

China Agricultural Outlook (2018-2027)

Market Early Warning Expert Committee

Ministry of Agriculture and Rural Affairs

March 2018

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(In the order of the number of strokes in surnames)

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FOREWORD

The year 2018 marks the start for implementing the outcomes of the 19th National Congress of the Communist Party of China and the rural vitalization strategy, the 40th anniversary of the reform and opening up pioneered by rural reform, and is key to the smooth execution of the 13th Five-Year Plan. The Fifth China Agricultural Outlook Conference convened on 20-21 April 2018 and the China Agricultural Outlook Report issued by the Conference for the next ten years are important measures to learn and implement the Xi Jinping thought on socialism with Chinese characteristics for a new era and decisions and instructions of the Central Committee of the Communist Party of China (CPC) and the State Council and is crucial for leveraging information and markets to implement the rural vitalization strategy and promote agricultural and rural modernization. As an important outcome of the development of agricultural monitoring and early-warning system with Chinese characteristics, the China Agricultural Outlook Conference has played a significant role in regulating agricultural markets in a more science-based manner, enhancing the proactive response of various market players to market dynamics and constantly raising China's influence on the international markets.

The China Agricultural Outlook Conference 2018 is supported by the Market Early Warning Expert Committee of the Ministry of Agriculture and Rural Affairs (MARA) and co-organized by the Agricultural Information Institute of the CAAS, Information Center of the MARA, Rural Economy Research Center of the MARA and the Agricultural Trade Promotion Center of the MARA. The China Agricultural Outlook (2018-2027) released at the Conference is a baseline projection made by agricultural outlook expert teams on market supply-demand situation of agricultural products in China for the future ten years, on the basis of the outlook work done over the previous four years, taking into comprehensive analysis China's macroeconomics, agricultural policies, climate conditions, innovation of science and technology, resource endowment and the international market and by adopting the China Agricultural Monitoring and Early-warning System (CAMES) developed by the agricultural monitoring and early-warning innovation team of the AII of CAAS, in the background of dynamics of domestic and foreign agricultural market, policy and climate. The baseline data mainly comes from statistics publicly released by China statistics departments and the agricultural market monitoring data released by agricultural and rural departments, and also includes field survey data accumulated by relevant research institutions for years. The Market Early Warning Expert Committee of the MARA had in-depth and detailed studies on the main conclusions of the Outlook Report; experts of the national system of industrial technologies of modern agriculture provided important support in terms of data provision and conclusion consultation. Special thanks go to the Market and Economic Information Department and other departments and bureaus of the MARA for their valuable suggestions to revise and improve the China Agricultural Outlook (2018-2027) during opinion solicitation.

The China Agricultural Outlook (2018-2027) includes 12 chapters, covering 18 important agricultural commodities, such as grain, cotton, oilseeds, sugar, vegetables, fruits, meats, eggs, dairy and aquatic products. To be specific, Chapter 1 Overview is authored by market analyst Li Ganqiong; Chapter 2 Cereals is written by rice analysts, Peng Chao, Zhang Huan and Gao Qiang, wheat analysts Meng Li, Cao Hui and Sun Hao, and corn analysts Xu Weiping, Xi Yinsheng and Wu Tianlong; Chapter 3

Oilseeds and Oilseed Products is written by soybean analysts Yin Ruifeng, Zhang Zhen, Zhang Jing and Wang Yu, fat and oilseed analysts Zhang Wenli, Li Songlin and Xu Guodong; Chapter 4 Cotton is authored by cotton analysts Yuan Ruiling, Li Xiang and Zhai Xueling; Chapter 5 Sugar is edited by sugar analysts Ma Kai, Zhu Yawei, Xu Xue and Ma Guangxia; Chapter 6 Vegetables is authored by vegetable analysts Zhang Jing and Kong Fantao; Chapter 7 Fruits is edited by fruit analysts Zhao Junye and Wu Jie; Chapter 8 Meat is authored by pork analysts Zhu Zengyong, Li Mengxi and Zhang Xuebiao, poultry analysts Zhang Li and Zhu Haibo and beef and mutton analysts Zhu Cong, Qu Chunhong and Si Zhizhi; Chapter 9 Poultry Eggs is written by poultry egg analysts Zhang Chao and Yu Haipeng; 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 Tao Sha, Zhang Qiao and Zhang Jing.

