

The Food Security Research Based on Supply Chain Perspective in Northeast Three PROVINCES

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Abstract—Northeast three provinces are major grain-producing areas and important national commodity grain base of our county, has the good grain production basis conditions. However there are also lower grain comparative benefits, slow in increasing peasants' income, inadequate transportation infrastructure and logistics resources scattered, etc. And one reason of these problems is supply chain development lags behind in the grain circulation, the low efficiency and high cost about the traditional food logistics, is becoming one of the outstanding problems obstructing the Chinese food security. Therefore, this article takes the supply chain perspective analysis food security in the northeast, and put forward the countermeasure and the suggestion developing the grain supply chain, fully guarantee food market supply.

Keywords- Rtheast three provinces, Food safety, Supply chain, countermeasures

1. Introduction

The word "supply chain" comes from "SupplyChain" in English, The earliest puts forward in the early 1980s, and be regarded in the late 1990s. schary and skjott. Larsens (1995) regard as that supply chain refers to a series of activities that integrated, treatment and control product from the raw material and manufacturing to distribution, at the same time execute the integration activities in the most economical way. Charles C. Poffier et (1996) deem that supply chain is a system that organization transfer its products to its customers. Supply chain network system is composed of suppliers, manufacturers, traders, retail stores, consumers or an organizational structure of upstream and downstream customers. Each member of the whole supply chain operation has significant influence. Johnson and wood (1996) also think supply chain is the join of organization, each value link of the whole chain, through the contact of interface, communicate and work to meet the demand of customers. Therefore the so-called supply chain is refers to a product or service system combination of upstream, middle and downstream vendors, the ultimate aim of the entire supply chain depends on satisfying final consumer demand. from integration perspective of enterprise and enterprise, D.F. Ross (1997) think supply chain representatives each link from Suppliers to the final consumers, and attempts to link various resources of internal and external partners in enterprise, make the supply chain become highly competitive and make customer value more colorful supply system. Zhihua wu (2010) think that supply chain contain the whole system from the raw material flow to product delivered, around the core enterprise, connecting a functional nets chain structure by suppliers, manufacturers, distributors and retailers and end users, it involves the whole process from supplier to the customer.

In April 1983, the FAO world safety committee passed the food safety problems put forward from both director-general Edward, uziah asaph horses and American economists in alberta, val DE period (torre Vaidés Alberto). J. Tony, d. balak, Geng law and heman S.A A.L. MaiKeBen etc think that a national food safety level depending on low-income food needs met degree, etc. Rosé grant M.etc. (2003) think food security should realize depended on increasing investment and reform policies; Erik Licht - enberg etc. (2008) fully emphasize the role of farmland protection policy in China etc. Since Lester brown put forward the point of "Chinese grain threat", food security has become China's research society hotspots. Domestic research about food security started in the 1980s, initially mainly introduced foreign theories, methods and policy proposals, in the mid 1990s mainly disproved the brown's viewpoint. We can say that many domestic scholars are long-term focused on food safety problems ,during the 1990s, the YanRuiZhen, HuangJiKun, ZhongFuNing, HuangZuHui, ZhuZe, etc, in recent years, KongZhiXiang (2005), HanJun (2005),

JiangChangYun (2004), XiaoGuoAn (2005), LuoLiangGuo (2006), NieZhenBang (2006), China (2007), DingShengJun (2008), etc. They made extensive discussion about future grain safety prediction, the change of food security situation in domestic and foreign, food security connotation and evaluation index, grain self-sufficient and food trade status, grain supply and demand, and structure and food safety pre-warning, grain macro-control, food security model, objective on food security, ensure food safety measures, etc, and made a series of research results. But at the same time in studying food security problems from inner relationship of research food industry and its immanent relationships, they ignore the basic fact “the microeconomic foundation in China's grain security is not enhanced with the unceasing of open degree” (gaofan,2007), ignore that China's grain industrial chain link are numerous and have artificial segmentation (liyimin,2005), ignores slants big bullwhip effect of food chain and its demand on food, price and the important influence in food security, (wuzhijia,2010). Facing the new situation, the liquidity increases unceasingly of domestic and foreign food safety, a country or region's food safety problems could be by other factors.

