

Study on Green Cold Chain Development of Agricultural Products in Chifeng

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Abstract: With the rapid development of Chifeng's economy and the improvement of consumers' consumption level, Chifeng's agricultural cold chain logistics has gradually improved. In the context of the 12th Five-Year Plan, the development of green cold chain transportation is an inevitable direction. Based on the analysis and exploration of the problems existing in the cold chain transportation of agricultural products in Chifeng, and according to the characteristics of the cold chain logistics of agricultural products in Chifeng, this paper puts forward some suggestions on the development and optimization of green cold chain, aiming at providing theoretical reference for the improvement of agricultural industry structure in Chifeng.

1. Introduction

Chifeng has long been a major agricultural production and consumption market due to its large population. There are many kinds of agricultural products and their output is large. The output of agricultural products has been in the forefront of Inner Mongolia for many years. With the increasing income of Chifeng people, people's demand for agricultural products has become more and more diversified, and the level of cold chain of Chifeng agricultural products has been further improved. Chifeng Municipal Government and relevant departments also guide the development direction of Chifeng cold chain logistics by implementing some systems and regulations. At present, Chifeng's cold chain is still in its infancy. There are four enterprises carrying out standardized cold chain transportation in the whole city, namely Chengfeng, Hengwei, Xuefeng and Huaqing Shentong Cold Chain Co., Ltd. There are 28 cold stores in the whole city, most of which are located in the urban area. However, the cold chain logistics transportation is a complex and huge process. The current level of Chifeng easily leads to the abnormal development of cold chain logistics. Under the restriction of many factors, the unimaginable environmental damage and resource loss in the whole cold chain logistics in the process of cold chain transportation result in the cold chain which should be developing towards green. The trend is towards waste and destruction. These problems hinder the development of Chifeng's agricultural products and the further foothold of Chifeng's cold chain logistics in China. Based on the long-term exploration of Chifeng's agricultural cold chain logistics, this paper puts forward the corresponding sustainable opinions and suggestions on the development of Chifeng's agricultural cold chain logistics in the context of green logistics, aiming to help solve the serious problems of Chifeng's agricultural cold chain logistics.

2. Basic Connotation of Green Cold Chain

2.1. Cold Chain Logistics of Agricultural Products.

Cold chain logistics of agricultural products refers to the storage of required agricultural by-products, including fruits, vegetables, meat and so on. All the processes before they reach consumers after production, including storage, transportation and sales, must be carried out in a standard environment to ensure that agricultural by-products are delivered to consumers before hand. A logistics management strategy for product quality and guaranteeing the least loss of agricultural by-products in the whole process.

2.2. Green Logistics.

Green logistics refers to the use of advanced logistics technology and environmental protection science and technology to reduce the damage of logistics to the environment and the loss of resources in the whole logistics operation. The process of green logistics mainly includes every link from green transportation to green circulation processing, environmental protection and resource saving in the forward and reverse logistics process. The emergence of green logistics is to achieve the sustainable development of the industry.

2.3. Green Cold Chain.

Due to the emergence of the concept of green logistics and the frequent problems in cold chain transportation, the concept of green cold chain is further proposed in combination with the related concepts of green logistics and cold chain transportation. Green cold chain is a combination of green refrigeration transportation, green refrigeration circulation processing and green refrigeration storage in the process of cold chain transportation, combining with the concept of green logistics, so as to ensure the quality of cold chain transportation and reduce the damage to the environment caused by cold chain transportation as well as the resource saving of the whole cold chain process, so as to achieve the double progress of cold chain logistics and environmental maintenance.

3. Development Status of Green Cold Chain of Agricultural Products in Chifeng

3.1. Active Status of Green Cold Chain of Agricultural Products in Chifeng

3.1.1. Further Improvement of Cold Chain Foundation Level.

With the gradual improvement of Chifeng's economic level, in order to meet the people's multiple needs for agricultural products, the related infrastructure and equipment of the cold chain of agricultural products are constantly improving at this stage. These infrastructure facilities, such as refrigerators and refrigerated trucks, are the basis for promoting the development of agricultural cold chain. Chifeng cold chain logistics products at this stage are mainly divided into two categories, one is primary products of agricultural products such as fruits and vegetables, and the other is processed products such as meat and dairy products. So there are such cold chain enterprises as Hengwei and Chengfeng. Chifeng now has more than 20 enterprises engaged in cold chain, 28 refrigerators, and 8 refrigerators under construction, and refrigeration infrastructure is constantly improving, and the number of refrigerated vehicles is also increasing. Under the national cold chain logistics development plan for agricultural products, Chifeng also proposed to realize sustainable development of agricultural products cold chain in the 12th Five-Year Plan for logistics development of Chifeng. It plans to establish relevant cold chain transportation control centers around Chifeng, establish and construct high-tech and environmentally friendly cold chain storage warehouses, and continuously promote cold chain logistics.

