

## The analysis of the deep processing industry of agricultural products situation and strategy in Heilongjiang Province

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**Abstract:** The system of agricultural products processing in Heilongjiang Province has formed initially. But the development of agriculture industry mainly rely on the original products. The paper expounds the problems of deep processing of agricultural products when constructing and the reason that restrict the development of deep processing of agricultural products through analysis. In addition, it comes up with four strategies to solve the problem: the betterment of the cropping industrial structure, the combination of present resources, build high quality brand of agricultural products and the increase of the adds-on of agricultural products. Through leading enterprises, big industry chain, big industry and big brands of efficient agricultural industry chain, transform the extensive agricultural products to high value-added products. And to achieve the goal of the transformation from the major grain-producing province to the strong agricultural province.

### 1. Introduction

Agricultural product processing industry, which plays an significant role in economy growth of economic less-developed areas, is the major power of regional economy development. The chapter three of the Central First Document 2017 pointed out expanding new industry, commercial activities and agricultural industry and accelerating the development of modern food industry. Food industry has developed rapidly in Heilongjiang Province in recent years. And the food industry of Heilongjiang Province has become one of the largest pillar industry in the province, only second to energy industry. The agricultural product processing industry still centers on the roughing. And most of the processing enterprises in Heilongjiang province are small businesses that have some problems about low level of technology, industry concentration and conversion rate of agriculture product processing. Exploring the predicament of agricultural product processing industry in Heilongjiang Province and thinking the feasible way of promoting the additional value of agricultural products contribute to expanding the agricultural industry chain and regional economy development. Heilongjiang Province should explore the materials of agricultural products in-depth and develop the intensive processing of agricultural products to make green food. And to achieve the goal of the transformation from the major grain-producing province to the strong agricultural province.

### 2. Current Situation and Existing Problems of the Deep Processing Industry of Agricultural Products

As a whole, food processing enterprises in Heilongjiang Province are with a lower overall quality. Most of brand enterprises are still small-scale management. The agricultural product processing industry has features of great energy consumption and low resource utilization. Those enterprises are suffering financial difficulties, which have to reduce the input. They can't enter a periodic virtuous circle. Most of agricultural product processing enterprises stop production when

they were established.

Problems existing in the construction of agricultural product processing industry mainly involves the following several aspects: Firstly, the majority of people's awareness of the deep processing of agricultural products has not transited to the modern agricultural products processing. Most of them considered it as a simple extension of agricultural production or the reprocessing of surplus agricultural products. Secondly, the farmers have a information lag. The supply of raw materials are asymmetrical with market information. And the professional quality of farmers in market competition is not up to standard. Third, the capital fund and strength put into by the producer is extremely limited, and the processing class remains lower-middle, and the product lacks market competitiveness. Many enterprises whose technical content are low ignore the importance of professional classification of raw materials. Fourthly, the integration of supply, production and sale has not been realized in real sense, and they are actually out of touch with each other, leading to the failure of the industrial chain to carry out a long-term benign operation. Fifthly, the government's relevant documents have made positive guidance to the food processing industry, but the implementation effect is not significant. There is no strong cluster in the industry. Finally, the industry overall standards are low. Requirements of the food processing industry management in the developed countries are "good manufacturing practices" (GMP). And prevailing security control in developed countries are "hazard analysis and critical control point (HACCP) system and ISO9000 system. But there are only only 133 of more than 50000 domestic food processing enterprises meet the national level 2 enterprises standards. The number is much less in Heilongjiang Province, which has become a key constraint of further development of the agricultural products processing in Heilongjiang Province<sup>[1]</sup>.

### **3. Analysis of the Reasons for the Slow Development of the Deep Processing Industry of Agricultural Products**

The entire three northeast provinces of China covers 1.47 million square kilometers, with a population of 121 million. But most of the purchasing power is mainly distributed in the southern China. The South whose processing enterprises have incomparable advantages of labor, transportation, advanced technology and so on contribute to the much lower cost of main agricultural products deep processing than that in our province, blocking the sales of the deep processing products of our province. At the same time, the existing grain processing enterprises in our province are not strong enough, and the gap between enterprises is too wide. The large enterprises cannot promote the development of the deep processing industry in Heilongjiang province.