Therefore, the purposes of food chain research, is not only to pursue the benefits in logistics process, but also to study its all nodes in the reasonable layout and science. China's grain supply chain, is a grain from production, processing, distribution and to end consumer's process, is a logistics and information flow network regard grain logistics as the center, including seeds, fertilizer producers, farmers and agriculture plantation companies, food processing enterprises, grain distribution enterprise, food supply logistics providers (warehousing, transportation) and end users. Through grain production suppliers, processors, sales wholesaler and government harmony reduce transaction costs and raise the entire food supply chain operation efficiency, enhancing the food chain integrally. Therefore, China's grain circulation system did not establish a complete food supply mode, did not research and reform as a whole one about all nodes and grain production, didn't form a complete and unified chain of production, storage, transportation, consumption. As a major grain producing areas, Northeast three provinces should more attach importance to the development prospects of supply chain.

2. Grain security advantages Based on supply chain perspective in Northeast THREE provinces

2.1 Northeast three provinces have good geographical condition and the product advantage.

Since joining the WTO, along with the further enlargement opening-up policy, the consumption structure increasingly become combination, fineness and the brand, and access development track of pursuit quality, nutritional, safe, green, leisure and diversification. For example, there are rice resources and developing organic paddy rice, green good conditions and broad domestic market space in the northeast region. In addition, the northeast area located in the transport arteries, logistics system is sound, provides the convenience for its profound processing industry expand export rice. The region in the west coast of the Pacific and Eurasian northeast side, the central position in northeast, Japan, South Korea, north Korea, Mongolia, Russia and other peripheral five countries, the region is the important rice export market. Northeast area also contact with Pacific countries, coastal ports and inland port almost all around the around. All these laid solid foundation for northeast rice profound processing industry expand productization.

2.2B northeast three provinces have grain production capacity and advantages in production.

Cultivated land area in the three provinces is steady uptrend by 31.5% between 1987 to 2008, it rose from 1631.23 million hectares in 1987 to 2145 million hectares in 2008. Grain planting area steady increased between 1986 to 2008, the three northeast provinces grain planting area had increased from 12221.4 thousand hectares in 1986 to 15379.2 thousand hectares in 2008, with an increase of 25.8%. the planting area of Heilongjiang province relatively rise faster by 10988 thousand hectares in 2008, Jilin province and Liaoning province planting area are 4391.2 thousand hectares respectively and 3035.9 thousand hectares. Look from food production, food production is fluctuating growth. The grain output increase from 4396.2 tons in 1986 to 8925.3 tons in 2008, the increase is 103%. Heilongjiang province comprehensive grain production capacity has reached 3,000 tons, jilin province comprehensive grain production capacity has reached 3,000 tons (see chart 1). By some visible, northeast 3 provinces have a good foundation in ensuring food security aspect.

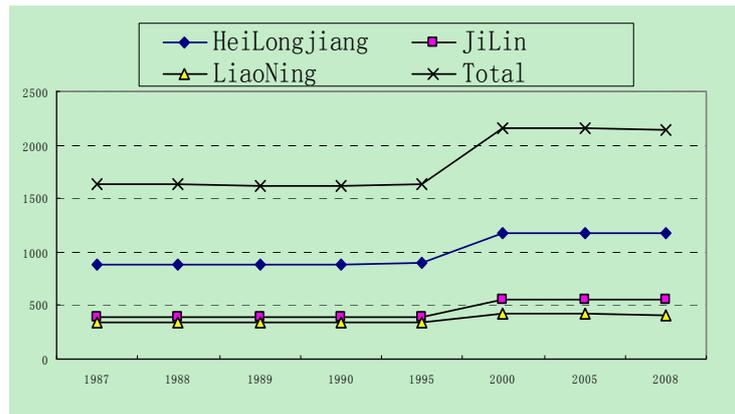


Figure 1 variation of cultivated land area in northeast 3 provinces in 1987 ~ 2008 (Unit: Million hectares)