3.1.2. Further Improvement of Transportation Network in Chifeng.

In order to ensure the rapid development of society as a whole, Chifeng has continuously improved the construction of highways and railways in recent years. From the highway data of 2013 to 2017, it can be seen that the highway mileage of Chifeng is increasing continuously and has a initial scale in transportation. By 2017, the highway mileage of Chifeng and 27,000 kilometers have reached, and the highway has reached more than 5 kilometers. At present, the most frequently used cold chain transportation is land transportation, and most of them are refrigerated truck transportation. Therefore, Chifeng vigorously improves the construction of highway mileage, which plays a very important role in the development of logistics and cold chain logistics in Chifeng.

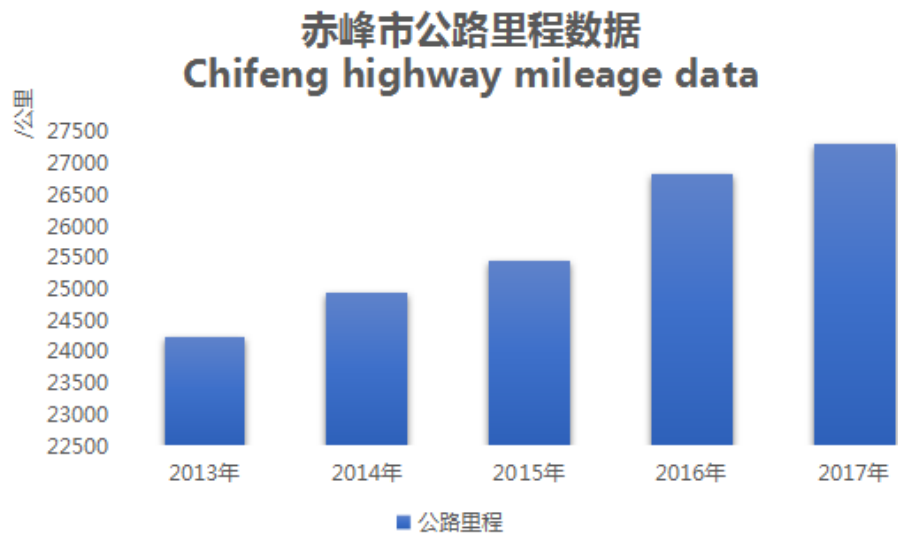


Fig 1. Data Source: Chifeng Yearbook

3.1.3. Gradual Change of Consumers' Concepts on Agricultural Products Consumption.

The biggest driving force for the development of cold chain is the demand of consumers. Chifeng is a populous city in Inner Mongolia Autonomous Region, and the consumption of agricultural products has always been in the forefront. According to the survey of consumer goods retail consumption in Chifeng in recent years, the total sales of Chifeng in 2013 was 52626 million yuan, and by 2017, the total retail sales of Chifeng reached 75.82 billion yuan, an increase of 44% in five years. With the improvement of people's income level, consumers have higher requirements for the products they consume. The requirement for agricultural products has been raised to a higher level. People are more inclined to consume agricultural products which are in a safe environment in the whole process from the output of agricultural products to the circulation to consumers. More attention should be paid to the safety of agricultural products. This prompts the existing agricultural products production, processing and circulation enterprises to adopt green cold chain system to transport agricultural products in the process of production, processing and circulation, and also drives the agricultural products cold chain logistics enterprises to change the direction of green cold chain, which provides power factors for the development of green cold chain in Chifeng.

