities, yield per mu in demonstration farms could reach 700 kg, 2 times of national average (337 kg). Yield increase is highly possible if effective measures are taken and new technologies are adopted. On the other hand, infrastructure should be improved to facilitate yield increase. Measures will be taken to implement the *Master Plan for Building High-Standard Farms*, to transform low-yield farms in the north latitude 33° region, improve lime concretion black soil in northern Jiangsu, northern Anhui, and southern Henan, explore a number of high-standard farms which can ensure yield, and further increase the share of wheat farms with guaranteed irrigation. According to model estimation, wheat yield will reach 5,393 kg/ha in 2016, 5,491 kg/ha in 2020 and 5,549 kg/ha in 2025 (up by 0.3% annually).

Production will grow at a slower rate. Wheat growing area will decline slightly but

yield will increase, thus wheat production will keep growing, though at a slower rate. Estimation shows that wheat production will reach 130.1 million tons in 2016, 131.91 million tons in 2020 and 132.79 million tons in 2025, with an annual rate of 0.2% -much lower than 2.6% over the past decade.

2.2.3 Consumption outlook

Consumption will grow steadily. Wheat consumption will grow steadily in the next 10 years. Estimation shows that consumption will reach 120.27 million tons in 2016, 126.3 million tons by end of the thirteenth five-year period, and 132.63 million tons by 2025. Consumption will out-grow production. Among those, consumption as food, feed and for industrial use will keep growing; losses and seed consumption will decline.

Food consumption will keep growing. Per capita food consumption will come down as food consumption patterns get upgraded. According to the National Statistics Bureau, per capita grain purchase for urban residents dropped from 130.72 kg to 78.76 kg between 1990 and 2012 (down by 39.8%); In the same period, per capital grain consumption by rural residents decreased from 262.08 kg to 164.27 kg (down by 37.3%), and wheat consumption from 80.03 kg to 52.33 kg (down by 34.6%). China's population will keep growing in the thirteenth five-year period, due to more favorable second-child policy. According to the forecast by the Population and Labor Economy Institute of Chinese Academy of Social Science, the Chinese population will keep growing in the next 10 years before reaching the apex (1.413 billion) in 2025. Population growth will stimulate consumption increase. Estimation shows that staple food consumption will reach 85.36 million tons in 2016, 86.9 million tons in 2020 and 88.16 million tons in 2025 (up by 0.4% annually), taking up around 66% of total wheat consumption. Apart from changes in quantity, consumption mix will also be different. Market surveillance shows that staple food (such as flour) consumption has been growing at a slower rate. Among those, market demand has been narrowing for common quality flour and its products, but increasing for tailored flour. Wheat production faces new challenges, namely enhancing industrialized production of premium quality wheat, and restructuring variety mix while ensuring adequate supply in total.

Feed consumption will decline then rise. Wheat and corn can substitute each other as feed; therefore, wheat consumption as feed depends on price ratio between wheat and corn. As wheat price was lower in the recent years, wheat consumption as feed has been growing substantively-the share of feed consumption in total consumption rose from 10% to nearly 20%. Market situation changed as new varieties of corn was placed in market

since 2014. Corn supply increased, and wheat/corn price ratio changed significantly, leading to sizable decline of wheat consumption as feed. With changes to domestic corn price and corn collection and storage policies, wheat consumption as feed will remain low in the near future, and then gradually rebound as wheat/corn price ratio recovers. Estimation shows that wheat consumption as feed will reach 10.69 million tons in 2016, 12.49 million tons in 2020 and 14.88 million tons in 2025 (up by 3.1% annually), accounting for 11% of total consumption.

Industrial consumption will grow rapidly. Industrial consumption covers those used to produce deep processing products such as starch, alcohol, soy sauce, MSG, etc. China is making rapid progress in industrialization and urbanization. International experiences show that processing demand will outgrow food demand in this stage. As food industry makes further progress, processing demand will keep growing. Estimation shows that industrial consumption will reach 14.44 million tons in 2016, 17.13 million tons in 2020 and 19.86 million tons in 2025 (up by 3.7% annually), accounting for 15% of total consumption.

Losses and seed consumption will decline. Improved drying and storage facilities will reduce wheat losses. Estimation shows that losses will be 5.19 million tons in 2016, 5.21 million tons in 2020 and 5.18 million tons in 2025 (0.6% less than 2015), accounting for 3.9% of total consumption. As wheat growing area may decline, seed consumption is expected to decrease from 4.59 million tons in 2015 to 4.55 million tons in 2025 (down by 0.9%), accounting for 3.4% of total consumption.

2.2.4 Trade outlook

Net import will remain for wheat in the next 10 years. Global price has been more favorable in the recent years, constituting the main reason of import surge in the context of wheat production increase for 12 years in a row. Domestic and international price gap will remain in the foreseeable future, as global wheat supply is in good shape while prospect for demand is gloomy in the context of sluggish economic recovery. In addition, with upgraded consumption pattern, demand for tailored and premium quality flour, as well as for high quality wheat, will further grow, which cannot be met by domestic supply in the short term. Demand for import will remain to enrich varieties. Estimation shows that wheat import will reach 2.69 million tons in 2025 (less than 2015), mainly from Australia, Canada and US. As the “One belt one road” strategy is implemented, wheat import from central Asia (such as Kazakhstan) will further grow. Wheat export has been on decline in recent years. In the next stage, wheat export will remain at around 200,000 tons, mainly to Hong Kong, DPRK and Macao.

2.2.5 Price outlook

To increase economic return and food production for grain farmers, China implemented minimum purchase price policies on wheat in 6 major producing provinces (Hebei, Shandong, Jiangsu, Anhui, Henan and Hubei) since 2006. Minimum purchase price rose for 7 years in a row since 2008, representing a major cause of wheat price inflation. The policy is facing growing pressure with changing environment in domestic and international market. The 3rd plenary session of the 18th CPC Central Committee advocated to reform price formation mechanism for agricultural products, and let market play a decisive role in resource allocation. Minimum purchase price policies continued in major producing provinces in 2015 and 2015; however, purchase price was not raised, but stood at the level of 2014. Annual average price dropped for the first time in 2015, putting an end to the “continuous growth” momentum.

Rising production cost will continue underpinning wheat price. China has already entered high-cost era in agricultural production. Production cost kept rising over the past decade. Accelerated pace of industrialization and urbanization spurred rapid growth of labor and land cost. Rice growing cost per mu rose by 1.57 folds, from 355.92 yuan in 2004 to 914.71 yuan in 2013. Among those, the cost for materials and services rose by 1.08 folds from 200.28 yuan to 417.08 yuan. In the same period, monthly salary of migrant workers increased from 780 yuan to 2609 yuan, driving up labor cost of wheat production from 111.84 yuan to 343.78 yuan (by 2.07 folds) and the share of labor cost from 31.4% to 37.6%; land cost grew from 43.8 yuan to 153.85 yuan (by 2.51 folds), and the share of land cost from 12.3% to 16.8%. In contrast, unit production cost in the US only rose by 18.9% -labor cost down by 39.8%, opportunity cost for land up by 19.1%. China will make further progress in industrialization and urbanization in the thirteenth five-year period, meaning that labor and land cost will grow in an irreversible manner in agricultural production, leading to further inflation of wheat price. As policy support fades, wheat market will experience bigger fluctuation, but price will remain largely stable.

2.3 Corn

Corn is one of the 3 major food crops in China and an important raw material for feed. The use of corn is extensive in industries. Corn industry is highly relevant to optimize dietary pattern, improve livelihood, and boost economic prosperity. Corn production maintained sound momentum during the twelfth five-year period. Corn

growing area set historic high for years in a row-38.13 million hectares in 2015, up by 17.4% over 2010 (an increase of 5.64 million hectares). Corn production kept growing, reaching 193 million tons in 2011, 200 million tons in 2012 (topping the 3 major food crops), and 225 million tons in 2015 (an increase of 47.33 million tons over 2010, up by 26.7%). Corn yield grows at a bigger margin, averaging 0.6% during the twelfth five-year period. Production growth in major producing region (the northeast) makes bigger contribution. Corn consumption as feed accounted for over 60% of total consumption; however, quantity of such consumption dropped due to import surge for sorghum and wheat in 2014/15; underpinned by temporary collection and storage policies, corn price remained high since 2008-wholesale price in producing regions averaging 2.24 yuan/kg from 2011 to 2015; price tumbled when the government lowered purchase price for temporary storage in September 2015, having declined to the level 5 years ago by December 2015. In spite of those efforts, domestic corn price remains higher than price in global market. Net import was 4.72 million tons in 2015, and will amount to 17.25 million tons for the twelfth five-year period. In the thirteenth five-year period, corn growing area in the “scythe-shaped region” will reduce by 1.8% annually. As de-stocking measures are implemented, industrial consumption and feed consumption will both grow rapidly (3.0% annually). Stock to use ratio will drop to below 70% by 2020, enabling market pricing for corn. In the fourteenth five-year period when corn production concentrates in regions with competition edge, and improved varieties and new technologies are extended to the whole country, corn production will recover solid momentum. Estimation shows that corn production and consumption will be 212 million tons and 227 million tons by 2025 respectively, representing a tight balance in the market, thus fostering balanced development of upstream and downstream industries.

2.3.1 General outlook

Readjustment in corn production patterns will make good progress in the next decade: production will grow steadily, consumption will ease its growth to mild increase, and market fundamental will shift from over-supply to tight balance, thus fostering balanced development of upstream and downstream industries.

Growing area and production will both decline. Estimation shows that corn growing area and production will be 36.95 million hectares (down by 3.1%) and 215.17 million tons (down by 4.2%) respectively in 2016; the decline will continue in the thirteenth five-year period, growing area down to 34.42 million hectares by 2020 (down by 1.8%) and production down to 205.67 million tons (down by 1.1%). Driven by consumption, corn production will recover somehow in the last 5 years over the outlook

period, growing area up to 34.55 million hectares by 2025 (up by 0.09% annually) and production up to 212.29 million tons (up by 0.64% annually). During the outlook period, growing area and production will decline at an annual rate of 0.07% and 0.15%.

Consumption will slightly increase. Corn consumption will reach 197.51 million tons, 221.92 million tons and 226.99 million tons in 2016, 2020 and 2025 respectively, up by 1.6% annually. Among those, feed consumption will grow substantively (2.7% annually) due to population expansion and revenue growth; food consumption will maintain steady growth (0.3% annually); industrial consumption will decline (0.1% annually) after reaching the turning point; seed consumption and losses will drop at an annual rate of 0.7% and 2.8% respectively.

Price may diverge. Corn price may go downwards significantly in the thirteenth five-year period. Estimation shows that corn price will drop substantively in 2016 before reaching the turning point and going up in 2020. By 2025, corn price will be more closely related to price in global market.

Trade will remain stable. De-stocking will be a priority task for supply-side reform in the thirteenth five-year period. Measures will be taken to boost export and slash import, which may restore net export. Estimation shows that corn export and import will be around 2 million tons and 250,000 tons respectively in the first 2 years during the outlook period; by 2025, import will surge to around 2 million tons while export will be less than 10,000 tons.

2.3.2 Production outlook

Corn growing area will decline in general. Following the *Guidance on Restructuring Corn Production in the “Scythe-shaped Region”* issued by the Ministry of Agriculture, localities began to scale down corn growing area in 2016. Hebei province will transform 3 million mu corn growing area to grow small grains, edible fungus, herbal medicine, vegetables, forest and fruits. Corn used as silage and for special purpose will be encouraged, and a cropping-livestock combination model will be explored. Jilin will reduce corn growing area by 3 million mu-1.2 million mu in western region vulnerable to drought, 800,000 mu in eastern hilly region converted to corn/soy rotation, 80,000 mu converted to grow feed corn, 150,000 mu converted from dry farm to irrigated farm, and 100,000 mu shifted to develop protected agriculture. In northern Heilongjiang Province, 5 million mu corn farms will be converted in 2016 to grow edible soy, potato and other crops. Inner Mongolia will convert 2 million mu corn farm in northeastern and central hilly regions, to grow silage corn. Shaanxi will cut 600,000 mu corn farm in the northern desert area, and grow 1 million mu silage farm in Guanzhong region. Provinces

in the “Scythe-shaped region” will convert and reduce 15 million mu corn farm in 2016. As economic return declines for corn farming in 2015, farmers in other regions may also choose to convert corn farms. Estimation shows that corn growing area will be reduced to 36.93 million hectares in 2016, registering decline for the first time since 2003. China faces big challenge in corn de-stocking in the thirteenth five-year period. Corn growing area will be further reduced to 34.41 million hectares by 2020. In the last 5 years of the outlook period, oil price decline will substantively lower cost for fertilizer and machinery, while concentrated production in competitive regions will largely increase yield, thus economic return may further grow for corn production, leading to recovery of corn growing area (up by 0.1% annually) and steady trend of production (Figure 2-5).

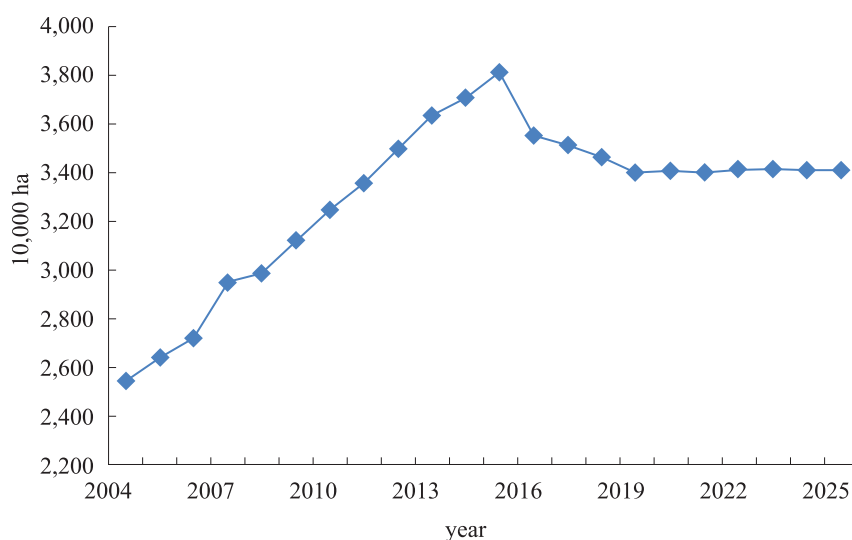


Figure 2-5 Corn sowing area in China, 2004 – 2025

Source: data for 2004 – 2015 is from National Bureau of Statistics, data for 2016 – 2025 is forecast data.

Yield will fluctuate at a bigger margin. Declining return on corn growing in 2015 upset many farmers. Investigation finds that market for agricultural inputs was weak, and the use of chemicals and pesticide reduced. Many farmers reported that they will not apply pesticide such as herbicide on corn farms in 2016, to restore soil fertility. In 2017, they will grow millet, sorghum, rice, peanut and soy on the corn farms. Estimation shows that corn yield will decline to 5824 kg/ha in 2016 (1.1% lower than 2015) and then rise to 5978 kg/ha in 2020 (2.6% higher than 2016). Average yield will increase by 0.7% annually in the thirteenth five-year period, as corn production is concentrated in competitive regions, large-scale production is expanded, and new technologies and improved varieties are introduced. Regional gap on yield will also be narrowed. In the last

5 years during the outlook period, economic return on corn production will show a good prospect, sending a positive signal to farmers. In absence of abnormal weather conditions, yield will be further increased and become a main driving force for production growth, with more measures taken such as soil deep loosening, stalk incorporation, variety improvement, etc. Estimation shows that corn yield will reach 6144 kg/ha by 2025 (320 kg/ha more than 2016), up by 0.6% annually in the 10 years (Figure 2-6).

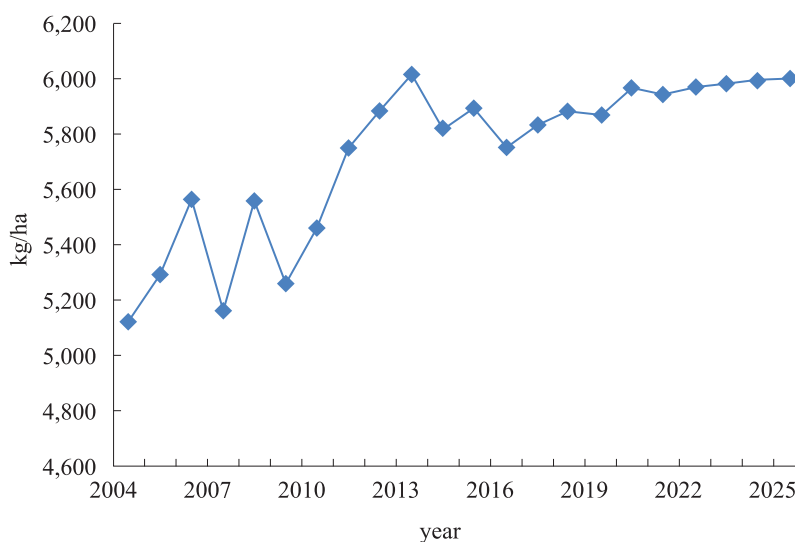


Figure 2-6 Corn yield in China, 2004 – 2025

Source: data for 2004 – 2015 is from National Bureau of Statistics, data for 2016 – 2025 is forecast data.

Production may decline. Corn growing area will reduce substantively in the thirteen five-year period. Thanks to the high yield, corn production will maintain above 200 million tons, reaching 215.17 million tons in 2016 and 205.67 million tons in 2020, down up 1.1% annually. Driven by technological advancement and yield increase, production will recover the growth momentum in the last 5 years during the outlook period, reaching 212.29 million tons by 2025 (up by 0.64% annually), 1.3% less than 2016 (Figure 2-7).

2.3.3 Consumption outlook

Consumption demand will grow. Corn consumption is closely tied with macro-economic development. As China's economy will usher into new normal conditions in the next decade, slower growth margin may have implications over corn consumption; however, de-stocking initiative will underpin rapid growth of corn consumption (3%) in the thirteenth five-year period. In later stage, corn demand will maintain irreversible growth

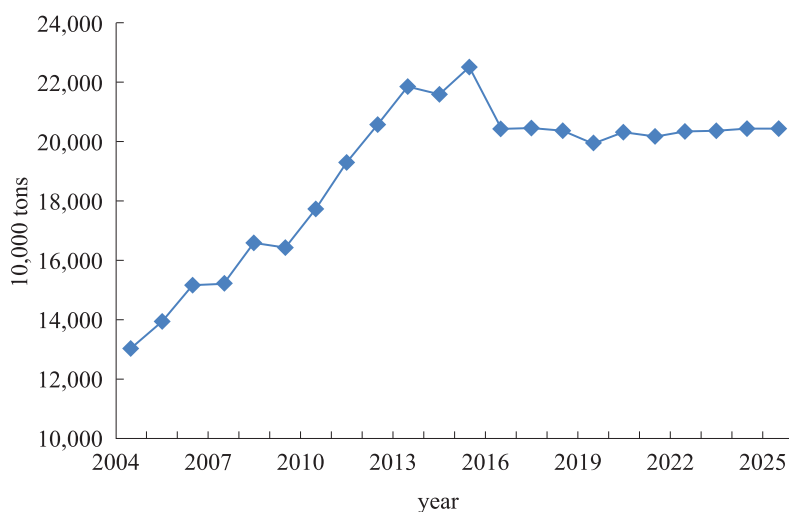


Figure 2-7 Corn production in China, 2004 –2025

Source: data for 2004 –2015 is from National Bureau of Statistics, data for 2016 –2025 is forecast data.

(around 0.4% annually) due to multiple reasons, i. e. , population expansion, progress in urbanization, rural poverty alleviation, upgraded dietary patterns, and less import substitutes. Estimation shows that corn consumption will be 197.51 million tons in 2016 (up by 11.2%), 221.92 million tons in 2020, and 226.99 million tons in 2025 (Figure 2-8).

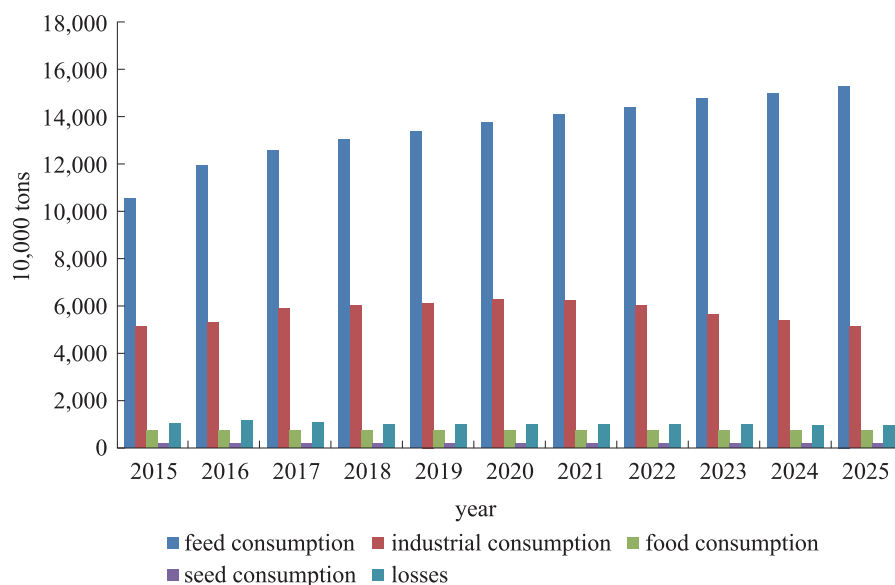


Figure 2-8 Corn consumption in China, 2015 –2025

Consumption as food will remain stable. Corn is consumed as food by those who were born before 1990s. The new generation has a totally different dietary pattern. They pursue taste and fashion, and seldom eat corn directly. Population will further grow-at an

even faster rate-with more favorable second-child policy, but that will not have big impact on corn consumption as food. Estimation shows that corn consumption as food will remain largely stable, 7.19 million tons in 2016, 7.28 million tons in 2020 and 7.37 million tons in 2025 (up by 0.3% annually).

Feed consumption will grow in an irreversible manner. Corn consumption as feed will recover rapidly in 2016 in an enabling environment-rapid recovery of pork price, stable growth of poultry production, more stringent import policies on corn substitutes, and expected decline for wheat and sorghum import. Estimation shows that corn consumption as feed will reach 119.2 million tons in 2016, up by 13.5%. China will attain the goal of “comprehensively well-off society” in the thirteenth five-year period. Additional 100 million people will become urban residents, 70 million people will be lifted out of poverty, and income will double. Demand for meat, egg and milk will grow substantively, leading to demand increase for corn consumption as feed, which is estimated to be 137.33 million tons in 2020. Price formation mechanism for corn will be further improved by end of the outlook period, and feed consumption will keep growing. Estimation shows that feed consumption will reach 151.16 million tons by 2025, up by 2.7% annually, representing 67% of total corn consumption.

Industrial consumption will grow in a controllable manner. Facing de-stocking pressure, China may launch a series of measures in the thirteenth five-year period, e.g. mobilizing processing factories to bid for corn in temporary storage, and encouraging trading companies to export corn as appropriate or involve in some international aid programs. Fueled by economic recovery and market demand, industrial consumption will recover rapid growth. Corn will be used for a wider array of purposes, and industrial chain for deep processing will be extended (modified starch, starch sugar, lysine and fermented products). Estimation shows that industrial consumption will reach 55.75 million tons in 2016 (up by 8.8%) and 62.74 million tons in 2020 (up by 3.0% annually). De-stocking pressure will be eased in the last 5 years during the outlook period. With no further policy support, processing factories will shift towards cost-efficient, environment-friendly and sustainable production. Industrial consumption may be reduced-though not much. Estimation shows that industrial consumption will reach 55.3 million in 2025, 0.8% less than 2016.

Seed consumption will keep declining. With intensive restructuring in corn production, corn growing area will be slashed, leading to decline of seed consumption. Estimation shows that seed consumption will be 1.66 million in 2016 (down by 3.1%) and stay at around 1.55 million tons from 2020 to 2025.

2.3.4 Trade outlook

Corn import will be subject to domestic supply/demand balance and price gap between domestic and global market. As China faces growing pressure for de-stocking, corn price is estimated to plunge in 2016. In contrast, price in global market will rebound. Contract price of corn in CBOT inflated by 1.5%, 2.8% and 4.4% over March in May, July and September 2016 respectively. Price gap will be narrowed between domestic and international market, constituting a disincentive for corn import. Estimation shows that corn import will narrow by around 250,000 tons in 2016, down by 94.7%. Facing growing pressure in de-stocking, China will take measures to shore up export. It is estimated that corn export will reach around 1.7 million tons in 2016, restoring net export. Over-supply will continue in domestic market in the thirteenth five-year period, and corn in global market may no longer enjoy price advantage. China is a big importer of corn in global market. Import surge will drive up price in global market, which may in turn suppress import growth. Estimation shows that corn import and export will be reduced to less than 500,000 tons by 2020. As supply-side reform makes progress, ties between domestic and international market for corn will be strengthened in the last 5 years during the outlook period. Steady growth of corn consumption will shore up corn import, which will be around 2 million tons in 2025.

2.3.5 Price outlook

Corn price will decline then increase. Corn is a major feeding material and boasts a long industrial chain, making it vulnerable to economic fluctuation. Corn price reform will step into deep water zone in 2016. Reform in price formation mechanism for agricultural products will be intensified, and feeding materials such as corn may be priced by market. Estimation shows that corn price will come down substantively in 2016. Corn market witnessed over-supply in the thirteenth five-year period, especially in the last 3 years. In that context, China took active measures to restructure corn production, in order to reduce inventory and lower cost. Corn price will remain low for some time. In the latter part of the outlook period, corn market will experience tight balance. Demand for premium quality corn will increase, and production cost will grow irreversibly, thus driving up price for corn. Corn price will be further consolidated as price for petroleum slowly rebounds and industrial demand for corn grows. On balance, corn price will inflate mildly in the last 5 years during the outlook period; however, average price during the outlook period will be lower in comparison with the twelfth five-year period.

Chapter 3

Oil

3.1 Soybean

Soybean is the most important oil crop in China and a main source of protein feed for livestock industry, playing an important role in agricultural production and social economic development. Soy production, import and consumption in 2016 were 11.61 million tons (down by 4.3%), 81.74 million tons (up by 14.5%) and 89.53 million tons (up by 6.0%) respectively. Soy growing area and production has been on decline in the twelfth five-year period. Total production as 63.48 million tons from 2011 to 2015, with 2015 production 19.8% less than 2011; demand for protein feed in livestock sector underpinned steady growth in soy consumption. Total consumption was nearly 400 million tons from 2011 to 2015, up by 5.3% annually. In the context of under-supply and more favorable price in global market, soy import amounted to 328 million tons from 2011 to 2015, up by 11.6% annually. In 2014, China piloted reform measures on soy price subsidy, leading to more market-based pricing, and price decline in domestic market in 2014 and 2015. With changes to corn collection and storage policies as well as soy price subsidy policies, soy growing area may recover in the next decade. Production will increase steadily, crushing and food consumption will grow slightly, while import will grow at a slower pace. Soy pricing will be more market-based, subject to supply/demand balance in domestic market and affected by international market. Estimation shows that soy production will reach 12.03 million tons in 2016 (up by 3.6%), consumption 91.69 million tons (up by 2.4%), and import 82.28 million tons (up by 0.7%). Domestic soy price will remain stable. Soy production, consumption and import will grow at an annual rate of 2.8%, 1.9% and 1.0% respectively in the thirteenth five-year period. Growth margin for consumption and import will be much smaller than those in the twelfth five-year period. By end of the outlook period (2025), soy production, consumption and import will be 14.85 million tons, 108 million tons and 88.64 million tons in respective, up by 27.9%, 20.6% and 8.4% over 2015.

3.1.1 General outlook

Soy growing area will recover growth in the next 10 years, with steady increase of production and consumption. Import will remain large in volume, but at a slower rate of growth. Soy price in domestic market will increase slightly in the next decade due to growing cost increase and progress in cultivating domestic soy brands.

Production will grow steadily. A series of reform may be completed in the next

decade: changes to corn collection and storage policies, improvement in soy target price subsidy policies in the northeast, subsidies on “grain/legume crop rotation”, etc. Those policy measures, with development of soy deep processing industries, will help recover growth of soy growing area in China. Soy yield will increase with improved practices in field management and technological advancement in breeding. Growth in area and yield will spur steady increase of production.

Consumption will grow steadily. Soy consumption will grow steadily in the next decade. Better livelihood, urbanization progress as well as achievement in lifting 70 million people out of poverty will fuel demand for meat, egg, milk and edible plant oil, leading to increase in soy crushing consumption. In addition, demand for products such as soy protein, issue protein, soy lecithin will also increase deep processing consumption. During the outlook period, soy consumption as seed will slightly increase with growing area expansion. Losses will also increase, but remain at around 1-1.2% of total consumption. Demand will further outgrow production in the next 10 years, with supply/demand gap gradually widening, though slightly.

Import will grow at a slower pace, while export will grow steadily. Given under-supply in domestic market and more favorable price in global market, demand for import will remain strong in the next 10 years; however, import growth will slow down due to the massive quantity. It is estimated that soy import will grow at an annual rate of 0.8%, much lower than 12.5% in the past 10 years. Soy export will remain stable, at around 200,000 tons annually.

3.1.2 Production outlook

Soy growing area will slightly decrease. In the context of changing policies on corn collection and storage as well as agricultural restructuring, soy growing area will recover growth and increase to 6.88 million hectares in 2016, up by 4.4%. No. 1 Document of the Central Government in 2016 provided that “guidance be offered on the identification of food-producing regions as well as protected regions for the production of major agricultural products such as soy, cotton, oil seeds and sugar cane”. This provision will be materialized in the thirteenth five-year period-further reform on soy target price subsidy policy in the northeast, and subsidies on “grain/legume crop rotation”. A series of favorable policies will underpin steady recovery of soy growing area. Estimation shows that soy growing area will reach 7.42 million hectares in 2020, up by 830,000 hectares over 2015 (12.5%). In the last 5 years during the outlook period, soy growing area will further expand, though at a slower rate, due to more solid implementation of subsidy

policies, development of deep processing industries and cultivation of domestic soy brands. Estimation shows that soy growing area will reach 7.8 million hectares in 2025, 926,000 hectares more than 2016, up by 1.4% annually in those 10 years.

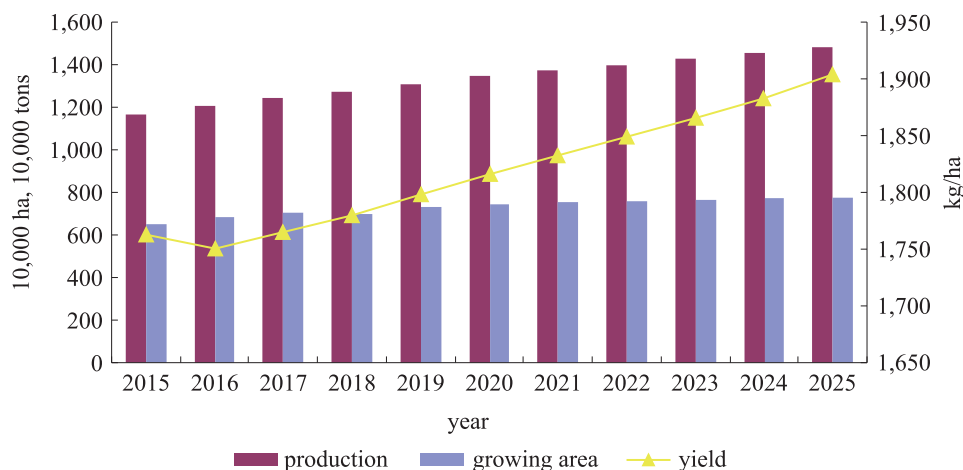


Figure 3-1 Soy growing area, yield and production in China, 2015 – 2025

Source: Agricultural Information Institute of Chinese Academy of Agricultural Science, CAMES

Yield will grow steadily. Yield will be mainly subject to natural environment (climate, rainfall, etc.) in 2016. Estimation shows that yield will remain largely stable-1748.55 kg/ha. Soy yield in China is currently lower than that in the US and Brazil, but may be increased during the outlook period with adoption of improved varieties, large-scale growing, mechanized production and improved field management. Estimation shows that soy yield will increase to 1814.02 kg/ha in 2020 (up by 3.0% over 2015) and 1903.85 kg/ha in 2025 (up by 8.1% over 2015).

Production will grow steadily. Estimation shows that soy production will reach 12.03 million tons in 2016, up by 3.6%. With increase in growing area and yield, soy production will grow steadily in the thirteenth five-year period. Soy production will reach 13.46 million tons by end of the thirteenth five-year period, 1.85 million tons more than 2015, up by 15.9%. Soy production will further increase to 14.85 million tons in 2025 (3.24 million tons more than 2015, up by 27.9%), with annual growth rate of 2.4% in the ten years.

3.1.3 Consumption outlook

Consumption will grow steadily. Estimation shows that soy consumption will reach 91.69 million tons in 2016, up by 2.4%. Soy consumption will steadily increase in the thirteenth five-year period, increasing by 9.49 million tons (up by 10.6%) by end of that

period (2020), and reaching 108 million tons by 2025 (up by 18.42 million tons-20.6% over 2015). Consumption will grow 1.8% annually in the outlook period (Figure 3-2).

