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Overview of the 12th Five Year Development Plan for the Chinese Food Industry: Cereal Processing

The food industry is a pillar of the Chinese national economy and a basic source of employment. It is also responsible for the important task of providing safe, secure, nutritious, and healthy foods for 1.3 billion people in China.

During the 11th five year plan period (2006–2010), the Chinese food industry maintained rapid growth (Table I). The gross output value of the food industry in 2010 was 6.1 trillion yuan RMB, accounting for 8.8% of the gross industrial output value; driving the development of agriculture and distribution and related manufacturing industries; and playing an important role in expanding domestic demand, increasing employment, promoting income, and ensuring stability.

The focus of the 12th Five-Year Planning Program for the National Economy and Social Development of the People's Republic of China (2011–2015) is to accelerate structural adjustments within the food industry, promote industry transformation and upgrades, establish a modern food industry system based on Chinese characteristics, and achieve sustainable healthy development. The 12th five year plan has been designed as the guidance document for development of the national food industry in China over the next five years.

Overall Food Industry Development Objectives

The current plan increases the focus on intensification, scale, quality, and safety within the food industry in China through 2015. The detailed objectives of the 12th five year plan include further optimization of regional distribution systems; formation of a modern food industry with the capacity for strong, independent innovation; ensuring food safety, nutrition, and health; development of stronger international competitiveness; enhancing the contribution of the food industry to society; solidification of the position of the food industry as a pillar in expansion of urban and rural consumption; driving related industry development; and facilitating social harmony and stability (Table II).

Improve Food Safety and Nutrition. The detailed objectives for food safety and nutrition include improving the food industry system of standards, intensifying the establishment of a system of food quality and safety standards, establishment (rectification) of 1,000 national and industry standards, and improving the food safety management system. Under the plan, large-scale food manufacturing enterprises will universally implement Good Manufacturing Practices. More than 60% of food processing plants will achieve hazard analysis and critical control point (HACCP) authentication. Food companies will establish credit management systems. Finally, the qualification rate for tested food quality will reach >97%, increasing consumer satisfaction with food products.

Scale Profits While Maintaining Rapid Expansion. While meeting market requirements and fulfilling the mandate to modernize, optimize, and upgrade, the food industry must be kept stable and maintain its rapid expansion. According to the most recent five year plan, by 2015 the gross output value of the food industry will reach ≈12.3 trillion yuan RMB (a 100% increase), with an average increase of 15% per year. Taxes generated by the food industry will reach 1.88 trillion yuan RMB (a 75% increase), with an average increase of 12% per year. The ratio of the gross output value of the food industry to agriculture will increase to 1.5:1.

Increase Ability to Innovate Independently. Breakthroughs will be sought in key technologies such as food safety controls, energy efficiency, environmental protection, etc. Meanwhile, food processing core technologies, as well as advanced equipment with independent proprietary intellectual property rights, will be developed and implemented. By 2015, R&D funding for food science research will account for 0.8% of the food industry output value, and the autonomization rate for key equipment will increase to >50%.

Sustained Optimization of the Organizational Structures. Strong, large-scale food enterprises and companies that can provide a driving force and that have good development prospects and a competitive advantage will be developed and fostered. The manufacturing concentration of key industries will be increased. According to the development plan, by 2015 there will be more than 50 food companies with sales >10 billion yuan RMB. Mid-sized and small food enterprises will be positioned to cater to specialized and niche markets, providing new advantages. Beneficial development will gradually be realized, and enterprises with outdated technologies will gradually be eliminated. Standards for outsourcing and common development of each type of enterprise will be established.

Increase Efficiency of Regional Distribution Structure. Coordinated development of the food industry in eastern, central, and western China will be instituted using the technological advantages of eastern China and resources of central and western China. Food processing enterprises will be encouraged and supported to centralize production around the industrial zone. Under the current plan, by 2015 the ratio of the gross output value of the food industry in central, western, and northeastern China to that of the entire nation will increase to ≈60%, and modern food industry zones with specific scales and strong regional influences will be developed.

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Increase the Effectiveness of Resource Utilization, Energy Savings, and Emission Reductions. By 2015, comprehensive utilization of food industry by-products will increase to >80%. CO_2 emissions per unit of gross domestic product will continue to decrease by ≈17%. Energy consumption will decrease by ≈16%, and total emissions of major pollutants will decrease by ≈10%.

