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# Development Status and Industrial Security Countermeasures of Maize Deep-processing Industry in Shandong Province——Based on the Actual Investigation in Five Cities and Counties of Shandong Province

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**Abstract** Corn deep processing industry is an important follow-up industry for corn production and processing. Shandong has numerous large-scale corn processing enterprises and is one of the fast-growing regions in China for deep processing of corn. The status of production and processing of corn in the major corn-producing areas of Shandong Province such as Dezhou, Liaocheng and Tai'an was investigated on the spot. It was found that the development of the corn industry in Shandong also has many problems, such as the mismatch between corn demand and production areas, the excessively small planting area of special corn and the poor communication between technology and demand, resulting in barriers in technology and raw materials in the production and processing links of corn and making it difficult to form a complete industrial chain system. According to the actual investigation, a highly efficient agricultural industry safety review mechanism was established based on the sound judgement of industrial safety to ensure the safety of the company's development, and at the same time, the interpretation and promotion of the strategy of going abroad was strengthened, so as to provide a full range of information services for corn processing enterprises and help to further develop and optimize the corn industry in Shandong.

**Key words** Corn industry security, Development status, Countermeasure analysis

## 1 Introduction

Corn deep processing industry is an important follow-up industry for corn production and processing. The current corn processing industry, as a raw material-oriented industry, is mainly distributed in China's Huang-Huai-Hai Plain and the Northeast Plain. The corn deep processing enterprises in Shandong Province are large in scale and large in quantity. At the same time, Shandong is one of the regions with the fastest development of corn deep processing in China. In 2012, Shandong's corn processing capacity exceeded 15 million t, reaching 15.668 million t for the first time. In the past five years, the annual corn conversion capability of Shandong's corn deep processing enterprises has all reached or exceeded 15 million t. Among them, the outputs of corn starch, starch sugar, corn monosodium glutamate, lysine and other corn deep processing products rank top in China.

Shandong's corn industry also has many problems at the same time of development and optimization. Due to the specificity of corn-producing areas, the corn demand and production area are not matched in the production process, the planting area of special corn is too small, and the communication between technology and demand is not smooth, leading to the presence of barriers in technology and raw materials of corn production and processing links

and making it difficult to form a complete industrial chain system. Based on this, the development status of corn production and processing industry in the major corn-producing areas of Shandong Province such as Dezhou, Liaocheng and Tai'an was surveyed. Through business interviews, the status of Shandong's corn processing industry was learned, and the market quotation, development status and development trend of China's corn processing industry, the differences in the level of technological development of the domestic and foreign corn processing industries, and the status quo and willingness of enterprises to use foreign capital were further recognized.

## 2 Development situation of corn production and processing industry

### 2.1 Situation of corn production in China and Shandong Province

Corn is one of the three major grains in China. In 2011, the corn planting area exceeded  $3.33 \times 10^7$  ha, reaching  $3.34 \times 10^7$  ha; in 2012, the total output of corn exceeded  $2.00 \times 10^8$  t, exceeding that of rice for the first time; and in 2015/2016, the output reached  $2.2458 \times 10^8$  t, accounting for 36.1% of the total grain output. At present, it is the grain crop in China with the largest planting area and total output. In 2008, the Chinese government began to implement the temporary reserve policy in order to increase the income of corn growers. The temporary reserve policy greatly mobilized the enthusiasm of farmers for planting corn. This has led to the recent increase in corn acreage, production and inventory<sup>[1]</sup>. Although corn production hit new highs,

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the price of domestic corn, due to the temporary reserve policy, has a disadvantage compared to corn imported from foreign countries such as the United States, and corn inflows continue to occur. In 2015/2016, the production of corn in China was  $2.25 \times 10^8$  t, and the imports were estimated to reach  $4.6 \times 10^6$  t. At the same time, for non-traditional food crops, the consumption of corn in 2015/2016 was only  $1.93 \times 10^8$  t. The expansion of imports and the insufficiency of consumption led to the increase in the government's temporary reserves. The pressure on the temporary reserve policy was increasing and the financial burden it brought was also increasing. The temporary reserve policy protected the interest of rural households through the government's compulsory intervention, but the market's adjustment of corn prices and production were weakened. In the process of implementation, business entities are the recipients of government-guided prices, and their profit and development space had been squeezed to a certain extent. The predicament in the development of the business entities, to a certain extent, also forced the government to reform the policy. On March 28, 2016, the National Development and Reform Commission announced the reform and adjustment of the corn temporary reserve policy, which had been implemented for eight years. In recent years, the purchase and reserve policy has resulted in corn production far exceeding market demand. Cancelling the purchase and reserve policy can, in a certain degree, be able to digest the huge domestic corn reserves and reduce the price of corn. At the same time, the level of corporate subsidies can be raised to bring new opportunities for development to corn processing companies.