Data sources: "China Statistical Yearbook "historical data

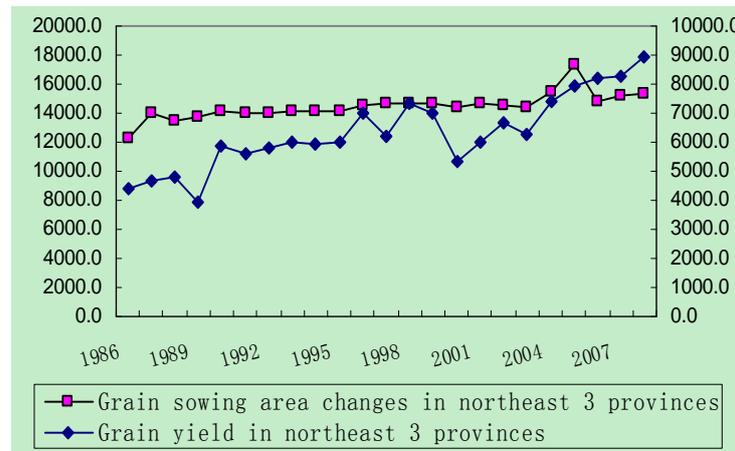


Figure 2 grain yield and grain sowing area changes in northeast 3 provinces in 1986 ~ 2008 (Unit: Thousands of hectares, Million tons)

Data sources: "heilongjiang Statistical Yearbook", "jilin Statistical Yearbook", "liaoning Statistical Yearbook" historical data

2.3 The Northeast leading enterprises are constructing foundation of food chain

Northeast grain processing enterprises mainly sell products through modern channels, namely business super market, and actively establish stable long-term supply cooperative relationship with food processing enterprises. These large enterprises establish stable crude supply cooperation channel with the food grown by purchasing processing enterprise in industrial chain upstream. They invest in purchases of food storage and process to stable food to reduce production operating costs. Northeast soybean processing enterprise owns meters grease, HaGaoKe, Jilin Deda, Liaoning Fuhong etc. Large processing enterprise also have Beidahuang rice group, Lvdu group etc and jilin Dechun, Yufeng, Dongfu such enterprise, as a representative of the rice processing enterprises. Enterprises execute orders with local farmers, provide plant seeds, fertilizer and technical guidance to farmers, buy product from farmers after acquisition processing. They deal in the market for food sales and brand promotion, wait for means to build stable sale of industrial chain through joint-venture to ensure food safety and enterprise image.

3. Analysis of food security issues in Northeast China base on Supply Chain view

Food security in the Northeast region has some advantages including regional advantage production advantages, and some large leading enterprises, but also there are some problems, specifically in the following areas:

3.1 Lower food production comparative interest and peasants raising income slowly

According to Table 1, Agricultural income of farmers per capita share of total income showed a decreasing trend in the three northeast provinces. Among them, the farmers in Heilongjiang Province in 2000 the per capita farm income share of total revenue was 39.2% by 2008 have been reduced to 28%; while per capita agricultural income of farmers share of total revenue increased from 39.4% in 2000 31.2% in 2008 in Jilin Province; 2008 compared with 2001, agricultural income of farmers in Liaoning proportion of total income declined by 7.6%. Although market prices and subsidies for growing grain increased since the end of 2006, but relative to the rising cost of grain, making the comparison of grain-growing economic benefits is still low, Agricultural income of farmers per capita of total revenue proportion become lower and lower . Although food production in Northeast China has strengths, but the slow raising income of farmers, food production revenue is very low due to variety of reasons, but the food supply chain system is unperfect is one of the reasons.

3.2 Lack of transport infrastructure affecting grain supply chain development

Inadequate grain logistics infrastructure leads to a long cycle of food transport, high cost, low efficiency of food logistics, professional is not strong .The main reasons: First, currently does not allow a special train Bulk entry has seriously affected the "North-South transport grain" efficiency. Second, the high cost of logistics. Heilongjiang ninety-three company estimates that: the high cost of funds, the interest cost per ton of soybeans in Northeast is 85 yuan, 70 yuan higher than that of imported soybeans; acquisition costs are high, the costs of the acquisition of soybeans from thousands of families is 70 to 75 yuan per ton, 50 yuan higher than the coastal soybean; high transport costs, from Heilongjiang shipped to Dalian or Shanhaiguan the costs of freight are 65 yuan per ton. Thus, Heilongjiang Province has restricted the commodity circulation by the impact of rail capacity and flow, the capacity is obviously insufficient.