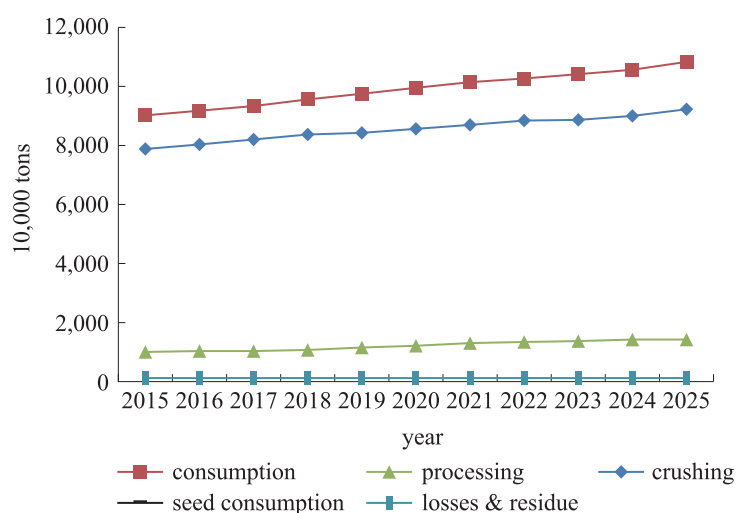


Figure 3-2 Soy consumption and consumption mix in China, 2015 – 2025

Source: Agricultural Information Institute of Chinese Academy of Agricultural Science, CAMES

Consumption through crushing and processing will growth steadily. Crushing and processing consumption was 87.5% of total consumption in 2015, representing the main part of consumption. Estimation shows that soy crushing consumption will reach 80.19 million tons in 2016, up by 2.3%. The Chinese population will further grow in the thirteenth five-year period, additional 100 million people will become urban residents and 70 million people will be lifted out of poverty. That will spur consumption of meat, egg and milk, and increase demand for soy meal as protein feed. Soy oil will also witness growth in consumption as one of the major edible plant oil. Total crushing consumption will be 415 million tons between 2016 and 2020. Given the absolute quantity of soy crushing at present, crushing consumption will grow at a slower rate (1.62% annually) in the next 5 years. By end of the thirteenth five-year period, i. e. 2020, crushing consumption will reach 85.53 million tons, up by 9.1% over 2015. By end of the outlook period, i. e. 2025, crushing consumption will reach 92.23 million tons, up by 1.57% annually from 2015 to 2025.

Soy consumption as food will increase. Food consumption includes direct consumption (traditional soy products), soy protein and deep processing products. At present, per capita daily consumption of soy is around 21 grams, while that of traditional soy food (Tofu, soy milk) is less than 15 grams (in equivalent soy). According to nutrition and dietary guidance, per capita daily soy consumption should be around 40 grams, meaning

that there is a gap between now and future. Soy protein products are used mainly to produce meat products, beverages, and frozen food. As people get more income, they will increase demand for soy processing products such as soy protein and Vitamin E. Development of soy deep processing industry (such as soybean phosphatides and soy isoflavone) will fuel demand for processing products. Estimation shows that food and processing consumption will reach 9.88 million tons in 2016, up by 3.3%. Food consumption will reach 11.79 million tons in 2020 and 13.96 million tons in 2025. Food consumption will grow rapidly in comparison with crushing consumption, up by 3.9% annually from 2016 to 2025.

Seed consumption and losses will remain stable. Seed consumption will increase along with expansion of soy growing area. Estimation shows that seed consumption will be 560,000 tons, 600,000 tons and 620,000 tons in 2016, 2020 and 2025 in respective. Soy consumption will grow, so will the losses. Estimation shows that soy losses will be around 1.07 million tons, 1.1 million tons and 1.14 million tons in 2016, 2020 and 2025 in respective. The share of losses in total consumption will remain 1%-1.2% between 2016 and 2025.

3.1.4 Trade outlook

Import will grow at a slower rate. Estimation shows that soy import will reach 82.28 million tons in 2016, up by 0.7%. Supply shortage will remain the main cause of import growth during the outlook period; however, growth margin will slow down in comparison with the past decade give the absolute size of import. Total import of soy will amount to 420 million tons between 2016 and 2020. Soy import will reach 85.56 million tons by end of the thirteenth five-year period (2020), with annual growth of 1.0% during the 5 years, much low than the growth rate in the twelfth five-year period (11.6%). Estimation shows that soy import will reach 88.64 million tons by 2025, with annual growth margin of 0.8% in 10 years (Figure 3-3).

Export will remain stable. Estimation shows that soy export will reach 170,000 tons in 2016, up by 23.7%. Soy export will remain stable in the thirteenth five-year period and the last 5 years during the outlook period, reaching 230,000 tons and 250,000 tons in 2020 and 2025 respectively.

3.1.5 Price outlook

Soy price will slightly increase. As global production keeps growing while consumption growth slows down, market fundamental for soy is further eased. According

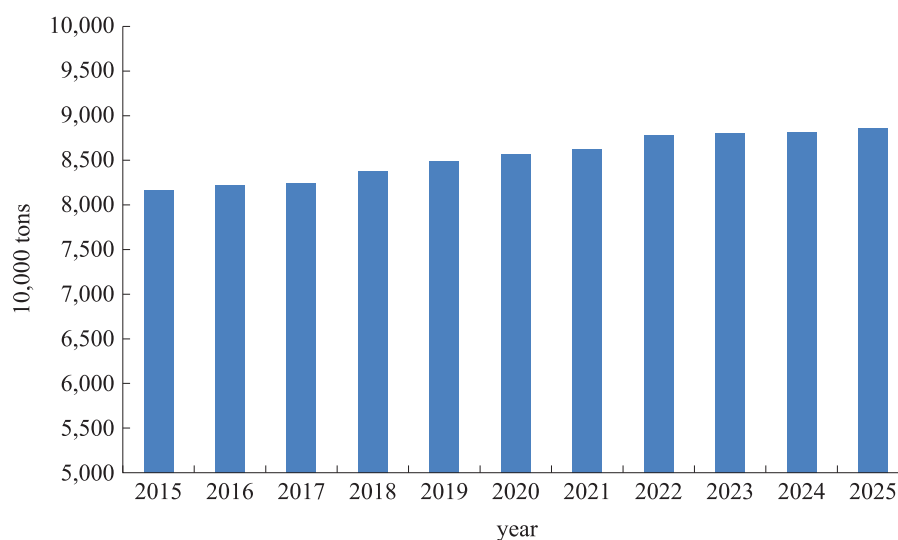


Figure 3-3 Soy import in China, 2015 – 2025

Source: Agricultural Information Institute of Chinese Academy of Agricultural Science CAMES

to the forecast by monthly report on agro-product supply and demand in the US, global soy inventory will reach around 80 million in 2015/16; soy price in global market will remain low in the short term, exerting pressure over domestic price. It is estimated that domestic soy price will remain stable in 2016. In the long run, soy price will be underpinned by growing cost as cost for land, labor and social service will all go up. In the latter part of the outlook period, soy production will remain at around 15 million tons given steady growth of consumption and natural resources constraint (e. g. water, land). In 2015, global soy price was at the bottom of the past 6 years. It is very likely that global price will rebound, leading to inflation in domestic price. Domestic soy price will slightly increase in the latter part of the thirteenth five-year period and in the last 5 years over the outlook period.

3.2 Oilseeds and oilseed products

Oilseeds which mainly include soybean, rapeseed and peanut, are major raw materials for vegetable oil, and account for the majority of agricultural products that China imports. In 2015, the total oilseed production was 47.08 million tons in China, a year-on-year drop of 0.3%; and the production of vegetable oil made of domestically produced oilseeds was 10.165 million tons. The consumption of vegetable oil continues to grow and reached 31.50 million tons. Due to the big gap between production and demand, the import of oilseeds and vegetable oil grows significantly, and the oilseed

import reached 87.5798 million tons and the import of vegetable oil reached 6.79 million tons. During the 12th Five-Year Plan period, China's oilseed production was generally stable with slight decline, and registered 47.55 million tons, 47.42 million tons, 47.12 million tons, 47.21 million tons and 47.08 million tons respectively for 2011–2015. To be specific, soybean production dropped from 14.485 million tons to 11.611 million tons, a year-on-year decline of 5.4%; rapeseed production rose from 13.4256 million tons to 15.0324 million tons, an average year-on-year increase of 2.9%; peanut production fluctuated and rose from 16.0464 million tons to 16.6132 million tons, an average year-on-year increase of 0.9%. In 2011–2015, the consumption of vegetable was 27.58 million tons, 29.67 million tons, 30.94 million tons, 31.22 million tons and 31.50 million tons, respectively, with an average annual growth rate of 3.4%. The import of oilseeds for the production of vegetable oil had increased year on year, and registered 54.82 million tons, 62.28 million tons, 67.84 million tons, 77.52 million tons and 87.57 million tons for 2011–2015 respectively; the average annual growth rate was as high as 12.4%. To be specific, the net cumulative import of soybean was 326 million tons, an annual growth of 11.8%; the net cumulative import of rapeseed was 17.405 million tons, an average annual growth rate of 37.2%. The import of vegetable oil increased slightly and registered 7.8 million tons, 9.6 million tons, 9.22 million tons, 7.87 million tons and 8.39 million tons for 2011–2015 respectively, an average annual growth rate of 1.8%.

Looking into the future ten years, oilseed production will generally be stable with increase, and there will be obvious features at different stages and difference among varieties of products; the consumption of vegetable oil will continue to grow, yet with further slowed down speed; the import of oilseed and vegetable oil will maintain at high levels, yet the import growth rate will be slowed down; the price fluctuation of oilseed and vegetable oil will further intensify.

Due to the impact of the policy adjustment for rapeseed purchase and significantly declined price in 2015, there is some adjustment in oilseed production data in 2016 compared with the predication made last year, i. e. oilseed production is adjusted from increase to decrease and the projected decrease is 0.7%. The difference of different varieties will be obvious. The area and production of peanut and soybean will both increase; and the area and production of rapeseed will decrease significantly. Considering the field investigation and modeling analysis of the team of oilseed market analysis and early-warning in seven major rapeseed producing provinces, the report predicts that the area and production of rapeseed will both drop by 9.8% and 9.35% respectively in

2016; Driven by the relatively high comparative benefits, the intention to grow peanut will increase. Based on the field investigation and modeling analysis in major producing provinces, it is predicated that peanut area will increase by around 2 million mu in 2016, the growth rate will be adjusted from 1.5% predicated last year to 3%. The consumption of vegetable oil is 31.69 million tons, a year on year increase of 0.6%. The import of oilseeds and vegetable oil is 88.93 million tons and 6.85 million tons respectively. During the 13th Five-Year Plan period, due to the impact of technology advancement and the adjustment of cultivation structures, the total production of oilseeds in China will be steadily increase and reach 240 million tons; oil crushed with domestically produced oilseeds will reach 49.40 million tons; total vegetable oil demand is nearly 160 million tons, and the gap between production and demand will be 110 million tons. By 2020, oilseed production will be 49.70 million tons; to be specific, the production of rapeseed, peanut and soybean will be 13.97 million tons, 18.35 million tons and 13.45 million tons respectively; the consumption of vegetable oil will be 32.30 million tons; the import of oilseeds and vegetable oil will be 91.93 million tons and 5.45 million tons respectively. By 2025, oilseed production will be 52.44 million tons; to be specific, the production of rapeseed, peanut and soybean will be 14.3933 million tons, 19.13 million tons and 14.85 million tons respectively; the consumption of vegetable oil will be 33.27 million tons; the import of oilseeds and vegetable oil will be 95.03 million tons and 4.35 million tons respectively.

3.2.1 General outlook

Oilseed production has increased steadily with obvious features at different stages and divergence among different varieties. Looking into 2016, oilseed production is estimated to decrease by 0.7%. There will be wide divergence among varieties. To be specific, the production of peanut and soybean will grow slightly and rapeseed production will decline significantly. Considering the field investigation and modeling analysis of the team of oilseed market analysis and early-warning in seven major rapeseed producing provinces, the report predicts that the area and production of rapeseed will both drop by 9.8% and 9.35% respectively in 2016. Driven by the relatively high comparative benefits, the intention to grow peanut will increase. Based on the field investigation and modeling analysis in major producing provinces, it is predicated that peanut area will increase by around 2 million mu in 2016, the growth rate will be adjusted from 1.5% predicated last year to 3%. During the 13th Five-Year Plan period, due to the impact of technology advancement and the adjustment of cultivation structures,

the total production of oilseeds in China will be steadily increase. By 2020, oilseed production will be 49.70 million tons; to be specific, the production of rapeseed, peanut and soybean will be 13.97 million tons, 18.35 million tons and 13.46 million tons respectively; by 2025, oilseed production will reach 52.44 million tons; specifically, the production of rapeseed, peanut and soybean will reach 14.3933 million tons, 19.13 million tons and 14.85 million tons respectively. The production of vegetable oil crushed with domestically produced oilseeds will recover after a slight decline and is estimated to reach 10.083 million tons by 2020, and 10.435 million tons by 2025, up by 277,000 tons over the base period of 2013–2015, up by 2.7%.

Vegetable oil consumption will steadily increase. Due to population growth and the acceleration of urbanization, China's consumption of oilseeds and vegetable oil will steadily increase. However with the popularization of healthy consumption concept, residents' diet will develop towards decreasing the intake of vegetable oil; the total consumption of oilseeds and vegetable oil will steadily increase, yet with slowed down speed. In addition, with the rising of domestic rapeseed brands, the preference for traditional Xiaozha rapeseed oil consumption in Hubei, Sichuan and Guizhou, the major producing provinces, has become more obvious. A relatively stable consumption group has been established and the consumption market will gradually expand. The total consumption of vegetable oil in China in 2016 is estimated to be 31.60 million tons; during the 13th Five-Year Plan period, the total consumption will steadily increase and reach around 32.30 million tons by 2020, and 33.27 million tons by 2025, registering an average annual growth rate of 0.55%, far lower than the average annual growth rate of 5.9% during 2005 and 2014.

Oilseed import will grow yet with slowed down speed; the net import of vegetable oil will generally decline. Oilseed import will increase by 1.5% and reach 88.93 million tons in 2016; during the 13th Five-Year Plan period, oilseed import will grow slightly, with an average annual growth rate of 1%; oilseed import will reach 91.93 million tons by 2020, and exceed 95.00 million tons by 2025, with soybean import rising to 88.64 million tons. During the Outlook period, oilseed import will grow at an average annual rate of 0.8%. The net import of vegetable oil will generally drop and decline to around 4.21 million tons by 2025.

Price fluctuation will intensify. China adjusted the temporary collection and storage policy for soybean and rapeseed in 2014 and 2015, which shows that the pricing mechanism of oilseed products has been further improved. During the Outlook period, due to the impact of domestic and foreign markets, oilseed price will fluctuate more

frequently. In 2016, the weak oilseed price will continue. Despite the fact that Canada, China and other major producing countries have reduced the area of rapeseed cultivation, yet given the sufficient supply of rape seeds, particularly soybean on the international market and the low level of global crude oil price, it is estimated that there is slight change for significant increase of rape seed price. In the future ten years, with the market playing a major leading role in the pricing of oilseeds, the connection between domestic oilseed price and the price on the international market will be intensified and fluctuation will intensify. Due to the impact of the trend of crude oil price, vegetable oil price will also fluctuate at the weak level.

3.2.2 Production outlook

Oil seeds growing area will increase in general, by 0.5% annually during the outlook period. Growing area experiences slight decrease to 20.41 million hectares in 2016 due to declining comparative gains, but will then rise to 21.16 million hectares in 2020 and 21.6 million hectares in 2025. Great disparity exists among varieties. With changes to comparative gains and to cropping mix, growing area will decrease by 9.8% for oil seeds, but increase by 3% and 3.6% for peanut and soy respectively. In the next 10 years, growing area for oil seeds will expand and decrease in different stages as crop production industry expedite the progress of restructuring. Estimation shows that growing area for canola, peanut and soy will reach 6.96 million hectares, 4.88 million hectares and 7.42 million hectares by 2020; growing area for canola, peanut and soy will be 7.1 million hectares (down by 7.1%), 4.89 million hectares (up by 5.3%) and 7.8 million hectares (up by 18.4%) by 2025.

Yield for oil seeds will increase steadily. Yield increase has a strong potential when favorable measures are taken-breeding and using improved varieties, introducing large-scale production, enhancing mechanization practices and improving field management. Supply-side reform will shape a more integrated oil seeds industry and optimize the operating models, creating conditions for large-scale, intensive and industrialized development in regions with competition edge, and thus contributing to yield increase. Yield for rape seeds, peanut and soy will all increase slightly in 2016. Yield for oil seeds will increase steadily in the thirteenth five-year period and the next decade. Estimation shows that yield for rape seeds, peanut and soy will reach 1995 kg/ha, 3750 kg/ha and 1814 kg/ha respectively by 2020; by 2025, yield for rape seeds, peanut and soy will reach 2026 kg/ha, 3907 kg/ha and 1903.85 kg/ha respectively, up by 3.0%, 9.4% and 8% in comparison with 2015.

Production for oil seeds and edible plant oil will increase. Given policy change and drop in comparative gains, oil seeds production will decline to 46.76 million tons (by 0.7%) in 2016. Among those, rape seeds production will decline by 9.35%, peanut production will increase by 4.0% and soy by 3.6%. By end of 2020, oil seeds production will reach 49.7 million tons, including 13.97 million tons of rape seeds, 18.34 million tons of peanut and 13.46 million tons of soy. Oil seeds production will reach 52.44 million tons by 2025, including 14.39 million tons of rape seeds (down by 4.3% over 2015), 19.13 million tons of peanut (up by 15.2% over 2015), and 14.85 million tons of soy (up by 27.9% over 2015). Production for edible plant oil crushed with oil seeds will reach 10.43 million tons by 2025, 277,000 tons more than 2015 and up by 2.7%.

3.2.3 Consumption outlook

Demand by the catering industry gradually recovered in recent years. According to the *2015 Annual Report of Catering Industry in China*, revenue of the catering industry plunged into bottom low for the past two decades in 2013. The revenue reached 2.78 billion yuan in 2014, up by 9.7% (0.7 percentage points more than the previous year), putting an end to slower growth rate for 3 continuous years. Consumption of oil seeds and edible plant oil will increase slightly in the outlook period due to population growth and urbanization progress; however, as people begin to recognize the value of healthy diet and resource conservation, they will eat less plant oil and optimize their consumption mix, thus leading to a slower pace of growth for the consumption of edible oil. In the meanwhile, preference will grow for traditional seeds oil produced in Hubei, Sichuan and Guizhou as brands are cultivated, creating a bigger market and leading to further optimization of consumption mix for edible plant oil.

Estimation shows that oil seeds consumption will reach 125 million tons in 2016 (up by 0.2% over 2015), 130 million tons in 2020 and 135 million tons by 2025 (up by 8.2% over 2015), with an annual rate of 1.3% during the outlook period. Consumption of edible plant oil will reach 31.6 million tons in 2016, 32.3 million tons in 2020 and 33.27 million tons in 2025, up by 0.55% annually, a rate much lower than that between 2006 and 2015 (4.5%). Per capita consumption of edible plant oil will be 23 kg in 2016, up by 2.0% over 2015. Per capita consumption will reach 23.5 kg in 2025 – 24.8 kg in the cities (up by 1.1% over 2015) and 21.2 kg in the countryside (up by 1.5% over 2015).

Consumption mix of edible plant oil will be upgraded. Of total consumption of edible

plant oil in 2015, soy oil, canola oil, palm oil and peanut oil accounted for 49% , 24% , 13.7% and 7.9% in respective. The share will decrease for palm oil and increase for peanut oil as people begin to value healthy consumption and demand high quality products; the share of corn oil will also rise with increasing production due to improved capacity in deep processing; soy oil will remain the biggest share in total plant oil consumption. Estimation shows that soy oil, canola oil, palm oil and peanut oil will take up 49% , 24% , 13.7% and 7.9% respectively in total consumption by 2025.

3.2.4 Trade outlook

Import has outgrown export substantively for oil seeds and edible plant oil in the past decade, due to under-supply in domestic market. As price formation mechanism is improved, price gap for oil seeds between domestic and international market will be narrowed in the next 10 years. Supply gap will remain sizable in the short term due to gloomy comparative gains, thus import is needed to plug the gap. In mid to long run, productivity and competition edge will both be enhanced with variety improvement, mechanization practice, and decline in unit cost of production. Oil seeds import will slightly increase during the outlook period, though at a slower rate, while direct import of edible plant oil will gradually decrease.

Estimation shows that oil seeds import will be nearly 89 million tons in 2016, including 82.28 million tons of soy import and 5.2 million tons of rape seeds import (increased due to production decline in domestic market). Import of soy and rape seeds will remain solid in the next decade, which may fluctuate mildly between years. Estimation shows that oil seeds import will reach 91.93 million tons in 2020, including 85.56 million tons of soy import and 4.98 million tons of rape seeds import. Volume of import will reach nearly 95 million tons in 2025, including 88.64 million tons of soy import and 5 million tons of rape seeds import. Oil seeds will still be heavily dependent upon import. Import of edible plant oil will reach 6.85 million tons in 2016 and then keep declining to around 4.35 million tons in 2025, in the context of smaller production of oil seeds in domestic market and price fluctuation in global market.

3.2.5 Price outlook

Price for rape seeds in China will fluctuate at a wider range in the outlook period due to changes in domestic and international market. China reformed temporary collection and storage policies for soy and rape seeds in 2014 and 2015. With improved price formation mechanism, price for rape seeds will be more directly affected by international

market. Global market for rape seeds will continue the over-supply pattern in 2016, putting domestic price in a disadvantageous condition. As market plays decisive role in price formation of oil seeds, domestic price will be more closely linked with international market in the next 10 years, and fluctuate at a bigger range. Price for edible plant oil will also experience mild fluctuation driven by price changes to raw materials.

Price of rape seeds. As price formation mechanism improves, domestic price for rape seeds will be influenced more heavily by production and global price, and fluctuate at a bigger range. Globally, rape seeds production will come down in major producing countries such as Canada and China; however, as supply is sufficient in global market for oil seeds, soy in particular, and petroleum price remains low, price for rape seeds is unlikely to grow substantively. In domestic market, as market for traditional canola oil expands and total consumption grows, disparity will exist for rape seeds price in different regions and for products produced with different crushing techniques.

Peanut price. Peanut consumption will remain stable in 2016, while market price may hike. Driven by cost, peanut price may grow mildly in the next decade, with bigger margin of fluctuation and growth.

Soy price. Given sufficient supply in global market, soy price will remain low in the first few years during the outlook period; in the latter part of the outlook period, as crushing cost grows and potential of physical crushing market in China is released, soy price in domestic market will gradually stabilize and create gap with international soy price. Soy price will slightly increase.

Chapter 4

Cotton

As the world's largest cotton consumer and importer, China has attached great importance to cotton production in its economic and social development. During the 12th Five-Year Plan period, domestic cotton production was reduced steadily, current production landscape adjusted, the consumption structure upgraded, and market-oriented regulation policies introduced to better meet the need of the industry. During 2011 – 2015, the planting area of cotton decreased by 24.6% from 75.57 million mu to 56.984 million mu; the yield dropped by 14.9% from 6.589 million tons to 5.605 million tons; consumption declined by 16.1% from 8.77 million tons to 7.357 million tons, and importation fell by 56.2% from 3.363 million tons to 1.472 million tons. In 2016, the yield and planting area of cotton in China are expected to be 5.157 million tons and 51.99 million mu. In 2016 – 2020, the cotton production landscape will continue to be adjusted, with further concentration in Xinjiang Uygur Autonomous Region and less in Yangtze and Yellow River regions; meanwhile, consumption and imports will drop and the cotton-related industry will be upgraded. In 2020, the end of the 13th Five-Year Plan period, cotton yield and consumption in China are estimated to fall by 3.9% and 1.1% to 4.958 million tons and 7.079 million tons respectively, and the planting area is expected to increase by 3.2% to 53.661 million mu, compared with the 2016 level. It is projected that, during 2016 – 2025, except cotton imports which will rise from 1.001 million tons to 1.568 million tons, the total production, planting area, per unit area production, and consumption, will all drop, from 5.157 million tons to 4.67 million tons, 51.287 million mu (3.419 million ha) to 51.202 million mu (3.413 million ha), 100.5 kg/mu (1,507.5 kg/ha) to 91.2 kg/mu (1,368 kg/ha), and 7.158 million tons to 7.038 million tons respectively. The cotton price in China will keep in line with that of the international market, and remain stable in the following decade.

4.1 General outlook

The planting area and yield of cotton will decrease. For some reasons such as lower comparative profits, higher production costs, and the national strategy of prioritizing grain production, China foresees a downward trend in the total cotton acreage and production in 2016 – 2025. In 2016, cotton production and acreage is predicted to be 5.157 million tons and 51.99 million mu (3.466 million ha) and 5.157 million tons, down by 10% and 8% respectively compared with 2015. The 12th Five-Year Plan period witnessed an improvement in the quality of cotton and reduction in the total and per unit area production across the country. It is estimated that in 2020 the planting area and total

production of cotton will be 53.661 million mu (3.5774 million ha) and 4.958 million tons, decreasing by 5.8% and 11.5% respectively from the 2015 level. In the 13th Five-Year Plan period, with fewer comparative advantages, China's cotton acreage and production will show a trend of moderate decrease. In 2025, the estimated acreage and yield will be 51.202 million mu (3.4135 million ha) and 4.67 million tons, down by 4.7% and 6.2% compared with 2021, and down by 10.1% and 16.7% compared with 2015.

Total cotton consumption will decrease and consumption structure will be upgraded. In the following decade, domestic cotton consumption will steadily fall, as the potential for textile exports is limited, cotton substitutes are being improved, and textile industries are relocated due to rising costs on the domestic market in recent years. Cotton consumption in China is predicted to drop by 2.7% year on year to 7.158 million tons in 2016, and will remain at a low level through the 13th Five-Year Plan period. Cotton consumption is estimated to drop by 3.8% from the 2015 level to 7.079 million tons in 2020 and will fall by 4.3% from 7.357 million tons to 7.038 million tons in 2015–2025. Although the total cotton production in China keeps falling, the domestic demand for cotton has been on the rise as a result of the upgraded textile industry and further supply-side reform.

Cotton import will continue to drop. With domestic surplus of over 10 million tons, China is expected to import far less cotton in a short term. But in a medium-and-long term, cotton imports will remain at a stable level, given that the market-oriented regulation policy across the country will give full play to the role of the market and thus both domestic and international markets and resources would be made better use of. Slowdown in domestic textiles growth and the flourish in its Asian competitors will lead to less cotton import to China in the years ahead. Cotton import in the 13th Five-Year Plan period will be far less than that in the 12th Five-Year Plan period. It is predicted that cotton imports will register 1.001 million tons in 2016, down by 31.1% year on year; 1.121 million tons in 2020, down by 22.8% from the 2015 level; and 1.568 million tons in 2025, up by 8% over 2015.

Domestic cotton prices will be closely connected with the international market. Since the trials on target prices for cotton were launched in the country in 2014, the relations of market demand and supply have become the primary determinant of cotton prices, resulting in alignment between domestic and international market prices. As two ends of China's cotton industry, namely the supply of raw materials and the marketing of products, rely on the world market, domestic and international prices will continue to be closely linked.

4.2 Production outlook

The next five years will witness a fall in the overall production of cotton in China, for reasons such as rising labor costs, high market volatility, lower comparative profits and limited soil and water resources. Cotton production will further be concentrated in the Northwest of the country, particularly Xinjiang Uygur Autonomous Region, and reduced in regions along the Yellow River and Yangtze River. In 2016, the planting area and total production are expected to fall by 8.8% and 8% year on year to 51.99 million mu (3.466 million ha) and 5.157 million tons respectively. Cotton acreage will keep shrinking in 2016 – 2020. However it will remain at a stable level after 2019 with an improvement in the global situation, and then go through steady reduction and sporadic volatility after 2020 as the textile industry rapidly moves to other countries. When the 13th Five-Year Plan draws to an end in 2020, the acreage and production are predicted to fall by 5.8% and 11.5% compared with 2015 to 53.661 million mu (3.5774 million ha) and 4.958 million tons respectively; and in 2025 they are estimated at 51.202 million mu (3.413 million ha) and 4.67 million tons, down by 10.1% and 16.7% from the 2015 level (Figure 4-1 and Figure 4-2).

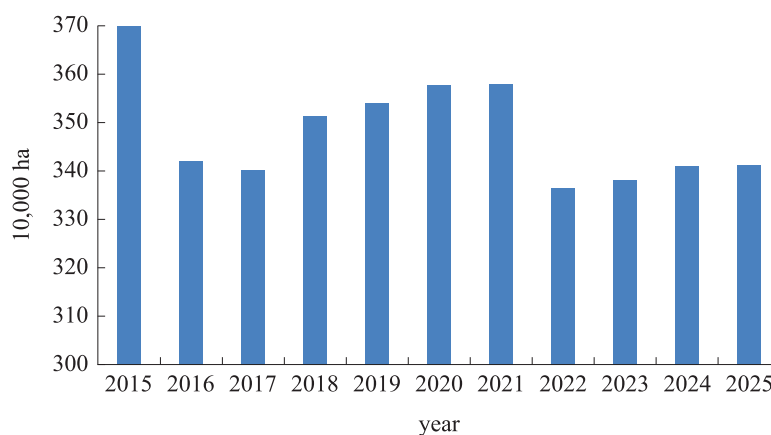


Figure 4-1 Planting area of cotton in China 2015 – 2025

The per unit area production will fall and quality will improve. The next decade will witness a 7.3% fall in per unit area yield and enhanced quality. China has already been among top cotton producers in the world in terms of per unit area production, which stood at 98.4 kg/mu (1,476 kg/ha) in 2015. As the supply-side structural reform advances, cotton production will better serve the needs of consumers by focusing more on down length, strength and other standards textile businesses are interested in than

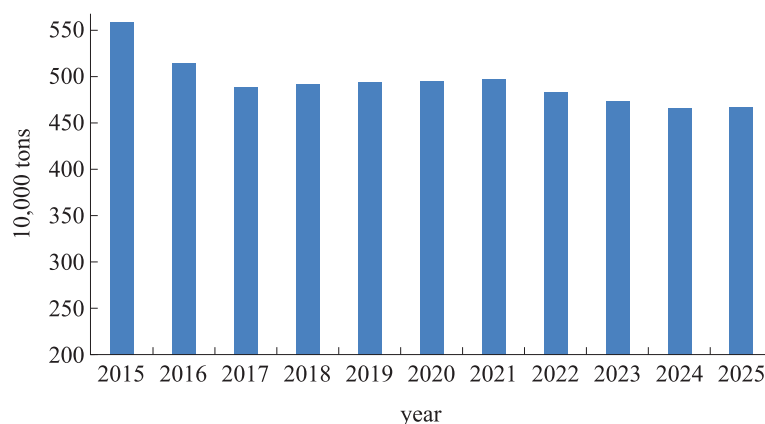


Figure 4-2 Total cotton production in China 2015 – 2025

solely on high ginning outturn. This, as a result, will inevitably cause a fall in per unit area production. And another cause would be the irresistible trend of expanded mechanization in cotton harvesting. The 13th Five-Year Plan period is crucial for upgrading of the cotton industry, and the supply-side structural reform will bring a big change in the cotton production model and an improvement in per unit area yield and quality. In 2025, per unit area yield is predicted to fall by 7.3% from the 2015 level to 91.2 kg/mu (1, 368 kg/ha). The next decade will be a crucial period for China to upgrade the textile industry and usher in a new stage of development which focuses on improvement of quality and industry level, unlike the past decade when the industry was scaled up mainly by demand and inputs. This new stage will have ever higher requirements for quality, thus forcing the country to speed up the quality improving process.

The trend of concentrating cotton production in Xinjiang Uygur Autonomous Region is getting ever clearer. As the only region to carry out the trial of target prices for cotton in 2015, Xinjiang will remain the favored place in the adjusting of cotton production landscape. Besides, it is hard to widely apply machinery in the inland which is beset by small production scale and complicated growing models, although mechanization is an inevitable trend in cotton production in the country. What's more, rising labor costs also constitute a reason underlying falling production in the inland. Yet given farmers' need for crop rotation and their farming habits, production will gradually come to a stable level in the years ahead.

Cotton surplus will shrink enormously. It was estimated by the industry that the abundant stockpile of cotton in 2015 put the government under considerable financial pressure. Therefore, to deal with domestic surplus will be the main task in a short

term. Since cotton imports will drop in 2016 due to fewer import quotas, the state reserves will become the main tool to regulate the cotton market. It is predicted that cotton surplus will go back to a normal level at the end of the 13th Five-Year Plan period and register 3.5 million tons in 2025, down by 75% from the 2015 level.

4.3 Consumption outlook

Cotton consumption will decline steadily. China's textile industry grew fast during 2001 – 2007 and then peaked afterwards. Yet due to rising labor costs and consequent industrial transfer, cotton consumption in the country has been kept below 10 million tons in recent years. Looking ahead, consumption will show a downward trend with fluctuations, for such reasons as rising domestic garment consumption, slower garment export growth, replacement of cotton with fiber, faster industrial transfer and import of cotton yarn. Nevertheless the country's cotton consumption will still be kept at a certain level, thanks to its mature textile industry, high urbanization rates and increased industrial competitiveness. Cotton consumption is predicted to be 7.158 million tons in 2016 and then go through a steady fall throughout the 13th Five-Year Plan period. The figure is estimated at 7.079 million tons in 2020 and 7.038 million tons in 2025 (Figure 4-3).

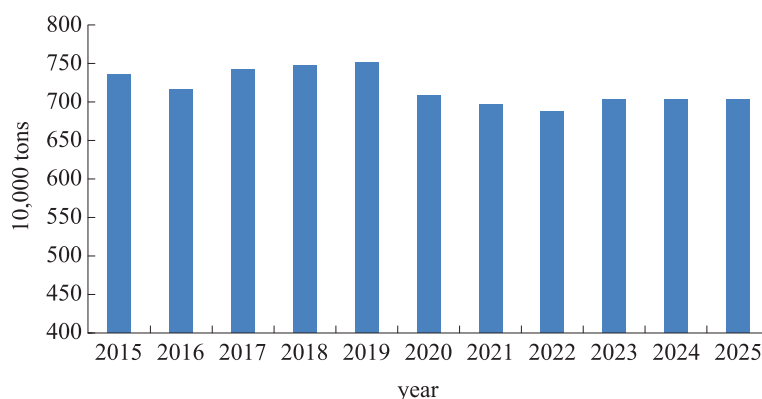


Figure 4-3 Cotton consumption in China 2015 – 2025

Cotton will be gradually replaced by imported cotton yarn. China is facing strong challenges in the international textile market from such countries as Vietnam, Indonesia, Cambodia and India, which with lowers labor costs have emerged as strong competitors on the middle and low end market. In recent years, China has become less competitive in low-count yarn and some low-end textiles, resulting in growing import of yarn from abroad. In 2015, China imported 2.345 million tons of yarn, equivalent to about 2.486 million tons of cotton. China's disadvantage in the international competition is difficult to

change in the future, even though the price gap between domestic and international markets will continue to narrow.