Corn is one of the important crops in Shandong Province. The horizontal and vertical comparisons of the development of corn in China and Shandong Province from 2010 to 2015 were shown in Table 1 and Table 2. From the perspective of planting area, since

2010, China's corn planting area has been increasing. The growth rate of the area showed a slow decline year-on-year, and the trend of corn planting in Shandong Province is synchronizing with that of the whole country. The annual planting area of corn fluctuated by 8.5% of China's total area, and was significantly lower than the national level in terms of growth rate. In recent years, it has generally stabilized at around 1.5%<sup>[2]</sup>. From the corn production point of view, China's corn production was stable at about  $2.1 \times 10^8$  t, of which Shandong's output accounted for about 9.5%. The growth rate of corn production in Shandong Province fluctuated significantly. As a whole, the corn production in 2015 increased by 6.15% compared with that in 2010. The yield of corn in Shandong is basically stable, 10%–11% higher than the national average yield perennially, stable at the level of 6 450 kg/ha<sup>[3]</sup>.

In 2016, the National Development and Reform Commission canceled the corn temporary reserve policy. The adjustment and cancellation of the policy will, to a certain extent, impede farmers' enthusiasm for planting corn and reduce corn planting area<sup>[4]</sup>. According to the National Grain and Oil Information Center, China's corn planting area will be reduced by nearly 5% to  $3.63 \times 10^7$  ha in 2016, and production will decline by 2.3% compared with the previous year to  $2.015 \times 10^8$  t. It is estimated that the China's corn market will enter an adjustment period in the next few years. The area and output of corn will further decline, which will help adjust the structure of China's corn industry and reduce the impact of corn reserves on national fiscal and domestic markets under the previous policies. In Shandong Province, corn is mainly planted in the Huang-Huai-Hai Plain, and the cities with larger planting areas of corn were Dezhou, Heze, Weifang, Liaocheng and Jining, in which the planting area and output of corn account for 54.6% and 58.9% of the totals of the province.

**Table 1 Planting area of corn from 2010 to 2015**

Year	Planting area of corn//667 ha				
	China's total	China's year-on-year growth rate//%	Shandong	Shandong's year-on-year growth rate//%	Proportion of Shandong's planting area in China's total//%
2015	57 178.97	2.68	4 760.70	1.51	8.33
2014	55 685.09	2.22	4 689.71	2.15	8.42
2013	54 477.60	3.68	4 591.07	1.41	8.43
2012	52 544.73	4.44	4 527.10	0.74	8.62
2011	50 312.51	3.20	4 493.80	1.37	8.93
2010	48 750.18		4 432.90		9.09

**Table 2 Trend of corn production in China and Shandong Province from 2010 to 2015**

Year	Corn production// $\times 10^4$ t					Yield//kg/ha		
	China	China's growth rate//%	Shandong	Shandong's growth rate//%	Proportion//%	China	Shandong	Increase//%
2015	22 463.16	4.17	2 050.90	3.15	9.13	5 892.90	6 462.00	9.66
2014	21 564.63	-1.30	1 988.34	1.08	9.22	5 808.90	6 360.00	9.49
2013	21 848.90	6.26	1 967.14	-1.37	9.00	6 015.90	6 427.05	6.83
2012	20 561.41	6.66	1 994.51	0.80	9.70	5 869.65	6 609.00	12.60
2011	19 278.11	8.77	1 978.67	2.41	10.26	5 747.55	6 604.95	14.92
2010	17 724.51		1 932.07		10.90	5 453.70	6 538.05	19.88

