

Development Status and Countermeasures of Cold Chain Logistics in China

-- Take Shandong Province as an Example

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Abstract: With the advancement of China's urbanization process, the competition in the field of cold chain logistics is becoming more and more fierce. People's attention to food safety is increasing, and the cold chain logistics industry in Shandong Province has been developed. Cold-chain logistics industry, however, has some problems, such as imperfect infrastructure, technology and talent shortage, etc., therefore, cold chain logistics industry in Shandong province should take a series of countermeasures, such as strengthening the construction of infrastructure, promoting technological innovation, cultivating talents, etc., is expected to further promote the development of cold chain logistics, improve service quality and transportation efficiency. This will help promote the development of agricultural products, fresh food and other industries in Shandong province, and promote economic growth and the increase of employment opportunities.

Keywords: Cold Chain Logistics; Shandong Province; Infrastructure; Talent Training.

1. Introduction

China's cold chain has been developing rapidly in recent years. Tan Lin can [1] and Zhao Jing [2] analyzed the problems existing in the current stage, elaborated the reasons from two aspects, and finally put forward the corresponding development countermeasures from three aspects. How to find the business model suitable for the needs of the market has become the current focus and difficulty is also the problem faced by most cold storage companies. Therefore, Wu Lihong [3] studies and discusses the development mode based on supply chain management.

Compared with the traditional circulation mode, the introduction of the Internet enables fresh agricultural products to be used to achieve the goal of direct selling. Xue Mei [4] proposed that the decision-making system involved in fresh agricultural products specifically includes strategic level site selection decision, strategic level inventory decision, and operational level distribution decision. Currently, China's cold chain logistics infrastructure remains to be improved. Xiao rust [5] elaborated the development of China's fresh agricultural products cold chain logistics, importance, improvement ways. Zhang Jianqi put forward [6] At present, China's agricultural products cold chain logistics system still has problems such as imperfect system, lack of high-end cold chain logistics technology and equipment.

2. Development Status of Food Cold Chain Logistics in Shandong Province

Shandong province is a mainly agricultural province, the cold chain logistics rapid development, in 2018, Shandong province give full play to its industry advantages, seize the national policy opportunities, through a series of supporting measures to promote the logistics cost reduction, innovation and application of supply chain, realize the steady growth of

the logistics industry, its development level and competitiveness improved significantly, become the province's economic transformation and industrial upgrading of strong support and guarantee the [7]. The total amount of cargo flow in Shandong Province in 2018 is shown in Figure 1:

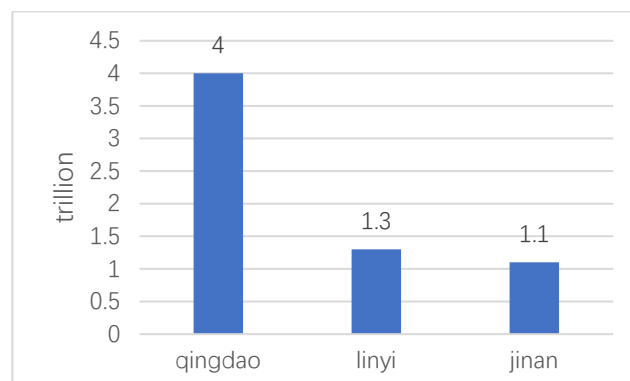


Figure 1. Total cargo flow in Shandong Province in 2018

In 2018, the total cargo flow of Qingdao, Linyi and Jinan in Shandong province was 4 trillion yuan, 1.3 trillion yuan and 1.1 trillion yuan, respectively. It can be seen from this that Shandong Province is a large province with great consumption potential, and its demand for frozen food is very large. The continuous expansion of the frozen food market will inevitably bring new opportunities and challenges.