China's textile export growth will be hindered. China will expect a slow and even negative growth in textile exports in the future, due to increasing production costs and competitions from some countries and territories in West Asia and North Africa, such as India, Pakistan, Indonesia, etc. Meanwhile, cotton substitutes will gradually replace cotton, thus to some extent further reducing domestic cotton consumption.

4.4 Trade outlook

China's cotton imports will increase after a previous decrease. With a surplus of over 10 million tons, China will see a decline in cotton imports in a short term. It is the market forecast that the Chinese government will take 3 – 5 years to run down stocks. To this end, China will limit cotton quotas for sliding duties, leading to less import for some time to come. It is estimated that China will import 1.001 million tons in 2016, down by 33.3% year on year. During the 13th Five-Year Plan period, the need to clear out the inventory will require China to cut cotton imports substantially.

In a medium and long term, cotton imports will remain at a stable level, because policy adjustments for the cotton market across the country will give full play to the role of the market and promote better use of domestic and international markets and resources, and meanwhile some textile businesses have needs for imported cotton owing to domestic shortage. After 2020, domestic surplus will return to a normal level. Falling production and growing demand for high-quality cotton in the country will result in an increase in imported cotton as a significant complement to the Chinese market. However, the total amount of imported cotton to China will be limited by a slowdown in domestic textile industry and rapid growth of the competitors in other Asian countries. It is predicted that, compared with 2015, imported cotton will fall by 25.3% to 1.121 million tons at the end of the 13th Five-Year Plan period and rise by 8% to 1.568 million tons in 2025 (Graph 4-4).

In terms of the source of imports, in spite of a slight cut in its cotton production and trade volume, the United States will remain the largest source of imported cotton to China and is expected to supply over 40% of imported cotton to the Chinese market in 2025. Although India's cotton production has been on the rise, its rapidly growing textile industry implies more domestic consumption and less exports. So its share of China's import quotas will decline. As the Belt and Road initiative moves forward, it will further

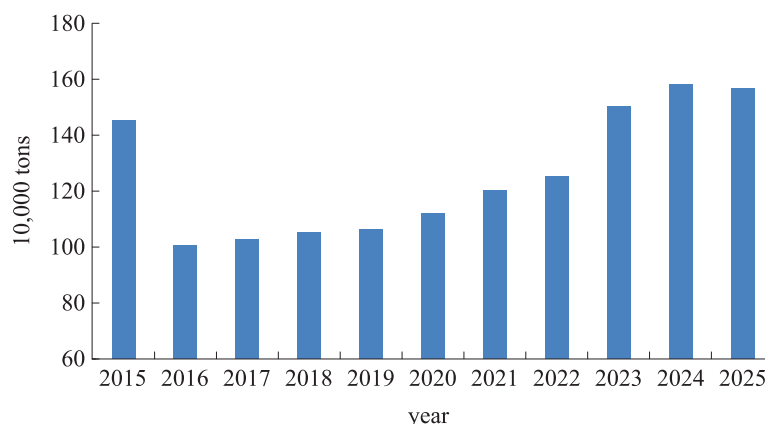


Figure 4-4 Cotton imports to China 2015 – 2025

facilitate China’s trade links with Central Asia and thus bring in more cotton from those countries such as Uzbekistan. Meanwhile, there is also a certain level of need for fine-quality cotton from Australia. During the outlook period, China will not see a significant change in its cotton exports which will still mainly focus on neighboring countries and territories in Asia.

4.5 Price outlook

Cotton prices are subject to the government policy of running down cotton reserves in a short term, yet they are determined by supply-demand relations in a long term. Since the trials of target prices for cotton were launched in the country, the market has been playing a decisive role in the process of price formation. Domestic cotton prices, which completely depend on such factors as costs and supply-demand relations, are greatly affected by the international market. In a short term, market prices will be impacted by the price set by the government in order to run down the inventory; in a long term, though the nominal prices are expected to go up, the actual prices will be determined mainly by the supply-demand relations.

China will continue with the trials of target prices for cotton in 2016, and cotton prices are mainly determined by the supply-demand relations. It is the market expectation that the Chinese government will take 3-5 years to move excess inventory, which means that the national policy and state price for running down cotton reserves will be the main determinants of market prices in a short term. Overall, there will be a fall in total production, yet no recovery of the demand, adding to the pressure of running down stocks. Domestic cotton prices will fluctuate at a low level with limited room for increase.

In a medium and long term, there will be no sharp volatility in cotton prices on the Chinese market, because the Chinese government, which faces the pressure of running down stocks on the one hand and consider influence of the downward prices on cotton producers on the other, will prudently choose the timing of underselling cotton reserves and properly deal with relations between different stakeholders. In a long term, domestic cotton prices will be aligned with that of the international market. Since China puts two ends of the production process, namely the supply of raw materials and the marketing of products, on the world market, the domestic and international prices will remain closely linked.

Chapter 5

Sugar

Sugarcane and sugar beet are major sugar crops in China. As an important raw material in food and industrial production, sugar has been widely used in various areas such as food processing, pharmacy, building materials, chemical engineering, paper making, fodder and fermentation, etc. China is the world's fourth largest producer, second largest consumer and largest importer of sugar. In 2015, its production fell by 20.7% to 10.56 million tons, consumption rose by 2% to 15.1 million tons, and importation increased by 19.6% to 4.81 million tons, compared with 2014. During the 12th Five-Year Plan period, domestic sugar production increased and then started to decrease, with 10.45 million tons, 11.52 million tons, 13.07 million tons, 13.32 million tons and 10.56 million tons, which together added up to 58.92 million tons; domestic consumption was on the steady rise, with 13.58 million tons, 13.3 million tons, 13.9 million tons, 14.8 million tons and 15.1 million tons, all of which amounted to 70.68 million tons; and imports grew rapidly, with 2.06 million tons, 4.26 million tons, 3.66 million tons, 4.02 million tons and 4.81 million tons. The next decade will see a steady increase in production, consumption and importation, as well as a medium and low level of sugar prices in China. It is projected that in 2016 the production will drop by 14.8% to 9 million tons, consumption increase by 2% to 15.4 million tons, importation fall by 3.1% to 4.66 million tons, compared with 2015, and prices will recover slightly. During the 13th Five-Year Plan period, China's production, consumption and importation are estimated at 48.93 million tons, 80.13 million tons and 28.22 million tons, and domestic prices are expected to rise steadily. The forecasts for 2020 are 10.78 million tons, 16.66 million tons and 6.39 million tons; and for 2025 are 11.18 million tons, 18.41 million tons and 8.49 million tons, increasing by 5.9%, 21.9% and 76.5% respectively over the 2015 level.

5.1 General outlook

Total production will increase steadily. The planting area and production are projected to be 21.75 million mu (1.45 million ha) and 9 million tons in 2016, down by 8.2% and 14.8% respectively year on year, due to falling sugar prices and farmers' profits. During the 13th Five-Year Plan period, sugarcane production will be further concentrated in competitive regions in Guangxi Zhuang Autonomous Region and Yunnan Province, and sugar beet in Xinjiang Uygur Autonomous Region and Inner Mongolia Autonomous Region. The domestic planting area of sugar crops is expected to shrink further, but the per unit area production will go up, thanks to improved infrastructure

and species, mechanized harvesting and farming operation of appropriate scale. The output of sugar crops and sugar will bounce back slowly. In 2020, the planting area of sugar crops is predicted to shrink by 6% from the 2015 level to 22.2 million mu (1.48 million ha) and total sugar production will increase by 2.1% over the 2015 level to 10.78 million tons. During 2020 – 2025, thanks to improved techniques and infrastructure, domestic sugar output is expected to grow slightly and reach 11.18 million tons in 2025, up by 3.7% from the 2020 level.

Sugar consumption will keep rising. As China has an ever larger population thanks to the loosening family-planning policy, growing economy and higher urbanization rate, there will be an increasing need for sugar in the country. The consumption will rise by 2% year on year to 15.4 million tons in 2016, total 80.13 million tons through the 13th Five-Year plan period, increase by 10.3% from the 2015 level to 16.66 million tons in 2020, and rise by 10.5% from the 2020 level to 18.41 million tons in 2025.

Sugar imports will keep growing. China expects to import 4.66 million tons of sugar in 2016, almost the same with that in 2015. With a decline in global production, world supply will fall short of demand for the first time since 2011, thus pushing up international sugar prices. During 2016 – 2025, there will be a need for sugar imports in China as domestic production cannot meet the growing demand. Meanwhile, since there is a gap between domestic and international prices, China will face a long-term pressure of importing sugar from abroad. Sugar imports are expected to total 29.71 million tons for 2016 – 2020, 6.39 million tons in 2020 and 8.49 million tons in 2025.

Sugar prices will fluctuate considerably. It is predicted that domestic sugar prices will show a modest increase in 2016, mainly because of stronger government measures against sugar smuggling and falling overseas production. As sugar supply falls short of demand globally due to a cut in world sugar production during 2016 – 2020, international prices will increase a little and domestic prices will rise steadily. In 2020 – 2025, nominal prices on the Chinese market will get higher than the current level, but actual prices in inflation-adjusted terms will remain almost unchanged, because sufficient international supply and the ceiling effect imply limited room for a price rise.

5.2 Production outlook

The planting area will show a steady shrink. It is projected that the planting area will shrink by 8.4% to 21.75 million mu (1.45 ha) in 2016, as farmers are facing falling profits and even losses, caused by multiple factors including low market prices and

purchase prices and rising production costs. According to statistics, purchase prices for sugar in Guangxi Zhuang Autonomous Region dropped by 20% from 500 yuan/ton to 400 yuan/ton during 2012 – 2015. Sugar crops face serious challenges from other cash crops such as eucalyptus and cassava. During the 13th Five-Year Plan period, owing to economic growth and rapid urbanization, there will be no fundamental changes in the trend of shrinking arable land in China. Domestic areas planted with sugar crops will get smaller, as production costs go up in the country and profits of sugar processors and producers are taken away by their foreign competitors. In response, the Central Committee of the Communist Party of China stated in the Document No. 1 that guidelines must be developed to designate production zones for grains and other important agro-products such as soybean, cotton, oil crops and sugarcane. With greater policy supports to major sugar producing zones, the downward trend of planting areas within these zones are expected to be curbed. The estimated domestic acreage of sugar will drop by 6.3% from the 2015 level to 22.2 million mu (1.48 million ha) in 2020, and increase by 4.7% from the 2020 level to 23.25 million mu (1.55 million ha) in 2025 as a natural result of market changes.

The per unit area yield will increase. It is expected that the per unit area production of sugar will remain stable with little fluctuation in 2016. During the 13th Five-Year Plan period, the per unit area yield will further increase, as China continues to transform sugar production pattern, make structural adjustment, improve infrastructure, implement the *Plan for Sugarcane Production in Major Producing Regions 2015 – 2020*, and build high-yield demonstration farms. The per unit area yield will reach 5,000 kg/mu (75 tons/ha) in 2020, up by 6.4% over 2015. During 2020 – 2025, driven by scientific and technological advancement, the per unit area output will further go up in China and the gap with other major producing countries will continue to narrow. The forecast for 2025 will reach 5,400 kg/mu (81 tons/ha), increasing by 8% over 2020.

Total production will show a steady increase. As domestic planting area of sugar crops has been shrinking due to falling prices and profits, along with recurrence of severe weather and reduction in sugar yield rate of canes, the prospects for sugar production in 2016 would be bleaker than that in 2015. The estimated planting area and total production will fall by 8.2% and 14.8% year on year to 21.75 million mu (1.45 million ha) and 9 million tons in 2016. During the 13th Five-Year Plan period, sugar crops and sugar production will be further concentrated in competitive regions; planting areas of sugar crops, especially sugar canes, will further shrink; and the per unit area yield of sugar crops will increase a little and total production will gradually rise again, thanks to

improvement of infrastructure and species, mechanized harvesting and farming operation of appropriate scale. It is projected that, compared with 2015, 22.2 million mu (1.48 million ha) will be planted with sugar crops in 2020, shrinking by 6%, and 10.78 million tons of sugar produced, increasing by 2.1%. During 2020–2025, China's sugar production will show a modest growth as a result of technological advancement and infrastructure improvement. The figure will register 11.18 million tons in 2025, an increase of 3.7% over 2020 (Graph 5-1).

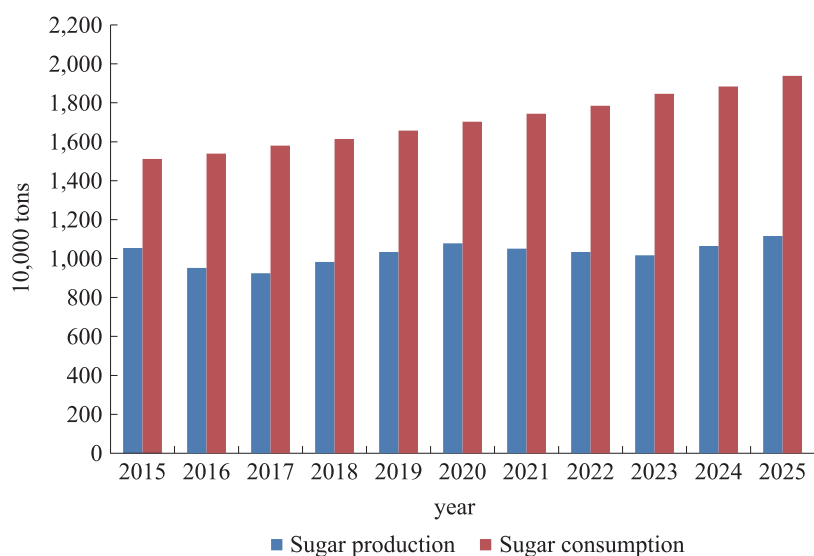


Figure 5-1 Sugar production and consumption in China 2015–2025

5.3 Consumption outlook

Sugar consumption will continue to grow. Sugar consumption will increase year by year as a result of increasing population, rapid urbanization and economic growth. In terms of population, China ranks first in the world, with 1.37 billion by the end of 2014. In recent years, China has been relaxing the family planning policy in response to the aging trend. In 2013, the third Plenary Session of the 18th CPC Central Committee unveiled the two-child fertility policy for couples where either the husband or the wife is from a single-child family; and in 2015, the fifth Plenary Session introduced the universal two-child policy, putting an end to the three-decade-old one-child policy. The Chinese population is projected to reach 1.41 billion in 2025. If each Chinese on average consumes as much sugar in the following 10 years as he/she does now, namely 11 kg, then the added population will contribute another 440,000 tons to the total sugar consumption. In terms of urbanization, China's urbanization rate will rise steadily to

56.1% in 2015. What the world's major economies experienced in urban development indicates that there is still big room for urbanization in China. Its *National Plan for New-Type Urbanization 2014 – 2020* set the target of raising the urbanization rate to 60% in 2020. At present, domestic per capita sugar consumption is less than half the world average, but growing urbanization will drive it up considerably in the years ahead. Overall sugar consumption in China is expected to reach 15.4 million tons in 2016, an increase of 2% , or 300,000 million tons, year on year. This upward trend will continue afterwards. The total amount of sugar consumed for the whole 13th Five-Year Plan period is expected to reach 80.13 million tons. Consumption will stand at 16.66 million tons in 2020, and 18.41 million tons in 2025, up by 21.9% , or 3.31 million tons, over the 2015 level.

China's sugar is mainly consumed for the industrial purposes. Out of health concerns, direct household consumption will have limited room of increase and the majority of sugar still be used as industrial raw materials. It is estimated that industrial and household consumption will register 9.87 million tons and 5.53 million tons respectively in 2016 and both will then increase steadily. They are expected to respectively total 51.48 million tons and 34.6 million tons for the whole 13th Five-Year Plan period combined, 10.83 million tons and 5.83 million tons in 2020, and 12.15 million tons and 6.26 million tons in 2025.

5.4 Trade outlook

Imports will be on the rise. It is projected that, with little change from the 2015 level, sugar imports in 2016 will reach 4.66 million tons. The number is larger than the forecast for the same period in 2015, because the production fall is greater than it was expected and thus widens the supply-demand gap. With a cut in the international production, sugar supply will fall short of demand for the first time since 2011. However, since stocks have been on the rise over the past five years, global supply will keep abundant and the domestic and international price gap wide in 2016. During 2016 – 2025, there will be a need for sugar imports as domestic production cannot meet the growing demand. Meanwhile, there is a gap between domestic and international prices. As a result, China will face a long-term pressure of importing sugar from abroad with the amount exceeding the forecast for the same period of 2015. Sugar imports are expected to total 29.71 million tons for 2016 – 2020 combined, 6.39 million tons in 2020 and 8.49 million tons in 2025 (Figure 5-2).

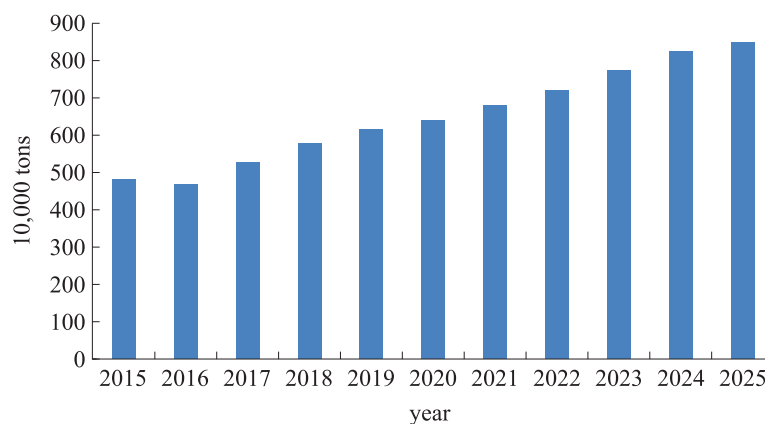


Figure 5-2 Sugar imports to China 2015 – 2025

5.5 Price outlook

Sugar prices will go through considerable fluctuations. In 2016, domestic prices will show a modest increase for various reasons. First, the State Council convened a meeting on anti-sugar smuggling to adopt more strict measures against the behavior; second, major sugar producing regions raised the down payment on sugarcane for state purchase, driving up business costs. For example, Guangxi Zhuang Autonomous Region, the largest sugar producer in China, increased the down payment from 400 yuan/ton to 440 yuan/ton in 2015, leading to higher production costs. Meanwhile the falling production, domestically and internationally, constitutes another cause behind rising prices. As sugar supply falls short of demand due to a cut in international sugar production during 2016 – 2020, international prices will increase a little and domestic prices will rise steadily. In 2020 – 2025, nominal prices on the Chinese market will get higher than the current level, but actual prices in inflation-adjusted terms will remain almost unchanged, because sufficient international supply and the ceiling effect implies limited room for a price rise.

Chapter 6

Vegetables

Vegetables are produced and consumed more than any other types of agricultural products in China and represent an importance source of income for farmers. In 2015, China had 325, 245, 800 mu of vegetable field, up by 1.3% year on year. The total output was 769.175 million tons, 1.2% more than the same period last year. Thanks to people's growing health awareness and favorable policies such as those supporting the processing of potatoes into staple food, vegetable consumption increased by a small margin. Amid seasonal fluctuations, vegetable prices climbed up to some extent. Imports and exports grew steadily. Trade surplus continued to expand. In the 12th Five-Year Plan period, enormous achievements were made in the vegetable industry, with stronger production capacity, rising consumer demand, steady market performance, and more prominent comparative advantages in the international market. In the next decade, the industry will keep its steady growth. In 2016, production capacity will further strengthen. Total output will continue to increase. Consumer demand, driven by greater health awareness and the development of the processing of potatoes and other vegetables, will rise higher. Market prices will go up slightly due to less labor and land supply and better quality of brand name products. As the trade environment keeps improving, vegetables will continue to enjoy comparative advantages and competitiveness in export and import, and the trade surplus will remain. In the 13th Five-Year Plan period, China's vegetable industry will move faster to cut down costs, improve performance and upgrade quality. While maintaining steady production, the industry will focus more on quality improvement, greater economic returns and better protection of the environment. While keeping areas with traditional strengths in vegetable production, the capacity to provide coordinated supply to city clusters will steadily increase. Vegetable consumption will slowly rise. Faster progress will be made in processing potatoes into staple food. There will be greater demand for organic, green and safe products. Vegetable prices will continue the seasonal fluctuations and remain generally stable while small increases are expected. It is likely that leafy vegetables that are not easily stored and transported and the common vegetables consumed in large quantities will be locally produced and consumed. Risks of price swings associated with cross-region, long-distance transport will be reduced. International comparative advantage will remain significant, with imports and exports growing steadily and continued trade surplus. It is projected that in 2020, national vegetables output will reach 787.8 million tons, consumption 504.12 million tons, export 11.25 million tons, and import 390,000 tons. In the later stage of this Outlook period (2021 – 2025), China vegetable industry will maintain stable development, with steady and rising output, greater consumption,

more imports and exports and continued trade surplus. It is estimated that by 2025, national vegetable production will be 798.32 million tons, consumption 521 million tons, and export 12.42 million tons.

6.1 General outlook

There are six major tasks at hand: fight a decisive battle to complete the building of a moderately prosperous society, consolidate the strong momentum in the development of agriculture and rural areas, transform the growth model of agriculture, enhance agricultural competitiveness, comprehensively deepen reform in rural areas, and promoting the integration of urban and rural areas. Agricultural industries, including the vegetable industry, also face new circumstances. Currently, agricultural modernization is progressing; reforms of the pricing mechanisms of agricultural produce are taking place; the agricultural sector is undergoing supply-side reform; the first, second, and tertiary industries are developing and integrating; household food consumption is upgrading and transforming; and strategies, such as the Belt and Road Initiative, are being implemented in a faster pace. Under these conditions, China's vegetable industry will also continue its sound and fast growth. In the next decade, especially the 13th Five-Year Plan period, the vegetable industry, while maintaining steady production, will shift towards better quality, more economic returns and better protection of the environment. It will move faster to lower cost, enhance efficiency, and upgrade quality. Production will continue to be concentrated in the areas with traditional strengths, yet at the same time, the capacity to provide coordinated supply for city clusters will be steadily improved. Vegetable consumption will maintain its growth at a small margin, and there will be more diverse demand for vegetables, such as for green, organic and safe products. Seasonal fluctuations will remain the key feature in vegetable prices, and the prices will rise amid the fluctuations. But faster progress will be made toward establishing a model that enables local production and consumption of leafy vegetables that do not store or transport well and common vegetable consumed in large quantities. Long distance transport of vegetables, such as between north and south and between east and west, will have a smaller impact on the stability of vegetable prices. Chinese vegetables will continue to enjoy comparative advantages in international competition, with steadily rising exports and continued trade surplus.

Total vegetable yield will keep increasing, but at a slower place. In the next 10 years, the 13th Five-Year Plan period in particular, better planting techniques and facilities and the application of standardized production technologies on a large scale will

contribute to greater yield. In addition, more potatoes will be grown in the “sickle-shaped” region covering China’s northeast, north, southwest and northwest, and the western region. This will also help increase vegetable yield. But due to factors related to productivity per mu and differences in varieties, growth will slow down. While production will be concentrated in areas with traditional strengths, there will be better coordinated supply for city clusters. It is forecast that in 2016, national vegetable yield will amount to 774.03 million tons, a year-on-year increase of 0.63%, and 2.2% higher than the forecast in 2015. In 2020, it is expected to reach 787.80 million tons, 2.42% more than 2015 and 1.86% higher than the forecast in 2015. In the 13th Five-Year Plan period, annual average growth will be 0.44%. In 2025, it is expected to reach 798.32 million tons, 1.34% more than 2020. The growth speed in the next 10 years is forecast to be 0.34% per year on average, lower than the average rate in the last 10 years.

Vegetable consumption will maintain its slow increase and demand will be more diverse. In the next decade, vegetable consumption will continue to rise steadily as potatoes are processed into staple food, people’s health awareness becomes stronger, and consumers favor more vegetables. The demand for particular varieties will be made stronger by regional preferences. More consumers will prefer organic, green vegetables and vegetables that are already cleaned and cut ready for use. This will promote the consumption of raw vegetables and vegetable processing and consumption in general. At the same time, other types of vegetable consumption, such as the making of fodder, will experience small changes. Innovations will be made in production and transport technologies and cold supply chain will be improved, reducing vegetable spoilage. It is projected that in 2016, national vegetable consumption will be 482.65 million tons, a year-on-year increase of 1.11% and 1.11% higher than 2015 forecast. In 2020, it will reach 504.12 million tons, 5.61% more than 2015 and 1.28% more than 2015 forecast. In the 13th Five-Year Plan period, the annual average growth rate will be 1.09%. In 2025, vegetable consumption will be 521 million tons. In the next 10 years, the annual average growth rate will be 0.90%.

Comparative advantages and trade surplus will continue. In the next 10 years, vegetable exports will keep the momentum of steady growth and imports will see fast increase. But trade surplus will remain. Trading partners will be more diversified. Processed vegetables for long-term storage and dried vegetables will take up a greater share of exports. The structure of import will improve. It is projected that in 2016 vegetable exports will reach 10.39 million tons, a year-on-year increase of about 2% and

2.47% more than the 2015 forecast. Imports will be 270,000 tons, up by 8.79% over the same period last year. In 2020, exports will amount to around 11.25 million tons, 2.83% more than the 2015 forecast, and imports 390,000 tons, up by 10.4% and 58.7% respectively than in 2015. In the 13th Five-Year Plan period, the average annual growth rates will be 2% and 9.89% respectively. By 2025, vegetable exports will reach 12.42 million tons, and imports 650,000 tons, an increase of 21.9% over and 1.65 times that of 2015. In the next 10 years, the average annual growth rates will be 2% and 10.43% respectively.

Seasonal fluctuations will remain the defining feature of vegetable prices, with the prices rising amid ups and downs. The seasonal and cyclical nature of vegetable production makes seasonal price fluctuations unavoidable. And it will remain so in the next 10 years. As a result of changing land ownership and rising costs of water, fertilizer, agricultural machinery and labor, in the Outlook period, vegetable prices will increase amid fluctuations. At the same time, vegetable fields near big cities will enhance capacity, and leafy vegetables that cannot be easily stored and common vegetables consumed in large quantities will gradually be locally produced and consumed. There will be smaller risks of price swings due to cross-region, long-distance transport.

6.2 Production outlook

During the period, vegetable production will continue to be concentrated in the six areas with traditional strengths. Modern techniques, such as biopesticide, organic fertilizer, mulch film, and drip irrigation will further develop. This will add to the functions of agriculture, encouraging the development of protection technologies for growing vegetables, sight-seeing vegetable fields, and multi-dimensional planting. Vegetable yield per unit will increase. New producers, such as specialized vegetable cooperative and family farm will continue to thrive. The use of the Internet of Things and other water and fertilizer control technologies and temperature and humidity control equipment will significantly enhance productivity. There will be more standardized, intensive production on a larger scale. More modern protective technologies will be used. And more brand names will be established. The capacity for year-round production will be strengthened. As regional economy develops faster and strategies in support of coordinated development of city clusters, such as Beijing-Tianjin-Hebei, the Yangtze River Delta, and Pearl River Delta, are implemented at a faster pace, regional coordinated supply of agricultural produce, including vegetables, will be further improved.

In the Outlook period, supply-side reform in agriculture will speed up the structural adjustment of the sector in southwest China and other parts of the country. But faster urbanization in the east will reduce the share of vegetable fields in suburban areas. Vegetable fields will expand in central and western China, and stabilize at a certain level in the east. Resource restraints, such as those of land and water, will enhance. In addition, the labor force in the vegetable industry is aging and prices are climbing. As a result, the “floor” for vegetable production will continuously rise higher and hold back its development to a certain extent.

On the whole, the vegetable industry, besides keeping stable yield, will make faster progress towards quality production with better economic returns and stronger protection of the environment. The output of green, organic and safe products will increase rapidly, and the total vegetable yield will stay at a stable level and see some growth. In the Outlook period, the total area of vegetable field will maintain stable or experience slight increase. Yield per unit will rise steadily. Total output will be stable and increase to some extent. Due to changing agricultural structure in the “sickle-shaped” region and western China, the area of potato field in Heilongjiang, Sichuan and Gansu Provinces will expand. It is, therefore, projected that in 2016, national vegetable yield will reach 774.03 million tons, a year-on-year increase of 0.63% and 16.68 million tons more than the 2015 forecast, representing an increase of about 2.2%. In 2020, it will reach 787.80 million tons, up by 2.42% over 2015. The average annual growth rate during the 13th Five-Year Plan period is expected to be around 0.44%. In 2025, vegetable yield will be 798.32 million tons, increasing by 1.34% than 2020. The average annual growth rate in the next 10 years is expected to be 0.34%, lower than that of last decade.

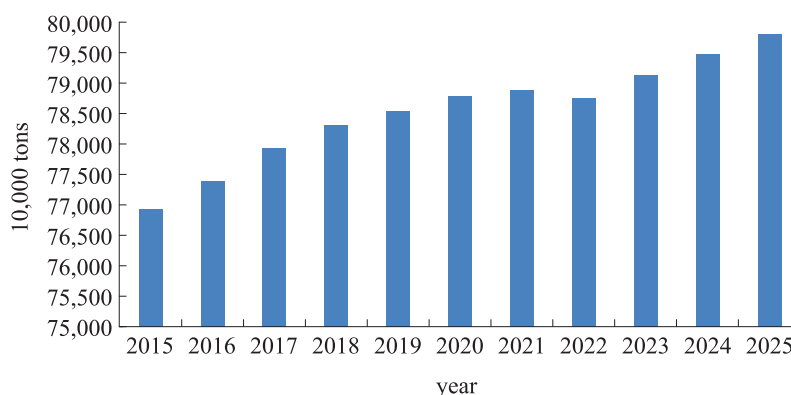


Figure 6-1 China's Vegetable Production 2015 – 2025

6.3 Consumption outlook

Vegetables are an important part of the Chinese people's green diet and a crucial source of dietary fiber and micronutrients, playing a significant role in daily food consumption. Vegetable consumption will be generally stable and increase to some extent. In the next 10 years, as population grows, processing techniques advance, and more potatoes are processed into staple food, vegetable consumption will increase. In 2016, national vegetable consumption is expected to be 482.65 million tons, an increase of 1.11% over previous estimate and a year-on-year increase of 1.11%. In 2020, it is forecast to be 504.12 million tons, up by 5.61% over 2015. In the 13th Five-Year Plan period, the average annual growth rate will be about 1.09%. In 2025, vegetable consumption will be 521 million tons. In the next 10 years, the average annual growth rate will be about 0.85%.

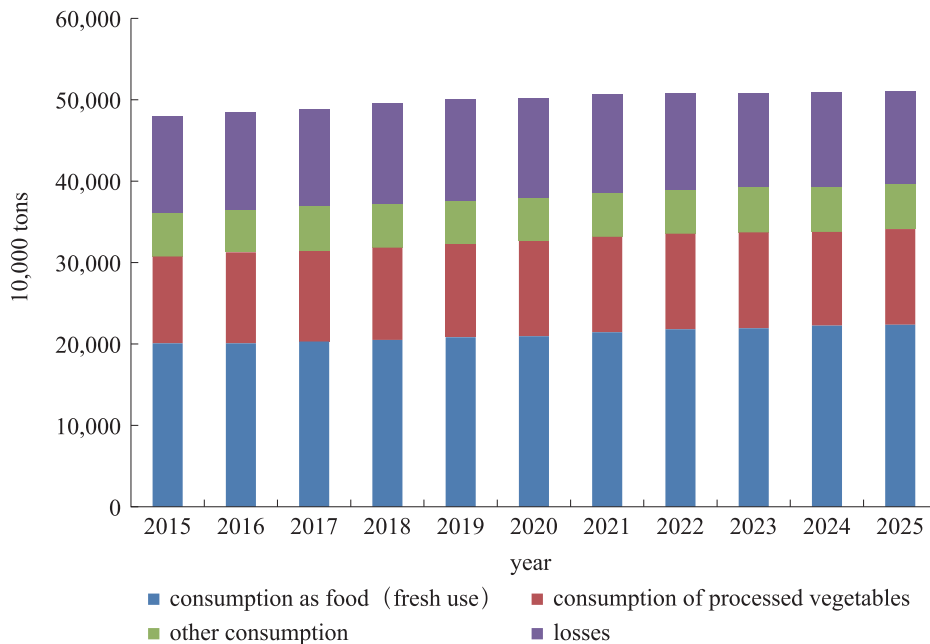


图 6-2 China's Vegetable Consumption 2015 – 2025

As individual income rises in urban and rural areas and a balanced diet becomes more popular, vegetable consumption in the next 10 years will steadily increase, driven by greater health awareness. In addition, consumers will increasingly prefer local produce in the right season and vegetables will be consumed as fresh as possible. This will also help push higher vegetable consumption. Region-wise, the demand for particular varieties

will be stronger due to dietary preferences in a given region. For example, southern consumers, especially Shanghai residents, have a special fondness for Shanghai cole. There is a popular saying, “Three days without green vegetables and you will be dizzy.” In the north, turnip, cabbage and potatoes are the three dominant vegetables consumers like to store for winter use. In Sichuan Province, Chongqing Municipality, and Hunan Province, there is a strong preference for pepper and it is found in almost every dish. There will be greater demand for organic green vegetables and vegetables that are already cleaned and cut ready for sue. In 2016, vegetable consumption is expected to reach 205.76 million tons, and 218.41 million tons in 2020. In the 13th Five-Year Plan period, the average annual growth rate is forecast to be 1.50%. In 2025, consumption will amount to 228.81 million tons. The average annual growth rate in the next 10 years will be 1.19%

Consumer demand for processed vegetables will steadily rise. Processing technologies will improve, equipment will be more sophisticated, and vegetable processing businesses will be more modern and specialized and carry out intensive production on a certain scale. The industry will serve more like a bridge connecting the first and tertiary industries. Consumption of processed vegetables will increase. At the same time, new types of processed vegetables, such as half-processed and instant products, will become the new fashion and the new force driving the consumption of processed vegetables. In the next 10 years, supported particularly by the processing of potatoes into staple food, consumption of processed vegetables and its share in total vegetable consumption will both see fast growth. In 2016, the consumption of processed vegetables is expected to reach 109.19 million tons, up by 3.02% over the same period last year and 2.66% higher than the 2015 forecast. In 2020, it will be 118.78 million tons, an increase of 12.07% over 2015. In the 13th Five-Year Plan period, the average annual growth rate will be 2.13%. By 2025, it will be 126.35 million tons. The average annual growth rate in the next 10 years will be 1.64%. With other types of consumption, such as fodder use, remain basically stable, the share of processed vegetables in total consumption is expected to stay at around 24%.