#### **3.1. Shortage of Raw Materials**

The shortage of raw materials is the primary factor restricting the development of deep processing industry. It is mainly divided into two aspects: the sole agricultural planting structure and raw material supply and market information asymmetry . On one hand, Heilongjiang province has formed a planting structure centering on food crops and cash crops and feed crops as a supplement, as shown in figure 1.

Since 2006, food crops have been growing at more than 90 percent of the crop. In the perspective of nation and government, the government hopes to continuously optimize the planting structure of Heilongjiang province and increase the economic benefits brought by agriculture. From the farmer's point of view, farmers cannot make sharp adjustments to market information changes, nor can they bear the risk of changing the planting structure

Agricultural products, on the other hand, raw material supply can not meet the needs of the development of deep processing enterprise. the average potato yield in Heilongjiang Province is only about 1 ton now, which give priority to potatoes for vegetable use. The starch content is only 10% to 12%. The starch content of potatoes for industrial use is high. And the raw materials potatoes suitable for starch processing has not been widely promoted. Among them, the supply of potatoes suitable for starch, whole powder, potato chips and fresh-eating virus-free seed potato is

only 20%. And the production of hybrid seeds is almost blank.

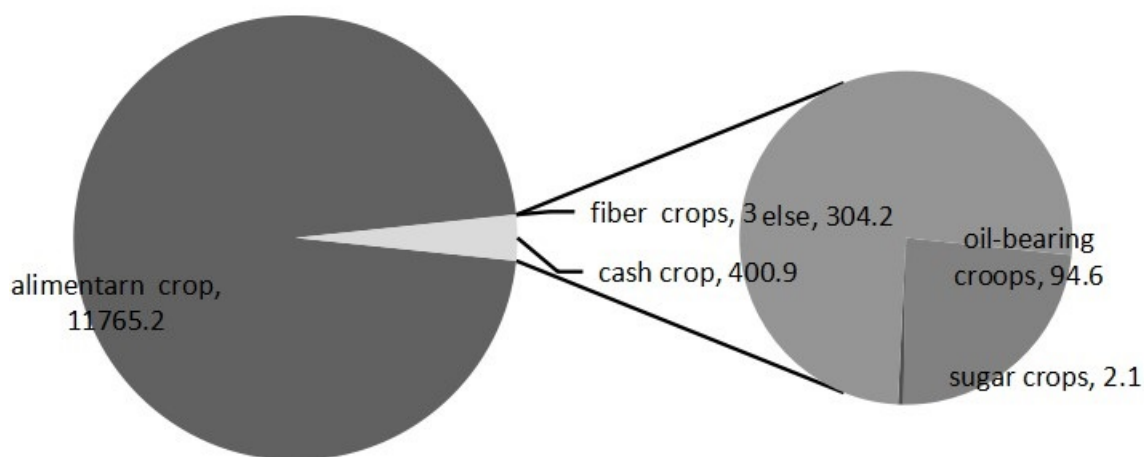


Figure 1 the planting structure of Heilongjiang Province

### 3.2. Higher Transportation Costs

In terms of production, the climate conditions in Heilongjiang province have been unfavorable, increasing the cost of enterprises equipment operations, the storage of agricultural products and other operating costs. And most of the enterprises lose money before they start processing. In terms of rice processing enterprises, rice price in 2012 is 2.8 yuan per kilogram. And it raised to 3 yuan per kilogram in 2013. The price of rice remaining unchanged, 0.2 yuan price difference make the processing enterprises no profit<sup>[2]</sup>.

From the perspective of transportation, the railway and highway transportation of our province are basically at the end of the nation, which is far from the hinterland of the domestic market. Therefore, The transportation radius is long and the cost is high. The north Jiangsu Province rice is 200 yuan cheaper than northeast rice at the cost of transportation, successfully crowding out the northeast rice in the market of inside Shanhaiguan<sup>[2]</sup>.

### 3.3. The Short Processing Industry Chain and the Unbalanced Enterprise Distribution

The agricultural products of Heilongjiang province are mostly primary products and are mostly limited to original products. Industry chain is generally short. Moreover Industry chain of some departments has broken, which make the enterprises have weak radiation ability and narrow growth space. It is not conducive to the development of the enterprise itself and the whole industry.