## 2.2 Use of corn and development situation of corn processing industry

At present, the use of corn in China is mainly divided into two directions: one is primary processing such as feed processing, and the second is deep processing such as food and industrial processing. Food processing is mainly based on starch processing. Starch products account for about 55% of China's corn deep processing products. With the further development of corn processing technology, the product structure of starch processing in China is constantly changing. The proportion of corn for deep processing will further increase. The primary processing of corn is mainly based on the processing of primary starch, corn oil, protein powder and other by-products. As technology advances, more and more companies are beginning to process starch secondarily, and a variety of products such as sugar and modified starch are produced. Based on technological progress in recent years, some companies represented by Shandong Baolingbao Biotechnology Co., Ltd. further improved the starch processing technology relying on biotechnology, and some deeper, high-value-added products such as xanthan gum, glycerin, various sweeteners, sour flavors and various amino acids have been produced, which have greatly improved the added value of corn products and further modified the processing structure of corn starch. At present, there are thousands of processed corn products that have been developed, and they are widely used in food, medicine, chemical and other industries. With the constant advancement of China's biotechnology and the further deepening of new applications development and original uses expansion, corn deep processing products will be greatly enriched, and the starch product market will be further expanded. There is huge room for further development. Therefore, the corn deep processing industry is hailed as "sunrise industry" and "gold industry".

## 3 Development situation of corn processing industry

### 3.1 Development status of corn processing industry

From 2010 to 20147, China's corn processing industry developed rapidly. The entire industry has experienced a period of rapid development, with continuous increase in production capacity and output. Geographically, domestic corn processing enterprises are mainly concentrated in the northeast and north of China, due to the raw material market and product market.

Shandong is the province with numerous large-scale corn processing enterprises. It is one of the fastest growing areas of corn deep processing in China<sup>[5]</sup>. Currently, the corn conversion capacity of corn deep processing companies (excluding primary processing) in Shandong Province has exceeded  $1.5 \times 10^7$  t, and about  $1.0 \times 10^7$  t of corn has been converted actually. Corn processing products in Shandong Province mainly include corn alcohol, corn starch, starch sugar, modified starch, corn monosodium glutamate, lysine and citric acid<sup>[6]</sup>. Among them, the production of corn starch, starch sugar, corn monosodium glutamate and lysine ranks first in China; the output of corn starch accounts for about 50% of the total production capacity of enterprises above designated size; the production capacity of starch sugar is more than half of China's total; the production of corn monosodium glu-

tamate accounts for 46% of China's total; and the modified starch production capacity of enterprises above designated size accounts for about 35% of China's total, second only to Jilin Province. In addition, Shandong Province is the province with the largest lysine production capacity and the second largest citric acid production capacity in China. Lysine production capacity of Shandong Province accounts for about 35% of China's total production capacity, and citric acid production capacity accounts for about 23% of China's total.

### 3.2 Development predicament of corn processing industry

At present, China has entered a new normal economy with structure adjustment and steady growth. The excessively rapid growth of the corn processing industry, which caused a serious overcapacity in the previous period, began to face industrial changes and challenges. During the investigation, it was learned that with the increase of state-to-business environmental protection requirements and penalties, in the context of excess capacity, many small companies with high energy consumption, poor management and inconformity to environmental protection requirements have been required to stop production for rectification. In 2016, the corn market faces the adjustment of temporary reserve policy, and corn processing companies will also face new development opportunities and challenges. Specific performance is shown in the following aspects.

#### 3.2.1 The competitiveness of the entire industry in the international market needs to be improved.

According to incomplete statistics, there are more than 1 000 enterprises engaged in corn processing in China. Among them, less than 100 companies have an annual output of over 100 000 t. Most of the corn processing enterprises in Shandong Province are small- and medium-sized enterprises and unable to invest large sums of money for technological transformation, with lower equipment updating rate and lower product technology content. Many companies have the characteristics of small volume, low level of processing, high production costs, low comprehensive utilization of resources and weak comprehensive processing capacity. It is difficult to form a complete industrial chain, and there is still room for improvement in the competitiveness of the international market.

#### 3.2.2 The processing degree of corn is low, and the added value of its products is low<sup>[7]</sup>.

Although China's corn processing industry has developed a lot, corn is still dominated by primary processing, mainly concentrated in the production of modified starch, starch sugar, monosodium glutamate, lysine, glutamic acid and other products with simple process and low product added value. Over the same period, foreign corn deep processing is dominated by products with high technology content, higher added value and stronger competitiveness, such as glucose and food additives. There is a big gap between China's corn processing and the developed countries' in terms of processing degree and product value. Corn quality standards and control system also have a certain gap with foreign countries.

#### 3.2.3 Affected by credit policies such as mortgages, the phenomenon of shortage of funds in starch processing companies is common.

China's corn starch processing industry is dominated by small- and medium-sized enterprises, mostly private enterprises.