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 agricultural outlook activities for 2018. The team of monitoring and early-warning innovation of agriculture in China led by Chief Scientist and Researcher Xu Shiwei has provided basic data system and CAMES model simulation and predication technology for the China Agricultural Outlook (2018-2027). Li Ganqiong, Wang Dongjie, Zhuang Jiayu, Liu Jiajia, Zhang Yongen, Wang Shengwei, Zhang Chao, Yu Wen, Zhou Han, Di Jiaying, Yu Haipeng, Wang Yu, Li Xian, Li Jianzheng, Chen Wei, Li Denghua, Li Yanni, Gao Liwei, Seng Shanshan, Wu Chen and other team members have undertaken a large amount of concrete and detailed work in data compilation and analysis, model improvement and calculation, report compilation and revision, consultations and discussion organization and Chinese-English translation; Pan Yuehong, Liu Hong, Wu Pei, Ren Yufeng and Zhang Zhiguang have made contribution to report editing and proofreading. In developing the Report, Shen Guiyin, Zhang Qiao, Li Zhiqiang and other experts reviewed the initial draft of the Report. The China Agricultural Science and Technology Press made efforts in type-setting and printing.

China has been issuing the China Agricultural Outlook Report for the future ten years for successive years, which signifies that China has scaled a new height in the capacity of agricultural monitoring, early-warning and research. However, it should be noted that since the mid- to long-term agricultural outlook is subject to the impact of multiple domestic and foreign uncertainties, the Outlook Report may make mistakes. Valuable opinions from colleagues at home and abroad are welcomed to improve the Outlook work in the future.

Report Drafting Group

15 April 2018

Summary

The China Agricultural Outlook (2018-2027) reviewed the market situation of grain, cotton, oilseeds, sugar, vegetables, fruits, meats, poultry eggs, dairy, aquatic products and feeds in 2017, and provided systematic outlook on the trend of production, consumption, trade and price for important years of 2018 and 2020 as well as the future ten years, based on appropriate assumptions on macroeconomic and social development and environment conditions of agricultural development in the future ten years, taking into comprehensive consideration of the baseline projection of the CAMES model and analysis and judgment of relevant experts.

China's macro-economy and policy assumptions for the next ten years. China's economy will switch to high quality growth, with an average annual growth rate of 6.1%; income of urban and rural residents will continue to grow, and their disposable income will grow at 3.6% and 6.6% respectively (after adjusting for price factors, with 2017 as the base period); total population will grow at an average annual rate of 2.73‰; urbanization rate will increase steadily; by 2020 and 2027, the urbanization rate of permanent residents will reach 61.3% and 65.4% respectively; CPI will fluctuate mildly within an appropriate range, with growth maintained at 2.2%-3.0%; RMB value will be basically stable, and the average annual nominal foreign exchange rate between RMB and USD will fluctuate within the range of 6.25-6.65; international crude price will recover and generally follow a trend of mild upward growth. For agriculture, policy dividends will be released continuously and rural vitalization strategy will open a new vista for agricultural development.