In 2016, Shandong Province meat products reached 774,000 tons; the annual output of aquatic products was 9.31 million tons, and the annual output of vegetables was 103.27 million tons. Cultivate professional cold chain logistics enterprises, the development of cold chain house, fresh supply chain, cold chain resources trading platform and other new mode, new formats, using advanced cold chain technology and equipment facilities, improve logistics standards, to reduce the circulation of fruits and vegetables, meat, aquatic

products, ensure the quality of products, improve the competitiveness in the international and domestic market, is the top priority. The capacity of cold storage in Shandong Province from 2016 to 2018 is shown in Figure 2:

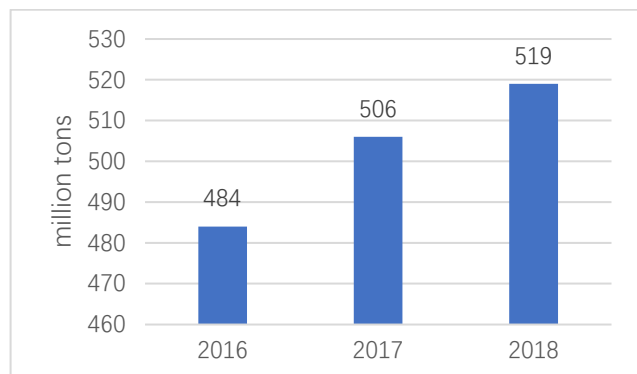


Figure 2. Capacity of cold storage in Shandong Province from 2016 to 2018

In 2016, the cold storage capacity of Shandong province was 4.84 million tons, in 2017, the cold storage capacity of Shandong Province was 5.06 million tons, and the cold storage capacity of Shandong Province was 5.19 million tons. It became the first region in the country with a refrigeration capacity of more than 5 million tons. The third-party cold chain logistics companies represented by Rongqing Logistics have developed rapidly and actively explored and built the facilities and management system matching the world-class level.

3. Problems Existing in the Cold-Chain Logistics Industry

3.1. The Cold Chain Logistics System has not Formed a Line

Shandong province is an important producer of agricultural products in China, with a wide variety of agricultural products, involving grains, fruits, vegetables, livestock and poultry and other fields. However, the cold chain logistics system in Shandong province failed to form a chain, there are a series of problems and reasons. The production of agricultural products in Shandong province is scattered, the agricultural production bases are widely distributed, the production scale is small, the scale and frequency of agricultural products transportation are limited, and it is difficult to form a centralized and efficient cold chain logistics system [8]. The construction of cold chain logistics facilities in Shandong Province is relatively lagging behind, and the existing cold chain facilities and equipment have problems such as backward technology, aging facilities and imperfect functions.

These problems lead to the relatively backward transportation mode and management mode of cold chain logistics in Shandong Province, which cannot meet the storage and transportation requirements. The lack of information communication and coordination between cold chain logistics service providers and farmers is also one of the reasons for the formation of cold chain logistics system has not formed a chain [9].

3.2. Imperfect Infrastructure

The primary reason for the imperfect infrastructure in Shandong Province is that the construction of cold chain

logistics facilities lags behind, which does not match the growth rate of agricultural production and market demand. The traditional refrigerated warehouses and means of transportation have limited quantity and quality to meet the needs of transportation and storage of agricultural products. Especially in the context of scattered and small scale of agricultural production areas, cold chain logistics facilities cannot meet the needs of large-scale transportation and storage. The functions of cold chain logistics facilities are not perfect. Most of the cold chain logistics facilities in Shandong Province are traditional refrigerated warehouses and refrigerated vehicles, and lack of modern temperature control equipment and intelligent management system, which leads to the relatively backward transportation mode and management mode of cold chain logistics, which cannot meet the requirements of long-distance transportation and storage of agricultural products. Shandong province layout of cold-chain logistics facilities is relatively unbalanced, mainly concentrated in some big cities and important port area, and agricultural production areas and remote areas of cold chain logistics facilities is relatively less, this leads to agricultural products from the origin to the market of cold chain transportation distance is longer, cold chain logistics coverage is limited, increase the risk of product loss and transportation costs.