Spoilage of vegetables will be gradually reduced. The juiciness, storage difficulty and perishability of vegetables will remain the key challenges in transport and distribution and a major cause of spoilage. In the meantime, primary processing in the field, cold-chain transport, and commercialized handling will make more progress. New models of sales distribution, such as local production for local use, direct sales, and Internet +

enabled sales, will continue to emerge. All of this will shorten the distance of vegetable distribution and streamline the sales process. In the next 10 years, vegetable spoilage will decline, with both lower self-spoilage^① and attrition rate^②.

6.4 Trade outlook

Since joining the WTO, China's agricultural sector has been increasingly open, and the vegetable industry has demonstrated strong comparative advantages, becoming an important source of foreign exchange revenue in agricultural commodities. China will push forward reform and opening-up and implement the Belt and Road Initiative and the strategy for agricultural products to go global while maintaining the traditional comparative advantage. As a result, Chinese vegetables will see improving trade environment and greater international competitiveness. In late 2015, the China-ROK FTA and China-Australia FTA took effect. Negotiations on the upgrading of China-ASEAN FTA were completed and the two sides signed the Protocol to Amend the Framework Agreement on Comprehensive Economic Cooperation. These developments will further boost the import and export of Chinese vegetables.

In the area of trade, the next 10 years will see steady increase of vegetable imports and exports and continued trade surplus for China. It is projected that in 2016, vegetable exports will reach 10.39 million tons, up by 2.0% year on year and 2.47% higher than the 2015 projection. Imports will be 270,000 tons, a year-on-year increase of 8.79%. By 2020, exports will grow to 11.25 million tons, 2.83% higher than the 2015 forecast. Imports will stand at 390,000 tons. The 2020 exports and imports will be 10.4% and 58.7% more than the 2015 figure respectively. By 2025, vegetable exports will be 12.42 million tons, and imports 650,000 tons, 21.9% more than and 1.65 times that of 2015. In the next 10 years, the average annual growth rates will be 2% and 10.43% respectively for export and import. Different types of vegetables will take up different shares in exports. High value-added vegetables, such as processed vegetables for storage and dried vegetables, will make up an increasing part of export, while fresh and frozen vegetables will remain a minor part.

① Self-spoilage refers to losses unique to vegetable products, such as missing, water loss, and spoilage as a result of harvesting, sorting, storage, transport, and sales from vegetable fields to end purchase.

② Attrition rate refers to generic loss in the consumption, processing and cooking of vegetables after purchase.

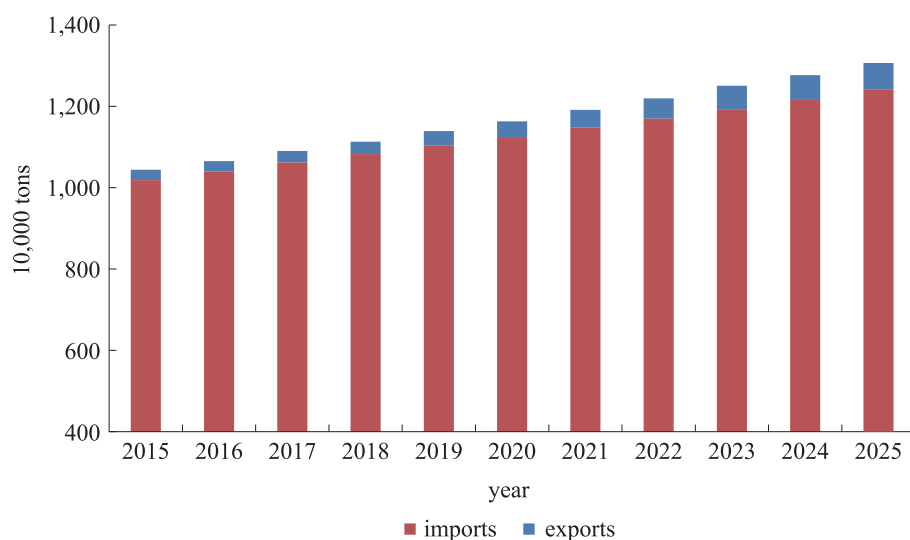


Figure 6-3 China's Vegetable Trade 2015 – 2025

6.5 Price outlook

Vegetable prices will experience notable seasonable fluctuations and rise amid the ups the downs. A nation-wide vegetable distribution network has already been put in place in China to meet the need of buying and selling vegetables on a nationwide market. But problems such as asymmetrical information between supply and demand, long-distance transport, under-developed cold supply chain are common causes of price swings of particular varieties of vegetables or even the selling out of some vegetables. First, vegetable price changes will be mainly seasonal and cyclical for most time of the year, as the production is heavily influenced by changing seasons. Second, price rise will be mainly attributable to higher costs in production and circulation. Third, China's economic growth is moderating, the catering industry faces stronger downward pressure, and more migrant workers are returning to their hometowns to start their own businesses. This will lower the group consumption of vegetables. It could affect the supply-demand balance in a particular period or a given region and bring challenges to the smooth operation of the markets. Fourth, On-line sales of vegetables and interactions between online and offline will be made stronger by the Internet + strategy. O2O and B2C business models will be introduced into the vegetable industry. Consumers can buy fresh vegetables online or via their mobile phone apps, without having to venture out. This will greatly streamline vegetable distribution, increase its efficiency, and possibly produce an impact on prices. Fifth, in recent years, to meeting people's need for a better life, the government

unveiled a number of measures to support the stable production and smooth circulation of vegetables, such as encouraging the development of protective facilities for growing vegetables, building refrigeration houses near vegetable fields, and improving cold supply chain. Other policies, such as insurance for production and prices, regulatory catalogue and mayors taking responsibility for ensuring good vegetable supply, will significantly boost the capacity of the industry to maintain production and price stability. On the whole, in the next 10 years, price changes will mainly be seasonal fluctuations. In the Outlook period, China's demographic dividend will dwindle, pushing up the labor cost for the vegetable industry as it is labor intensive. In addition, the change of land ownership, better agricultural equipment and facilities, and the growing share of vegetables produced in protective facilities and off-seasonal vegetables will make price rise more likely. But due to the state of the macro-economy and factors related to supply and demand, prices will rise by a smaller margin. In addition, vegetable fields near major cities will enhance production capacity. Leafy vegetables that do not store easily and common vegetables consumed in large quantities will be increasingly produced and consumed locally. There will be less need to transport vegetables from the south to the north and from the west to the east. Therefore, risks of price swings associated with cross-region, long-distance transport will be subdued.

Chapter 7

Fruits

China is a major producer and consumer of fruits. The fruit industry represents a main source of revenue for farmers in key fruits-producing areas. In 2015, fruits supply exceeded demand by a small margin, prices dropped significantly on a year-on-year basis, and trade surplus increased to a small extent. It is projected that in 2016, fruits production will slightly grow, and consumption will continue to increase. Prices will stop falling after a small drop, and import and export will keep expanding. During the 13th Five-Year Plan period, it is projected that fruits supply and consumption will continue rising, with a small surplus in a good year. Prices of different fruits will continue to diverge, and import and export will further grow. By 2020, fruits yield will reach 292 million tons, with 137 million consumed fresh and 32.78 million tons consumed as processed products. In the later period covered by the Outlook (2021 – 2025), production and consumption will grow at a slower rate, with the consumption of processed fruits growing faster than that of fresh fruits. Supply and demand will reach basic balance. Better quality and rising production costs will keep fruits prices at a high level. Import and export will grow. By 2025, fruits yield will be 307 million tons, with 143 million tons consumed fresh and 38.15 million tons consumed as processed fruits. Compared with the previous ones, this Outlook takes more into account the potential in expanding fruit farm and the consumption of processed fruits in the next decade. It also points out that in the Outlook period, fruit market competition will be more intense and prices of different fruits will further diverge. Market risks will increase. Natural disasters will affect yield. Major uncertainties can still be found in foreign trade. All this calls for closer attention from the government and market players.

7.1 General outlook

The growth model of production will be transformed. Currently, fruits yield enjoys a strong momentum of growth, and the potential in expanding fruit farm is still being released. Production forecast for the next decade has been revised higher from the figure last year. It is projected that in 2016, the area of fruit farm will reach 15.47 million hectares with 275 million tons of yield. By 2020, fruit farm will cover 16 million hectares with 292 million tons of yield. By 2025, fruit farm will be 16.39 million hectares with 307 million tons of fruits produced. In the 13th Five-Year Plan period, the average annual growth rate will be 1.37%, lower than the 5.37% of the 12th Five-Year Plan period. In the later stage of the Outlook (2016 – 2025), it will be 0.94%. In the next 10 years, fruits production will still bring about high economic returns,

encouraging the expansion of fruit farm, although by a small margin. More advanced technology, management and scale operation will push yield per unit higher. Driven by the supply-side reform in the agricultural sector and consumption, fruits production will be more standardized and at a larger scale, supporting better quality and improving supply structure.

Consumption will grow further. Increasing population and progress in urbanization will boost the consumption of fresh fruits. As consumer demand for processed fruits increase, processing techniques improve, and the industrial chain extends, the consumption of processed fruits will surge. In 2016, the consumption of fresh fruits and processed fruits will be 128 million tons and 28.1 million tons respectively. By 2020, they will reach 137 million tons and 32.78 million tons respectively. By 2025, they will be 143 million tons and 38.15 million tons respectively. In the Outlook period, the growth rates of fresh consumption and consumption of processed fruits will be 1.40% and 4.18% respectively. The growth rate of processed fruits consumption is revised higher than last year's forecast.

Foreign trade will increase. In the Outlook period, the import and export market of fruits will expand as a result of the conclusion of foreign trade agreements and improving foreign trade environment. The emergence of brand name fruits, standardized production and better overall quality will help support the export of fruit and fruit products. Higher income and a stronger demand for upscale fruits will promote fruit import. In the Outlook period, the trade volume of fruits and fruit products will continuously grow. It is expected to top nine million tons in 2016, 11.4 million tons in 2020, and 13.5 million tons in 2025. Imports and exports will stay in basic balance.

Prices of different fruits will further diverge. In early 2016, strong inventory kept fruit prices lower than the same period last year, and the average annual price is expected to be slightly lower than that of 2015. In the 13th Five-Year Plan period, fruits supply will be higher than demand by a small margin, and the likelihood for major price rise is small. In the Outlook period, rising costs and better quality will elevate fruits prices and keep them at a high level. Prices of high-end and low-end fruits and those of common and rare fruits will further diverge.

7.2 Production outlook

Fruits yield in the next 10 years will grow at a slower pace than it did in the last decade. Yield increase will mainly come from the expansion of fruit farm and higher

productivity per unit. While the output grows, the quality will be improved due to standardized and scale production driven by agricultural supply-side reform and consumer demand. This will help improve the supply structure of fruits.

There is still space for fruit farm to expand. In recent years, it has been expanding with a strong momentum. In 2016, the total area nationwide will reach 15.47 million hectares, up by 1.16% year-on-year. Among this, orchards will cover 13.10 million hectares, a year-on-year increase of 1.21%, and the fields for melons and other fruits will be 2.53 million hectares, a year-on-year increase of 0.42%. Compared with other agricultural products, fruits remain more profitable. It is an important part of the national strategy of targeted poverty alleviation to expand vegetable fields in southwest, northwest and north China in the 13th Five-Year Plan period. In the “sickle-shaped” region, corn fields will be reduced. In some parts of north China, farming and grazing areas are interlaced. These areas will be favorable for the expansion of fruits farm. Orchards in Guizhou, Yunnan Province and Tibet in southwest China and Qinghai Province and Xinjiang in northwest China are expected to expand. If sugar canes fields continue to dwindle in Guangxi, the newly vacated area will be partly used to grow fruits. In the meantime, some farming land on steep slopes will be returned to forests or grassland as required by government policy [Document (2015) 258], which will also be a source of new fruit farm in the Outlook period.

A good place for sightseeing, leisure and education, fruit farms and ecological orchards in particular are an indispensable part of leisure agriculture and countryside tourism. The development of leisure agriculture [Document (2016) 1] and more business investment in agriculture will be conducive to the development of the fruits industry. But the expansion of fruit farm will be limited by the shortage in water and land resources. Fruits will also need to compete for land with other agricultural produce, such as vegetables. In the 13th Five-Year Plan period, fruit farm will expand by 0.62% annually on average. Orchards will expand by 0.78% annually on average, and fruit fields 0.3%. By 2020, the total area of fruit farm will be 15.76 million hectares, including 13.45 million hectares of orchards and 2.55 million hectares of fields. In the later period of the Outlook (2021–2025), the area will expand at a slower pace. Fruit farm is expected to expand by 0.39% annually on average. The area of orchards will grow by 0.55% and that of fruit fields 0.16%. By 2025, the area of fruit farm will reach 16.07 million hectares, including 13.82 million hectares of orchards and 2.57 million hectares of fields.

In the Outlook period, the fruit industry will focus more on quality than

quantity. The new priority will be upgrading quality and efficiency instead of a excessive pursuit of higher productivity per unit. Per unit yield will increase at a slower pace. In early 2016, abnormally low temperatures across the country affected the yield of some tropical and subtropical fruits. It is forecast that in 2016, the average fruit yield per unit will be 1.78 ton/hectare, a year-on-year increase of 0.14%. The average yield per unit of orchards will be 1.36 ton/hectare, up by 0.5% over the same period last year, while that of fruit fields will be 3.84 tons/hectare, 0.12% more than the same period last year. In the 13th Five-Year Plan period, per unit yield will grow at an annual average of 0.83%. For orchards, the figure will be 1.13%, and for fields, 0.33%. By 2020, per unit yield will reach 1.85 ton/hectare, 1.43 ton/hectare for orchards and 3.9 tons/hectare for fields. In the later period of the Outlook, the growth of per unit yield will further decelerate, with an expected annual average of 0.66%. For orchards, it will be 0.86%, and for fields, 0.2%. By 2025, per unit yield will be 1.91 ton/hectare, 1.5 ton/hectare for orchards and 3.94 ton/hectare for fields.

In the Outlook period, supply-side reform in the fruits sector requires adjusting the layout of production, increasing operation to a certain scale, improving the structure of varieties, upgrading quality, and better handling after harvest. Greater yield and better quality will have to rely on technologies for growing fine varieties, transforming and upgrading orchards, preventing disease and pests, integrating water and fertilizer, agricultural machinery, and commercialized handling after harvest, as well as new management models, such as standardized, intensive production and the development of brand names.

Due to the small increase in planting area and per unit yield, the Outlook period will see continued rise of fruits yield. In 2016, it will be 275 million tons, up by 1.38% year-on-year. Orchards will produce 178 million tons of fruits, 1.73% more than the same period last year, and fields will produce 96.98 million tons, 0.54% more than the same period last year. In the 13th Five-Year Plan period, the average annual growth rate will be 1.48%. For orchards, it will be 1.95%, and for fields 0.63%. By 2020, fruits yield will reach 292 million tons, including 192 million tons of orchard fruits and 99.49 million tons of field fruits. In the later period of the Outlook (2021 – 2025), the total production is expected to grow at 1.06% per year. Orchard yield will grow by 1.43% and field 0.36%. By 2025, total yield will reach 307 million tons, including 206 million tons of orchard fruits and 101 million tons of field fruits.

In the belief that the next decade will see continued release of the potential of further expanding fruits farm, this Outlook projects a larger area of fruits farm than the last one

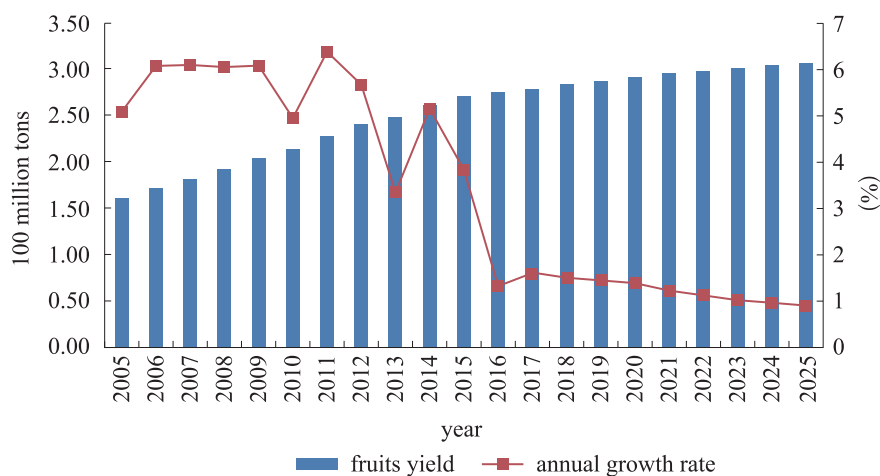


Figure 7-1 China's fruits production and annual growth rate 2005 – 2025

did. Supported by moderate increase of areas and per unit yield, fruits yield will continue to grow and reach 300 million tons in the later period of the Outlook.

7.3 Consumption outlook

In the Outlook period, fruits consumption will keep growing, mainly as a result of more population, higher income and urbanization. In 2020, direct fruits consumption is expected to reach 137 million tons, and processed consumption 32.78 tons; In 2025, direct consumption will be 143 million tons and processed consumption 38.15 tons (Figure 7-2). In the Outlook period, direct consumption will grow by 1.4% annually on average and processed consumption 4.18%.

As income and consumer awareness rise, consumers in urban and rural areas will increasingly see fruits as an integral part of a healthy diet. Their demand for fruits and purchasing power will also grow. This will lead to higher per capita consumption of fruits. *Dietary Guidance for Chinese People (2007)* points out that the daily intake of fruits per person should be 200 – 400g [(73 – 146) kg/ (person · year)]. The new Guidance being revised may further stress the importance of eating fruits. In 2016, per capita fruits consumption is projected to be 91.3kg. It will increase to 97.9 kg in 2020 and 101.2kg in 2025. The fast development of e-commerce in agriculture and modern logistics will help address the asymmetry of information between production and sales and increase the accessibility of fruits. As more people are lifted from poverty, rural income grows at a fast pace, and the income gap between urban and rural residents narrows, the gap in fruits consumption will between urban and rural residents will also be smaller. In

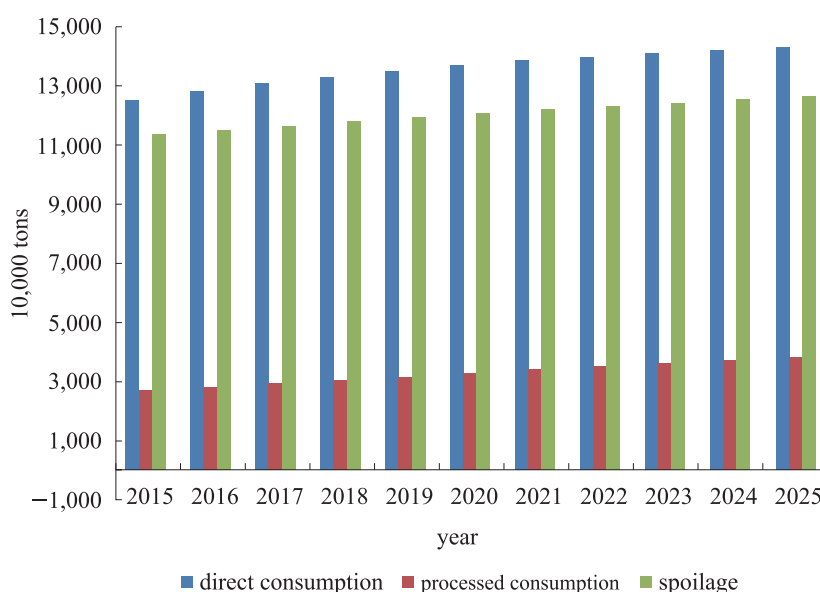


Figure 7-2 China's fruits consumption 2015 –2025

2025, per capita fruits consumption in urban areas is expected to be 93.9kg, representing an average annual growth rate of 0.40%. In rural areas, it will be 73.6kg, growing by 1.58% annually on average.

As consumer demand shifts between fruits of different varieties and qualities, the consumption structure will undergo marked changes. In the Outlook period, consumer demand for rare and functional fruits, safe, green, organic fruits, and brand name fruits will continuously grow, and consumer choices will be more diverse. The *Food Safety Law of the People's Republic of China* updated in 2015 specifically prohibited the use of highly toxic pesticide on vegetables, melons, fruits, medicinal herbs and other crops identified by the government. This will help boost consumer confidence. With rising income in underdeveloped regions and the development of e-commerce in fruit industry, fruits produced in remote areas will be more accessible, and the regional disparity and imbalance in fruits consumption will be eased.

Processed fruits represent an important area of growth for consumption. As living standards improve, the demand for fruit products, such as juice, juice drinks, fruit wine, jam and fruit slices, will rise fast. In addition, the government places high importance on the integrated development of the first, second and tertiary industries. It has expressed the willingness to improve policies for subsidizing primary processing of agricultural produce at the place of origin and supporting deep-processing and special processing industries in rural areas, in an effort to extend the industrial chain of agriculture and find more sources of income for farmers. The extension of the industrial

chain, greater input in deep-processing, and more advanced processing technologies will propel the development of fruit-processing industries, and consumption of processed fruits is expected to grow fast. This Outlook forecasts higher consumption of processed fruits in the next decade in comparison with last year's Outlook, and fruit processing rate will be closer to that in developed countries.

7.4 Trade outlook

In late 2015, China-ROK and China-Australia FTA came into effect, and China-ASEAN negotiations on upgrading free trade area were completed with the signing of Protocol to Amend the Framework Agreement on Comprehensive Economic Cooperation. This will bring about new impetus for fruits import and export in China. In particular, fruits import from Australia will rise significantly. According to World Apple and Pear Association, in 2016, apple yield in the southern hemisphere will decline by 2% and pear 8%. Apple export will grow by 6% and pear export fall by 1%. China's export of pears is likely to grow. In 2016, fruits import and export will both grow by over 6%, with the total trade volume standing at around nine million tons.

In the Outlook period, the signing and enforcement of foreign trade agreements will improve trade environment and help expand the trade of fruits and fruits products. In terms of export, Chinese fruits and fruit products will remain competitive. Higher standards and brand building will support export growth. Export volume is expected to grow amid fluctuations. In terms of import, rising income and demand for imported fruits will push the fruits import higher. Fresh fruits will continue to dominate China's fruit import. In the 13th Five-Year Plan period, fruit export and import will continuously grow, with import growing slightly faster than export. In 2020, both export and import will reach 5.7 million tons. In the later period of the Outlook (2021–2025), import and export will grow at similar pace and reach 6.5 million tons in 2025.

As to trading partners, in the Outlook period, the growth of Chinese fruits export will mainly come from ASEAN, the United States, and Russia. Import growth will come from ASEAN, the United States, New Zealand, Australia, Chile, and Peru. China is moving faster to build a global network of free trade and advancing the Belt and Road initiative. More trade agreements, FTA negotiations and trading partners will bring about a more diverse group of partners for fruits import and export.

7.5 Price outlook

As a result of a bumper harvest and strong inventory last year, fruit prices in January and February 2016 were notably lower than the same period last year. The average annual price is expected to be slightly lower than that of 2015, but higher than 2013. In the Outlook period, fruit prices will remain high, mainly because of higher labor prices, rents and material costs, greater demand, and better quality. In the Outlook period, fruits production and demand will maintain a basic balance, thereby deterring a surge in the overall prices. The advances in agricultural e-commerce and modern logistics and innovations in the model of linking production with sales will help streamline procedures, reduce distribution cost, and curb excessive price rise. As conditions for fruit storage and transport improve, the structure of maturities adjusts, and fruit imports increase, the seasonable fluctuations of the prices of large-volume fruits will be moderated.

While the overall price stays high, more price divergence will be seen. In the Outlook period, driven by consumer demand, the fruit industry will focus less on growth in quantity but more on quality and efficiency. On the one hand, fruit prices are elastic and consumer preference and demand are not static. On the other, there is both time and space asymmetry between consumer demand and production. In the process of industrial upgrading, producers in different regions and of different varieties and sizes will adapt in different paces. High-end and low-end products will co-exist for a long time, so will large-volume and rare products. The supply-demand differences in various market segments will add to price divergence. Some varieties will continue to be limited to particular regions and stay in structural imbalance. Under certain conditions, it may trigger major price swings or dead storage.

Chapter 8

Meats

8.1 Pork

Pork is the main type of meat consumed in China. The year of 2015 saw a marked fall in China's pork production, showing a tight balance in demand and supply. Pork ss and farming profits were at their best ever since 4 years ago. In 2016, pork production is estimated to be stable in general with yet a slight drop, at 54.60 million tons, a 0.5% year-over-year decline. Pork import is estimated to go up to 850,000 tons due to the influence of tight supply and widening gap between domestic and international pork prices. Live pig price is to be at its rising curve and reach the peak of the current cycle. During the 12th Five-Year Plan (2011 – 2015) period, China's pork production witnessed an annual increase of 1.6% and per capita share of pork was up by 1.3%. Compared with the 11th Five-Year Plan (2006 – 2010) period, pork and live pig prices jumped by 33.8% and 33.9% respectively, pork (including live pig, whose quantity is converted by adding a 72% coefficient) export was raised by 8.1%, and pork import saw a 2.6-fold gain. During the 13th Five-Year Plan (2016 – 2020) period, due to the impact of resources, costs and environmental protection, pork production will grow at a lower speed; pork consumption and import will see a steady increase; and demand and supply of pork will maintain a proper balance with live pig prices on a choppy rise. By 2020, China's pork production and consumption will reach 58.30 million tons and 58.80 million tons respectively, with 500,000 tons of net pork import. During the 14th Five-Year (2021 – 2025) Plan period, given a larger population and higher income, pork production and consumption will pick up speed, with demand and supply slightly tightening and import volume expanding. By 2025, 784 million head of live pig will be slaughtered and pork production will stand at 62.50 million tons, with 63.20 million tons of pork consumed.

8.1.1 General outlook

We will see a smaller increment in slaughtered pigs and pork production. As the production capacity tapering of sows is continued, China's pork production in 2016 will see a small drop at 0.5% and remain stable in general; the high live pig price will help restore production capacity with an estimated increase in sows inventory to the latter half of 2016. Pork production in 2020 will be 58.30 million tons, up by 6.3% from 2015. In 2025, 784 million head of live pigs will be slaughtered and 62.50 million tons of pork produced, representing a 7.2% and 5.6% increase respectively compared with

2020. Live pig production during the 13th Five-Year Plan (2016 – 2020) period will strictly comply with the recently promulgated *the Environmental Protection Law of the People's Republic of China*. Measures will be taken to treat pollutions caused by live pig farming in South China, including the designation of areas with a pig-farming quota and areas where pig farming is not allowed. Thus pig farming will be led to take place in main maize-producing areas and areas that still have unused capacity. Scaled-up live pig farming will be given a boost, in which pork production ratio in the nation's total volume from the Northern and Northeastern part of China will rise steadily, whereas that from the Southern and Southwestern part will reduce; and pork production volume will witness an annual average increase of 1.2%, off by 0.4 percentage point in comparison with the 12th Five-Year Plan (2011 – 2015) period. During the 14th Five-Year Plan (2021 – 2025) period, the deep-seated restructuring of China's live pig farming industry will be continued, featuring further optimized production pattern and transformed production mode. Pork production volume will be growing at a larger speed, averaging 1.4% annually. Industrial benefits and farming profits are anticipated to remain within a reasonable range. During the projected period (2016 – 2025), annual average increase rates for pigs slaughtered and pork produced will be 1.0% and 1.3%.

We will see gains in pork consumption. Affected by a minor reduction in pork production volume and an estimated rise in pork import, total pork consumption and per capita share in 2016 are predicted to fall by 0.3% and 0.8% from the previous year, reaching 55.30 million tons and 40 kg per capita per year. As livelihood keeps improving, people's attitude towards consumption changing and demand of consumption market being optimized, the next ten years will see an increase in pork consumption by urban residents, ample room for consumption growth in rural areas, marked growth for consumption of deep-processed pork products, diversified forms of meat consumption, and a continued shift of pork consumption demand from meat quantity to quality. During the 13th Five-Year Plan (2016 – 2020) period, China's pork consumption will grow at 1.2% annually in average, reaching 58.80 million tons in 2020, expanding by 6.5% than 2015. During the 14th Five-Year Plan (2021 – 2025) period, due to economic growth and a larger population, pork consumption will grow more rapidly, averaging 1.5% annually, reaching 63.20 million tons in 2025, an increase of 5.8% than 2020; per capita share will be 44.7 kg per capita per year, up by 4.9% from 2020. During the projected period (2016 – 2025), the annual average growth for total pork consumption and per capita share will be 1.3% and 1.0% respectively.

We will see gains made in pork trade. Although pork consumption demand is

growing at a slower speed, China's pork import forecasts continue to rise in 2016, standing at around 850,000 tons, due to the impact of reduced pork production volume and marked differences in domestic and international pork prices. Pork import in 2020 is predicted to be 700,000 tons, showing a somewhat fall as a result of an estimated increase in pork production volume. During the latter half of the projected period (2021 – 2025), pork import will go up as supply falls short of demand. In 2025, 900,000 tons of pork will be imported while pork export will remain stable, at around 200,000 tons.

We will see pork prices raise in a cyclical fluctuation. In the short term, as affected by a slight decrease of slaughtered pigs, live pig price in 2016 is to be at its rising curve and reach the peak of the current cycle, indicating a positive market situation. Impacted by environmental protection, feed, land and water resources, costs for live pig production will experience a choppy rise. Increasing costs for environmental protection, feed and labor will emerge as the major factors limiting the development of live pig industry. The key to cut costs is to improve the efficiency of scaled-up farming. During the latter half of the projected period (2021 – 2025), live pig prices will be stabilized with minor variations.

8.1.2 Production outlook

From 2016 to 2025, live pig slaughter and pork production volume will be raised steadily at a markedly slower rate. As demand growth is slowing down, production pattern of live pigs will be optimized through structural adjustment. Pork production will pick up speed due to the rising consumption demand towards the end of the projected period. To increase pork production volume, we should mainly rely on improving farming efficiency, as environment and resources have reached limits. Pork production will transition from one that used to rely on quantity expansion to the industrialized production mode that offers great quality and high efficiency.

In the short term, pork production volume in 2016 will slip by 0.5%. Forecasts for 2016 is 4.00 million tons below that for 2015, with the main reason being the shrinking live pig production capacity in South China, in particular the downward inventory of sows, as a result of the newly-implemented policies for environmental protection. In South China, some areas are given a farming quota while some are prohibited from pig farming. Moreover, the market has been anemic for two years in a row, which leads a portion of farmers to quit raising pigs. The increment in sows inventory in large-scale farming facilities (enterprises) failed to offset the reduced capacity caused by the medium and small-scaled pig farmers who have quitted. Annual production volume in 2016 is

predicted to stand at 54.60 million tons, off by 0.5% from the previous year. Live pig prices will be rising, possibly to an all-time high. Sows production capacity is estimated to restore beginning from the latter half of 2016, thanks to the incentive high prices of live pig.

From 2016 to 2025, the annual average increase for pig slaughter and pork production will be 1.0% and 1.3% (Table 8-1). During the 13th Five-Year Plan (2016–2020) period, due to an rapidly aging population, downward economic growth and reduced growth for demand, live pig production will go through some adjustment and optimization. Pork production will grow at a slower speed with an annual increase of 1.2%, rising from 54.60 million tons in 2016 to 58.30 million tons in 2020. Pig slaughter in 2020 will stand at 742 million head, up by 0.9% annually. During the 14th Five-Year Plan (2021–2025) period, China will witness a higher level of urbanization and the implementation of the new second-child policy. Residents' income will be doubled by 2020 and the 70.00 million poor populations will be lifted out of poverty. Under the influence of the aforementioned factors, pork consumption demand will be on the rise as pork production goes up, at an annual growth rate of 1.4%. In 2025, 784 million head of pigs will be slaughtered and pork production will reach 62.50 million tons (Table 8-1). Carcass weight will see a modest gain, standing at 79.73 kg in 2025, an annual average increase of 0.3%.

Table 8-1 Annual rate of change for pork production in China

Subjects	2006 – 2015	2013 – 2015	2016 – 2025 *	2025 *
Annual average production (million tons)	50.57	55.50	58.68	62.50
Annual rate of change (%)	1.9	0.9	1.3	–

Data sources: * Forecasts. The rest of the data comes from the National Bureau of Statistics (NBS).

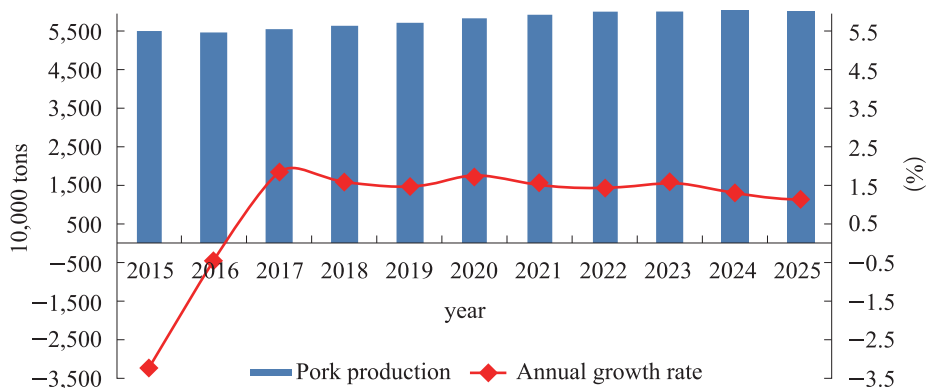


Figure 8-1 2015 – 2025 China's pork production and annual growth rate

Notes: the data of pork production in 2015 is from the NBS

8.1.3 Consumption outlook

From 2016 to 2025, a larger population, increased income and deepening urbanization will push pork consumption higher. In 2020, total pork consumption is predicted to be 58.80 million tons, among which 11.90 million tons are processed pork. In 2025, total pork consumption is predicted to be 63.20 million tons, among which 15.40 million tons are processed pork. In this period, total pork consumption will see an annual average growth rate of 1.3%.