3.2. Constraints of Green Cold Chain of Agricultural Products in Chifeng

3.2.1. Insufficient Conception of Cold Chain of Agricultural Products.

First of all, from the perspective of producers and farmers, since the concept of green was put forward only in recent years, most farmers and producers still use traditional production and storage methods to produce and store agricultural by-products. There is no cold chain in the whole process, resulting in a large number of agricultural by-products reached a high loss rate in the early stage, which is green. The color cold chain as a whole is a big defect. In terms of logistics enterprises, there are few enterprises that can really carry out green cold chain transportation in Chifeng at this stage. Most enterprises pay little attention to whether they cause damage to products or the environment in the cold chain process, and their awareness of green logistics is weak. Many agricultural by-products may be green when they leave the factory, however, in the process of cold chain transportation, enterprises do not pay attention to the destructive effect of cold chain transportation on the environment, so green agricultural products will become no longer green. At the government level, the government is still at the concept stage for green cold chain. The cold chain transportation of agricultural products and the production of agricultural products are in an unbalanced stage. In 2017, Chifeng Municipal Government invested 35.96 billion yuan in agriculture, animal husbandry and fishery, but only 10.12 billion yuan in transportation, which was 29.3% less than the previous year. Agricultural development is a continuous process, not only to

complete a step or improve an institution. The government lacks the guidance of the green cold chain of agricultural products, so that the development of green cold chain in all aspects of the whole cold chain will be in the concept stage for a long time due to the trend of government construction.

3.2.2. High Green Cold Chain Cost for Agricultural Products.

Cold chain transportation is an important link between agricultural products and the market, and the primary factor affecting the cost of green cold chain transportation of agricultural products is the cost of green cold chain transportation. In the whole process of cold chain transportation, the cost of cold chain transportation is fuel cost, toll and personnel cost. In addition, in order to ensure the high fidelity of products in the process of cold chain transportation, it is inevitable to increase the operation of refrigeration time. The distance from the nearest Qixian county to Chifeng is more than one hour, and even up to five hours. Long-term cold chain transportation will inevitably lead to long-term refrigeration, which will further deepen the impact on the environment in addition to the cost increase. In the transportation process of cold chain logistics, besides fuel cost accounting for a very important aspect, reaching 43%, the toll also accounts for about 30% of the total cost by human labor. In addition, the insurance, maintenance and depreciation of refrigerated vehicles also have a large proportion. If environmental protection is to be considered, the cost will inevitably continue to increase.

3.2.3. Backward Infrastructure Construction of Green Cold Chain for Agricultural Products.

According to the concept of green cold chain, it is the key to combine environmental protection with resource saving and cold chain transportation in the process of cold chain. To do this, the infrastructure of the cold chain is the key point. Chifeng is still in the initial stage of cold chain development. Most of the cold chain logistics infrastructure is relatively weak and has not formed a large-scale operation. Among the 28 existing refrigerators, only the Southwest Refrigeration Storage and Western Meat United Refrigeration Storage adopt the new technology of modern refrigeration construction, which has rich and diverse functions and can adapt to a variety of product types; while most of the other refrigerators still use the old technology, and the refrigeration facilities are relatively backward, so they can only refrigerate some frozen food such as meat and meat. Fish, which consumes a lot of power, is even more difficult to achieve a green cold chain.

3.2.4. Green Cold Chain Transportation Standards are not Uniform.

The nature of green cold chain logistics belongs to the combination of cold chain logistics and green service. This requires the green cold chain in the operation process must have a unified transport service standards. At this stage, we can see from the green cold chain transportation in Chifeng that the standard of cold chain transportation is not uniform, and many enterprises can not provide standardized green cold chain services for the market. Even many cold chain transportation enterprises shut down refrigeration facilities or adjust refrigeration temperature in order to save the cost of cold chain transportation, which makes the operation of the whole cold chain transportation industry and its non-standard. In the short run, it can save costs for enterprises. In the long run, it will increase the loss of agricultural products, and further lead to the increase of costs and damage to the environment. The different standard of green cold chain transportation reduces the quality of cold chain transportation and prevents the sustainable development of green cold chain for the whole agricultural industry.

4. Development Strategy of Green Cold Chain for Agricultural Products in Chifeng

Developing Green Cold Chain of Agricultural Products Based on the Characteristics of Agricultural Products in Chifeng

4.1. Creating and Perfecting Green Cold Chain Project.

Green cold chain project mainly includes the improvement of green cold chain infrastructure and