3.3. Shortage of Technology and High Cost

The cold chain logistics technology in Shandong province is relatively lagging behind, mainly reflected in the equipment level, temperature control technology, traceability system and other aspects. Relatively small investment and research and development, as well as the lack of technology introduction, lead to the cold chain logistics equipment and technology level are the problems remaining to be solved [10]. The lack of unified industry standards and norms in the cold chain logistics industry in Shandong Province leads to some unstandardization in the operation and management of enterprises and employees. The lack of standardized operation and unified standards of the industry not only affects the operation efficiency of the cold chain logistics industry, but also restricts the development of technology and talents. The equipment, storage facilities and transportation tools involved in cold chain logistics all need to have the ability to maintain a low temperature environment, so the invested equipment cost is high. Especially in some areas of Shandong Province, due to the relatively lagging construction level of cold chain logistics facilities, the investment cost of updating and transforming facilities is also high. Secondly, the transportation cost of cold chain logistics is high. Because the cold chain logistics needs to maintain a low temperature environment, additional thermal insulation equipment and energy are needed in the transportation process, which leads to the rise of transportation costs. In addition, cold chain logistics transportation also needs to equip professional personnel for temperature monitoring and operation, and labor costs will increase accordingly. Cold chain logistics needs to carry out strict temperature control and product management, which requires a lot of manpower and material resources for monitoring and management. Cold chain logistics also needs to establish a tracking system to ensure the safety and traceability of products, which also requires a certain management cost. Finally, the cold chain logistics market demand is inelastic. Because cold chain logistics is mainly used in specific industries, such as agricultural

products and medicine, its market demand is relatively fixed. The transportation and storage cycle of cold chain logistics is long, and the demand is unstable, which makes the operating cost bear great pressure.

4. Countermeasures of Cold Chain Logistics Industry in Shandong Province

4.1. We will Strengthen Infrastructure Development

In order to improve the efficiency and safety of the cold chain logistics industry, Shandong Province cold chain logistics enterprises should strengthen the construction of cold storage and other infrastructure. Enterprises in the industry can be promoted to build standardized and standardized cold storage and transportation facilities by means of government guidance and capital investment. After the 1980s, many developed countries began to introduce more advanced cold chain equipment for agricultural products, the most famous is the new type of machine-cooled refrigerated container, whose refrigeration effect is remarkable and vigorously promoted by many countries, and its growth rate can reach an average increase of 15% per year. In the process of strengthening its hardware construction, we should focus on the refrigeration effect of logistics chain, the improvement and update of insurance equipment, invest a large amount of capital in refrigeration technology, introduce professional research talents, and promote the expansion of technology.

At the same time, combined with the modern information technology to create the "Internet + logistics" system construction. Real-time control of the whole process of products from production to customer value realization, to promote the effective integration of information technology and logistics system. In this mode, the information communication between downstream enterprises and upstream enterprises is closer, and the supply information of upstream enterprises and the use information of downstream enterprises can be timely grasped, which not only saves unnecessary time wasted by mutual communication and communication, but also makes the relevant costs need to be repeated. The large amount of capital saved by enterprises can better concentrate on the core products of enterprises, improve the added value of products, so as to make the needs of customers to be further met.