From 2016 to 2025, the annual average growth rate for pork consumption and per capita share will be 1.3% and 1.0% respectively. As meat consumption pattern is increasingly diversified, the consumption of pork will grow at a slower rate even though it remains the main type of meat consumed in China. From 1996 to 2005, the growth for per capita share of pork was 4.0%. From 2006 to 2015, the number slipped to 1.5%, falling 2.5 percentage points. As China entered the new normal of economic growth, per capita share of pork saw a much slower annual average increase of 0.5% (Table 8-2) from 2013 to 2015. In 2015, China's national per capita disposable income recorded 21,966 *yuan*, up by 7.4% (in inflation-adjusted terms), 0.6 percentage point below the previous year; the per capita disposable income for urban residents stood at 31,195 *yuan*, rose by 6.6% (in inflation-adjusted terms), 0.2 percentage point below one year earlier; the per capita disposable income for rural residents reached 11,422 *yuan*, grew by 7.5% (in inflation-adjusted terms), 1.7 percentage points below twelve months earlier. The ratio of urban income per capita to its rural counterpart was 2.73, slipped by 0.02 from the previous year. As pork production dwindles and income growth slows down, both China's pork consumption and per capita share of pork in 2016 will experience a modest fall. Pork consumption is anticipated to be 55.30 million tons, representing a small drop by 0.3% from the previous year. Per capita share of pork is anticipated to be 40 kg per year per capita, with a year-on-year decline of 0.8%. There is still great potential for higher per capita pork consumption in rural areas. Meanwhile a steady increase will be witnessed in urban pork consumption, which becomes increasingly diversified and individualized. There is also a growing demand for processed pork. During the 13th Five-Year Plan (2016 – 2020) period, downward economic growth will have to some extent curbed growth of pork consumption, which will average 1.2%. In 2020, pork consumption is anticipated to increase to 58.80 million tons, increasing by 6.0% from 2015, and per capita share of pork will reach 42 kg per year per capita, up 2.0 kg per year per capita, growing by 0.8% annually. During the 14th Five-Year Plan (2021 – 2025) period, annual pork

consumption growth will average 1.5%, reaching 63.20 million tons in 2025 (Figure 8-2). From 2016 to 2025, annual pork consumption growth will average 1.3%. Per capita share of pork will be 44.70 kg per year per capita in 2025, an average annual increase rate of 1.0%. With urbanization deepening and consumption being optimized, the proportion of deep-processed pork consumed in total pork consumption will mount and is anticipated to grow by 4.8% on average from 2016 to 2025. During the 13th Five-Year Plan (2016 – 2020) period, the 9.88 million tons of processed pork to be consumed in 2016 will be raised to 11.90 million tons in 2020, increased by 24.4% with an annual growth rate averaging 4.5%. During the 14th Five-Year Plan (2021 – 2025) period, with greater processing capabilities and improved consumption habit, the annual growth rate of processed pork consumption will average 5.2%. In 2025, 15.40 million tons of processed pork will be consumed, jumping by 28.9% from 2020.25% of pork will be deep processed.

Table 8-2 Annual rate of change for per capita share of pork in China

Subjects	2006 – 2015	2013 – 2015	2016 – 2025 *	2025 *
Per capita share (kg)	37.71	40.90	42.33	44.70
Annual rate of change (%)	1.5	0.5	1.0	–

Data sources: Data for 2004 to 2015 is calculated according to pork production, population and pork import/export data released by the NBS. * Forecasts.

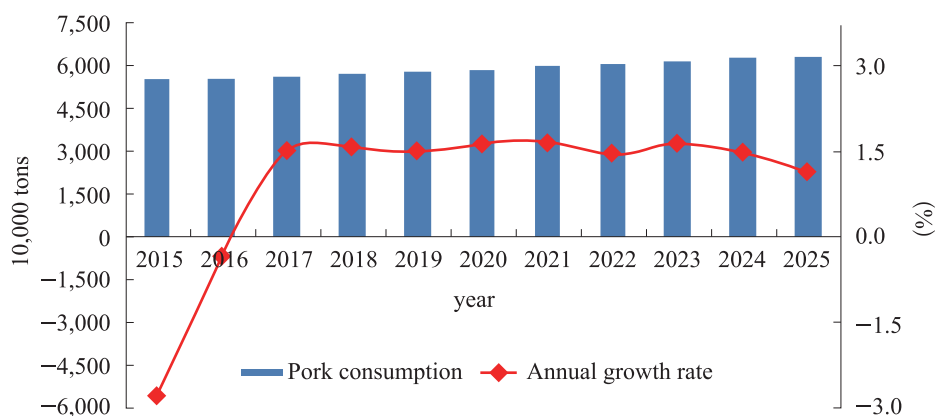


Figure 8-2 2015 – 2025 China's pork consumption and annual growth rate

Notes: Data of pork production in 2015 is from the NBS. The value of consumption is calculated by adding up pork production volume, net import volume of pork and change in balance.

8.1.4 Trade outlook

As pork prices rally and international and domestic prices are being drawing further apart, pork import volume in 2016 is estimated to go up to around 850,000 tons. Pork

import forecast for 2016 is 250,000 tons larger than that for 2015, due to a small slip in pork production and widening gap between international and domestic prices. Since production capacity will be restored, pork import volume is going to decline starting from 2017 and fall back to 700,000 tons in 2020. Import volume will continue to rise as a result of mounting demand toward the end of the projected period. In 2025, import is expected to be 900,000 tons and net import volume will rise to 700,000 tons from 580,000 tons in 2015 (Figure 8-3).

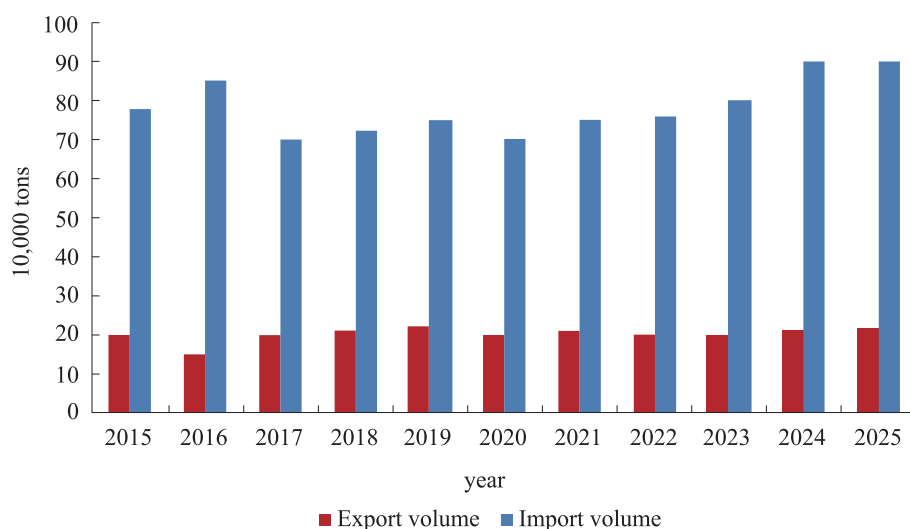


Figure 8-3 2015 –2025 China’s pork import/export volume

Notes: Export volume consists of pork and live pig. The volume of live pig is converted with a ratio of 72%.

Pork export volume will remain stable. Due to the rising pork prices and tightened demand and supply in 2016, pork export volume (including the converted live pig export volume) is estimated to fall to 150,000 tons. Under the influence of production costs and other factors, pork export will be stabilized, standing at around 200,000 tons.

8.1.5 Price outlook

Live pig prices and pork prices will be at the rising curve in 2016. Affected by the shrunken production capacity of sows for 28 consecutive months, pork supply will continue to fall short of demand in 2016, the first half of which will see a small increase in prices, whereas prices in the latter half of the year may hit a record high. In 2016, live pig prices are anticipated to be anywhere between 16 to 22 *yuan/kg*, averaging 17.5 *yuan/kg* and above; pork prices between 25 to 33 *yuan/kg*, averaging 28 *yuan/kg* and above. Live pig prices will cool off as pork consumption enters off-season after the Spring Festival. However it is anticipated to experience a choppy rise beginning from the second quarter and rise to a

record high in the third quarter, since the room and time for cooling prices is very limited. The soaring pork prices will be somewhat curbed by a greater pork import volume and the release of national reserve pork, given the fact that international pork market remains sluggish, domestic live pig prices continue to rise and domestic consumption demand grows. Live pig farming will enjoy higher profits, as live pig prices are to reach the peak of the current cycle.

From 2016 to 2025, live pig prices and pork prices will generally see a choppy rise. Although corn prices at home and abroad have been falling in recent two years and brought down fodder costs, live pig prices will be pushed up by the rising piglet prices and labor costs in the long run. Looking forward, costs of environmental protection in live pig farming will only get higher, coupled with growing fodder prices and labor costs, live pig prices and pork prices in the next decade will experience a choppy rise. Labor costs will somewhat slip and live pig prices see smaller variations after pig farming is scaled up and adopts more advanced techniques in the latter half of the projected period.

8.2 Poultry

Poultry is the type of meat with the second largest consumption in China, accounting for more than 20% of meat consumption in total. In 2015, poultry production volume recorded 18.26 million tons, a year-over-year increase by 4.3%; 408,800 tons of poultry were imported, moved lower by 13.3% from one year earlier; per capita share of poultry was 13.2 kg, up by 3.1% from the previous year. During the 12th Five-Year Plan (2011 – 2015) period, we have seen scaled-up and standardized operation and an increasingly integrated value chain in poultry production. Production output has been increasing steadily, with an annual growth rate of 2.0%. Poultry import/export first rose and then dropped, with an accumulative net export of 28,000 tons. With population growing and urbanization deepening, poultry consumption saw a steady gain and per capita share of poultry grew by 1.3% annually in average. Driven by rising fodder and labor costs, poultry prices kept climbing, with annual growth rate averaging 5.3%. Looking forward, rises in China's poultry production will be continued, with a small increase in import/export and consumption, and growing costs will push prices to higher levels. During the 13th Five-Year Plan (2016 – 2020) period, affected by downward economic growth, growing population, urbanization and poverty alleviation endeavors, poultry production volume will be up slightly, consumption on steady rise, prices be pushed up by growing costs, import remain stable and export increase slightly. In 2016, it is anticipated that

poultry production and consumption will rise modestly with stable import/export. In 2020, poultry production volume will reach 19.68 million tons, poultry consumption 19.61 million tons. During the latter half of the projected period (2021 – 2025), we will see a dynamic equilibrium in poultry demand and supply due to an adequate provision of poultry. In 2025, production will reach 21.24 million tons with 15 kg of per capita share of poultry.

Considering that China's economic growth slipped to 6.9% in 2015, China is now under increasing downward pressure, consumption growth will be moderate and the central government is pushing forward supply side structural reform. As a result, the predicted growth rate of poultry production in the next decade is dialed down. The consumption and price outlook for poultry is basically kept at the same level with 2015, except that the anticipated import/export volume is a bit lower due to complex international trade situations and uncertainties, such as outbreaks of animal diseases.

8.2.1 General outlook

China's poultry industry is undergoing transformation with a slowly growing production volume. It is estimated that 2016 will see a small year-on-year gain in poultry production, which is attributed to satisfactory profits harvested from Huangyu broilers farming in 2015, greater demand for consumption and the prediction of higher prices. During the 13th Five-Year Plan (2016 – 2020) period, as economic growth slows down and consumption structure upgrades, China's poultry production volume is expected to grow slowly, reaching 19.68 million tons in 2020, increased by 7.8% from 2015. During the latter half of the projected period (2021 – 2025), poultry production will continue to grow thanks to a larger demand. In 2025, poultry production volume will stand at 21.24 million tons, up by 7.9% from 2020. The forecast of production growth rate for the next decade is 0.4 percentage point lower than that for 2015, given the quickly recovered production volume in 2015, the slow consumption growth curbed by economic downward pressure and the implementation of supply side structural reform.

Poultry consumption pattern is upgraded with steadily increasing consumption volume. In 2016, poultry consumption in China is predicted to be stable with minor increments, which is contributed by ever growing incomes and increased consumption level. During the 13th Five-Year Plan (2016 – 2020) period, as population grows and urbanization deepens, poultry consumption will rise steadily, with 14.0 kg of per capita share in 2020, expanding by 6.1% from 2015. During the latter half of the projected period (2021 – 2025), poultry consumption growth will be continued, with 15.0 kg of

per capita share in 2025, jumping by 7.0% from 2020. Considering the smaller income elasticity of poultry consumption, estimated growth rate for the next decade is kept at the same with that for 2015 despite the fact that the demographic policy has been changed.

Poultry trade will see a steady growth with greater export. In 2016, poultry import in China will remain stable, as domestic consumption growth slows down with overcapacity and greater supply than demand and frequent outbreaks of avian influenza in the world. During the 13th Five-Year Plan (2016 – 2020) period, poultry trade pattern will basically remain the same. Imported poultry will come from such Countries in the American Continent as Brazil, the US, Argentina and Chile, while the majority of export will go to Japan. Central Asia and West Asia are also the potential destinations of poultry export. In 2020, import is anticipated to stand below 500,000 tons. During the latter half of the projected period (2021 – 2025), both import/export will rise. In 2025, import is anticipated to stand at 530,000 tons and export 540,000 tons, jumping by 15.2% and 8.0% from 2020. Import/export fell in 2015 due to complex global trade and uncertainties. Therefore the import/export forecast for the next decade, the 13th Five-Year Plan (2016 – 2020) period in particular, is lowered.

We will see high poultry prices with few fluctuations. In 2016, poultry prices in China will see a small year-over-year increase, due to production capacity adjustment. Poultry prices throughout 2016 will experience normal fluctuations with the alternation of seasons. No major gains are anticipated because fodder prices are expected to be weak. During the 13th Five-Year Plan (2016 – 2020) period, poultry prices will see choppy yet small increments given the fact that the rising farming costs slow down. In 2020, poultry prices are predicted to approach 20 *yuan*/kg. During the latter half of the projected period (2021 – 2025), poultry prices will remain high, pushed up by high level farming costs. The estimated growth rate of poultry prices for the next decade is lower than that for 2015, as global fodder prices drop and meat prices move on a down slope. Prices in the next 10 years will show different characteristics in various stages.

8.2.2 Production outlook

The next decade will witness a steady rise in poultry production. In 2016, China's poultry production is anticipated to reach 18.45 million tons, a year-on-year increase of 1.0%. The growth is attributed to consumption demand slowdown and overcapacity, which can be soaked up but it takes time. In addition, land and water shortages, enhanced awareness for environmental protection and rising production costs are factors that limit the fast expansion of poultry industry. The No. 1 Document issued by the central government in

2016 clearly states that we will make sure innovation plays a greater role as a growth driver; push forward the agricultural supply side structural reform; speed up the transformation of development pattern of agriculture; ensure stable growth in agriculture and sustained income growth for farmers; embark on the road to agricultural modernization featuring high production efficiency, safe products, resource conservancy and environment-friendliness. During the 13th Five-Year Plan (2016 – 2020) period, poultry production growth will be maintained as animal husbandry industry undergoes transformation and structural adjustment, and consumption demand grows. In 2020, poultry production volume is anticipated to be 19.68 million tons, up by 7.8% from 2015. The annual growth rate will average 1.5%, clearly lower than the 2.0% during the 12th Five-Year Plan (2011 – 2015) period. During the latter half of the projected period (2021 – 2025), poultry production will continue to grow steadily due to breeding improvement and scientific and technological innovation. In 2025, poultry production is expected to be 21.24 million tons, growing by 7.9% from 2020. The annual growth rate will average 1.5% (Figure 8-4).

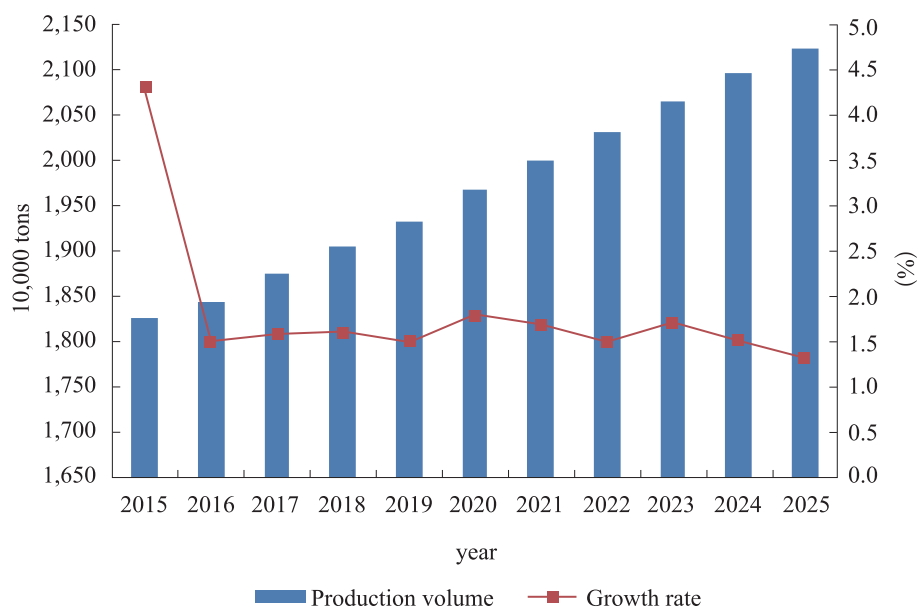


Figure 8-4 2015 – 2025 China's poultry production trend

Data sources: data from 2016 to 2025 are forecasts.

In the next decade, the poultry industry will develop in a different pattern, that is in a larger scale, more intensive and standardized, which will contribute to the industrial transformation and upgrade. At the 2016 National Working Meeting for Agricultural Development, decisions were made to facilitate the transformation and upgrade in animal

husbandry; speed up standardized farming in larger scales; build regional demonstration projects that utilize waste materials from crop and animal production as resources and realize bio-safety disposal; and reduce pollution in animal husbandry industry. Over the past 5 years, there has emerged a great deal of large-scaled broiler farming (farms that have the capacity to slaughter 1 million chickens), accounting for nearly 15% of poultry farming industry. However, the ratio of scaled-up operation in broiler farming in China is still rather small compared with the developed countries. This ratio also varies greatly in different parts of China. As efforts are made to implement the policies regarding scaled-up and standardized operation in poultry farms, we will see more scaled-up poultry farms and higher market concentration rate in the near future. In addition, broiler poultry industry will see an all-round transformation and upgrade, with less pollution, stronger brand reputation and value chain integration.

8.2.3 Consumption outlook

Poultry consumption will see a steady rise with a larger population, higher incomes for urban and rural residents and deepening urbanization. In 2016, poultry consumption is anticipated to go up slightly, with 13.3 kg of per capita share, a year-over-year increase of 0.6%. No major growth is predicted, considering more diversified diets by people, wider sources for animal proteins and consumption of aquaculture products, beef and mutton. During the 13th Five-Year Plan (2016 – 2020) period, small production growth will be maintained as economy grows and income increases. In 2020, per capita share is predicted to reach 14.0 kg, up by 6.1% from 2015, and an annual average growth of 1.2%, a bit lower than the 1.3% during the 12th Five-Year Plan (2011 – 2015) period. The consumption of quality and healthy poultry will rise as consumption pattern is upgraded and poultry industry produces less pollution and builds stronger brand reputation. During the latter half of the projected period (2021 – 2025), small growth in consumption will be continued as people adopt healthy attitudes towards consumption. In 2025, per capita share is expected to be 15.0 kg, increasing 7.0% from 2020 (Figure 8-5).

In the next decade, residents will adopt a healthier attitude towards consumption, which leads to fast changes in poultry consumption pattern. Since 2015, many local governments have adopted policies to limit live poultry operation and promote frozen poultry meat. Huangyu broilers farming have been going through transformation. Researchers are developing new breeds that are suitable for slaughtering and processing and relevant technology. Meanwhile, fresh meat derived from Huangyu broiler is taking up a bigger

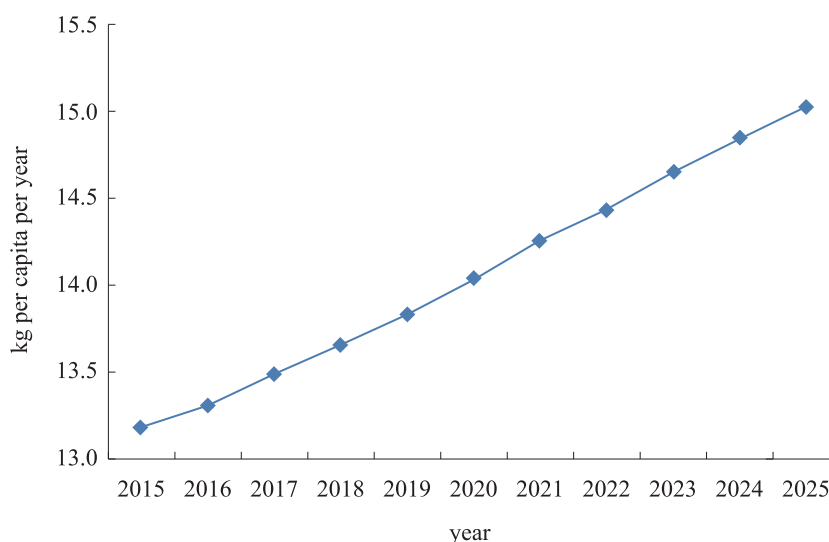


Figure 8-5 2015 – 2025 China’s poultry consumption

Data sources: data from 2016 to 2024 are forecasts.

Notes: domestic per capita consumption is calculated by dividing (production volume + import volume - export volume + changes in inventory) by population.

market share with the rapid development of e-commerce and cold chain logistics. Although Huangyu broilers were more typically consumed in some areas, trend has been seen for its expansion to the north part of China. It is expected that poultry consumption pattern will change. It is inevitable that frozen poultry meat will take the place of live poultry, with a growing market share by poultry cuts, multi-purpose products, cooked poultry and low-temperature processed products. In addition, there is possibly a larger market demand for duck, goose and pigeon, and a slightly smaller proportion of chicken consumption.

8.2.4 Trade outlook

We will see slower import growth and a small increase in export. In 2016, poultry import is anticipated to slip slightly as the US poultry was denied access into China due to the outbreaks of avian influenza. In recent years, there has been marked fluctuations in China’s poultry import/export given the complex international trade situations. After the global avian influenza outbreak in 2015, the MOA and AQSIQ successively banned the import of poultry and poultry products from Netherland, the United Kingdom, Canada and the US. In January 2016, access of the US poultry remained denied for another outbreak in the US. During the 13th Five-Year Plan (2016 – 2020) period, China’s poultry import is generally stabilized due to the influence of international economic environment and domestic consumption demand. Import volume is anticipated to be within 500,000 tons with a slow

annual average growth rate. Poultry import is to satisfy the domestic demand for chicken paws and chicken giblets. Poultry export still enjoys the potential for a small growth as the industry continues its transformation and upgrade, despite the fact that it is restricted by international trade environment and unified standards. During the latter half of the projected period (2021 – 2025), poultry import/export are anticipated to grow due to greater consumption demand. In 2025, poultry import is estimated to be 530,000 tons, export 540,000 tons, jumping by 15.2% and 8.0% from 2020.

The market concentration rate for poultry import/export remains high with great potential for export. In the next decade, China's poultry trade pattern is not expected to see marked changes, while the majority of import still comes from such countries on the America continent as the US and Brazil. Market concentration rate for import is expected to be anywhere between 80% to 90%. Export will mainly go to Asia, including Japan, Malaysia and Kyrgyzstan. Only 3% of poultry of Chinese origin flow into international trade, way below the 20% of the US. Developing countries such as Brazil have seen their ranking rise in global poultry trade recently. As the second largest poultry producer in the world, China enjoys a great potential for growing export. Nowadays, the most remarkable demand for import comes from Asian countries. Moreover, China has been consolidating its Belt and Road Initiative and pressing ahead with greater opening-up in agriculture. It has also signed numerous bilateral trade agreements. In the future, China will explore more export opportunities mainly in such neighboring countries and regions as Mongolia, Central Asia, West Asia and the Middle East.

8.2.5 Price outlook

In 2016, China's poultry prices are anticipated to see a modest increase. High prices forecasts due to the capacity cut in Baiyu broilers production is somewhat brought down by falling fodder costs which is caused by a stable macro-economy. Earlier in 2016, prices were pushed up by larger demand during the spring festival. After the festival, demand fell back and prices dropped. In the latter half of 2016, prices are expected to grow, showing a V-shaped price movement.

During the 13th Five-Year Plan (2016 – 2020) period, fodder costs growth will slow down and poultry prices rise in small increment. During the latter half of the projected period (2021 – 2025), the trend of high costs in poultry farming will be irreversible and poultry prices will be rising in general. Compared with such main poultry producers as the US and Brazil, China's farming cost is high with low efficiency and weak competitiveness in prices. FAO-OECD forecasts that global poultry prices in the next decade will fall due to

decreased fodder prices. However, growth in China's farming cost will be continued, considering higher costs for labor, modern farming facilities and environmental protection. Poultry prices will be pushed higher by rising costs.

8.3 Beef and mutton

China is a big producer of beef and mutton, ranking the third and the first in the world. In 2015, production volume of beef and mutton reached 7.00 million tons and 4.41 million tons, increasing by 1.6% and 2.9% from twelve months earlier, showing a trend for positive growth. Beef prices were stable whereas mutton prices dropped. Beef import grew greatly whereas mutton import fell. Since the 12th Five-Year Plan (2011 – 2015) period, beef and mutton production have been growing steadily with a slowing down demand growth and high beef and mutton prices. Mutton prices were subject to marked fluctuations at high levels. Beef import grew successively and mutton import grew before it fell. In 2016, beef production is expected to be 7.15 million tons, a year-over-year increase of 2.2%; mutton production 4.40 million tons, almost the same with the previous year. Due to the loss suffered by the domestic mutton market, production is estimated to drop a bit. During the 13th Five-Year Plan (2016 – 2020) period, developing herbivorous animal husbandry will be a priority. Science and technology related to beef and mutton will be deployed to facilitate production, which is anticipated to grow steadily. In 2020, beef and mutton production volume are estimated to stand at 7.85 million tons and 5.10 million tons. During the 14th Five-Year Plan (2021 – 2025) period, beef and mutton productivity will continue to rise. In 2025, beef and mutton production volume are anticipated to reach 8.50 million tons and 5.60 million tons, and beef and mutton import 1.05 million tons and 300,000 tons. Beef import is predicted to grow stronger from one year earlier due to some changes in demand and supply. Considering economic growth slowdown, growing consumption demand, changes in development pattern, rising production costs and disasters and diseases, beef and mutton supply will continue to fall short of demand and prices will remain high.

8.3.1 General outlook

We will see more scaled-up operations and steady increase in production volume. With ever growing support for production, beef production in 2016 will continue to grow with a year-on-year increase by 2.2%. Whereas mutton production will stop growing or even decrease due to a fall in mutton prices in 2015, when farmers suffered losses to varied

extent and some of them just stepped out. During the 13th Five-Year Plan (2016 – 2020) period, China will deepen its agricultural supply side structural reform, giving priority to herbivorous animal husbandry and forging a new model of crop and animal production by giving equal footing to grain and fodder cultivation, crop production and animal husbandry, and circular development. Science and technology related to beef and mutton are playing an increasingly important role in development. Beef and mutton production are anticipated to realize steady growth. In 2020, beef and mutton production volume will increase by 12.1% and 15.6% from 2015. During the 14th Five-Year Plan (2021 – 2025) period, beef and mutton production growth will be continued, reaching 8.50 million tons and 5.60 million tons in 2025, up by 8.3% and 9.8% from 2020. This is due to the transformed pattern for herbivorous animal husbandry and the further progress to be made by the engagement of new types of operation entities.

We will see an increase in consumption with greater requirement for quality. As population grows and meat consumption pattern and preferences change, beef consumption in 2016 is to be 7.68 million tons, increasing by 2.8% from the previous year; mutton consumption 4.63 million tons, remain stable with the previous year. During the 13th Five-Year Plan (2016 – 2020) period, beef and mutton consumption will continue to grow due to higher residents incomes and deeper urbanization. In 2020, beef and mutton consumption will be 8.60 million tons and 5.35 million tons, expanding by 15.1% and 15.6% from 2015, with a annual growth rate averaging 2.9%. During the 14th Five-Year Plan (2021 – 2025) period, the provisions of good quality beef and mutton will gradually meet the upgraded requirement by residents as production pattern changes and industry upgrading accelerates. In 2025, beef and mutton consumption will reach 9.54 million tons and 5.90 million tons, up by of 11.0% and 10.3% from 2020.

We will see gains made in beef and mutton import, and a generally stabilized mutton import with a modest increase. In 2016, beef and mutton import are expected to grow due to the impact of prices inversion at home and abroad. During the 13th Five-Year Plan (2016 – 2020) period, beef and mutton import growth will be continued due to decreasing tariffs on imported beef and mutton and live animals. A larger increment will be seen in beef import due to the impact of domestic productivity and global trade volume. In 2020, beef and mutton import will reach 750,000 tons and 260,000 tons. Beef import will be higher than the forecast in 2015, as is affected by the changes in domestic supply and demand and positive trade policies. We will see markedly less illegal importation and more legal import channels as China's control system on agricultural trade is put in place and more resources are mobilized to crack down on smugglers. In 2025, beef import is expected to

stand at around 1.05 million tons and mutton at around 300,000 tons.

We will see high prices with slight variations. In 2016, beef prices will be stabilized as farming costs rise and consumption demand grows. Mutton market will recover with better farming benefits. Mutton prices will rebound in 2016. During the 13th Five-Year Plan (2016–2020) period, beef and mutton prices will remain at high levels, as supply will still fall short of demand. During the 14th Five-Year Plan (2021–2025) period, with more and stronger preferential policies, beef and mutton productivity will be further improved. The tight supply of beef and mutton will be eased to different extent. No major variations in beef and mutton prices are estimated, which are to remain stable with some small increases due to ever increasing labor costs, fodder raw materials prices and CPI.

8.3.2 Production outlook

In the short term, support for beef and mutton production will grow stronger. In 2016, beef production will experience steady growth, reaching 7.15 million tons, a year-over-year increase by 2.2%. Given fact that the setbacks in mutton market in the past two years, economic returns for farming reduced and farmers' enthusiasm was very low. Mutton production is estimated to stop growing, standing at 4.40 million tons, a year-on-year slip by 0.2%. Production volume is lower than what was estimated in 2015. During the 13th Five-Year Plan (2016–2020) period, modern animal husbandry development will be pushed forward with an optimized pattern. Herbivorous animal husbandry will be given a solid footing. Scaled-up production and intensive operation will be the two pillars of this industry. Farming activities will be standardized and industrialized and overall productivity will be enhanced greatly. By giving equal footing to crop and animal production, rearing livestock in pens and efficient utilization of fodder and forage, we can maintain stable growth in beef and mutton production. In 2020, beef and mutton will be 7.85 million tons and 5.10 million tons, increased by 12.1% and 15.6% from 2015, with annual growth rate averaging 2.3% and 2.9%. During the 14th Five-Year Plan (2021-25) period, more scaled-up operations will emerge with a greater role played by science and technology. In 2025, beef production will stand at 8.50 million tons, increased by 8.3% from 2020, with annual growth rate averaging 1.6% (Figure 8-6); mutton production 5.60 million tons, up by 9.8% from 2020, with annual growth rate averaging 1.9% (Figure 8-7).

Overall cattle, sheep and goats farming capacity will grow steadily, as the transformation of development pattern of herbivorous animal husbandry speeds up and new type of operation entities in various forms enjoys further development. In 2020, scaled-up operation, in which the farm is capable of slaughtering at least 50 head of beef cattle and

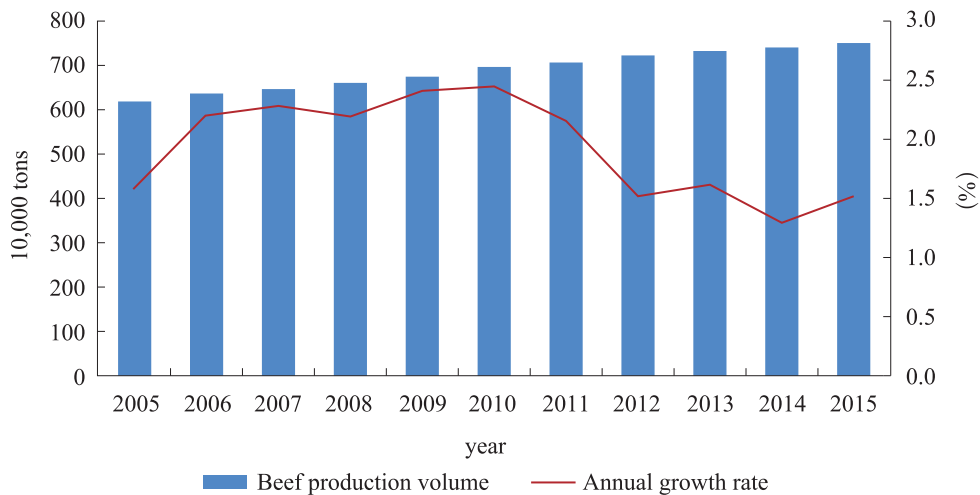


Figure 8-6 2015 –2025 China's beef production volume and annual growth rate

Data sources: Data for 2015 is from the NBS. Data from 2016 to 2025 are forecasts.