3.3 Food resource logistics partitioning is difficult to create

Food Logistics is an important component of the food supply chain, and it's a cover of the food transportation, storage, handling, packaging, distribution, processing, and information application which formed a complete chain, and with the business flow, information flow, capital flow together constitute the a complete system food supply chain . Part of the northeast region is located in the border, where economic underdevelopment, transportation, warehousing, information technology, etc lags behind, a lot of infrastructure facilities are older, the amount of infrastructure can take advantage is not great. Such as in Heilongjiang Province the resources of food Logistics are scattered. basically large companies almost establish their own logistics network, resulting in low utilization of resources, integration of resources not strong, increasing transportation costs, affecting efficiency of circulation.

3.4 Control of multinational food dealer on domestic food processing and circulation has been

Grain supply chain in the northeast can neither effectively respond to the food change in trend of uncertainties can not achieve that made food products changing from the functional products to the emergency products timely, Basic research and applied research of food security early warning is weak, the early warning of the entire system from food production to consumption is incomplete and food emergency response system is not perfect. Thus, in recent years large multinational grain merchants not only entered into the domestic soybean industry, and they has control of the production capacity more than 70%, Multinational grain merchants also gradually monopolized the domestic soybean imports and local soybean gradually was squeezed out of purchase orders of industry,. According to the Heilongjiang ninety-three companies reflected, U.S. multinationals ADM, Singapore, Kuok Brothers companies have invaded our country in the rough machining areas of soybean crush. So, with the deepening invaded by international grain merchants, and if farmers, enterprises do not realize the importance to the development of food supply chain, it will not only made old problem which is the high cost of food security and low efficiency deteriorate ,but also will lose food security leadership in the strategy and will cause other serious problem.

4. Conclusion

4.1 Provinces in Northeast China must improve the region's food supply chain

With the gradual formation of the special economic zone of Chinese grain production, it is the inevitable choice for the Northeast to improve our food supply chain by purchasing deserving and selling grain through the inter-provincial. First, build long-term cooperative relationships between grain-main-production provinces and grain-main-sale provinces. Particularly tight in the food, the main production provinces *ensure the grain supply for main sale provinces*. Second, under the food subsidies of preferential agricultural policy, the main production provinces provide a large number of grain resources through the establishment of a sound supply chain not affect the main sales areas the smooth procurement of food businesses. Third, the financial sector provide appropriate financial policy support to the acquisition of inter-provincial or inter-provincial sales of food companies, to establish and improve the food supply chain between provinces.

4.2 Develop the food supply chain logistics system vigorously and train food supply chain leading enterprises

First, the systematic development strategy is the first condition for food supply chain. Food supply chain logistics system emphasizes the rational distribution of each node and line valid connection, the efficiency of the optimal grain logistics system, the lowest cost. scientific planning, rational layout, advanced technology and equipment support for food logistics form an economic efficient improve food logistics network system. Establishment of emergency food logistics deployment control center, the development of scattered technology improves grain logistics efficiency and reduces logistics costs of food.

Second, speed up building leading enterprises that meet the food needs of the market to achieve win-win market various investment entities. Grain deep processing enterprises are an important ring of food supply chain, both with regard to the development of food industries and to China's food and food-industrial products as a raw material resource potential and development, which have important implications on food security and economy of China development. Make full use of existing deep-processing industrial base, enhance the overall value of food, open space for food distribution, and vigorously promoting big business at the core of China's food supply chain construction.