In 2017, China made new progress in the supply-side structural reform in agriculture. The output of main agricultural produce grew steadily; another bumper harvest was made in 2017 and total grain output ranked No. 2 in history and was maintained above 600 million tons for 5 consecutive years; the output of cotton, oilseeds and sugar crops were up by 3.5%, 2.8% and 1.7% over the previous year respectively; the supply of meat, eggs, milk, aquatic products, fruits, vegetables and tea were sufficient. **Agricultural production structure kept on improving;** significant outcomes were realized in reducing corn production, increasing soybean production, expanding forage production, adjusting pork production and raising milk production; the acreage of kernel corn was down by 50 million mu (3.33 hectares), over 10 million mu (0.67 hectares) of grain-producing areas were switched for feed crop production; and pig farming further concentrated in major corn producing regions. **The aggregate consumption of agricultural products continued to grow;** Food grain consumption declined steadily; feed use consumption and deep processing consumption of corn grew rapidly; the consumption structure of meat, dairy products and aquatic products continued to upgrade; the growth of vegetable oil consumption slowed down; and the consumption of vegetables and fruits continued to increase slightly. **Agricultural trade continued growing;** China imported 25.6 million tons of cereals and cereal flours, 95.54 million tons of soybean and 5.81 million tons of vegetable oil; the import of dairy products increased by 13.5%; China continued to running trade surplus for vegetables, fruits and aquatic products. **The overall price of agricultural products declined;** the minimum purchase price of rice was adjusted downward slightly; the minimum purchase price of wheat was stable; after the new season of corn entering into the market, corn purchase price was stable with slight

increase; the price of soybean, peanut and other oilseeds declined to varying degrees; the price of fresh and live produce was generally stable with slight decline.

In 2018, new progress will be made in the switch to high quality development in agriculture. China's agricultural development will be guided by the rural revitalization strategy. The supply-side structural reform will be deepened and agricultural production will grow strongly and the structure will continue to be optimized. Grain production capacity was further consolidated and improved; total output has remained stable at over 600 million tons. The supply of high-quality rice and strong and weak glutenous wheat continues to increase. The paddy area is expected to be reduced by more than 10 million mu (0.67 hectares) and the livestock production will increase steadily and the output of aquatic products will continue declining slightly. **The consumption of agricultural products will keep growing and consumption will be upgraded expeditiously.** Food grain consumption will remain stable; and the consumption of milk, beef, mutton and aquatic products will increase rapidly. The consumption of processed potatoes and corn will increase significantly, and consumer demand for green, diversified and brand products will grow rapidly. **The import of agricultural products will continue to increase with diverging pattern for imported items.** The import of cereals and soybean will slow down; pork import is expected to decline; the import of sugar, beef, mutton, poultry, cotton and milk will maintain rapid growth. **The price of agricultural products are expected to be generally stable with big fluctuations for selected items.** The characteristics of high price for high quality of rice and wheat and booming purchase and sales will be more obvious. Corn de-stocking will accelerate and the price will increase steadily; the downward pressure for price of oil, cotton and sugar will intensify; the price of fresh and live agricultural products will be generally stable; pork price will be stable with slight decline and the price of beef, mutton, poultry, aquatic products and feed will be stable with slight increase.

In the next 10 years, high-quality agricultural development will achieve remarkable results and the uneven and under development of agriculture will be effectively resolved. The comprehensive production capacity of agriculture will continue with the momentum of robust growth; cereals will be featured by basic subsistence instead of periodical sufficient supply. The output of major agricultural products will continue rising steadily; wheat output will remain stable; rice and corn output will fall before rise; sugar and mutton output will grow at an average annual rate of over 2.0%; dairy products, beef, feed, fruits, pork and poultry output will grow at an average annual rate of 1.0%-2.0%; the production of livestock products will shift towards the main grain producing areas, and the supply quality and efficiency will be significantly improved. **The consumption of agricultural products will grow steadily and consumption will upgrade in a notably accelerated manner.** With the increase of residents' income level, the popularization of nutrition knowledge and the acceleration of urbanization, the consumption of dairy products, beef, mutton and sugar will grow rapidly, with an average annual rate of over 2.0%, and the average annual growth rate of vegetables, fruits, poultry, soybeans and feed consumption will be 1.0%-2.0%. The demand for convenient and nutritious processed food will increase, and the consumption of processed potatoes, beef, pork, fruits and poultry will grow at an average annual rate of 4.0%-5.0%. **Trade in agricultural products will remain active with more diversified varieties and sources of import.** The average annual growth rate of imports of sugar, dairy products, aquatic products and mutton is estimated to be 12.3%, 3.3%, 1.7%, and 1.1%. The growth rate of soybean will slow