4.2. Promote Technological Innovation

Cold chain logistics enterprises in Shandong province should increase the investment in technology research and development, and improve the technical level. Through the introduction of advanced cold chain logistics technology at home and abroad, an intelligent, automatic and information logistics system can be built to improve logistics efficiency, save cost, and improve service quality and safety. We will strengthen research and development and innovation of cold-chain logistics technologies. The government can increase its support for the research and development of cold chain logistics technology, encourage enterprises to strengthen scientific research cooperation, introduce and develop advanced cold chain technology and equipment. The government can provide corresponding financial support and preferential tax policies to encourage enterprises to increase their investment in technology research and development. At

the same time, we should strengthen the supervision and law enforcement of the industry, punish and rectify the enterprises that do not meet the standard requirements, and improve the overall level of the industry. Finally, strengthen the publicity and promotion of the cold chain logistics industry. The government and industry associations can increase the publicity and promotion of the cold chain logistics industry, and enhance the visibility and attraction of the industry. At the same time, strengthen cooperation and exchanges with other industries, promote win-win cooperation among various industries, and promote the rapid development of the cold chain logistics industry

4.3. Cultivate Talents

Cold chain logistics enterprises in Shandong province should strengthen talent training, pay attention to the introduction of excellent talents, and cultivate local talents. The quality and skills of employees can be improved by developing training mechanisms and carrying out skill competitions, and the core competitiveness of cold chain logistics enterprises can be enhanced. Shandong province should take the training and introduction of agricultural products cold chain logistics talents as a major project. First of all, a reasonable training should be developed for the logistics industry practitioners. A special training base should be established, and various ways of combining long-term and short-term training, on-the-job training and school training should be adopted to create a group of professional and technical personnel and logistics management specialists with comprehensive ability who meet the needs of cold chain logistics, and the in-service logistics personnel should be actively continuing educated. The qualification examination and professional title system of logistics division should be constantly improved to strengthen its popularization in the logistics industry and related positions, so as to create a good space environment for the training of logistics talents in Shandong Province. Secondly, Shandong province should implement the modern logistics talent education project. Encourage and support related colleges and universities in Shandong province or vocational and technical schools set more courses related to cold chain logistics, such as modern logistics management, application technology and e-commerce courses, vigorously cultivate cold chain logistics talents, conducive to the development of human resources of cold chain logistics, establish echelon mechanism, strengthen the construction of high-quality talent team.

4.4. Cost Reduction

Cost reduction is the key to promote the development of cold chain logistics industry. Cold chain logistics enterprises in Shandong Province should reduce logistics costs and improve market competitiveness through technological innovation, equipment update and other ways. In order to reduce the cost of cold chain logistics in Shandong Province, the utilization rate and efficiency of cold chain logistics facilities can be improved. Optimize the layout and planning of facilities to reduce the idle and waste of facilities, while introducing advanced equipment and technology to improve the energy efficiency of facilities and reduce operating costs. Through the establishment of intelligent temperature monitoring and traceability system, the management level and efficiency of cold chain logistics can be improved, and human errors and losses can be reduced. Strengthen the cooperation and coordination among cold chain logistics enterprises, and

strive for more favorable prices and service conditions. The government can introduce relevant fiscal and tax policies to provide financial and tax preferential support to reduce the burden on enterprises. At the same time, it can also guide enterprises to carry out technological innovation and upgrading, improve the competitiveness of cold chain logistics and reduce costs. To sum up, the high cost of cold chain logistics in Shandong Province is mainly caused by the high facility investment cost, high transportation cost, high management cost and the lack of elasticity of market demand. To reduce costs requires the joint efforts of the government, enterprises and the industry to strengthen cooperation and coordination, and reduce the operating cost of cold chain logistics and improve the market competitiveness of agricultural products by optimizing the utilization of facilities, information construction and policy support.

5. Conclusion

At present, the development of cold chain logistics in Shandong province has made certain achievements, and the cold chain logistics in Shandong province has made great development in the fields of agricultural products, aquatic products and fresh food, to meet the market demand. However, there are still some problems and challenges, such as imperfect infrastructure, inefficient transportation, professional talent shortage and high costs. This paper puts forward some countermeasures to build and improve infrastructure, promote technological innovation, strengthen talent training and reduce costs. Through the implementation of the above countermeasures, it is expected to improve the transportation efficiency, service quality, reduce the cost of cold chain logistics, and improve the competitiveness of enterprises.

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