Processing enterprises are mainly small and medium-sized enterprises in the province. facing larger management risks. Rural financial institutions are generally cautious to issue the loans. Rural small and medium-sized enterprises' way to get money is narrow. Shortage of funds and the lack of technical knowledge seriously hindered the further development of small and medium-sized enterprises. Although Heilongjiang Province has formed processing enterprises group represented by 12 leading enterprises in the province, it still can push up the economic growth because of the lack of perfect risk-and-benefit-sharing mechanism. It also have few influence to the domestic market. The marketing system, which is dominated by the wholesale market of agricultural products and market, cannot effectively solve the contradiction between the small production and the big market in the production and marketing.

### 3.4. Imperfect Brand Incubation

Brand construction is an important part of agricultural products marketing. At present, our province has cultivated and produced a number of well-known brands and well-known trademarks, such as "North Great Famine", "93" and "Wuchang rice". According to the analysis of brand evaluation, there are many small brands in the brand whose species is single and lack of advantages. As the top thirteen major grain producing areas, Heilongjiang Province lacks famous brand of

agricultural products, which is still a wide gap to develop into strong agricultural province.

The development of principle part of brand is not perfect, and there is no real competitive advantage in the market, which leads to serious homogeneous product competition. Scattered and weak farmers have difficulty in overcoming their own weaknesses and have the "functional defect" of entering the market and participating in market competition. Some enterprises are fighting themselves, difficult to make progress, which has caused the interal consumption of the market competitiveness of high-quality rice brands. It makes more difficulties to control the market. In addition, the brand standardization degree is low. Both the product quality and the reputation lack guarantee. Many high quality agricultural products can only occupy the low end market, cannot bring higher premium.

#### 4. The Development Measure of the Deep Processing Industry of Agricultural Products

##### 4.1. Optimize the planting structure of our province

Using software MATLAB r2014a to work out table 5.2, and do the following analysis: Extreme normalization data is within [0,1]. The data tends to 1 indicates better economic benefits. If the data tends to 0 it indicates the economic benefit is poor. As it can be seen from the table, the benefits of economic crops are generally higher than that of food crops.

Table 1 the cost and output value of the main crops in Heilongjiang

	Rice	Wheat	Corn	Soybean
The output value of each mu (yuan)	1377.52	1001.71	949.54	559.62
The cost per mu (yuan)	1202.21	984.3	1083.72	674.71
Output and input ratio	1.145823	1.017688	0.876168	0.829423
The extreme difference	0.052346	0.135827	0.069372	0.427352
	Peanut	Roasted	Beet	Vegetables
The output value of each mu (yuan)	1493.54	3857.14	1848.5	6533.19
The cost per mu (yuan)	1396.83	3578.57	1619.83	4345.3
Output and input ratio	1.069235	1.077844	1.141169	1.503507
The extreme difference	0.35576	0.368531	0.462474	0.962314

Therefore, the adjustment of planting structure in Heilongjiang province should stabilize the plant of food crops, optimize the plant of economic crops and expand the plant of feed grain. The province should maintain the production of wheat and paddy and develop the high quality paddy and gluten wheat and weak gluten, and continue to decrease the corn plant area in non-dominant plant areas. It should also increase the proportion of silo corn and corn for feed, put more into high-production technology, broaden the crop variety and extend the industrial chain after ensuring the stability of production. The planting area of soybean and potato should be expanded appropriately, so as to ensure reasonable rotation of the dry field, expand the cultivation of high-yielding and efficient economic crops, and promote the development of food crops, economic crops and feed crops. At the same time, provide the professional guidance to farmers and promote farmer's ability of holding market demand information, guide farmers to plant high protein soybean, expand the scale of grains, mixed beans grow, develop medicago, fruits and vegetables ,enrich the variety of agricultural products to increase the economic benefits.