down to 0.6%, and the average annual growth rate of vegetable oil will drop to 1.8%. Countries that have entered into free trade zone agreements with China and countries along the Belt and Road will become important sources of China's agricultural import; the EU is expected to hold an important position in China's import of dairy products and other livestock products. **The price of agricultural products will be more subject to market influence and will follow a mild upward trend.** The market price formation mechanism for agricultural products keeps on improving; the price of rice and wheat will steadily decline in the first half of the outlook period; corn price will fluctuate more wildly; price of fresh and live products will be subject to prominent seasonal fluctuation. The price of agricultural products will rise steadily driven by cost, economic growth and other factors in the latter half of the outlook period.

Rice: output will remain stable and the total consumption will increase. In the future ten years, China's rice acreage will first shrink and then expand; with yield increasing constantly, total output will be stable. Food rice consumption will continue to grow; consumption as feed and for processing purposes will increase slightly; consumption as seeds and wastage will decline somewhat, and the total consumption will increase. Policy will affect price formation in the long run, and rice price will remain stable with steady increase. Affected by the overall price level at home and abroad, rice import will be stable; with de-stocking speeding up, export will continue to increase.

Wheat: production will remain stable and consumption will grow steadily. In the next 10 years, the area of wheat in China will stabilize after a slight drop, and the overall output will increase steadily. It is expected that the output in 2027 will reach 139.82 million tons with an average annual increase of 0.2%. Consumption will increase steadily and reach 13,526 million tons in 2027, with an average annual increase of 0.9%. Specifically, food, feed and industrial consumption will grow continuously; seed consumption and wastage will drop slightly. With the acceleration of China's food price support policy reforms, market will gradually play a decisive role in the formation of wheat price. It is expected that wheat market price will decline slightly in the next 1-3 years and will rise slightly in the long term.

Corn: production will concentrate towards advantageous producing regions, acreage will drop before rise and price will strengthen. In the next 10 years, the supply-side reform of corn will continue to deepen and comprehensive production capacity will continue to increase. After downward adjustment, acreage will increase steadily and stabilize at 530 million mu in 2027; output will recover to 238 million tons; thanks to the improvement of policy and market environment, feed corn consumption will increase rigidly and deep processing consumption will maintain rapid growth; with domestic and foreign prices intertwining, corn import will be maintained at 2-3 million tons; price will linger at a low level in the first half of the outlook period and rise in the second half.

Soybean: consumption demand will grow steadily and import will continue increasing. In the next 10 years, planting area is expected to be stable at no more than 126 million mu, yield will increase, and the total output will increase steadily and reach more than 16 million tons by 2027; driven by the increasing demand for crushing, processing and food use, consumption will increase steadily and reach 116.53 million tons by 2027, an increase of 10.9% over 2017; soybean under-supply will still be the norm, and soybean import will remain high during the outlook period, but the average annual growth rate will slow down to 0.6%, and soybean import will

exceed 100 million tons by the end of the outlook period.

During the outlook period, supported by demand, soybean price will generally be stable and will steadily increase at the latter half of the outlook period.

Oilseeds: the output will steadily increase and the consumption structure will further improve. In the next 10 years, given the structural adjustment of the crop production sector and technological advancement, oilseed output will increase steadily and reach 38 million tons by 2027. With the increase of the urbanization rate and the total population, the consumption of edible oilseeds is expected to reach about 152 million tons by 2027; the consumption of vegetable oil will increase steadily to about 34 million tons, with an average annual increase of 0.3% during the outlook period; the consumption structure of vegetable oils will upgrade significantly and diversified demands will become more apparent. The gap between the production and demand of oilseeds will remain high, and it is expected that the import of oilseeds for vegetable oil production will exceed 106 million tons by 2027.