The level of credit is low, and there is a lack of property that can be used to guarantee mortgages. Banks often refuse to lend out for financial security reasons, leading to a lack of development funds. At present, many banks generally implement the system of first-principal loans and lifelong loan responsibilities. Strict punitive measures are taken against those who are at risk. As a result, some corporate owners abandon loan financing to avoid risks, seriously restricting the expansion and sustainable development of enterprises.

**3.2.4** Affected by macroeconomic environment, the market demand is weak. Since the second half of 2016, the supply of corn in the new season has gradually returned to normal. The corn starch market demand entered a seasonal down cycle; domestic corn starch companies' profit declined; and operating rate of corn starch processing industry is in a clear downward trend, currently less than 60%, but it still meets the demand. This indicates that the market demand is weak, and the production capacity of processing companies is seriously excessive on the other hand. Affected by low processing profits, demand for corn is constrained, and huge stocks are still to be digested. The long-standing problem of oversupply in the market still exists.

**3.3 Basic situation of foreign capital utilization in China's corn processing industry** In 2011, the Ministry of Commerce revises the *Catalogue for the Guidance of Foreign Investment Industries*, which clearly states that the corn deep-processing industry is a type of restricted foreign investment. Since then, foreign investment in corn deep processing industry has gradually weakened<sup>[8]</sup>. Under the protection of national policies, domestic corn processing enterprises have achieved rapid development. With the advancement of global economic integration and the gradual deepening of China's opening to the outside world, large transnational agricultural enterprises are gradually extending the industrial chain and optimizing the global industrial chain layout. Corn is an important food crop in the world. Its upstream and downstream global industrial chain integration continues to advance. As the overall competitiveness of China's corn starch processing industry needs to be improved, there is still a certain gap between China's deep processing technologies and foreign countries', and the development of domestic companies is constrained by funds, the surveyed companies generally have willing to cooperate with large-scale transnational agro-industry companies and use the foreign funds to develop. In this context, the U. S. Ingredion Incorporated has implemented mergers and acquisitions with China's Huanong Special Corn Development Co., Ltd. The amount of M&A is RMB 86 million, which is a wholly-owned acquisition. After the agreement is completed, the Huanong will become a wholly-owned subsidiary of Ingredion.

## 4 Problems

### 4.1 The international competitiveness of China's corn processing industry needs to be improved<sup>[9]</sup>

**4.1.1** Raw material. From the perspective of raw material, domestic corn prices are significantly higher than the international market. More and more companies are trying to reduce costs by

importing foreign corn. But due to the impact of the national import quota system, domestic corn processing companies are at a disadvantage in terms of costs. From the technical point of view, the corn processing enterprises in developed countries generally have their own R&D institutions, with high R&D investment every year. Domestic enterprises are subject to restrictions on funds and talents, and they usually have no enough technical support in the R&D of product deep processing and expansion of industrial chain.

**4.1.2** Capital. From the perspective of funding, the international financing resources available to large-scale corn processing enterprises are relatively abundant, and financing costs are generally low. In contrast, domestic companies have a narrow range of financing channels. Explicit financing costs are already higher than international financing costs, and there is a large part of the hidden financing costs, greatly influencing reinvestment of enterprises. In summary, the overall competitiveness of China's corn starch processing industry caused by internal and external reasons remains to be improved.

**4.2 China's corn processing industry has certain advantages in terms of variety and geographical location** From the product point of view, China's corn breeding basically adopts conventional breeding methods. At present, the international community does not have a consistent conclusion on the safety of GMO products. Some European and Asian countries such as Japan and South Korea have adopted restrictions or prohibitions on the import and export of genetically modified agricultural products and their deep-processed products. In this situation, corn and its processed products of the United States dominated by genetically modified plants will lose some of the foreign markets. However, conventionally cultivated corn and related products have become more and more popular, for their relatively high quality and food safety in the international market, especially in Japan, South Korea and other surrounding countries with large import of starch. In addition, more than 50% of the global corn trade volume comes from Asia. Countries and regions around China such as Japan, South Korea, Malaysia, Indonesia and Taiwan Province of China are important corn importers in the world, with an annual consumption of more than  $3.5 \times 10^7$  t, accounting for 50% of global corn imports. Among them, Japan and South Korea are the world's largest and second largest corn importers, respectively. In the field of corn and processed products, China has a natural geographical advantage in the cooperation with these countries. These will bring new opportunities for the export of corn and its processed products in China.