##### 4.2. Integrate Existing Resources

Agricultural products processing industry is facing cost, sales and investment difficulties. It is

necessary to focus on the construction of key issues and make all agricultural products processing enterprises united. From the perspective of systems and mechanisms, a complete set of system of agricultural production and processing should be formed. The Paper suggest government to form a Heilongjiang green food company that take the form of enterprises investments in order to concentrate resources of the province and this should be in accordance with market mechanism. The company sets up two main subsidiaries, the production subsidiary and the marketing subsidiary, and some supplementary subsidiaries such as non-GMO plant subsidiary, organic fertilizer subsidiary, hydraulic machinery subsidiary, agricultural production science institute, food science institute and so on. Orders will be received in the name of Heilongjiang green food company and the enterprises' right of accepting orders will be retained at the same time. Orders will be distributed reasonably through internal mechanism. As for hierarchy, Xian is the smallest unit in the hierarchy , feeding back data from the bottom to the top and receiving orders from top to bottom. Set up a special data analysis team to analyze market trends and adjust production policies in a timely manner. On the other hand, analysis the feedback data and make adjustments according to the region situation. Insist on case by case, from a relationship net whose members are related to and complement one another. And create friendly and supportive relationship to use public resources together reasonably and build information net together. The function of Heilongjiang green food company should be maximized. To build the image of strong agricultural province with the whole province's strength.

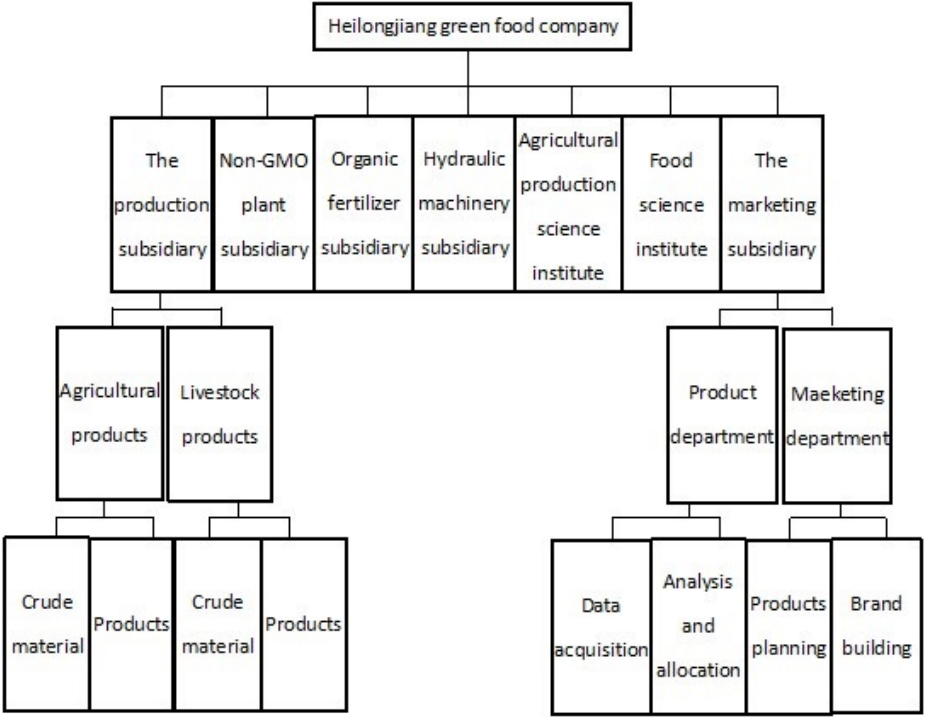


Figure 2 The division diagram of the Department function of Heilongjiang green food company

### 4.3. Build high quality brand of agricultural products

Based on the “1+5” principal, we shall build green, organic high quality Heilongjiang produce brands. “1” means the consumers will be the very core and foundation that the brands will be built upon. Through accurate analysis of the targeted clients and customers, we shall be able to clearly figure out the direction toward which our brands will be built and eventually enhance the market sales results of our brands. The “5” is a specific extension of our pre-existing model, it entails “Set up accurate market orientation; Set up pluralistic brand product line; Build up brand image; Consistently promote the brands; DIY brand last-mile marketing channels.