Cotton: quality will steadily improve and acreage and output will decline. Affected by the declining relative efficiency and the rising production cost, the area and production of cotton in China both exhibit downward trends. Cotton acreage and output will reach 45.60 million mu (3.04 million hectares) and 5 million tons by 2027, down by 9.3% and 15.1% over 2017. Cotton quality will move closer to the needs of the textile industry and the overall quality will steadily increase. Production will further concentrate towards Xinjiang¹ and cotton areas in the hinterland will scale back; cotton consumption will follow a fluctuating downward trend and is expected to drop from 8.22 million tons to 6.5 million tons in 2017-2027, a decrease of 20.9%. Cotton import volume will first increase and then stabilize and is expected to reach 1.5 million tons by 2027, an increase of 36.4% over 2017.

Sugar: output will rise steadily, the consumption will generally increase and import will continue to grow. In the next 10 years, China's sugar crop planting area will remain basically stable, and the yield will increase. It is expected that China's sugar output will reach 11.91 million tons, consumption 18.32 million tons and import 7.3 million tons by 2027, an increase of 28.2%, 23.0% and 218.8% respectively over 2017. Due to the influence of a combination of factors such as supply and demand and international sugar price, China's sugar price is expected to fluctuate significantly in the next 10 years.

Vegetables: overall supply will be sufficient and trade surplus will remain. In the next 10 years, the acreage of vegetables in China will be basically stable with generally relaxed supply and demand relationship. The total output will increase at an average annual rate of 0.9% and reach 859.63 million tons by 2020; the commodity rate is expected to reach 68.4% by 2020 and exceed 70% by 2027; per capita consumption will grow steadily and vegetable wastage rate will decline; prices will rise will moderate seasonal fluctuation; the comparative advantage of international trade will enhance; surplus will remain and the net export will grow at an average annual rate of 3.9%.

Potato: output and consumption will both grow rapidly. In the next 10 years, with the further advancement of the supply-side structural reform in agriculture and the wide application of high yield cultivation techniques, potato output will increase

¹In this Report, the Xinjiang Uygur Autonomous Region is shorted as Xinjiang.

significantly and is expected to reach 130.49 million tons by 2020 and 166.47 million tons by 2027 with an average annual growth rate of 6.1%. With the implementation of the Potato as a Staple Food strategy and the popularization of health and nutrition concepts, potato consumption will also increase rapidly and is expected to reach 124.06 million tons by 2020 and 165.10 million tons by 2027, with an average annual growth of 6.2%. In the long run, the price of potato will rise under the impetus of rigid growth in production cost and the substantial increase in demand for staple food consumption. During the outlook period, the international competitiveness of Chinese potatoes will be further enhanced and the trade surplus will continue to expand.

Fruits: output growth will slow down, consumption will upgrade expeditiously and total import and export will expand. In the next 10 years, with the increase in area and yield, fruit output is expected to grow at an average annual rate of 1.6% and reach 337 million tons by 2027. Special varieties and categories will accelerate development and quality will improve rapidly. Both direct and processing consumption of fruits will increase; consumption structure will upgrade expeditiously with diversified forms of consumption. Production cost will drive up the average price of fruits; quality and limited quantity will become important factors affecting prices; booming import demand and export competitiveness will drive scaled up import and export and surplus will be maintained.

Pork: output growth will be strong first and stable latter, import tends to fall. In the next ten years, China's pig slaughtered number and pork production will grow at an average annual rate of 1.1% and 1.4% and reach 765 million pigs and 61.10 million tons of pork by 2027. Pork supply and per capita availability will grow at 1.2% and 1.0% annually on average and will reach 61.55 million tons and 43.08 kg respectively by 2027. Pig price will decline in the first half of the outlook period and recover at around 2020 and enter into the next round of price cycle. With the improvement of domestic pork production capacity and competitiveness, pork import is expected to gradually decrease, but will be maintained at a certain level.