4.3 Improve food distribution in northeast parts of China

First, improve the efficiency of a grain circulation. One of the most fundamental reason for food logistics which have low cost and high efficiency is its high degree of distribution. Widespread use of the corresponding bulk grain handling facilities, bulk grain handling storage and transportation of the basic realization of operation. Government policy guide through the fleet with the purchase and sale of food management and food companies, in consultation with the premise of ensuring transport acquisition of the necessary amount of the bulk grain transport vehicle; as well as form a partnership Bulk transport enterprises by transportation companies and grain marketing company. Form mixed ownership by the food, the railway and the community food co-funded logistics enterprises. Bulk grain transport in the railway, the government and food authorities and the railway sector reduce or compensation from the railway under the policy to improve the utilization of bulk grain transport; second, make full use of the transport infrastructure advantage, coordinate development of various transport modes, that is, multimodal transport. In northeast area make transport rail and ports complement support each other. While transport capacity in the full use of the port at the same time, configure the professional food convoys, railway actively cooperate to develop appropriate methods, the formation of specialized transportation of food to achieve rational use of resources, focus on the progressive realization of the comprehensive capacity of transportation of food.

4.4 Enhance the role of government and service organizations, improve supply chain operational mechanisms.

First, give full play to the role of government organizations, create a favorable external environment. First of all, under the current grain market information to the public properties and the vast rural areas do not have the material basis of information and technology, the government should assume responsibility of information technology, build information exchange systems consulting, information networks in the construction of grain should be given guidance and support. Establish and improve the quality standard system, improve the flow of quality control, information economics, which can effectively solve the "adverse selection" and "moral

behavior" as a result of market failure or market inefficiencies run, improve food supply chain development environment.

Second, improve the service organizations, businesses, and guide the coordinated development of the main supply chain. Food supply chain must be a modern distribution, logistics and distribution, transportation, information, storage and other aspects of the professional management of the business or organization in order to have a big development. Between the different segments of the same the supply chain, enterprises have a comparative advantage complement , so that integrated the whole supply chain enhancements. Improve the comprehensive competitiveness will help these enterprises to live together, in the dominant position of market competition.

Third, improve the food supply chain operation mechanism. Food supply chain, as a system of organizations, include farmers and their main leading enterprises, processing enterprises, storage and transportation companies and sales companies, etc., supply chain management involves the interests of individual members within the union must establish and improve the distribution of benefits between , constraints and risks of resolving mechanism, give full consideration to all involved in the supply chain within the main body of vital interests. Therefore, use leverage to mobilize the internal interests of the positive aspects, so that in all business areas of the body to achieve balance of interests, and promote the smooth progress of the food supply chain management.

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6. References

- [1] Zhou Huiqiu. Northeastern region of the overall grain production capacity of [M]. China Agriculture Press .2005.3
- [2] Long fang. New Century Food Security [M]. China Economic Publishing House, 2007.9
- [3] Wu zhihua. Grain logistics of [M]. China Agricultural Press, 2007.8
- [4] Huang Jikun and so on. The current round of food price fluctuations: the main reasons and future trends [J]. Management World, 2009 (1)
- [5] Wu zhihua and so on. Based on supply chain coordination of food security in the Yangtze River Delta [J]. Agricultural economic issues. 2010 (2)
- [6] Gao Fan. Organizational Innovation: China's goal of achieving food security point [J]. Research World, 2007 (3)
- [7] Hong Lan, Ke yet. Research on China's grain supply chain [J]. MARKET .2005 (2)
- [8] Du Wenlong. Our problem of food supply chain integration. [J]. BUSINESS .2006 (36)
- [9] Liu Xibin, Zhang Chunping. The future of Northeast China's grain logistics factors [J]. Logistics economic .2009 (12)
- [10] Jiangchang Yun, Song Haiying. Northeastern region refined rice processing industry in the development of ideas and policy recommendations [J]. ECONOMIC RESEARCH .2006 (28)Economic research
- [11] Roségrant M., etc..Global Food Projections to 2020—Emerging Trends and Alternative Futures.International Food Policy Institute, Washing-ton, DC, 2003
- [12] Rosegrant, M.Impact of Biofuel Policy on Developing Country Agriculture and Food Security.Paper presented on the American Agricultural Eco-nomics Association 2008 Conference, Orilando, 2008