## 5 Foreign cooperation status of corn processing enterprises

**5.1 Corn starch processing companies are generally optimistic about cooperation with foreign investment** The investigation on Fuyang Biotechnology Co., Ltd., Huanong Special Corn Development Co., Ltd. and other three companies showed that enterprises are mostly positive about the entry of foreign capital, but they believe that in-depth research and discussion on specific cooperation methods is required. In general, the cooperation purpose of

domestic corn starch processing enterprises, especially small- and medium-sized enterprises is to increase the demand for funds and increase the level of management. Most domestic corn deep processing companies are facing financial bottlenecks in their development. From the perspective of enterprise development, the problem of insufficient funds is hoped to be eased by introducing foreign capital. From the management point of view, domestic corn starch processing companies have a wide gap in management methods compared with international companies. Foreign capital can be used to import advanced management experience from foreign companies to improve management efficiency and economic efficiency. To this end, the Shandong Huanong Special Corn Biotechnology Co., Ltd. accepted the mergers and acquisitions of the Ingredion Incorporated.

**5.2 China's corn starch processing enterprises have a stronger need to go out** During the investigation, it was learned that domestic corn processing enterprises have begun to try to go out while facing foreign investment, and they hope to enhance the market competitiveness by utilizing domestic and foreign resources and markets. For example, Shandong Ruixing Group owns the fertilizer company with the largest single plant production capacity in China. In 2013, it further expanded its industrial chain through mergers with fertilizer processing companies in South Africa and Australia. At the same time, it has diversified its business by investing in other companies abroad. Fuyong Biotech Co., Ltd. is also planning to establish a corn starch processing enterprise outside China to meet the needs of the internal market by utilizing a large amount of cheap corn from Ukraine and other places.

## 6 Strategies and suggestions

**6.1 Strengthening investigation and research and judging reasonably industrial safety status** The background of this investigation is that foreign capital has initiated mergers and acquisitions with corn starch processing enterprises in China, which has risen to the height of national security review. It is understood that since the establishment of the national security review system for foreign capital mergers and acquisitions in China, this case is one of the few cases that has risen to the national security level for review and has a certain degree of representation. In order to strengthen the reasonable judgement of industrial security and understand the actual situation and particularity of the development of domestic enterprises, it is proposed to continue to strengthen the research and on-site evidence collection of foreign mergers and acquisitions, expand the scope of research and make convincing review comments.

**6.2 Establishing a highly effective agricultural industry safety review mechanism** China's national security review mechanism was established in 2011 and led by the National Development and Reform Commission. With the gradual implementation of the Sino-U.S. and China-EU investment agreements, the reform of foreign investment management is gradually deepening. The management model of negative list plus national treatment will be adopted. The national security review mechanism will be the last gate to ensure the safety of China's industries in addition to nega-

tive list. It is suggested to strengthen research on key areas and sensitive areas related to agriculture and establish an advanced effective security review mechanism for foreign-funded mergers and acquisitions, thus providing a full range of information and consulting services for security review and ensuring the safety of China's agricultural production.

**6.3 Strengthening supervision and management of business operations to ensure industrial safety** As the related merger and acquisition cases have certain representativeness and particularity in the relevant industries and the corresponding regions and product markets, and potential security risks may have been discovered in the security review process, it is necessary to establish a database of foreign mergers and acquisitions, design index system targeting at certain potential risk and strengthen the supervision and management of the companies after the merger to prevent risks.

**6.4 Strengthening the interpretation and promotion of the strategy of going abroad, and providing enterprises with comprehensive information services** The investigation learned that most of Shandong's corn starch processing enterprises have little knowledge of China's agriculture going out strategy and its mechanisms and policies, resulting in the situation that enterprises may be willing to spontaneous but they have not received the attention of related departments. It is recommended that the interpretation and publicity of the national agriculture going abroad strategy should be strengthened by organizing various activities such as forums, training and promotion to expand the scope of awareness and enable companies to find government agencies that can consult and establish contacts, smoothly promoting the actual investment behaviors that go abroad and contributing to the realization of national strategies. In addition, the needs of enterprises for overseas investment should be paid with more attention, and an agricultural foreign cooperation information service system needs to be established to provide enterprises with information on overseas agricultural resources, preferential policies for the use of foreign investment, legal environment and social culture and to support enterprises in going abroad.