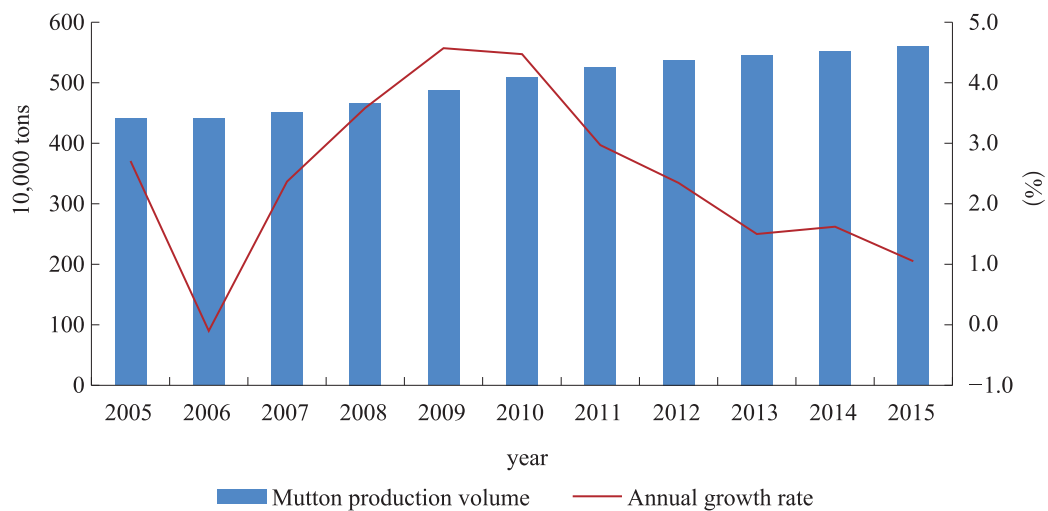


Figure 8-7 2015 –2025 China's mutton production volume and annual growth rate

Data sources: Data for 2015 is from the NBS. Data from 2016 to 2025 are forecasts.

100 head of mutton sheep or goats every year, accounts for 45% and above. On the provision of fodder and forage, the central government supports fodder and forage production of silage corn and alfalfa. In eligible areas, pilot projects are conducted to grow fodder crops instead of grain crops, and combine crop production with animal production. On disease control, PPRV will be terminated by 2020 according to the 2016-2020 *Plan on the Nationwide Eradication of PPRV* issued by the MOA. On science and technology support, the *National Plan on the Genetics Improvement of Beef Cattle and Mutton Sheep and Goats* will be implemented, with a view to accelerating the breeding of

fine species and ensuring domestic supply capabilities. China's cattle carcass weight is only 67% of the world average, 40% and 53% of the number of the US and Australia respectively. Sheep and goats carcass weight is slightly above the world average, but accounts for only 50% of the US, 68% of Australia and 78% of New Zealand. Per unit production for cattle, sheep and goats has the potential to grow.

8.3.3 Consumption outlook

In the short term, with a larger population and changing meat consumption pattern and preferences by urban and rural residents, beef consumption in 2016 is anticipated to reach 7.68 million tons, increasing by 2.8% from 2015; mutton consumption 4.63 million tons, remaining stable. During the 13th Five-Year Plan (2016 – 2020) period, beef and mutton consumption will rise steadily as income rises, urbanization deepens, greater targeted poverty alleviation efforts are made, and the nutrient values are more widely recognized by the residents. In 2020, beef and mutton consumption will stand at 8.60 million tons and 5.35 million tons respectively, expanding by 15.1% and 15.6% from 2015, with annual growth rate averaging 2.9%. During the 14th Five-Year Plan (2021 – 2025) period, as development pattern changes and industrial upgrade accelerates, the provision of good quality beef and mutton products will gradually meet the upgraded requirement by the residents. In 2025, beef and mutton consumption will reach 9.54 million tons and 5.90 million tons, jumping by 11.0% and 10.3% from 2020 (Table 8-3).

Table 8-3 Annual growth rate for beef and mutton consumption in China, %

Subjects	2006 – 2015	2011 – 2015	2016 – 2020	2016 – 2025
Beef consumption	2.8	2.7	2.9	2.5
Per capita share of beef	2.3	2.2	2.5	2.2
Mutton consumption	2.8	2.8	2.9	2.4
Per capita share of mutton	2.3	2.3	2.6	2.2

Data sources: Data for 2006 to 2015 is from the NBS. Data for 2016 – 2025 are forecasts.

Notes: Per capita share of beef (mutton) is calculated by dividing [beef (mutton) production volume + beef (mutton) net import volume] by population.

In 2016, per capita share of beef will see a moderate increase, standing at 5.56 kg, whereas per capita share of mutton will fall a bit to 3.35 kg. In 2020, the number will be 6.14 kg and 3.83 kg respectively, up by 13.1% and 13.6% from 2015. In 2025, the number is anticipated to grow to 6.75 kg and 4.17 kg, up by 9.9% and 9.0% from 2020. Beef and mutton are high-grade consumer goods, the consumption of which is subject to the impact of macro-economy and policies. However, the growth in consumption demand

by the general public will be continued, with mandatory growth seen in the areas where ethnic people live and work. Apart from the demand for larger quantity of meat, residents now have higher requirement for meat quality. Consumers tend to choose meat products with quality certification labels and well-known brand.

8.3.4 Trade outlook

In the short term, the beef and mutton prices inversion at home and abroad will lead the beef and mutton import to a modest increase in 2016, reaching 530,000 tons and 230,000 tons. During the 13th Five-Year Plan (2016 – 2020) period, beef and mutton import will gradually grow due to the continued fall in the tariffs on imported beef, mutton and live animals. Growth is more pronounced in beef import due to the influence of greater domestic production capacity and changes in global trade volume. In 2020, beef and mutton import will be 750,000 tons and 260,000 tons respectively. Given the growing domestic demand, international supply capacity and positive trade policies, beef import volume is larger than the forecast made in the previous year. In 2016, beef and mutton import will run parallel to that of 2015. Beef and mutton export will be stable with minor increments from 2016 to 2020.

In the long term, beef import increment will be continued while mutton import will remain stable with small increases. This is because China is working to put in place a control system on agricultural trade and mobilizing more resources to fight smuggling. We will see less illegal import activities and more legal import channels. In 2025, beef import is to be 1.05 million tons and mutton import 300,000 tons. China is now exploring import channels for beef and mutton. It has so far reopened access to beef imported from the US, Brazil and Chile, and has for the first time in history approved import of beef and mutton products from Hungary and Mongolia. During the 14th Five-Year Plan (2021 – 2025) period, beef and mutton export will remain stable with potential for small growth. Annual export of beef will be 10,000 tons and mutton 8,000 tons.

8.3.5 Price outlook

In the short term, the negative impact of international market on the domestic mutton market begins to subside, with prices stop falling and market and economic benefits from farming slowly recovering. In 2016, beef and mutton price will be stabilized. During the Spring Festival in 2016, there was room for higher prices as demand grew in an energized market. After the Festival, demand fell back and prices were expected to go down accordingly. During the 13th Five-Year Plan (2016 – 2020) period, the demand and supply of beef and mutton will remain tight and prices will remain high.

In the long term, the production of beef cattle and mutton sheep and goats are expected to rise steadily as farming patterns change and preferential policies for farming are adopted. Tight supply will be eased to varied extent and prices will not show major variations. On the other hand, beef and mutton prices will be stable with small increases due to long farming cycle, rising costs for labor and raw materials of fodder and a higher CPI.

Chapter 9

Poultry eggs

Poultry eggs are daily necessities of people's life in China. They are important products for the food basket. The past 30 years has seen great achievements by the egg industry in China. The average annual growth of output was 7.8% , ranking No. 1 in the world, accounting for about 40% of the world's total egg production. In 2015, with reduced feed costs, acceptable economic returns on breeding, sound management and control on disease related risks and other favorable factors, egg production increased significantly, reaching 29.99 million tons, an increase of 3.6% over 2014 (an increase of 1.0511 million tons). The consumption was 29.851 million tons, an increase of 3.2%. During the 12th Five-Year Plan period, egg production maintained continuous growth. Throughout the year 2011 to 2015, the production was 28.1142 million tons, 22.86117 million tons, 28.7606 million tons, 28.9389 million tons and 29.99 million tons, respectively, and the total production reached 144 million tons. The consumption grew steadily, accumulating to 143 million tons during 2011-2015. Exports was relatively stable, totaled at 492, 400 tons, of which the yearly exports were 104, 400 tons, 102, 500 tons, 93, 300 tons, 94, 600 tons and 97, 600 tons, respectively. In the forecast for 2016, the price of bean pulp, corn and other feed materials may continue to decline, leading to good economic returns of keeping laying hens. The egg production of 2016 is expected to be stable and slightly higher, totaling 30.222 million tons, an increase of 0.8% over the last year. Due to favorable factors such as higher population and income, further urbanization and consumption structure upgrading, egg consumption will continue to grow, reaching 30,103,600 tons by estimation, an increase of 0.8%. As eggs are high maintenance goods in transport and storage, the exports will continue to be mainly towards neighboring countries and regions, totaling around 95,000 tons. During the 13th Five-Year Plan period, with deeper supply-side structural reforms and upgrading of livestock breeding industry, the egg industry will become more commercialized and eco-friendly, with larger scale of economy. The egg production is expected to register steady development and higher output. At the same time, with the building of a comprehensive well-off society and greater level of urbanization, people's food consumption will see significant improvement. During the 13th Five-Year Plan period, the egg production will reach 154 million tons and the egg consumption will near 154 million tons. By the end of 2020, egg production and consumption is estimated to be 31.4266 million tons and 31.3281 million tons, an increase of 4.8% and 4.9% respectively, compared with 2015. During the 14th Five-Year Plan period, with advances in farming techniques and evident improvement in livestock species, eradication of major breeding diseases, egg production will maintain steady growth. Over the same period, the level of people's

consumption will rise dramatically. The egg production and consumption in 2025 is expected to be 32.9135 million tons and 32.7865 million tons, up by 9.7% and 9.8% respectively, compared with 2015.

9.1 General outlook

The output of egg production will continue to rise, but at a milder pace. In the forecast for 2016, the price of bean pulp, corn and other feed materials may continue to decline, so the economic returns of keeping laying hens will be good. The egg production is expected to be stable and slightly higher, totaling 30.222 million tons, an increase of 0.8% over the last year. During the “Thirteenth Five-Year Plan” period, with deeper supply-side structural reforms and upgrading of livestock breeding industry, the egg industry will become more commercialized and eco-friendly, with larger scale of economy. The egg production is expected to register steady development and higher output, reaching 154 billion tons over the five years, an increase of 7.6% over the 12th Five-Year Plan period. The estimated egg production in 2020 is 31.4266 million tons, an increase of 4.8% compared with 2015. During the 14th Five-Year Plan period, with advances in farming techniques and evident improvement in livestock species, barring major breeding diseases, egg production will maintain growth, reaching 162 million tons of output over the five years, up by 4.9% compared with the 13th Five-Year Plan period. The egg production in 2025 is expected to be 32.9135 million tons, up by 9.7% compared with 2015. The average growth of egg production is estimated at 0.9% annually.

The egg consumption is growing steadily, and the consumption of processed egg products is rising rapidly. In 2016, due to favorable factors such as rising population and income, further urbanization and structural upgrading of consumption, egg consumption is expected to continue to grow, reaching 30,103,600 tons, an increase of 0.8%. Looking forward to the 13th Five-Year Plan period, with the building of a comprehensive well-off society and greater level of urbanization, people’s food consumption will see significant improvement. During the 13th Five-Year Plan period, the egg consumption will near 154 million tons, an increase of 7.6% compared to the 12th Five-Year Plan period. In 2020, egg consumption is estimated to be 31.4421 million tons, an increase of 4.9% compared with 2015. During the 14th Five-Year Plan period, with more families choosing to have two babies, the consumption of eggs will rise further, reaching 161 million tons over the five years, an increase of 4.5% compared with the

13th Five-Year Plan period. The egg consumption in 2025 is estimated to be 32.7865 million tons, up by 9.8% compared with 2015. The egg consumption is expected to grow at an annual rate of 0.9%.

Trade in eggs will be stable. In the upcoming 13th Five-Year Plan period, China's continue to be a major exporter of eggs, maintaining an annual export volume of 950,000 ton, mainly towards neighboring countries and regions. With progress in cold-chain storage, transportation technology and egg processing industry, the markets for eggs exports is expected to further expand and diversify.

The price of eggs is expected to rise modestly, with evident seasonal fluctuations. In 2016, as the price of corn, bean pulp and other raw materials for feed continue to decline, the feed prices for laying hens also drop, so the price of eggs is expected to dip further. Looking ahead, however, with increasingly market-determined prices of major agricultural products, rising labor costs, intensified environmental and resource constraints on livestock breeding, the costs of egg production will rise mildly, so the price of eggs in China will experience moderate increase. At the same time, during holiday seasons with strong consumption demand, the price of eggs will continue to show seasonal features.

9.2 Production outlook

The output of egg will continue to rise. In the forecast for 2016, the price of bean pulp, corn and other feed materials may continue to decline, leading to good economic returns of keeping laying hens. The egg production is expected to be stable and slightly higher, totaling 30.222 million tons, an increase of 0.8% over the last year. During the “Thirteenth Five-Year Plan” period, with deeper supply-side structural reforms and upgrading of livestock breeding industry, the egg industry will become more commercialized and eco-friendly, with larger scale of economy. The egg production is expected to register steady development and higher output, reaching 154 billion tons over the five years, an increase of 6.9% over the 12th Five-Year Plan period. The estimated egg production in 2020 is 31.4266 million tons, an increase of 4.8% compared with 2015. During the 14th Five-Year Plan period, with advances in farming techniques and evident improvement in livestock species, eradication of major breeding diseases, egg production will maintain growth, reaching 162 million tons of output over the five years, up by 4.9% over the 13th Five-Year Plan period. The egg production in 2025 is expected to be 32.9135 million tons, up by 9.7% compared with 2015 (Figure 9-1).

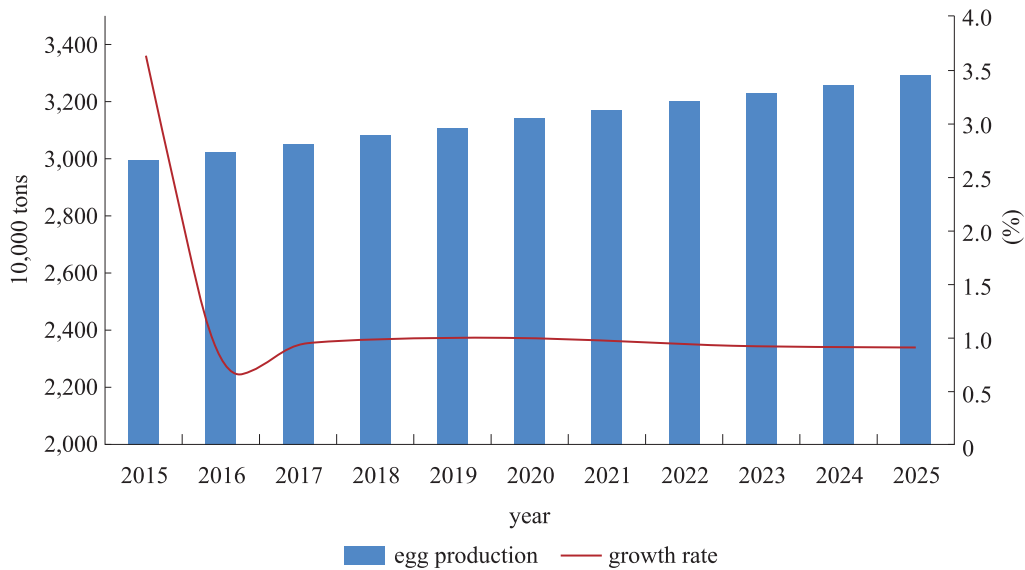


Figure 9-1 Output and growth of egg production in China during 2015 – 2025

The growth of egg production is gradually slowing down. Looking ahead, while favorable policies continue to support output of the egg industry, rising breeding costs including labor costs and disease prevention costs will drive down the comparative economic return on the industry. As heightened environmental requirements force out small-scale egg farmers who rely on extensive style of breeding, the egg production is to enter a structural-transiting period. The economic scale of egg farming continues to expand, but the breeding of laying hens is faced with challenges. As a result, the output growth has slowed. The average annual growth is expected to be 0.9% during the 13th and 14th Five-Year Plan period, evidently slower compared with the 2% growth during last decade (Figure 9-1).

9.3 Consumption outlook

Consumption of eggs increased steadily, but with slow per capita growth. In 2016, due to favorable factors such as higher population and income, further urbanization and consumption structure upgrading, egg consumption will continue to grow, reaching 30,103,600 tons by estimation, an increase of 0.8%. Looking ahead into the 13th Five-Year Plan period, with the building of a comprehensive well-off society and higher level of urbanization, people's food consumption will improve significantly, leading to steadily growth of egg consumption. The egg consumption will reach 154 million tons over the five years, an increase of 7.6% over the 12th Five-Year Plan period. By 2020,

the egg consumption will reach 32.3181 million tons, growing by 4.9% over 2015. During the 14th Five-Year period, with more family choosing to have two children, egg consumption is expected to grow further, reaching 161 million tons over the five years, up by 4.5% over the 13th Five-Year Plan period. In 2025, egg consumption will reach 32.7865 million tons, up by 9.8% compared 2015, equivalent to 0.9% of averaged annual growth. The average per capita consumption of eggs for domestic residents is expected to grow at annualized rate 0.7% , reaching 17.1 kg/person annually in 2025, which is a slow rate of growth. The annual per capita egg consumption of urban residents is expected to reach 19.7 kg, and for rural residents, the figure is 12.5 kg. The gap between urban and rural areas is still evident (Figure 9-2).

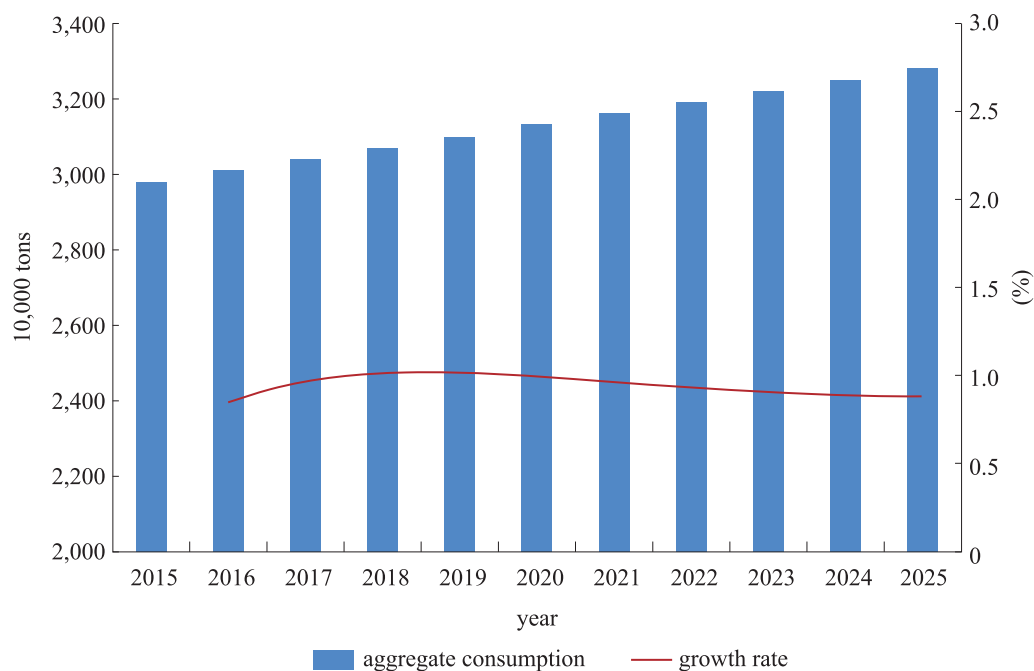


Figure 9-2 Egg consumption and growth rate in China during 2015 – 2025

Consumption of processed egg products will grow rapidly. In 2016, the consumption of processed egg products is estimated to be 4.6277 million tons, an increase of 1.1% over the last year. Looking ahead into the 13th Five-Year Plan period, thanks to further transformation and upgrading of the agricultural processing industry, the processing of eggs will undergo rapid progress with better coordination among the preliminary and deep processing, leading to more diversified products. The forecast aggregated consumption over the five years is 23.7184 million tons, reaching 4.8661 million tons by 2020, an increase of 6.3% compared to 2015. During the 14th Five-Year Plan period, as the demand by urban and rural residents for deeply processed and instant egg products further

expand, the development of the egg processing industry is to accelerate. The total consumption of processed egg products over the five years is estimated at 25.3826 million tons, reaching 5.236 million tons in 2025, an increase of 14.3% compared to 2015. The average annual growth of egg processing will reach 1.3%, faster than egg production and consumption (Figure 9-3).

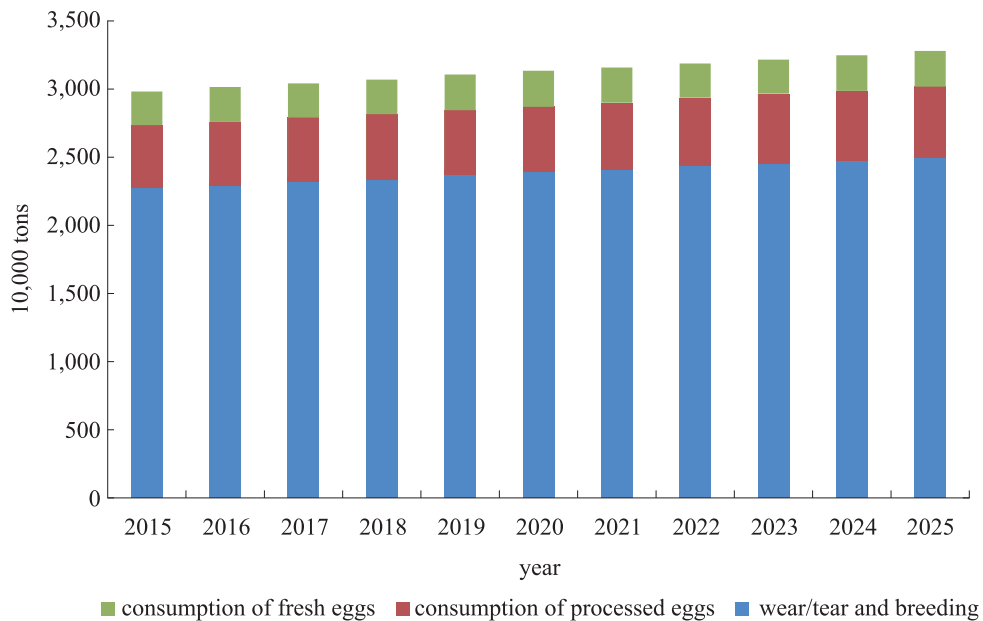


Figure 9-3 Egg consumption structure in China 2015 –2025

9.4 Trade outlook

Trade in eggs will remain stable. With the development of egg processing industry during the 13th Five-Year Plan period, the exports of egg products such as de-shelled eggs will increase, but that still only account for a small proportion of the total trade. Fresh eggs will continue to take up the lion's share of export. China will still be a net exporter of eggs with stable trade volume. Looking ahead, the egg exports will stay around 95,000 tons. The import of eggs is mainly for breeding purposes and the trade volume is very small. With improved domestic breeding species and techniques, and considering cases of import suspension due to poultry diseases, the import may dip further.

China's egg exports are mainly towards neighboring countries and regions. Since the eggs are fragile products for transport and storage, it is hard to deliver exports in large quantity and over long distance. At present, China's exports of eggs are mainly towards

Hong Kong, Macau, Japan and other neighboring countries and regions. The exports to Hong Kong and Macau account for over 80% of the total exports. Looking ahead into the future, with progress in cold-chain storage, transportation technology and egg processing industry, transport and storage may become less a drag on egg trade. The market for eggs exports is expected to further expand and diversify, but still be dominated by neighboring countries and regions.

9.5 Price outlook

The price of eggs is expected rise modestly, with evident seasonal fluctuations. In 2016, as the price of corn, bean pulp and other raw materials for feed continue to decline, the feed prices for laying hens also drop, so the price of eggs is expected to dip further. Looking ahead, however, with increasingly market-determined prices of major agricultural products, rising labor costs, intensified environmental and resource constraints on livestock breeding, the costs of egg production will rise mildly, so the price of eggs in China will experience moderate increase. At the same time, during holiday seasons with strong consumption demand, the price of eggs will continue to show seasonal features.

Chapter 10

Dairy

China is the world's third largest producer of dairy products and the largest importer. In 2015, dairy production in China reached 38.90 million tons, an increase of 1.0% over the last year, accounting for 5.0% of the global production. Dairy consumption was 50.1 million tons, down by 3.2%. The imports of dairy products was 1.61 million tons (equivalent to 11.1 million tons of raw milk), down by 11.1%, accounting for 15.6% of the global trade. During the 12th Five-Year Plan period, China's dairy production registered steady growth. The accumulated output was 191 million tons, increasing by 5.5% over the 11th Five-Year Plan period. With rising levels of consumption, dairy consumption reached 236 million tons, growing by 21.9% over the 11th Five-Year Plan period. Imports of dairy products increased substantially, amounting to 7.08 million tons (equivalent to 49.55 million tons of raw milk), up by 2.2.4% over the 11th Five-Year Plan period. Procurement prices of raw milk went up before dropping back, while the retail price of dairy products has risen continuously. Looking ahead to the next decade, China's dairy production will maintain stable growth, the consumption upgrading will accelerate evidently and dairy imports will continue to rise. In 2016, due to exit of small farmers and slow expansion of large farms, dairy production is expected to drop slightly to 38.79 million tons, down by 0.3% over the last year; consumption is about to reach 51.82 million tons, up by 3.4%; imports (raw milk equivalent) is estimated at 12.95 million tons, up by 16.6%; the price will edge upward amid fluctuation. During the "Thirteenth Five-Year Plan" period, China's dairy industry will accelerate its upgrading, with focus on the quality, economic scale, standardization, mechanization and integration of the industry. By 2020, dairy production is expected to reach 42 million tons, consumption is to reach 57.58 tons, and imports will rise to 15.88 tons, with the price fluctuating upward. By 2025, dairy production, consumption and imports (raw milk equivalent) will reach 45 million tons, 63.20 million tons and 18.8 million tons respectively, an increase of 15.7%, 26.2% and 69.4% over 2015.

10.1 General outlook

Dairy production will rise steadily. In 2016, due to exit of small farmers and slow expansion of large farms, dairy production is estimated at 38.79 million tons, down by 0.3% compared to the last year. During the 13th Five-Year Plan period, with deeper structural reforms in agriculture, including converting grain farmland to feed-growing land and cultivating high-quality feed and forage, China's dairy industry will stabilize

and grow, reaching 42 million tons of production by 2020, 8.0% higher than in 2015. Looking ahead, with upgrading and modernization of the dairy industry, the production in 2020 will reach 45 million tons, an increase of 15.7% over 2015.

Dairy consumption will maintain sustained growth. In 2016, thanks to picking up of dairy processing activities and higher demand, dairy consumption is estimated at 51.82 million tons, an increase of 3.4% over last year. During the 13th Five-Year Plan period, with higher living standards, heightened urbanization, roll-out of the two-child policy and the School Milk Scheme, dairy consumption in China will maintain rapid growth, reaching 57.58 million tons in 2020, an increase of 14.9% compared with 2015. Looking ahead, due to the structural upgrading and higher quality of consumption, dairy consumption is expected to reach 63.20 million tons in 2025, up by 26.2% compared with 2015.

Dairy imports will continue to grow. In 2016, imports of dairy products (raw milk equivalent) are estimated at 12.95 million tons, an increase of 16.6%. During the 13th Five-Year Plan period, driven by higher demand and the price premium, China's dairy imports will continue to rise, reaching 15.88 million tons by 2020, and an increase of 43.1% over 2015. By 2025, the imports are expected to reach 18.80 million tons, growing by 69.4% over 2015. Imported products with rapid growth are expected to include fresh milk, cheese and milk powder.

The price of dairy products is expected to fluctuate upward. In 2016, as dairy supply from the international market is quite adequate and the demand is lackluster, the purchasing price of raw milk in China may face downward pressure amid fluctuation. In the latter half of the year, however, with output adjustment from major producer countries, the market situation is expected to improve, and the prospect for domestic dairy industry will also turn brighter. Looking into the 13th Five-Year Plan period, due to stricter environmental requirements and rising breeding costs for milk cows, the purchasing price for raw milk will uplift, but the retail prices of dairy products will remain stable at a relatively high level.

10.2 Production outlook

The production of dairy products will increase steadily. Affected by incidents of dumping milk and selling cows by dairy farmers in end 2014 and early 2015, many small farmers exited from the market. At the same time, due to sliding economic returns, large farms are expected to slow down their expansion. As a result, raw milk production in

2016 is likely to decline slightly to 38.79 million tons, down by 0.3%. During the 13th Five-Year Plan period, with deeper structural reforms in agriculture including converting grain farmland to feed-growing land, China's dairy industry will accelerate its upgrading and enter a stage of steady growth, with focus on the quality, economic scale, standardization, mechanization and integration. Dairy production is expected to reach 4,200 million tons by 2020, an increase of 8.0% over 2015. Looking ahead, with integration and modernization of the dairy industry, the industrial chain and value chain will enhance significantly, leading to higher quality and stronger competitiveness. The dairy production in 2025 is estimated at 45 million tons, an increase of 15.7% over 2015. However, in the longer run, under stricter environmental protection requirements and constrained by resources shortage, the average annual growth for the forecast period is expected to slow down from 3.1% over the past decade to 1.5% (Figure 10-1).

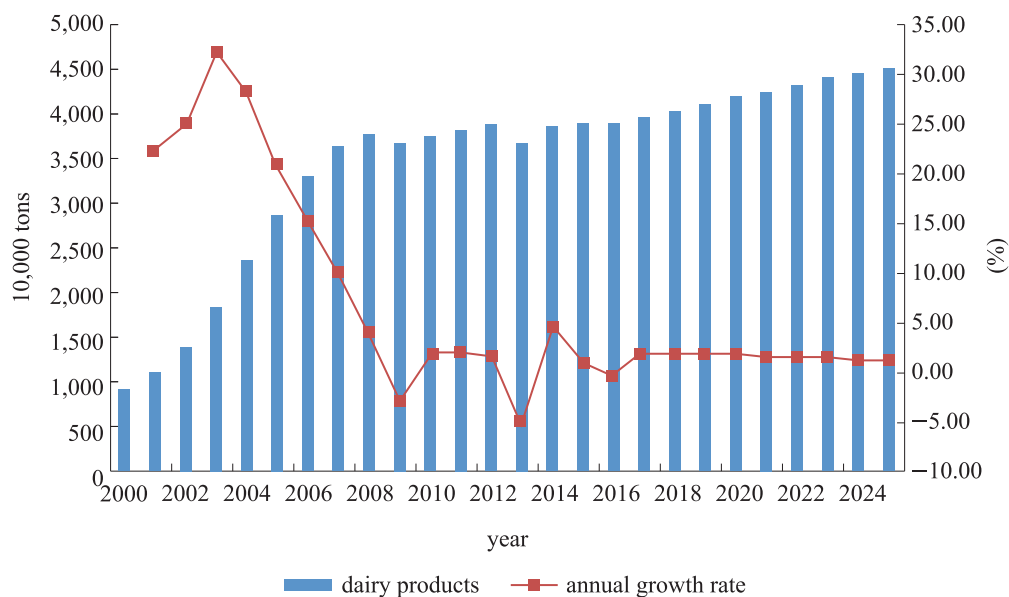


Figure 10-1 Dairy production during 2000 – 2025

Source: 2000 – 2015 data was from the China Statistical Yearbook, 2016 – 2025 data is estimation

Large-scale farming and higher yield per cattle will drive the steady growth of dairy production. In 2016, the supply-side reform in agriculture is to quicken the upgrading of the dairy industry. It is estimated that the commercialized breeding of milk cows will reach 50% of the total cattle, mechanization will accounts for over 90% of the industrial operation, and the annual average output per cattle is to reach 5.8 tons. During the 13th Five-Year Plan period, livestock breeding will become more commercialized with larger scale, stricter standardization and higher quality, leading to rapid improvement on the quality and efficiency. By 2020, dairy farms with over 100 breeding stock of milk cows

are expected to account for over 60% of the milk farms. Improved breeding species, feeding technology, management and flow of information will greatly raise the milk yields per cattle. Looking ahead, due to resource and environmental constraints, growth in the breeding stock of milk cows will be restricted, so the comprehensive upgrading of the dairy industry relies more on technological progress, improved varieties, better feeding conditions and meticulous management. By 2025, large-scale dairy cattle breeding will account for 67% of the total milk cows, with average output per cattle reaching 6.7 tons (Figure 10-2).

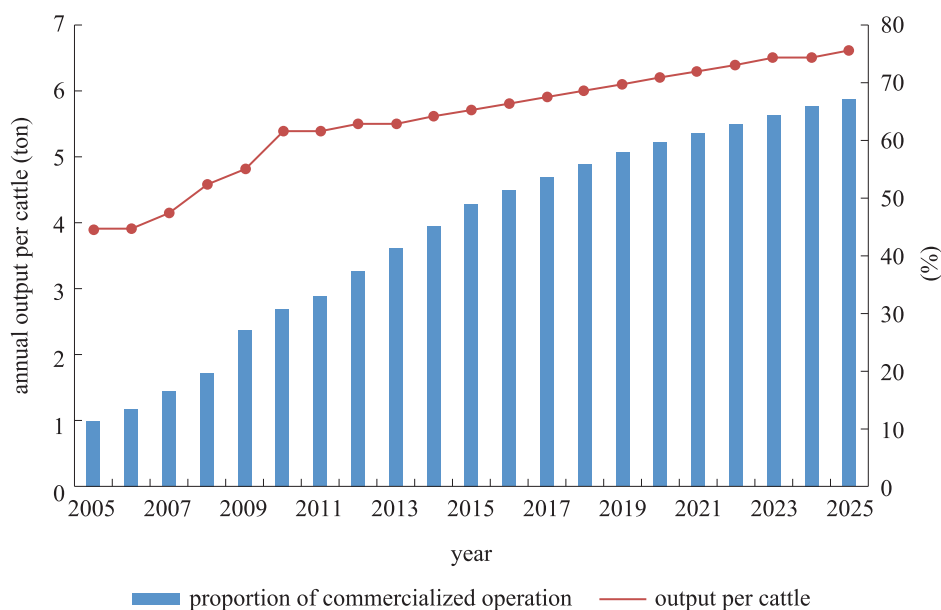


Figure 10-2 Long-term trends of output per cattle and commercialized operation during 2002 – 2025

Source: 2002 – 2015 data was from the “China Dairy Yearbook”; 2016 – 2025 data are projections

Note: The degree of the commercialized operation refers to the proportion of cattle from large farms with over 100 livestock annually to the whole livestock population nationwide

10.3 Consumption outlook

Consumption of dairy products will maintain sustained growth. In 2016, a series of industrial standards and policy measures were adopted, including the new *Food Safety Law*, *Management Measures for the Registration of Baby Formula Milk Powder (Trial)*, *Identification Measures for the Recovery Milk in the Pasteurized milk and UHT sterilized milk*, and *Opinions on Promoting the Development of Reforming of Farmland Cultivation*, which helps to enhance consumer trust and demand for domestic dairy products, and the market conditions is expected to improve for domestic dairy producers.