Improve Product Perception. The percentage of high-tech, high value-added, and alternative nonfood products will gradually increase. The position of established and/or well-known shops or food industry enterprises will be solidified and strengthened. Efforts will be made to expand the popularity and market share of brand-name food products. New food brands will be fostered.

Development Direction and Cereal Processing Industry Keys

Keys to the overall development direction of the cereal processing industry in China include updating the structure of the industry, active development of the feed processing industry, regulation of the development of alternative cereal products for nonfood applications, and ensuring the security of the food and feed supply. Acceleration of product restructuring to achieve product serialization and diversification; development of international cooperation in cereal processing; encouragement for domestic enterprises to invest and produce outside China; and establishment of rice, corn, and soybean processing enterprises outside China are also included in current development plans.

Rice. The development strategy is to increase the production ratios of excellent, specialized, nutrient fortified, and unpolished rice, as well as rice with rice embryos; to actively develop main meal products, convenience foods, and snack foods from rice; to produce rice bran oil and protein, oryzanol, rice wax, inositol, etc. through focused utilization of rice bran resources; and to develop rice flour, vermicelli, starchy sugars, rice-based foods, etc. through effective utilization of broken rice resources.

Wheat. The development direction for wheat includes increasing the production ratio of specialized wheat flour for applications in cooking, baking, and quick-freezing to nutrient fortified flour, whole-wheat flour, etc.; accelerating and driving industrialization of production of traditional main meal products made with wheat flour; and encouraging large-scale enterprises to produce wheat germ oil and wheat germ-based foods with wheat embryos and to produce dietary fiber (nondigestible oligosaccharides) from wheat bran.

Corn. The direction for corn includes increasing the development of the corn feed industry; actively developing corn-based main meal products, snack foods, and convenience foods; strictly regulating alternative processing of corn for use by the biochemical industry in nonfood applications; and ensuring the demand for corn-based food and feed products.

Soybean. The development strategy includes an emphasis on developing soybean-based food and protein products, such as soybean flour and fermented, puffed, and protein products, etc.; increasing the number of applications for functional soybean protein in meat products, flour-based products, etc.; expanding R&D for development of functional soybean protein modification, dietary fiber, and polysaccharides, and new processing technologies for soybean-based products.

Potato and Minor Crops. For potato, the strategy includes emphasizing development of alternative applications for potato starch and by-products; encouraging development of French fries, potato chips, and other snack, convenience, and puffed foods made from potato starch or whole flour; and increasing comprehensive utilization of by-products such as potato residues, etc. For minor crops, the focus will be placed on expanding efforts to develop applications for main meal products; accelerating development of specialized premixed powder applications; and development of convenience foods such as multicereal and quick-freezing products.

Development of Cereal Industry Distribution Structure

Following the current plan, rice-processing industrial parks will be developed rapidly within the main rice production zone of northeastern China, the central and lower reaches of the Changjiang River, and the main rice commerce zone formed by the Changjiang River, the Zhujiang River, and Beijing, as well as Tianjin and important logistics nodes. An economic model for comprehensive utilization of rice bran, rice husks, and broken rice will be formed, and a series of large-scale key rice-processing enterprises (>800 tonnes/day) will be restructured and expanded.

Combining the requirements for consumption and establishment of a high-quality wheat production base nationally, a strong-gluten, strong- and middle-gluten, and weak-gluten specialized flour production base will be established in the Huang-Huai-Hai region of northwestern China. In the central

Table I. Output and average growth rates for major food groups in China during the 11th five year program

Food Product	Unit	Year		Cumulative Growth Rate (%)	Annual Growth Rate (%)
		2005	2010		
Rice	Thousand tonnes	17,662	82,444	366.7	36.1
Wheat flour	Thousand tonnes	39,923	101,185	153.5	20.4
Edible plant oil	Thousand tonnes	16,120	20,050	24.4	4.5
Meats	Thousand tonnes	77,000	79,250	2.9	0.6
Aquatic products	Thousand tonnes	44,199	53,730	21.6	4.0
Finished sugar products	Thousand tonnes	9,124	11,029	20.9	3.9
Dairy products	Thousand tonnes	12,044	21,596	79.3	12.4
Cakes and cookies	Thousand tonnes	429	1,505	250.8	28.5
Canned foods	Thousand tonnes	5,003	9,186	83.6	12.9
Alcoholic beverages	Million liters	35,658	56,736	59.1	9.7
White wine (65%, vol/vol)	Million liters	8,528	8,906	4.4	0.9
Beer	Million liters	31,261	44,831	43.4	7.5
Grape wine	Million liters	434	1,088	150.7	20.2
Soft drinks	Thousand tonnes	33,804	99,838	195.3	24.2
Refined tea	Thousand tonnes	524	1,430	172.9	22.2