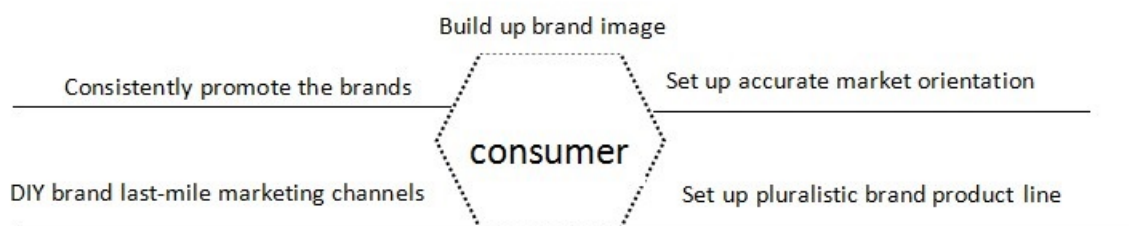


Figure 3 the “1+5” model diagram

The strategy for brand building shall be “from grand to small; from the whole picture to specific parts”. With that in mind, we shall cultivate the stem part of Superior Heilongjiang green produce brand, enhance the overall planning and intrinsic collaboration, build superior brand group. With the southern market and the market inside Shanhaiguan as our targeted sales region, we will strengthen the reputation, popularity and influence of Heilongjiang produce. We shall optimize and innovate the sales mode of our brand, guide the sales of produce based on its content. Emphasize the significance of “One industry in one town, one brand in one village”, capture the market share with our characteristics and brands. First, we shall guide the enterprises and farmers to creatively utilize IP restructuring, contract utilization and special sales warranty utilization. Then, with agriculture cooperation society as the leading force, we shall build a direct wholesale sales mode, common distribution mode with peer-to-peer last mile delivery, produce-supply-sales all-in-one mode with industry leaders as the driving force, the pluralistic sales mode with the e-commerce as the driving force. Second, we shall create consumption context to guide produce content marketing. We can label the produce for sale with tags such as “taste of childhood”, “my original feelings” and “nostalgic love”. We can film short movie or documentary of the characteristic regional food culture to incite resonance from consumers and enhance customer stickiness, or we can conduct personalized collaborative recommendations to potential consumers with the help of PCR algorithm.

We shall focus on creating appropriate both interior and exterior environment. The government shall create great investing opportunities to attract foreign capital flow and technologies. We shall strengthen the resource advantages in the province and fix our weak link, namely, transportation. As we are entering upon the new economy era, the competition of agriculture is actually the competition of science and technology in essence. It is not enough for the enterprises alone to accomplish technological innovation on deep processing. Instead, enterprises, research agencies and universities shall join their effort together to create the effective “investigate, R&D, manufacture” procedure<sup>[3][4]</sup>.

#### 4.4. Increase Added Value of Produce

Improve our imagination on produce R&D. Change the initial format of first processing and increase the value-added percentage of our produce. With the produce of our province as raw or complimentary material, we shall create as many deep processing and derivative products as possible. The products can involve food, health supplement, commodity, hair products and arts and craftsman supply etc. We shall develop the core technology of the products of our province and accelerate the conversion of R&D results, hence extend the industry chain of our characteristic products.

The added value of VAS (value-added service) shall also be increased. The processing companies not only need to attract the attention of consumers with brand name and cover, but also need to build a strong connection between market and produce processing companies, improve themselves upon customer feedback, hence make the production and marketing service more complete and smooth. In this way, the goal of “always adequate supply for demand, and vice versa” shall be achieved. There are two parts that shall be emphasized and fully utilized: in-store sales and



door-to-door delivery, which can be helpful for improving customers' sensory experience and satisfaction<sup>[5]</sup>.

We shall explore the possibility of mixing multiple industries. We shall take advantage of our robot industry and explore a new mode where robots can be a part of agriculture. We shall try to use robots to help with manufacture to lower production cost. Introduce and spread drone monitoring technology, advance modern park and recreation area construction projects. The agriculture tourism industry shall focus on fully utilizing the cultural content and solar terms and diminish the effect of climate and geography factors on Heilongjiang tourism via hosting pertinent agriculture celebration activities. Design products related to the 24 solar terms, "host guest during festivals, improve sales with celebration", to reconcile economic, societal and environmental benefits.

## **5. Conclusion**

The sustainable and sound development of agriculture relied on the consistent production, sales and profits of produce. Higher demand is created for the food processing industry of Heilongjiang as the progress of science and technology is unprecedented and the consumption level is constantly growing. The whole province shall step up efforts to help the produce processing industry to convert from first processing to fine and deep processing, extend the processing industry chain, and change the preconception and obsolete ideas that people possess of agricultural development. We shall boost the conversion of the produce of our entire province toward high technology, high nutrition and high added value, establish Heilongjiang green food brands and eventually achieve unprecedented breakthroughs of agricultural development.

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