## References

- [1] XU ZG, XI YS, ZHANG SH. Analysis on the implementation, mechanisms and effects of 2008/2009 national corn provisional reserve policy [J]. Problems of Agricultural Economy, 2010, 31(3):16–23. (in Chinese).
- [2] LIU Y, HOU TR, GUO XP, *et al.* The development status and countermeasures of corn industry in Shandong Province[J]. Journal of Shandong Agricultural University (Social Science Edition), 2017, 19(2):24–30. (in Chinese).
- [3] WEN FR, SHI JM. Analysis on the fluctuation of corn price in main producing areas—Taking Shandong Province as an example[J]. Journal of Agrotechnical Economics, 2014, 33(7):1–8. (in Chinese).
- [4] CAI HY, PENG JL, LIU HG. Analysis of the impact of temporary deposit system exit on maize industry chain[J]. Journal of Anhui Agricultural Sciences, 2017, 45(18):221–222. (in Chinese).

of information is an important factor in normal market transactions. Based on the situation of incompleteness of China's rural land information system, it is required to make effort to establish a rural land information system, build multi-channel information channels, and create an effective market information service platform for rural land owners and users. (i) It is necessary to thoroughly investigate the current situation of rural land, determine the scope of ownership, and register and issue the land use certificate. (ii) It is recommended to establish a legal system related to rural land information, propagate relevant government policies and regulations, the local land administration department should publicize and organize farmers and village cadres to study relevant laws and policies in depth. (iii) It is recommended to establish a rural land information network and extend the information network to the township land administration offices and village committees, to realize various land ownership and cadastral information are available for the farmers. In the land use plan, it is recommended to raise the participation of farmers in the formulation and implementation of land use planning. The establishment and improvement of the rural land information system are helpful for rural collective landowners to obtain reasonable rights and benefits in the course of market transactions and favorable for protecting weak groups such as farmers.

**4.3 Reforming the functions of village committee in the land management** If the village committee is extended as government power, then the power of land management should be stripped from the authority of the village committee. Village cadres have no right to manage village land affairs. The plan of villages shall be formulated by the superior land management department based on

the actual conditions of the villages and the opinions of the villagers and the overall land use planning. Besides, land administration departments at the county and township level should strengthen the management of the registration of cadastral information and property rights, issue land use certificates in a timely manner, and regularly superintend and inspect the villages to investigate illegal land occupation and use. In addition, it is recommended to set up special land bank to take charge of the circulation and transfer of rural land, and invite farmers to directly select representatives of land bank to deal with various agricultural land circulation activities on behalf of farmers. Furthermore, the superior authorities and village committees should supervise the operation of land bank, but they cannot directly manage them. At the same time, it is recommended to develop and improve rural land assessment system to prevent land speculation and facilitate the management of rural land markets. Both the superior land management department and the village cadres should not intervene in the land transfer. In sum, it is recommended to improve the village-level land management system and strengthen the supervision of village cadres, which is the need of the struggle against corruption and also a necessary move for building the political civilization.

## References

- [1] LIU GY, WANG ZB. New land law course[M]. Beijing: Peking University Press, 2009. (in Chinese).
- [2] ZHU QX. Research on the reform of China's land finance system[M]. Shanghai: Lixin Accounting Publishing House, 2015. (in Chinese).
- [3] ZHU LJ. Why does land corruption repeat emergence [J]. People's Tribune, 2016, 25(11B): 12–13. (in Chinese).

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- [5] CHEN T. Analysis of domestic comparative advantage and international competitiveness of corn industry in Shandong Province[J]. Rural Economy and Science-Technology, 2011, 22(1): 41–43. (in Chinese).
- [6] ZHU F, SUN ZM, LI SC. Analysis on the present situation and development countermeasures of corn production in Shandong Province[J]. Bulletin of Agricultural Science and Technology, 2015, 24(3): 6–9. (in Chinese).
- [7] LI B, ZHANG GG, LIN HL, *et al.* Current situation and developing

trend of corn deep processing industry in China[J]. Cereal & Feed Industry, 2011, 12(1): 20–23. (in Chinese).

- [8] XIE X. Study on the legal review of foreign capital mergers and acquisitions in China's agricultural industry on the perspective of industry safety [D]. Wuhan: Wuhan University, 2012. (in Chinese).
- [9] WANG YJ, ZHANG QZ, ZHU JM. The status and development proposals of corn's deep processing[J]. Journal of Agricultural Mechanization Research, 2010, 32(9): 245–248. (in Chinese).