Table II. Main indices of Chinese food industry development during the 12th five year program[a]

Index	Year 2010	Year 2015	Annual Growth Rate (%)	Attribution
Economies of scale				
Output value (trillion yuan RMB)	6.13	12.3	15	Expectative
Profit and tax (trillion yuan RMB)	1.07	1.88	12	
Industrial structure				
Number of large-scale enterprises or groups with sales income >10 billion yuan RMB	27	50	[23]	Expectative
Number of food industrial parks or groups			[200]	
Percentage of gross output value of food industry in central, western, and northeastern regions of China in relation to China as a whole	54.4	60	[5.6]	
Number of popular brands fostered			[300]	
Advances in science and technology				
Ratio of R&D scientific research funding to sales income (%)	0.4	0.8	[0.4]	Expectative
Independent exploitation rate of key equipment (%)	40	50	[10]	
Food safety				
Number of established and modified standards			[1,000]	Expectative
Percentage of food enterprises of a specific size that have passed HACCP authentication	50	60	[10]	Restrictive
Qualification rate for foods tested (%)	94.6	>97	[2.4]	
Resource utilization				
Comprehensive utilization ratio of by-products (%)	75	>80	[5]	Restrictive
Reduction in energy consumption per unit of gross domestic product (%)			[16]	
Reduction in water consumption per unit of industrial added value (%)			[30]	
Environmental protection				
Reduction in CO_2 emissions per unit of gross domestic product (%)			[17]	Restrictive
Reduction in chemical oxygen demand emissions (%)			[10]	
Reduction in nitric oxide emissions (%)			[10]	

[a] Absolute gross output value, profit, and tax were calculated based on 2010 prices. Growth rate was calculated based on fixed price; values in square brackets are cumulative numbers for the five years of the program.

and lower reaches of the Changjiang River, a series of large-scale key enterprises for processing wheat (>1,000 tonnes/day) will be restructured and established.

In the main corn production and processing region, mergers and reorganization will be increased to speed elimination of outdated technology; uncontrolled expansion of corn production for alternative nonfood applications will be curbed, and the quantity of corn processed for alternative applications will be controlled at sustainable levels. A large number of key high-tech enterprises that meet market requirements and have a stronger competitive force will also be established.

A soybean food processing base will be fostered to establish a soybean production region in northeastern China. Industrialization and standardization of production levels for bean curd and traditional soybean products will be increased, and new high-quality nutritious food products will be developed. Soybean processing for alternative nonfood applications will be supported to develop a soybean production region in the Huang-Huai-Hai region of China, and the industrial chain will be lengthened. Creation of new applications for soybean processing by-products will be encouraged to strengthen comprehensive utilization in coastal areas of China, and a base for producing high-grade feed proteins, fatty acids, and purified phospholipids will be constructed.

In the main production region for potatoes and sweet potatoes, a series of bases with the capacity to process 60,000 tonnes of fresh potatoes and 40,000 tonnes of fresh sweet potatoes per year will be developed. In the main cassava production region, modified cassava starch processing bases and plants capable of processing 200,000–300,000 tonnes of fresh cassava per year will be developed. Processing industries for minor crops will be developed in regions specific to crop production.

Summary of Cereal Industry Development Objectives

Based on the 12th five year development plan, by 2015 the gross output value of the cereal processing industry in China will reach 3.9 trillion yuan RMB, increasing an average of 12% per year. Ten large-scale cereal processing enterprises or companies with sales income >10 billion yuan RMB will be formed. The yield ratio of enterprises with rice processing >200 tonnes/day will be increased to >60%, and the yield ratio of enterprises with wheat processing >400 tonnes/day will be increased to >65%. Both will be 15% higher than the ratios for 2010.

Acknowledgments

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Resource

1. Ministry of Industry and Information Technology of National Development and Reform Commission. Pages 12-15, 24 in: 12th five-year developing plan of food industry. (In Chinese) National Development and Reform Commission, Beijing, People's Republic of China, 2011.