Poultry: output will grow moderately and export will increase steadily. In the next 10 years, the quality and efficiency of poultry meat production will continue to increase, and the output will rise steadily. It is expected that the output will reach 21.63 million tons by 2027, an increase of 14.0% over 2017; consumption transformation will accelerate, the proportion of chilled consumption will increase significantly, and the total consumption will increase slowly by 1.3% annually; trade structure will be basically stable, and export is expected to increase at an average annual rate of 1.0%. Driven by the rising cost of feed, labor, epidemic prevention and environmental protection, poultry meat price will generally maintain an upward trend.

Beef and mutton: production and consumption will grow and beef import will continue to increase. In the next 10 years, with the advancement of science and technology and the improvement of large-scale production, the comprehensive production capacity of beef and mutton will continue to increase, and the output will increase at an average annual growth rate of 1.7% and 2.2% and reach 8.63 million tons and 5.81 million tons respectively by 2027; consumer demand will steadily increase with diversified consumption patterns; under the impetus of rigidly rising costs, price will rise moderately and fluctuate slightly from year to year; beef import will continue to increase, and mutton import will be relatively stable, and net import will remain. Beef import will reach 1.22 million tons by 2027, and mutton import at around 280,000 tons.

Poultry egg: production and consumption will grow at a slower rate. In the next 10 years, with the improvement of layer breeds and production management, poultry egg production will increase, reaching 33.22 million tons in 2027, an increase of 8.2% over 2017. Cost will rise; the area with poultry farming limitation and ban in the southern water network region will expand, accelerating the exit of small-scale farmers and farmers of extensive operation. The growth of poultry egg production in China will slow down, and the average annual growth rate will be 0.8% in the next 10 years. With population growth and the transformation and upgrading of consumption patterns, poultry egg consumption will grow steadily, reaching 33.09 million by 2027, an increase of 7.9% over 2017; driven by cost, the price of poultry egg will gradually increase with remarkable seasonal characteristics.

Dairy products: production and consumption will increase steadily and import will continue to grow. In the next 10 years, the comprehensive production capacity of the dairy industry will be significantly enhanced and production will gradually recover. The output of 2020 and 2027 is expected to reach 38.70 million tons and 43.8 million tons, an increase of 5.9% and 19.8% from 2017. The rise of younger generations of consumers will promote the acceleration of consumption upgrading and structural optimization. It is expected that consumption in 2020 and 2027 will reach 55.97 million tons and 63.61 million tons, respectively, 10.1% and 25.1% more than in 2017. Driven by price difference, import of dairy products will continue to increase and is expected to reach 17.32 million tons by 2020, an increase of 20.6% over 2017.

Aquatic products: output will drop first and then rise and consumption will continue to grow. In the next 10 years, the output of aquatic products will gradually shift from a continuous decrease to a slight increase; the output growth will slow down prominently, with an average annual increase of 0.2%. Specifically, aquaculture production will slowly increase, and catch production will continue to decline and gradually stabilize. Food use and industrial consumption of aquatic products will continue to increase, and the proportion of processing consumption in total consumption will continue to rise from 38.5% in 2017 to 40.7%. The overall export of aquatic products will remain stable, generally staying at 4 million tons; imports will continue to grow rapidly and is expected to reach 5.78 million tons by 2027.

Feed: output and consumption of industrial feed will steadily increase and price will move upward. In the next 10 years, industrial feed products will be upgraded and optimized, and production will continue to increase. At the end of the outlook period, the output will increase to 241.07 million tons. In terms of consumption, pig feed and aquaculture feed will be main drivers of demand growth. The increase in demand for poultry feed tends to be stable, and the development potential of ruminant feed is large. The total consumption in 2027 is expected to increase to 244.83 million tons; during the outlook period, main raw material supply will shift from being loose to tight, feedstuffs price will strengthen; the benefits of large-scale operation of feed enterprises will increase; unit production cost will decrease; and the price of feed products will increase steadily during the outlook period.