the establishment of green informatization of cold chain logistics. In order to promote the development of green cold chain, the construction of cold chain infrastructure plays a vital role in the development of green cold chain. First of all, cold chain enterprises must carry out a consolidation and collection of infrastructure under the concept of green overall situation. Through the high-quality cooperation of various enterprises and departments, they should increase the investment of cold chain vehicles, achieve the collection of various types of cold chain vehicles, maximize the use of various facilities in cold chain transportation by expanding the scale of transportation, and establish refrigeration storehouses of modern technology to ensure the refrigeration needs of various types of agricultural products. Thus, the whole process of cold chain transportation from transportation to storage can be “cold link”, and the green and intensive cold chain transportation can be realized. Secondly, it is necessary to strengthen the hypothesis of green informatization of cold chain transportation. We will further promote the intensification of hang-and-drop transport and urban distribution in cold chain transportation. By using big data, 5G technology, 3S technology, Internet of Things and Internet technology to build a large data cloud platform of green cold chain, the whole process of green cold chain can be controlled and visible, so as to ensure the quality of agricultural products in the process of cold chain transportation, thereby further reducing the overall loss, and realizing the collection and visualization of green cold chain information. And consumers in the market can also increase their confidence in the green cold chain because they can see the whole green agricultural cold chain, which will further increase the income of enterprises.

4.2. Standardizing the Service and Transportation Standards of Green Cold Chain Enterprises.

Chifeng is at the beginning of green cold chain at present, so there are problems of cold chain logistics service and transportation chaos. It is necessary to further develop a series of standards for green cold chain service and transportation. Firstly, in the service of green cold chain enterprises, the poor service of green cold chain enterprises is an important issue in the development of green cold chain in Chifeng. The standardization of agricultural cold chain process can be guaranteed by strengthening the technical and operational standards of enterprise cold chain, cultivating the green consciousness of employees and improving the ethical standards of employees. From transportation, enterprises should formulate their own relevant cold chain transport standards, including the standard of temperature nodes in the process of cold chain transport, the standard of cold storage construction technology, circulation processing and packaging green process standards. In order to improve the service level of green cold chain of agricultural products in Chifeng, the formulation of multi-directional standards can also provide a guarantee for the development of green cold chain.

4.3. The Government's Policy to Strengthen Policies and Fiscal Policies.

In view of the lack of driving force for the development of green cold chain in Chifeng at this stage, one of the main reasons is that the government, consumers, producers and farmers in the middle still lack the understanding of green cold chain, and the government lacks guidance to the whole society. Now we must speed up the propaganda of green cold chain, let the concept of green cold chain go deep into the hearts of everyone in society, and make it have a scientific and rational concept to treat the development of green cold chain. Secondly, the government should provide policy support to the whole green cold chain industry, promulgate relevant laws and regulations on green cold chain, set up a special fund for green cold chain, reduce a series of taxes and fees of green cold chain enterprises, and formulate green entry standards for the cold chain transportation industry according to the characteristics of Chifeng agricultural products. The production of a series of wastes in cold chain transportation should be controlled, and the recovery and utilization of wastes in cold chain transportation should be strengthened. Under the dual inclination of finance and policy, the government should encourage green cold chain enterprises to achieve the unity of economic and environmental benefits, and provide financial assistance for enterprises striving to develop in this direction, so as to promote the green development of the whole Chifeng cold chain.

4.4. Enhanced Cooperation between Enterprises and Government with Universities and Industry Associations.

Because of Chifeng's unique geographical location, the development of cold chain transportation is slow at this stage. The scarcity of professional logistics personnel and the low quality of existing logistics personnel also affect the development of green cold chain transportation in Chifeng. Therefore, Chifeng should strengthen cooperation with colleges and universities, and set up special courses and specialty directions according to the characteristics of Chifeng's green cold chain of agricultural products. While cultivating the green cold chain talents of Chifeng, it can also alleviate the employment pressure of college students and make them directly match the green cold chain construction of Chifeng's agricultural products. Secondly, enterprises should strengthen cooperation with industry associations, enhance the knowledge literacy of employees by means of expert lectures and skills on-site operation, and improve and re-train existing employees and talents in many ways. Personnel departments should also do a good job in the systematic management of human resources, excavate and tap talent from all levels, and use the high knowledge of talent and high-tech advantages to optimize the current stage of green cold chain deficiencies.

5. Conclusion

With the continuous development of Chifeng's economy, green cold chain transportation will inevitably become a new direction of agricultural products transportation. The deterioration of the environment has also promoted the development of the cold chain in the direction of green. Chifeng, as a big city of population and agriculture, must fully recognize the problems existing in the development of green cold chain of agricultural products, and take the concept of green, energy saving and emission reduction as a guide. Under the idea of green logistics, we should use scientific, green and rational methods to solve the problems existing in green cold chain of agricultural products, and strive to make the green cold chain of agricultural products more sustainable. The green cold chain has been transformed into reality, thus accelerating the green coverage of Chifeng's agricultural cold chain and promoting the faster and healthier development of Chifeng's agricultural economy.

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