The dairy consumption will reach 51.82 million tons, an increase of 3.5%, of which food consumption accounts for 46.54 million tons, and feed consumption accounts for 1.96 million tons. During the “Thirteenth Five-Year Plan” period, dairy consumption will rise steadily thanks to the rising living standards, higher urbanization, rolling-out of the School Milk Scheme, and in particular, larger population due to the full implementation of the two-children policy. Meanwhile, several initiatives were launched to promote confidence in the domestic dairy industry, including the Quality Dairy Project and Social Responsibility – China’s dairy industry in action. The consumption is expected to reach 57.58 million tons in 2025, an increase of 14.9% over 2015, of which food and feed consumption accounts for 51.95 million tons and 2.11 million tons, respectively. Looking ahead, the quality and safety of dairy production in China is expected to enhance significantly, and the living standards, food requirements and consumer confidence of domestic consumers will rise rapidly. By 2025, dairy consumption is estimated at 6,320 million tons, up by 26.2% compared with 2015, of which food and feed consumption accounts for 57.23 million tons and 2.24 million tons respectively (Figure 10-3).

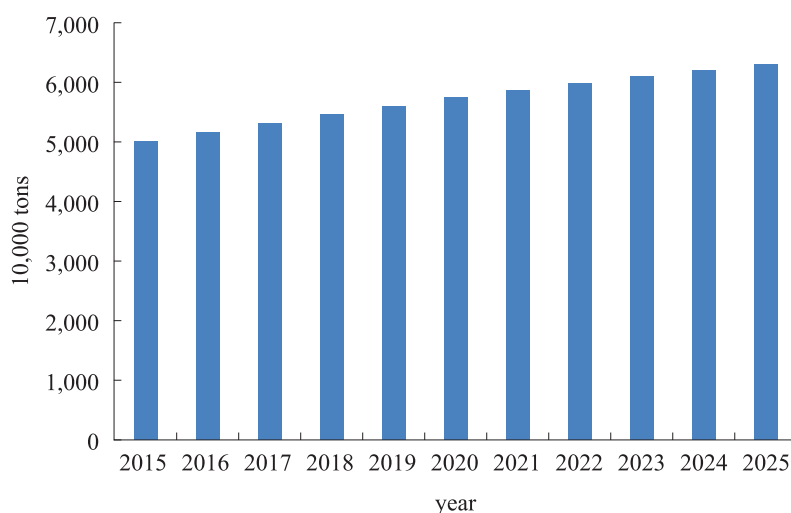


Figure 10-3 Demand trends of dairy consumption in China during 2015 – 2025

Chinese residents’ demand for dairy products is expected to increase. At present, dairy consumption by the Chinese is only one-third of the world average, so there is still much room for progress. The 12th Five-Year Plan period saw declined growth of dairy consumption in China, mainly due to confidence-damaging quality and safety problems. With the advancement of the supply-side reforms in agriculture and improvement in quality of agricultural and dairy products, consumer confidence and spending power will

be further enhanced. In 2016, the per capita dairy consumption (including dairy component in milk drinks, ice cream, cakes, etc.) by Chinese urban and rural residents is expected to reach 33.71 kg, an increase of 2.9%. The figure is expected to reach 37.12 kg by 2020, and then rise to 40.48 kg by 2025.

Urban and rural residents will demand more diversified, high-quality and imported dairy products. In the next decade, with rising living standards and better awareness of nutrition, urban residents in China will demand more diversified dairy products with emphasis on nutrition and flavor. Consumption of cheese and butter by urban residents and consumption of fresh milk by rural residents will increase significantly. In addition, with the rapid development of cross-border e-commerce and cold-chain logistics, dairy markets will be increasingly integrated globally. Fresh dairy products from New Zealand and Australia will be able to reach Chinese consumers quickly. In the future, it will be more convenient for Chinese consumers to get diversified dairy products from around the world. The adjustment of family plan policy, which allows a couple to have two children, has already attracted much attention at home and abroad. The EU has lifted a 30-year quota restriction on dairy production. A number of overseas major milk powder producers are targeting the Chinese market. Competition in China's dairy market in the future will become more intense.

10.4 Trade outlook

Dairy imports will continue to increase. In the short term, after the dumping-milk incidents in 2014 and 2015, many small dairy farmers exited the market. As a result, inventory at dairy processing businesses has run down, and the domestic supply and demand has improved. The roll-out of two-child policy will lead to mild rather than drastic increase of population in the short term. In 2016, the total import of dairy products (raw milk equivalent) is to reach 12.95 million tons, an increase of 16.6%. Looking ahead into the 12th Five-Year Plan period, driven by rising demand and price differences between home and abroad, China's dairy imports will continue to increase. It is expected to reach 15.88 million tons in 2020, an increase of 43.1% over 2015, and amounted to 18.80 million tons by 2025, growing by 69.4% over 2015 (Figure 10-4). At the same time, with structural upgrading and cost reduction, the Chinese dairy industry will grow stronger. Therefore, the averaged annual growth of dairy imports during 2016 – 2025 is estimated at 5.4%, evidently lower than the 13.2% rate during the past decade.

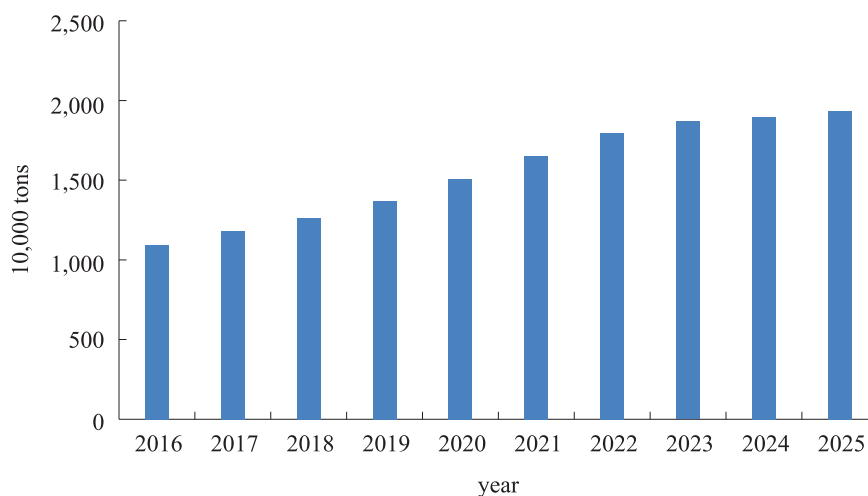


Figure 10-4 Imports of dairy products (raw milk equivalent) during 2015 –2025

Milk powder will continue to be China’s main imports of dairy products. The roll-out of two-child policy will directly drive higher the import demand for milk powder (mainly infant formula). However, as the population will not surge over the short term, the imports of milk powder in 2016 will be only slightly higher than 2015, reaching 800,000 tons. During the 13th Five-Year Plan period, the population is expected to register steady growth, leading to higher consumption of milk powder^[7]. In 2025, the imports of milk powder may exceed 1.2 million tons, equivalent to 9.6 million tons of raw milk.

Liquid milk imports will grow faster. With the advancing integration of global trade, in particular the signing of FTA between China and New Zealand, Australia and South Korea, more liquid milk imports (fresh milk and yogurt) are entering the Chinese market. In 2016, the imports are expected to grow steadily to top 550,000 tons. During the upcoming 13th Five-Year Plan period, as tariffs on dairy imports from New Zealand and Australia gradually drop to zero, and with rising domestic demand, liquid milk imports are expected to maintain strong growth momentum, probably exceed 1.1 million tons by 2025.

10.5 Price outlook

The prices are expected to continue to fluctuate in the short-term. Due to adequate supply of dairy products at home and abroad, declining dairy prices in international market and weak demand under the economic “new normal” domestically, raw milk production in China will be moving from supply surplus to basic equilibrium during the first half of 2016, leading to further fluctuation of purchasing price of raw milk. In the

latter half of the year, the dairy production may shrink as major dairy producers adjust their production capacity across the world. For instance, the EU has started to adjust its production since autumn of 2015, and the U. S. and New Zealand are also adjusting. As a result, dairy prices on the international market are expected to stabilize and pick up during the latter half of the year. Given the linkage between domestic and oversea markets, China's raw milk price is also expected to rise, but the pace may be lower than the international market. Though affected by the price of raw milk, the retail prices of fresh milk, milk powder and other dairy products will keep stable during 2016 without large fluctuations.

In the long term, the dairy prices may rise still. Looking into the 13th Five-Year Plan period, "green" development will become an important concept for animal husbandry. The expansion of dairy production is subject to resource and environmental constraints. With heightened punishment for violating environmental requirements, rising feed and labor costs as well as inflationary factors, the dairy prices are expected to continue to rise in the longer term. In addition, with rolling-out of the two-child policy, the demand for dairy products in China will maintain steady growth over the next decade, sustaining upward pressure for the prices of raw milk and retail dairy products. By the end of the projection period, affected by tight supply and rising costs, the price of raw milk in China will remain about 1.2 times higher than the global price of raw milk.

Chapter 11

Aquatic products

Aquatic products, including freshwater fish, marine fish, shrimp, crab and shellfish, are the major source of high-quality protein from dietary consumption of urban and rural residents in China. In 2015, the total output reached 66.9 million tons at a year-on-year increase of 3.5%, ranking first in the world. The market operation remained stable, with wholesale prices basically flat with those in the previous year. The import and export volumes were 4.08 million tons and 4.06 million tons respectively, valued at USD 8.999 billion and USD 20.336 billion. This represented a trade surplus of USD 11.337 billion. All these trade figures declined to some extent compared with those in the previous year. During the 12th Five-Year Plan period, China witnessed continuous increase in the production and consumption, strengthened processing capacity, basically balanced demand and supply, and expanded trade scale in terms of aquatic products. Accordingly, aquatic products contributed to diversified food consumption of the Chinese people and balanced agricultural trade. In the next decade, the production will be transformed and upgraded in a faster pace and the output will grow at a lower rate; the consumer demand will continue to rise and the structure of supply and demand will keep improving; and the import and export volumes will drop first and then rise and the net import volume will continue to increase. It is estimated that in 2016, the output and the direct dietary consumption will rise to 68.05 million tons and 29.08 million tons respectively; and the demand for processed products will reach 23.4 million tons and the import and export volumes 4.03 million tons and 3.96 million tons respectively. It is estimated that the output and consumption will add up to 350 million tons and 351 million tons during the 13th Five-Year Plan period, increasing by 13.6% and 14.2% respectively over the 12th Five-Year Plan period. The supply and demand will be basically balanced. The import and export volumes are expected to drop to the lowest level of 3.99 million tons and 3.87 million tons respectively in 2017, and then grow continuously. It is estimated that in 2020, the output will reach 71.8 million tons, the direct dietary consumption 31.5 million tons, the consumption of processed products 25.73 million tons, and export and import volumes 3.95 million tons and 4.18 million tons. These figures are estimated at 74.98 million tons, 33.31 million tons, 28.45 million tons, 4.08 million tons and 4.52 million tons in 2025.

11.1 General outlook

The output of aquatic products will grow at a lower rate. In the future, China will constantly strengthen the conservation of ecosystems. Due to the tightened resource

constraints, the growth potential of the output will be restricted. Furthermore, the labor cost is rising and comparative benefit declining. In such a context, structural adjustment, pattern transformation, and quality and efficiency improvement are identified as priorities for the fishery production. Therefore, the estimated output is lowered in the Outlook on the basis of the estimation in 2015. The output is expected to reach 68.05 million tons in 2016, rising by 1.7% over 2015. During the 13th Five-Year Plan period, the output will grow slowly at an annual average rate of 1.3% and reach 71.8 million tons in 2020. During the latter half of the outlook period (2021 – 2025), the growth rate will drop further. The output is estimated at 74.98 million tons in 2025. It is estimated that during the outlook period, the annual average growth rate of the output will be 1.1%. Under the guideline of “focusing on aquaculture and combining aquaculture and capture fisheries”, aquaculture will remain the major driving force for the growth of fishery production in China. The proportion of the output from aquaculture will continue to rise and account for nearly 77.5% in the total output of aquatic products in 2025.

The consumption of aquatic products will grow continuously. It is estimated that the total consumption will reach 68.13 million tons in 2016, increasing by 1.8% over 2015. During the 13th Five-Year Plan period, it will go up at an annual average rate of 1.4% and reach 72.03 million tons in 2020. In 2025, it will reach 75.42 million tons. During the outlook period, it will grow at an annual average rate of 1.1%. Specifically, both the direct dietary consumption and the consumption of processed products will rise continuously. It is estimated that the direct dietary consumption will reach 29.08 million tons in 2016, up 2.9% over 2015. It will increase to 31.5 million tons in 2020 and 33.31 million tons in 2025. During the outlook period, the direct dietary consumption will grow at an annual average rate of 1.5%, which is higher than that for the output. Meanwhile, the consumption of processed products will keep an upward tendency as well. It is estimated that 23.4 million tons of aquatic products will be processed in 2016. During the 13th Five-Year Plan period, the consumption of processed products will grow at an annual average rate of 2.4% and reach 25.73 million tons in 2020. In 2025, it will increase to 28.45 million tons.

The import and export volumes of aquatic products will drop first and then rise, and the net import volume will keep increasing. Currently, China is faced with huge downward pressure in terms of the import and export of aquatic products due to sluggish recovery of the global economy and low demand for imported aquatic products abroad as well as the rising processing cost in the country and the transfer of some processing enterprises to neighboring countries. In 2015, the actual import and export volumes

declined by 7.1% and 5.8% respectively over the estimated volumes. In the future, the world economy will remain in a tortuous recovery process along with in-depth adjustment. In China, the labor cost for processing and production will maintain rigid growth and the environmental cost will keep rising. Consequently, the situation for the import and export of aquatic products will still not be optimistic. Based on the above judgment, the practical investigation and the estimation in 2015, it is concluded that the import and export volumes in 2016 and 2017 will decline by a small margin. It is estimated that the export and import volumes will be 3.96 million tons and 4.03 million tons respectively in 2016 and further drop to 3.87 million tons and 3.99 million tons in 2017, and then turn to sustained increase. In 2020, they will reach 3.95 million tons and 4.18 million tons and the net import volume will increase to 230,000 tons. During the latter half of the outlook period (2021 – 2025), the export and import volumes will continue to grow and reach 4.08 million tons and 4.52 million tons respectively in 2025, and then the net import volume will rise to 440,000 tons.

The price will keep stable in an upward tendency. The supply and demand of aquatic products will remain basically balanced while the consumer demand is ever increasing and the supply capacity is further strengthening. Underpinned by the rising production cost, the price will keep stable in an upward tendency. It is estimated that, during the outlook period, the annual average increase rate of price will be around 3% and the integrated average price on the wholesale market will stay at 30 yuan per kg in 2025. As for different categories, the increase rate of the price of marine products will be higher than that of freshwater products.

11.2 Production outlook

11.2.1 Accelerated transition of development pattern and slow increase in output

The production of aquatic products will develop further and the output will continue to grow in China under the driving forces of consumer demand and technical progress. However, the producers will change the extensive development pattern based on expansion, resource consumption and increase in output to a green development pattern based on technical innovation, conservation of resources and environment, and branding and quality as a result of tightening constraints of fishery resources, narrowing space for aquaculture development and rising labor cost in China. Therefore, the output of aquatic products will grow at a slower pace. It is estimated at 68.05 million tons in 2016, with

per capita availability of 49.30 kg. The output from aquaculture will be 51 million tons. During the 13th Five-Year Plan period, the output of aquatic products will increase slowly to 71.8 million tons in 2020, with per capita availability of 51.31 kg. The output from aquaculture will reach 54.86 million tons. In 2025, the output of aquatic products will reach 74.98 million tons, rising by 8.08 million tons over 2015. The per capita availability will be 53.04 kg. The output from aquaculture will further increase to 58.1 million tons (Figure 11-1). During the outlook period, the output of aquatic products will grow at an annual average rate of 1.1%. Most of the growth will come from aquaculture. It is estimated that the output from aquaculture will account for 77.5% of the total in 2025 (Figure 11-2).

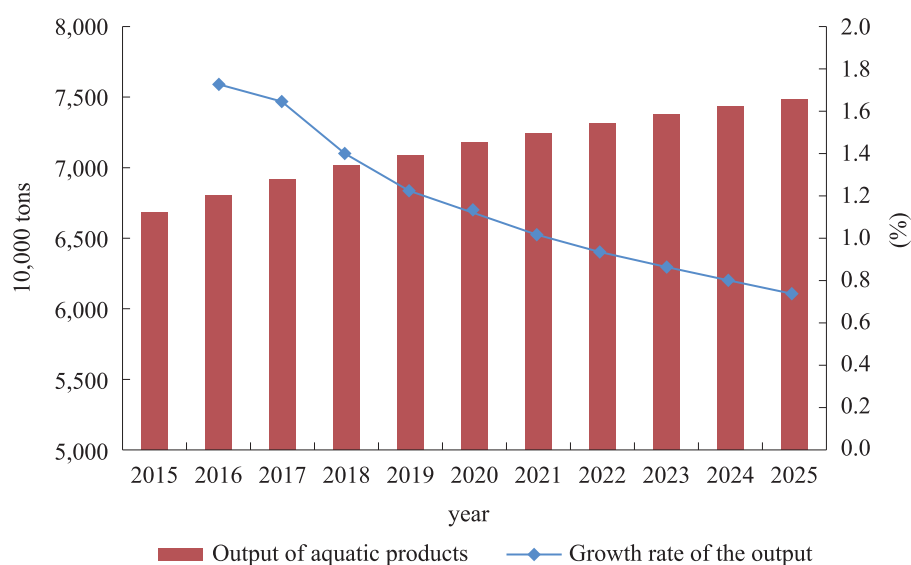


Figure 11-1 Output of aquatic products in China in 2015–2025

11.2.2 Decreasing output from capture fisheries

The status of declining offshore fishery resources has not been fundamentally changed though China has implemented stringent summer fishing moratorium, intensified the administrative law enforcement in the field of fisheries, and adopted diverse measures to conserve aquatic biological resources in recent years. This has restricted sustained growth of the output from capture fisheries to large extent. It is learnt that the competent authority has been reviewing the opinions relevant to the pattern transformation and structural adjustment of fisheries and improving the administrative system for marine fishery resources in accordance with the requirements of the State Council^[2]. It is foreseeable that the output from capture fisheries will show a downward tendency in the future. It is estimated at 17 million tons in 2016, which is basically flat with that in 2015. During the 13th Five-Year

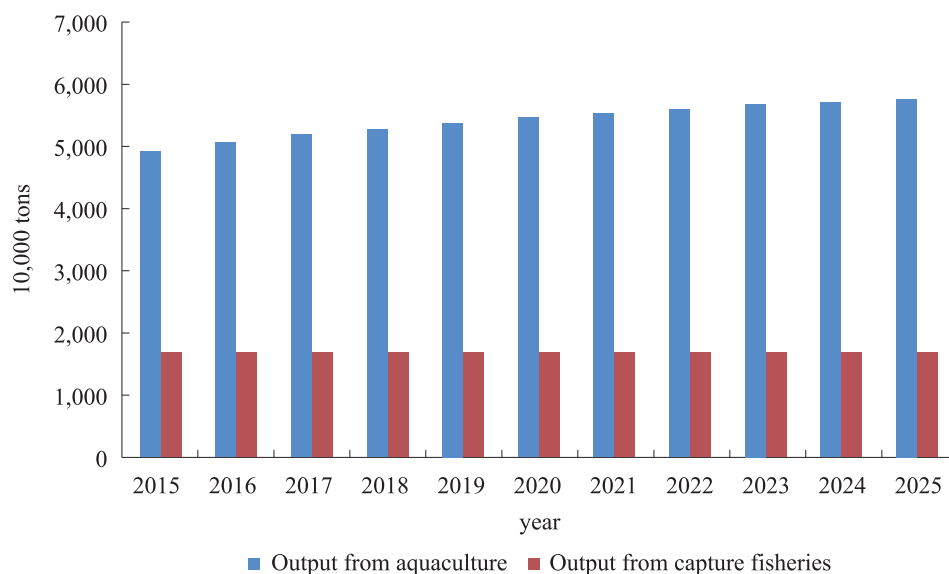


Figure 11-2 Output from aquaculture and capture fisheries in China in 2015 – 2025

Plan period, the output from capture fisheries will decline and stay at 16-17 million tons. During the outlook period, the output will keep a downward tendency in general, but it is possible to see it grow in some years. When enhancing the conservation of offshore fishery resources, China will actively explore the ways for the fisheries to “go global”. China will strengthen the bilateral cooperation with the United States, Japan and the EU and deepen the collaboration with Argentina, Mauritania, Myanmar and South Pacific island countries to promote the development of distant water fishery^[3].

11.2.3 Slower increase in the output from aquaculture

It is estimated that the output from aquaculture will reach 51.0005 million tons in China in 2016, up 2.5% over 2015. During the 13th Five-Year Plan period, it will increase to 54.86 million tons in 2020 at an annual average rate of 1.8%. In 2025, it will reach 58.1 million tons. During the outlook period, its annual average growth rate will be 1.5%, lower than that in the 12th Five-Year Plan period. The slower increase in the output from aquaculture is a result of resource constraints, rising cost and upgraded demand. In recent years, the environmental pollution caused by aquaculture has been very serious in China. In 2015, the State Council officially published *the Action Plan for Water Pollution Prevention and Control*, which stated that restricted aquaculture areas would be identified along major rivers and lakes as well as offshore areas and the sea areas for aquaculture would be limited to 2.2 million ha; and that eco-friendly and healthy aquaculture would be promoted through standardizing ponds and offshore net

cages and other measures. Since the intensified water resource management and environmental protection will narrow the space for aquaculture and lead to higher costs, it will be very difficult to win profits on the basis of growing output under the condition of rising labor and material costs. Meanwhile, the consumers will care more about the safety, quality and diversity of aquatic products owing to sustained increase in the per capita income. This will motivate the farmers to focus on species, quality and branding, rather than a profit-making model solely based on the increase in output.

During the outlook period, China will accelerate the transformation of aquaculture, and the species structure and culture patterns will also change evidently. In terms of the species structure, Cyprinidae? fishes will remain the major species due to their advantages of less feed consumption, high consumer demand, and high proportion in the output from aquaculture. However, their proportion in the output from aquaculture may drop slightly since the consumption will be diversified. The output of famous, featured and high-quality products will keep increasing and their proportion will rise as well. In terms of culture patterns, eco-recycling culture patterns, such as mixed culture of fish and shrimp, shrimp and crab, shrimp and soft-shelled turtle, shrimp and shellfish, and shellfish and algae, and integrated farming system in rice field, will be accepted by local governments and farmers because of their low operation risk, low incidence of diseases and high culture efficiency. Their extension and application will be further expedited. Industrialized mariculture is in line with the requirements of sustainable development thanks to its feature of water and land saving, high-density intensification and controlled discharge. It will become the inevitable trend for the transformation of aquaculture pattern.

11.3 Consumption outlook

During the outlook period, the total consumption of aquatic products will keep an upward tendency. It is estimated that the total consumption will reach 68.13 million tons in 2016, 72.03 million tons in 2020 and 75.42 million tons in 2025. Its annual average growth rate will be 1.1%. As for different types of consumption, both direct dietary consumption and consumption of processed products will show sustained increase.

11.3.1 Growing direct dietary consumption per capita and narrowing urban-rural gap

During the outlook period, the direct dietary consumption will grow faster than the

output of aquatic products due to rising per capita income, upgraded food consumption and increasing population. It is estimated that the direct dietary consumption per capita (including away-from-home consumption) will be 21.06 kg in 2016, up 2.5% over the previous year. For urban residents, it will be 28.15 kg, up 0.9% over the previous year; and for rural residents, it will be 11.56 kg, up 3.6% over the previous year. During the 13th Five-Year Plan period, the direct dietary consumption per capita will rise further to 22.51 kg in 2020 at an annual average growth rate of 1.7%. For urban residents, it will reach 28.70 kg at an annual average growth rate of 0.5%; and for rural residents, it will reach 12.68 kg at an annual average growth rate of 2.4%. In 2025, the direct dietary consumption per capita will reach 23.56 kg, increasing by 3.01 kg over 2015. For urban residents, it will reach 29.04 kg, increasing by 1.14 kg over 2015; and for rural residents, it will reach 13.36 kg, increasing by 2.20 kg over 2015. During the outlook period, the direct dietary consumption per capita will grow at an annual average rate of 1.3% (Figure 11-3). With the increase in population and the progress in urbanization, the total direct dietary consumption will also continuously rise to 29.08 million tons in 2016, 31.5 million ton in 2020, and 33.31 million tons in 2025. During the outlook period, its annual average growth rate will be 1.5%, slightly higher than that of the output of aquatic products.

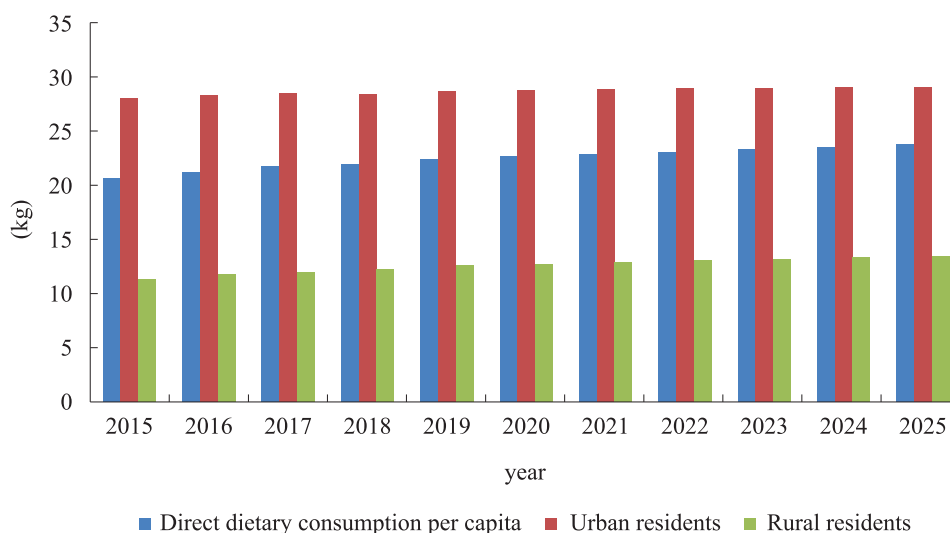


Figure 11-3 Per capita consumption of aquatic products in China in 2015 – 2025

Note: The per capita consumption of aquatic products includes the away-from-home consumption. In the model, the proportion of away-from-home consumption is calculated on the basis of the away-from-home consumption expenditure and the food consumption expenditure of residents published by the National Bureau of Statistics. Given that more aquatic products are consumed away from home, the proportion is adjusted in the process of calculation^[6].

11.3.2 Rising proportion of the consumption of processed products

The consumption of processed products takes up a lower proportion in the total consumption of aquatic products in China since fresh aquatic products are preferred. But the demand for processed products will keep growing because of economic and social development, higher requirement for efficiency and improving food processing technology. It is estimated that 23.4 million tons of aquatic products will be processed in the country in 2016, accounting for 34.4% of the total output. During the 13th Five-Year Plan period, the consumption of processed products will increase to 25.73 million tons in 2020 at an annual average rate of 2.4%, and the proportion of aquatic products for processing in the total output will rise to 35.8%. In 2025, the consumption of processed products will increase to 28.45 million tons and the proportion of aquatic products for processing in the total output will rise to 38% (Figure 11-4). In addition, the loss of aquatic products will decrease gradually due to improvement in transportation and communication conditions, agri-product wholesale market system, and cold-chain logistics and other storage and preservation techniques. It will fall from 15.87 million tons in 2015 to 13.66 million tons in 2025 and its proportion in the consumption of aquatic products will drop from 23.7% to 18.1%.

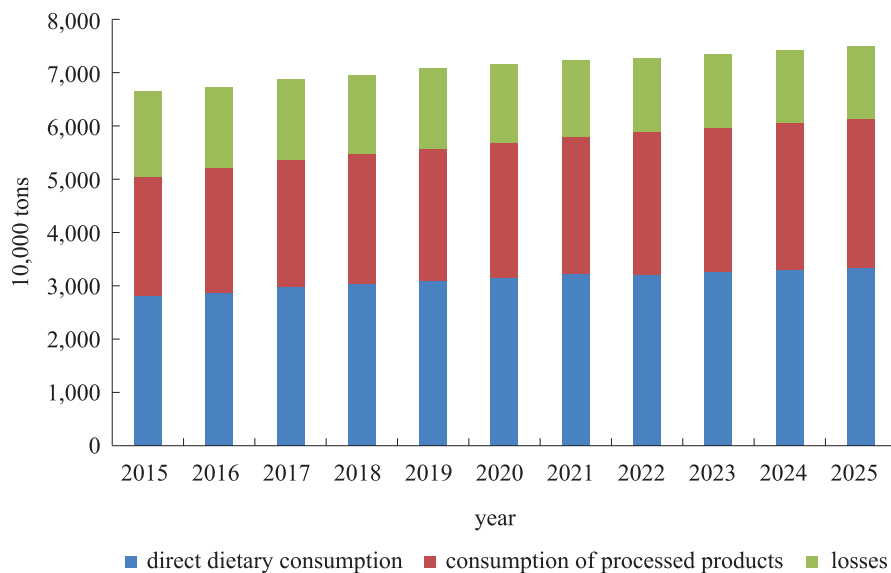


Figure 11-4 Consumption structure of aquatic products in China in 2015 – 2025

11.4 Trade outlook

11.4.1 Export volume

China is still confronted with grave situation in the trade of aquatic products. It is less likely for the external demand to rebound rapidly in the short term in a volatile recovery process of the world economy. China's export competitiveness has been declining due to rising labor cost in the processing sector. Major import countries have tightened the inspection and quarantine on the exports from China, which means technical barriers to trade are increasing. In such a context, it is estimated that the export volume of aquatic products will continue to drop slightly in the near future. In 2016, it will decrease to 3.96 million tons. During the 13th Five-Year Plan period, it will fall to the lowest level of 3.87 million tons in 2017. Then it will grow gradually thanks to the improving economic status of major import countries and regions, upgraded quality and safety of processed products and the progress in the "One Belt, One Road" strategy. In 2020, it will reach 3.95 million tons. During the latter half of the outlook period, it will stay at 4 million tons in general and reach 4.08 million tons in 2025.

11.4.2 Import volume

The processing trade with supplied or imported materials will decline to some extent in the future due to the weakening competitiveness in the export of processed products. Currently, the import volume of raw materials for the export-oriented processing accounts for 30% of the total import volume of aquatic products. Therefore, the decrease in such imports will have a big impact on the total, which will fall by small margin in the short run. It is estimated that the import volume of aquatic products will drop to 4.03 million tons in 2016. During the 13th Five-Year Plan period, the import volume of aquatic products will begin to grow in 2018 and reach 4.18 million tons in 2020 thanks to the continuous increase in the demand for high-quality aquatic products and the renewed growth in the export of processed products in the country. In 2025, it will rise to 4.5237 million tons and thus the net import volume will increase from 30,000 tons in 2015 to 440,000 tons in 2025 (Figure 11-5).

11.5 Price outlook

During the outlook period, the supply and demand of aquatic products will remain

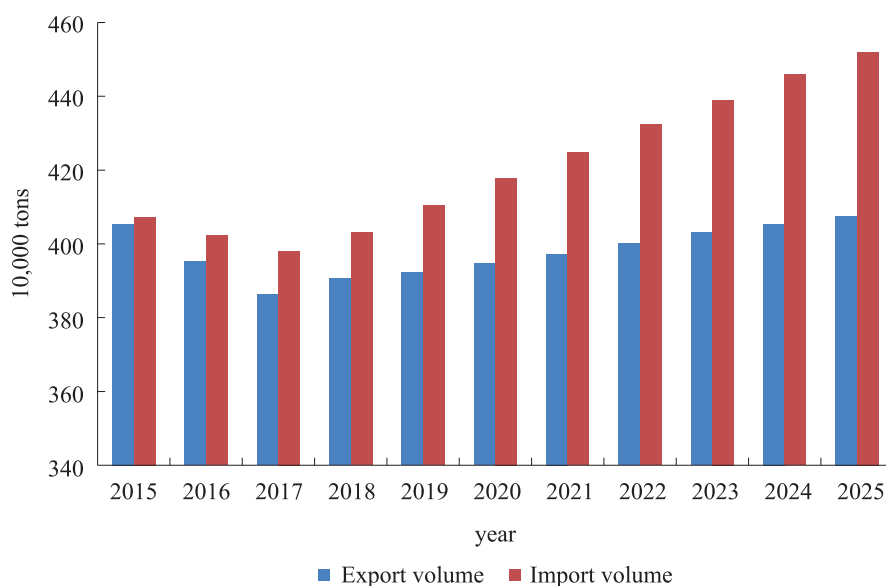


Figure 11-5 Import and export volumes of aquatic products in 2015 – 2025

basically balanced as they are both increasing continuously. Given the rising labor cost and environmental cost, the price will keep stable in an upward tendency, with little possibility of sustained and drastic surge. It is estimated that the annual average increase rate of price will stay at 3% and the integrated average price on the wholesale market at 30 yuan per kg in 2025, with varied tendency for products of different categories. The average increase rate of the price of marine products will be higher than that of freshwater products due to declining offshore fishery recourses, possible decrease in the supply of products from capture fisheries, high costs of marine net cage culture and industrialized aquaculture, and adequate supply of cultured freshwater products.

Chapter 12

Feed

Feed industry is a basic industry propping up the development of modern livestock and aquaculture industries, and also a livelihood industry that bears on the animal food supply of urban and rural residents. In 2015, the production of China's industrial feed declined slightly, yet remained in the position of No. 1 in the world. The demand for industrial feed dropped slightly; the price of major raw materials of feed fell dramatically. Although the price of feed products has entered into a downward channel, the average price of major products almost doubled that of foreign countries. During the 12th FYP period, total feed output and demand moved from rapid increase to stability; feed price declined from previous high level. In the future ten years, China's feed production and consumption will grow slowly, with an annual growth rate of 1.5% and 1.6% respectively, significantly lower than the 6.5% and 6.6% over the past ten years. It is predicated that by the end of the 13th FYP period, the total production and consumption will reach 208.68 million tons and 206.58 million tons and reach 225.51 million tons and 223.59 million tons respectively by the end of the outlook period. As for market price, domestic corn temporary stock policy and the adjustment of growing area in the sickle-shaped region will affect the price of raw materials of feed. It is predicated that feed market price will continue declining during the 13th FYP period; with the adjustment of the supply of raw materials, the market price will grow mildly from the end of the 13th FYP period to the end of the Outlook period. China's feed industry and economic development will enter into the New Normal concurrently.

12.1 General outlook

With the improvement of people's living standards, the acceleration of urbanization, in particular the implementation of the universal two-child policy, the population growth rate will increase and the demand for animal products will show an upward trend. There remains some market potential for China's feed industry; in particular, with the transformation of the mode of animal farming and the accelerated development of standardized and large-scale animal farming, feed industry will play a more prominent supporting role to the animal farming industry. In the meantime, with national economy entering into the New Normal and the further adjustment of the animal farming industry, feed industry will be greatly influenced. The profit margin of traditional feed products will be squeezed, while technically demanding feed products such as aquatic feeds, milk replacer for suckling pigs still enjoy some profits, and ruminants' feed enjoys bigger development potential. In addition, structural problems

with the raw material supply of feed in China are prominent with remarkably increased emergencies and non-traditional risks.

The production of China's feed industry will grow slowly. It is predicated that the total feed production will reach 196.87 million tons in 2016. During the Outlook period, the average annual growth rate is forecast to be only 1.5%, significantly lower than the 6.5% over the past ten years. The total production will reach 208.68 million tons by the end of the 13th FYP period and reach 225.51 million tons by 2025. The increase of total feed production is mainly driven by the increase of the production of compound feed, which will reach 201.05 million tons by 2025, with an average annual growth of 1.8%, accounting for 89.1% of the total industrial feed production. In terms of the animal farming structure, the advantage of ruminants' feed will become more obvious and the production will grow significantly faster than feed for pig, meat poultry and egg poultry during the same period.

China's industrial feed consumption will grow steadily. The total utilization of industrial feed will reach 194.51 million tons in 2016 and up by 1.5% over 2015. During the Outlook period, China's total feed demand will grow at an annual rate of 1.6%, a stark comparison with the 6.6% over the past ten years. The total utilization of industrial feed will reach 206.58 million tons by the end of the 13th FYP period, and 223.59 million tons by 2025, up by 17.4% over the base period. The improvement of the feed conversion rate and the change of animal farming structure will save the consumption of feed grain to a certain degree.

The price of China's feed products will drop first and then rise. In the short term, the oversupply of agricultural commodities will continue; the drop of price of raw materials of major feed will pull down feed cost. It is predicated that the average market price of compound feed for domestically fattening pig, broilers and layers will continue with the declining trend. With the launch of the supply-side structural reform, the adjustment of production structure and the gradual recovery of global economy after overall depression, the consumption demand and price level will rise and the feed price will recover and rise by the end of the 13th FYP period.

12.2 Production outlook

The scale of operation of the feed industry is getting larger. After 20 years of high-speed development and with the gradual disappear of dividends of large-scale animal farming operations, feed production will enter into a phase of saturation. Feed industry will gradually transition from capacity expansion to internal structure optimization and the

improvement of industrial efficiency. With the current trend of development of animal farming sector, feed industry will also move towards scale development. Some small feed enterprises with scattered products will exit the market, and large-scale group enterprises with refined product segmentation will become major players on the market. In addition, with the vertically integration of large-scale animal farming enterprise, feed supply will be incorporated into the enterprise industrial chain, thus bringing challenges to the traditional model of feed supply.

During the Outlook period, production growth will obviously slow down. In terms of the cycle of industrial development, pig and poultry farming has generally crossed the growth period and entered into the maturity period and demonstrates a feature of gradual development; herbivorous animal farming is transforming the model of production, yet the feeding technique is not yet improved; ruminant feed enjoys big room for improvement. In the future ten years, China's feed industry will continue enjoying a position with China as a big feed producer in the world, yet the production growth will obviously slow down. In the short run, with the improvement of animal farming returns, feed production will increase slightly, and is predicated to recover to 196.87 million tons in 2016, up by 1.3% over 2015. In the long run, the steady development of the animal farming industry puts forward rigid demand for feed, thus ensuring growth potential for the production of China's feed industry. It is predicated that the total feed production will reach 208.68 million tons by 2020, and increase to 225.51 million tons by the end of the Outlook period, up by 16.7% over the base year. During the Outlook period, the total production of China's feed industry will only grow at an annual rate of 1.5%, remarkably lower than the 6.5% average annual growth rate of the past ten years (Figure 12-1), this is in line with the slowdown trend of the production of animal products in China in the future ten years.

Feed product structural optimization will be stepped up. With the steadily scaled up operation of China's animal farming industry, the proportion of compound feed will continue to grow; the structure of China's feed production will further concentrate and optimize; the growth of the overall production of China's feed industry is mainly driven by the increase of production of compound feed. It is predicated that by the end of the 13th FYP period, the production of compound feed in China will reach 182.96 million tons, and reach 201.05 million tons by 2025, with an average annual growth rate of 1.8%, slightly higher than the 1.5% for total production of the feed industry; compound feed will account for 89.1% of the total production of the feed industry. The production of concentrated feed will drop year on year and is predicated to reach 19.19

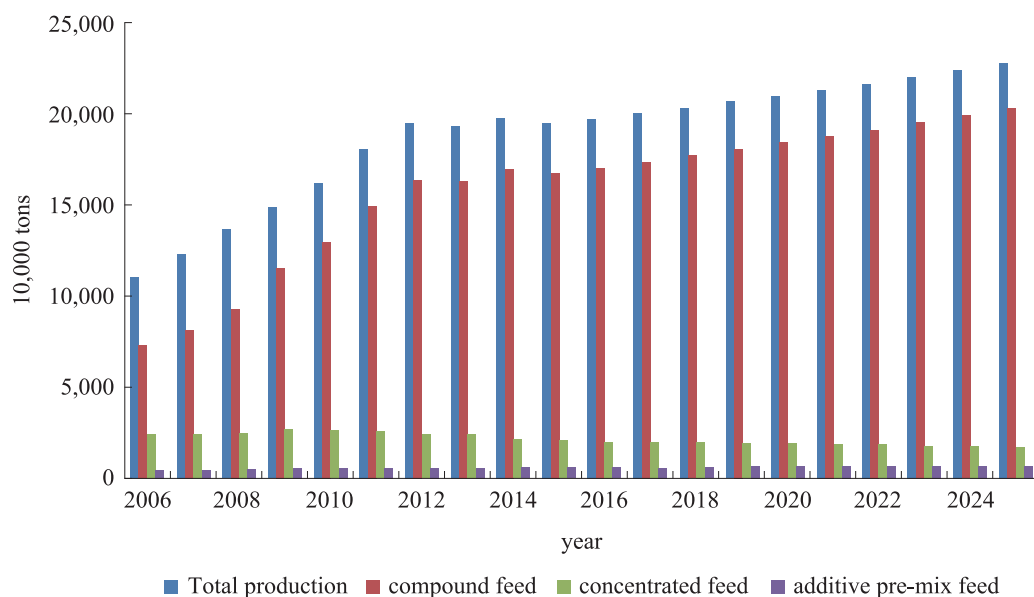


Figure 12-1 China's feed production 2006 – 2025

Source: CAMES, Agriculture Information Institute, CAAS.

million tons by the end of the 13th FYP period, and 17.53 million tons by the end of the outlook period, 21.2% lower than the base period; the proportion of concentrated feed in the total feed production will also decline to 7.7%. During the Outlook period, the production of additive pre-mixed feed will grow at an average annual rate of 1.4%, and is predicated to reach 6.54 million tons by the end of the 13th FYP period and 6.94 million tons by 2025, 10.2% higher than the base period.

Ruminants' feed will become a new engine for growth. Commensurate with the structure of animal farming in China, feed for pig, meat poultry and egg poultry is the mainstay of China's industrial feed. The production of pig feed, meat poultry feed and egg poultry feed is forecast to reach 80.21 million tons, 54.68 million tons and 29.81 million tons respectively in 2016, and reach 84.50 million tons, 57.58 million tons and 31.02 million tons by the end of the 13th FYP period, and reach 91.03 million tons, 61.42 million tons and 32.60 million tons by the end of the Outlook period, with an average annual growth rate of 1.4%, 1.3% and 1.0%, lower than the 8.2%, 7.6% and 3.5% over the past ten years. Due to the gap of beef and mutton supply in China, the demand for ruminants' feed will continue to grow. Currently, the proportion of ruminants' feed in China is far lower than the 25% – 30% share in the world feed structure; therefore, there remains huge room for growth. The MOA issued the cultivation plan for the sickle-shaped region, which stipulates reducing the cultivation area of corn, developing silage feed, forage, and alfalfa cultivation and supporting

farming of herbivorous animals, thus supporting the growth of ruminants' feed. It is predicated the production of ruminant feed will increase to 10.45 million tons by the end of the 13th FYP period, reach 12.41 million tons by 2025, with an average annual growth rate of 3.5%, obviously higher than that of pig feed, meat poultry feed and egg poultry feed (Figure 12-2). In addition, the production of aquatic animal feed will maintain an average annual growth rate of 1.6% during the Outlook period and is predicated to reach 19.57 million tons and 21.19 million tons at the end of the 13th FYP period and the end of the Outlook period.

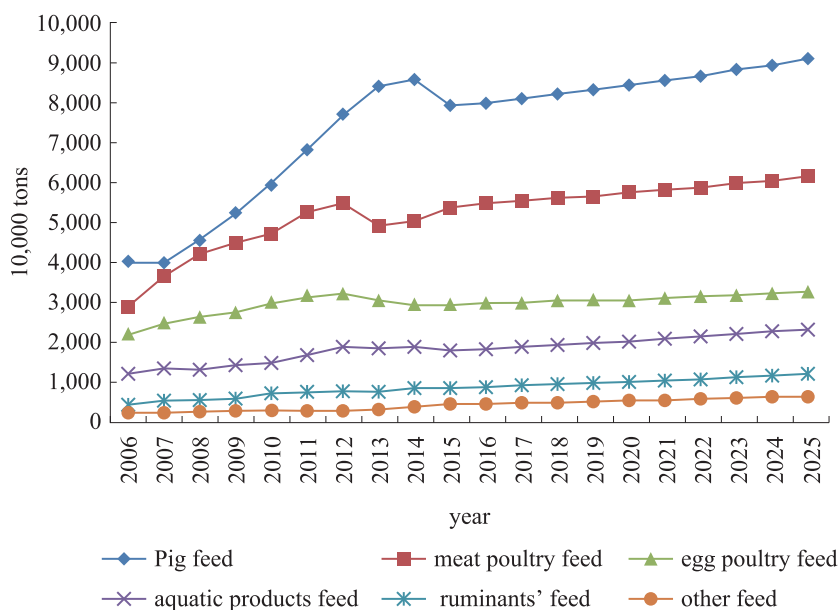


Figure 12-2 Production of major feed products in China 2006 – 2025

Source: CAMES, Agriculture Information Institute, CAAS.

12.3 Consumption outlook

China's industrial feed demand will grow steadily. Under the New Normal, the growth of consumption of animal products in China will slow down, which will exert negative impact on the demand for feed; however, considering the rising demand for diversified and high quality feed products, particularly with the emerging of new type of animal farming operations, and the rapidly scaled up and intensive production, feed demand will grow steadily. In the short term, with the recovery growth of domestic price of animal products, demand for feed consumption will gradually recover; the growth of consumption demand will mainly be driven by compound feed. The total utilization of

industrial feed in China will reach 194.51 million in 2016, up by 1.8% over 2015. In the long run, with the steady development of domestic livestock industry, the proportion of industrial feed in pig farming will be improved; after the transformation of farming model for ruminants, feeding technology will be improved to meet the special digestion requirement of ruminants, providing huge potential for feed demand, and rendering important support for the growth of demand for consumption of industrial feed in China. It is predicated that the total utilization of industrial feed in China will reach 206.58 million tons by the end of the 13th FYP period, and reach 223.59 million tons by 2025, up by 17.4% over the base period; however, the average annual growth rate of total feed demand will only be 1.6%, a stark comparison to the 6.6% over the past ten years.

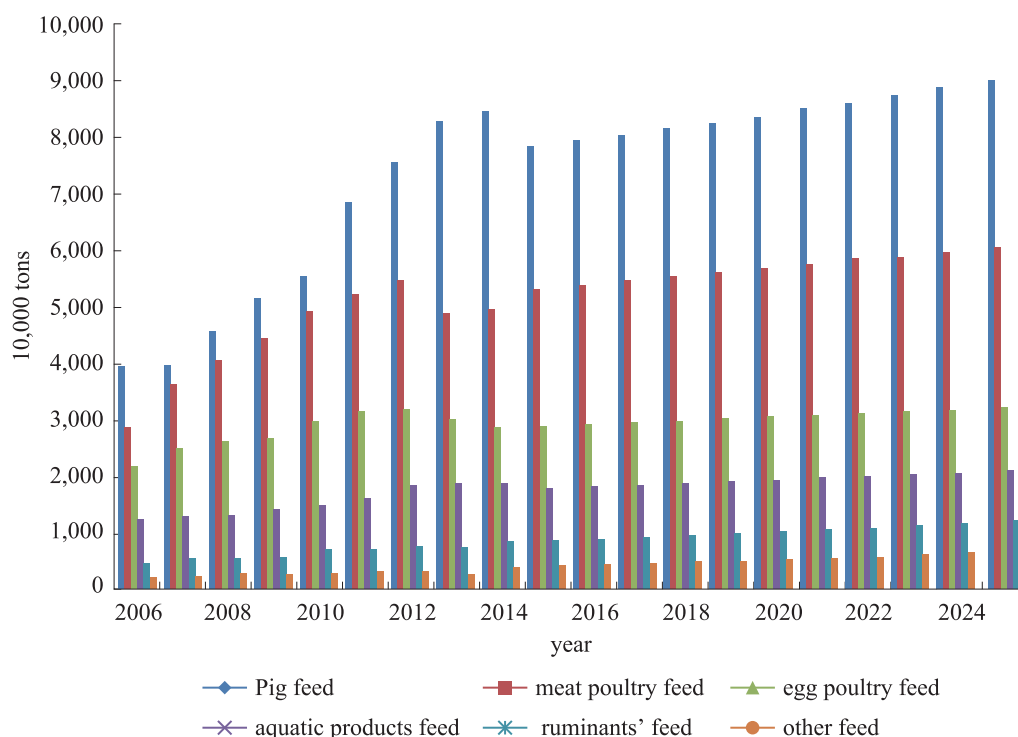


Figure 12-3 China's feed consumption 2006 – 2025

Source: CAMES, Agriculture Information Institute, CAAS.

The improvement of animal farming technologies will effectively reduce feed consumption. During the Outlook period, the average annual growth rate of the consumption of pig feed, meat poultry feed, egg poultry feed, ruminants' feed and aquatic animal feed are predicated to reach 1.4%, 1.3%, 1.0%, 3.5% and 1.6% respectively, lower than the 7.5%, 6.9%, 3.2%, 7.2% and 4.1% over the past ten years. The consumption of pig feed, meat poultry feed, egg poultry feed, ruminants' feed and aquatic animal feed will reach 83.71 million tons, 56.99 million tons, 30.64

million tons, 10.45 million tons and 19.57 million tons by the end of the 13th FYP period, and reach 90.23 million tons, 60.61 million tons, 32.25 million tons, 12.37 million tons and 21.08 million tons by the end of the Outlook period (Figure 12-6). The consumption of industrial feed in China did not show the same year on year growth as the production of various animal products, since the improvement of feeding techniques, and the breeding of livestock has enhanced the feed conversion rate. With the acceleration of IT application in agriculture and the development of intelligent agriculture, more precise farming and feeding technologies and information management tools have been applied in the animal farming sector, which will enhance the feed utilization rate and save feed. In addition, livestock feeding structure will also affect the utilization of feed. The improvement of domestic animal farming structure, the transfer to grain-saving breeds in meat production, the declining share of pork production and the rising share of beef and mutton, will save feed grain consumption to a certain degree.

12.4 Price outlook

Feed product price will recover and market will fluctuate. With the launch of the supply-side structural reform in agriculture, the No.1 central document for 2016 put forward that efforts should be made to improve the pricing mechanism and collection and storage policy of grain and other important crops, steadily advance the reform of corn collection and storage system, so that corn price could reflect the relationship of supply and demand of the market. In the short term, the oversupply of global agricultural products will continue; the appreciation of USD will bring negative impact on commodity price; the continuous declining price of raw materials of major feeds such as corn and meal has decreased feed production cost, thus bringing negative impact on the market price of feed products; currently, the average price of major feed products in China has almost double that of foreign countries, leaving certain room for adjustment. It is predicated that the average market price of compound feed for fattening pig, broiler and layers in China will continue to decline.

In the long run, the adjustment of domestic corn production capacity and stock will be completed by the end of the 13th FYP period, and corn market will show a new supply landscape. Global economy will gradually recover after overall depression, which will raise consumption demand and price; therefore, the market price of China's feed products will recover and rise. Market-based pricing of domestic feed products will become the hallmark of market of major feed products in the future ten years.

Annex

Supply-demand balance sheet of
major agricultural commodities

Table 1 China rice balance sheet 2015 – 2025

Unit: 10,000 tons

Category	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Production	14,577	14,629	14,555	14,441	14,399	14,355	14,400	14,461	14,462	14,449	14,422
Import	338	324	364	361	354	342	337	328	346	351	343
Consumption	14,521	14,562	14,633	14,699	14,755	14,801	14,842	14,894	14,944	14,991	15,029
Food grain consumption	10,735	10,747	10,780	10,818	10,845	10,868	10,879	10,900	10,922	10,943	10,957
Feed consumption	1,014	1,000	1,029	1,044	1,054	1,062	1,069	1,075	1,085	1,094	1,103
Industrial consumption	1,301	1,334	1,368	1,399	1,427	1,452	1,475	1,498	1,520	1,542	1,562
Seed use	159	159	158	157	156	155	155	156	156	155	155
losses	1,312	1,322	1,298	1,282	1,273	1,264	1,264	1,265	1,261	1,257	1,252
Export	29	80	70	60	50	50	50	50	50	50	50
Balance change	365	311	217	43	-52	-154	-155	-155	-186	-242	-314

Table 2 China wheat balance sheet 2015 – 2025

Unit: 10,000 tons

Category	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Production	13,019	13,010	13,063	13,115	13,168	13,191	13,226	13,238	13,251	13,265	13,279
Import	275	274	238	220	201	214	213	251	283	276	254
Consumption	11,966	12,027	12,187	12,348	12,494	12,630	12,752	12,880	13,011	13,141	13,263
Food grain consumption	8,510	8,536	8,578	8,622	8,658	8,690	8,711	8,739	8,767	8,795	8,816
Feed consumption	1,100	1,069	1,116	1,163	1,207	1,249	1,291	1,335	1,384	1,435	1,488
Industrial consumption	1,376	1,444	1,515	1,584	1,650	1,713	1,773	1,829	1,885	1,937	1,986
Seed use	459	459	458	458	457	457	457	456	456	455	455
losses	521	519	520	521	521	521	521	520	519	519	518
Export	20	20	20	20	20	20	20	20	20	20	20
Balance change	1,307	1,237	1,094	967	855	755	667	589	503	379	250

Note: data in the table refers to market year (from June of the current year to May of the next year)

Table 3 China corn supply and demand balance sheet 2015 – 2025

Unit: 10,000 tons

Category	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Production	22,458	21,517	20,747	20,354	20,472	20,567	20,696	20,795	20,946	21,036	21,229
Import	473	25	10	10	5	3	10	50	75	150	200
Consumption	17,755	19,751	20,722	21,364	21,713	22,192	22,337	22,500	22,517	22,621	22,699
Food grain consumption	716	719	721	724	726	728	730	732	734	736	737
Feed consumption	10,501	11,920	12,574	13,049	13,361	13,733	14,045	14,389	14,679	14,999	15,216
Industrial consumption	5,126	5,575	5,867	6,055	6,126	6,274	6,157	6,025	5,801	5,629	5,530
Seed use	172	166	160	157	156	155	155	155	155	155	155
losses	1,240	1,371	1,399	1,379	1,343	1,302	1,250	1,198	1,147	1,101	1,060
Export	1	170	230	150	50	30	5	3	2	3	1
Balance change	5,175	1,622	-195	-1,150	-1,286	-1,652	-1,636	-1,657	-1,498	-1,437	-1,270

Table 4 China cotton supply and demand balance sheet 2015 – 2025

Unit: 10,000 tons											
Category	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Production	560.5	515.7	489.9	492.3	494.8	495.8	497.8	482.8	473.2	466.1	467.0
Import	145.2	100.1	102.3	105.2	106.3	112.1	120.1	125.2	150.4	158.0	156.8
Consumption	735.7	715.8	742.2	747.5	751.1	707.9	697.9	688.0	703.6	704.1	703.8
Export	1	1	1	1	1	1	1	1	1	1	1
Balance change	-30	-100	-150	-150	-150	-100	-80	-80	-80	-80	-80

Table 5 China soybean supply and demand balance sheet 2015 – 2025

Unit: 10,000 tons											
Category	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Production	1,161	1,203	1,243	1,273	1,307	1,346	1,372	1,398	1,426	1,455	1,485
Import	8,174	8,228	8,247	8,365	8,492	8,556	8,621	8,773	8,792	8,821	8,864
Consumption	8,953	9,169	9,352	9,528	9,711	9,902	10,145	10,277	10,396	10,542	10,795
Crushing consumption	7,837	8,019	8,194	8,326	8,440	8,553	8,708	8,824	8,895	8,997	9,223
Food use consumption	956	988	994	1,035	1,102	1,179	1,266	1,279	1,327	1,370	1,396
Seed use consumption	55	56	57	57	58	60	60	61	61	62	62
losses	105	107	108	109	110	110	111	113	113	113	114
Export	13	17	18	21	22	23	23	24	24	25	25
Balance change	369	246	120	89	66	-23	-175	-130	-202	-290	-471

Table 6 China vegetable oil supply and demand balance sheet 2015 – 2025

Unit: 10,000 tons											
Category	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Production	2,660	2,663	2,654	2,665	2,701	2,745	2,750	2,764	2,782	2,795	2,834
Import	679	685	625	550	560	545	528	505	485	460	435
Consumption	3,150	3,160	3,188	3,206	3,222	3,230	3,259	3,285	3,302	3,315	3,327
Export	14	14	14	14	14	14	14	14	14	14	14
Balance change	175	174	77	-5	25	46	5	-30	-49	-74	-71

Note: import does not include palm stearin.

Table 7 China sugar supply and demand balance sheet 2015 – 2025

Unit: 10,000 tons											
Category	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Production	1,056	900	910	978	1,027	1,078	1,056	1,035	1,014	1,065	1,118
Import	481	466	523	576	618	639	681	722	773	826	849
Consumption	1,510	1,540	1,570	1,602	1,635	1,666	1,701	1,734	1,769	1,805	1,841
Industrial consumption	966	987	1,005	1,025	1,048	1,083	1,106	1,144	1,167	1,192	1,215
Food use consumption	544	553	565	577	587	583	595	590	602	613	626
Export	6	6	6	7	7	7	8	8	8	8	9
Balance change	21	-130	-130	-68	-16	6	-19	-49	-64	-6	22

Note: year refers to crop year (from October of the current year to September of the next year).

Table 8 Vegetable supply and demand balance sheet 2015 – 2025

Category	Unit: 10,000 tons										
	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Production	76,918	77,403	77,927	78,308	78,543	78,780	78,887	78,752	79,155	79,494	79,832
Self-incurred loss	27,113	27,299	27,464	27,560	27,221	27,071	27,157	26,905	26,815	26,718	26,664
Commodity production	49,804	50,104	50,463	50,748	51,322	51,709	51,729	51,847	52,340	52,776	53,168
Import	24	27	29	32	35	39	43	49	56	59	65
Consumption	47,734	48,265	48,929	49,449	49,887	50,412	50,883	51,162	51,609	51,830	52,100
Food use consumption	20,344	20,576	20,935	21,277	21,529	21,841	22,112	22,235	22,472	22,686	22,881
Processing consumption	10,599	10,919	11,229	11,439	11,651	11,878	12,077	12,246	12,490	12,514	12,635
Other consumption	5,346	5,351	5,364	5,378	5,403	5,420	5,440	5,444	5,456	5,463	5,482
losses	11,445	11,419	11,401	11,355	11,304	11,273	11,254	11,238	11,192	11,167	11,101
Export	1,019	1,039	1,060	1,081	1,103	1,125	1,147	1,170	1,194	1,217	1,242

Note: 1. Ending stock refers to beginning inventory, i.e. vegetable quantities maintained in a certain way after the consumption of the previous phase. 2. Production refers to the production harvested on the field and is generally the vegetable production used in statistics. 3. Self-incurred loss refers to the special loss of vegetables from discarding, water loss and rotting, from field to the end sales, involving harvesting, sorting, storage, transportation and marketing. 4. Commodity production refers to the quantity of vegetables ready for purchase by consumers after transportation, storage, wholesaling or retailing. 5. Food use consumption refers to home consumption and out – of – home consumption mainly in the form of fresh vegetables. 6. Other consumption includes feed and other relevant consumption. 7. losses refers to the general loss of vegetables after purchase in the process of consumption, processing and cooking. 8. Ending stock refers to ending inventory.

Table 9 Fruits supply and demand balance sheet 2015 – 2025

Category	Unit: 10,000 tons										
	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Production	27,146	27,501	27,937	28,355	28,762	29,157	29,517	29,844	30,107	30,418	30,705
Import	412	450	480	510	540	570	586	602	618	634	650
Consumption	26,585	27,090	27,624	28,133	28,604	29,061	29,458	29,808	30,142	30,465	30,766
Direct consumption	12,548	12,808	13,062	13,301	13,508	13,705	13,857	13,976	14,109	14,213	14,308
Processing consumption	2,690	2,810	2,929	3,047	3,163	3,278	3,393	3,505	3,611	3,715	3,815
losses	11,347	11,473	11,632	11,785	11,934	12,078	12,209	12,328	12,422	12,536	12,643
Export	423	440	473	505	538	570	586	602	618	634	650
Balance change	550	421	321	228	160	96	58	35	-36	-47	-62

Table 10 China Pork supply and demand balance sheet 2015 – 2025

Category	Unit: 10,000 tons										
	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Production	5,487	5,460	5,560	5,648	5,730	5,830	5,920	6,005	6,100	6,180	6,250
Import	78	85	70	72	75	70	75	76	80	90	90
Total supply	5,565	5,545	5,630	5,720	5,805	5,900	5,995	6,081	6,180	6,270	6,340
Total demand	5,565	5,545	5,630	5,720	5,805	5,900	5,995	6,081	6,180	6,270	6,340
Consumption	5,545	5,530	5,610	5,699	5,783	5,880	5,974	6,061	6,160	6,250	6,320
Direct consumption	4,146	4,101	4,098	4,125	4,185	4,219	4,235	4,247	4,262	4,283	4,293
Processing consumption	960	988	1,071	1,126	1,141	1,194	1,271	1,341	1,420	1,485	1,540

Category	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Other consumption	439	437	441	448	457	467	468	473	478	482	487
Export	20	15	20	21	22	20	21	20	20	20	20

Note: Amount of direct consumption includes resident consumption inside and outside home. Pork refers to fresh and frozen pork.

Table 11 China poultry supply and demand balance sheet 2015 – 2025

Unit: 10,000 tons

Category	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Production	1,826	1,845	1,875	1,905	1,933	1,968	2,002	2,032	2,066	2,097	2,124
Import	41	40	41	42	44	46	47	48	50	51	53
Consumption	1,818	1,837	1,863	1,899	1,930	1,961	1,997	2,030	2,062	2,100	2,125
Direct consumption	1,640	1,656	1,679	1,703	1,746	1,774	1,797	1,827	1,863	1,877	1,902
Processing consumption	109	111	112	124	126	128	140	142	145	168	170
Other consumption	69	70	71	72	58	59	60	61	54	55	53
Export	48	48	48	49	49	50	51	52	52	53	54
Balance change	1	0	5	-1	-2	3	1	-2	2	-5	-2

Note: processing consumption refers to deep processing; other consumption includes wastage etc.

Table 12 China beef supply and demand balance sheet 2015 – 2025

Unit: 10,000 tons

Category	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Production	700	715	732	748	766	785	802	814	827	838	850
Import	47	53	59	64	70	75	81	87	92	98	105
Consumption	747	768	790	812	835	860	882	900	918	935	954
Direct consumption	628	646	665	684	704	725	744	760	776	790	808
Processing consumption	91	93	95	97	100	102	104	106	108	109	111
Other consumption	28	29	30	31	32	33	34	34	35	36	36
Export	0.5	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.8	0.9	1.0

Table 13 China mutton supply and demand balance sheet 2015 – 2025

Unit: 10,000 tons

Category	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Production	441	440	451	467	488	510	525	537	545	554	560
Import	22	23	24	24	25	26	27	27	28	29	30
Consumption	463	463	474	491	513	535	551	564	573	582	590
Direct consumption	419	419	429	444	464	484	499	510	518	527	534
Processing consumption	26	26	27	28	29	31	32	32	33	33	34
Other consumption	18	18	18	19	19	20	21	21	22	22	22
Export	0.3	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.6	0.7	0.8

Table 14 China poultry egg supply and demand balance sheet 2015 – 2025

Unit: 10,000 tons											
Category	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Production	2,999	3,022	3,051	3,081	3,111	3,143	3,173	3,203	3,232	3,262	3,291
Import	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
Consumption	2,985	3,010	3,040	3,070	3,102	3,133	3,163	3,193	3,221	3,250	3,279
Direct consumption	2,279	2,298	2,319	2,342	2,366	2,389	2,412	2,434	2,455	2,474	2,492
Processing consumption	457.90	462.77	468.13	474.08	480.26	486.61	492.97	499.75	506.92	515.02	523.60
Seed use consumption and wastage	248.33	249.33	252.68	253.74	255.91	257.40	258.21	259.15	259.73	261.25	262.60
Export	9.76	9.50	9.50	9.50	9.50	9.50	9.50	9.50	9.50	9.50	9.50
Balance change	4.20	2.30	1.30	1.10	0.20	0.30	0.70	0.80	1.30	2.00	3.20

Table 15 China dairy products supply and demand balance sheet 2015 – 2025

Unit: 10,000 tons											
Category	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Production	3,890	3,879	3,976	4,080	4,158	4,200	4,266	4,315	4,368	4,420	4,500
Import	1,110	1,295	1,368	1,417	1,483	1,588	1,660	1,736	1,801	1,858	1,880
Consumption	5,010	5,182	5,333	5,482	5,621	5,758	5,886	6,006	6,119	6,223	6,320
Food use consumption	4,485	4,654	4,795	4,932	5,063	5,195	5,314	5,428	5,534	5,632	5,723
Feed use consumption	194	196	200	205	208	211	214	217	219	222	224
losses	117	116	119	122	125	126	128	129	131	133	135
Other consumption	214	216	219	223	225	227	230	232	234	236	238
Export	7	7	10	15	20	30	40	45	50	55	60

Note: import refers to the quantity of fresh equivalents.

Table 16 China aquatic products supply and demand balance sheet 2015 – 2025

Unit: 10,000 tons											
Type	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Production	6,690	6,805	6,917	7,014	7,100	7,180	7,253	7,321	7,384	7,443	7,498
Import	408	403	399	404	411	418	425	433	440	446	452
Consumption	6,692	6,813	6,929	7,027	7,117	7,203	7,280	7,353	7,420	7,483	7,542
Direct food use consumption	2,825	2,908	2,980	3,041	3,098	3,150	3,194	3,235	3,271	3,302	3,331
Processing consumption	2,280	2,340	2,400	2,459	2,516	2,573	2,630	2,686	2,740	2,793	2,845
losses	1,587	1,564	1,549	1,527	1,503	1,480	1,456	1,432	1,409	1,388	1,366
Export	406	396	387	391	393	395	398	401	403	406	408

Table 17 China feed supply and demand balance sheet 2015 – 2025

Unit: 10,000 tons											
Category	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Beginning stock	1,909	2,180	2,416	2,651	2,851	3,056	3,266	3,469	3,686	3,909	4,105
Production	19,436	19,687	19,973	20,264	20,561	20,868	21,183	21,509	21,846	22,193	22,551
Total supply	21,338	21,867	22,389	22,915	23,412	23,924	24,449	24,978	25,532	26,102	26,656
Total demand	21,338	21,867	22,389	22,915	23,412	23,924	24,449	24,978	25,532	26,102	26,656
Use	19,158	19,451	19,738	20,064	20,356	20,658	20,980	21,292	21,623	21,997	22,359
Ending stock	2,180	2,416	2,651	2,851	3,056	3,266	3,469	3,686	3,909	4,105	4,297