

Talking about China's Future Development with Reference to Foreign Cold Chain Logistics Development

Lei Yu¹, Sun Wenwen²

^{1,2}Postgraduate Student, Majored in Management Science and Engineering,

^{1,2}School of Logistics, Beijing Wuzi University, Beijing, China

ABSTRACT

People's normal life is more and more inseparable from the services of modern logistics. As a logistics service with the highest technical difficulty at present, how to face consumers' higher and higher requirements for cold chain logistics? Become the main battlefield for the future development of logistics enterprises. Especially after the outbreak of the epidemic, it has highlighted various shortcomings in the circulation of cold chain logistics in China, and we still need to make a lot of efforts on the road to maturity and improvement. After analyzing the development status and characteristics of cold chain logistics in some developed countries, this paper also points out the gap between China's cold chain logistics and developed countries, and recognizes the advanced experience of developed countries, and puts forward the prospect of China's cold chain logistics development.

KEYWORDS: Cold chain logistics; Developed countries; Development status; Future development

How to cite this paper: Lei Yu | Sun Wenwen "Talking about China's Future Development with Reference to Foreign Cold Chain Logistics Development" Published in International Journal of Trend in Scientific Research and Development (ijtsrd), ISSN: 2456-6470, Volume-6 | Issue-3, April 2022, pp.1784-1791, URL: www.ijtsrd.com/papers/ijtsrd49795.pdf



Copyright © 2022 by author (s) and International Journal of Trend in Scientific Research and Development Journal. This is an Open Access article distributed under the terms of the Creative Commons



Attribution License (CC BY 4.0) (<http://creativecommons.org/licenses/by/4.0>)

1. INTRODUCTION

1.1. Definition of cold chain logistics

Cold chain logistics generally refers to a systematic project in which refrigerated and frozen foods are always in a specified low temperature environment in all links from production, storage, transportation, sales, and before consumption to ensure food quality and reduce food loss. It is established with the advancement of science and technology and the development of refrigeration technology. It is a low-temperature logistics process based on refrigeration technology and using refrigeration technology as a means. It needs special equipment, and needs to pay attention to the transportation process, time control, transportation. A special form of logistics in which the type and logistics cost account for a very high proportion of the cost.

1.2. The significance of cold chain logistics

After 40 years of reform and opening up, the rapid development of the national economy has also brought about a substantial improvement in people's

living standards. The vigorous development of the e-commerce industry has effectively shortened the distance between logistics and every consumer, making logistics a people An indispensable part of daily life. Internet shopping has gradually changed the way of life. More people hope that they can buy vegetables at home without going to the supermarket. There is an online "vegetable basket". Therefore, in the process of turning traditional goods to modern logistics, cold chain logistics came into being under the condition that potential markets, consumer wishes and technical environments have matured. Cold chain logistics is a concentrated expression of the high-quality management of the supply chain and related advanced refrigeration technology. Cold chain logistics is not only reflected in the fresh and complete delivery of fresh meat, poultry, eggs, milk and vegetables to consumers through cold chain logistics, but more importantly, the emergence of cold chain transportation can effectively solve the Insufficient refrigeration conditions and improper temperature control protection cause the pain point of

loss of benefits due to inactivation of drug properties, which greatly facilitates and promotes the progress of China's pharmaceutical research. Especially during the epidemic, there have been many incidents of imported meat frozen outer packaging testing positive for the new crown, which requires us to pay full attention to the cold chain circulation, especially to learn from the experience of cold chain logistics in typical developed countries to improve the situation. Cold chain logistics construction.

2. The Development Status of Cold Chain Logistics in Developed Countries

2.1. America

The United States has the world's leading technological innovation technology and outstanding R&D talents. In terms of cold chain logistics, the United States has developed very mature cold chain enterprises and relatively advanced cold chain technology. Ameri-cold Realty Trust is the world's largest cold chain enterprise, accounting for about 22% of the global cold chain market, and its temperature-controlled storage and refrigeration systems are at the top level in the world [3].

In terms of cold chain technology, transportation vehicles are equipped with vehicle tracking systems and information traceability systems, and real-time supervision and location tracking of transportation vehicles are carried out during transportation, so that the entire process can be traced to any link of logistics information.

The US government has issued a series of policies to promote the development of cold chain logistics. For example, the United States has established a cold chain logistics association in the early years and issued a related cold chain standard system, which has strict constraints on product quality, safety supervision and operation specifications [4]. With the development of cold chain logistics, the U.S. government has continued to improve the cold chain standard system construction and market access system, promoting the continuous development of cold chain logistics under the safety and strict institutional guarantee.

2.2. Germany

Germany's cold chain logistics level has always been leading in Europe, and it has begun to attach importance to the construction of automated cold storage technology many years ago [1]. Through the application of advanced cold chain facilities and equipment, Germany can maintain a low product loss rate in the long-term development of cold chain logistics, which greatly avoids cold chain risks caused by non-standard temperature control, and ensures the

safety of cold chain logistics. Safe and efficient development.

Another reason for the high level of cold chain logistics in Germany is its emphasis on cold chain logistics and policy guarantees. Germany maintains extremely high requirements and standards for all kinds of fresh food such as meat, poultry, eggs, milk, and vegetables in the entire circulation process. For example, animal husbandry will use the identification system from the beginning of animal breeding, and use the traceability system in the subsequent links to strictly control the quality of the above products.

2.3. The Netherlands

The Netherlands has unique geographical conditions in Europe. The three largest rivers in Western Europe all flow through the Netherlands, and water transportation is well developed. The Netherlands also has the largest port in Europe, the Port of Rotterdam, which is adjacent to important vegetable and fruit planting areas, providing convenient conditions for the cold chain transportation of fruits and vegetables. With its outstanding natural advantages, the Netherlands has frequent exchanges with neighboring developed countries, and has gradually become a European agricultural product distribution center and economic and trade transfer station.

The Netherlands implements strict production standards for all agricultural and sideline products, which puts forward higher requirements for cold chain logistics. Taking the most important dairy product in Dutch agriculture as an example, the production standards stipulated by the Netherlands far exceed the relevant standards of the International Organization for Standardization (ISO) [2]. In addition, the construction of its data informatization platform is relatively complete. During the entire logistics process of transporting products, customers and cold chain enterprises can use the logistics information traceability code at any stage to query the real-time temperature and location information of products at any time according to their own requirements, which greatly enhances the It improves the transparency of product logistics information and consumers' trust in the safety of enterprises and cold chain logistics.

2.4. Canada

The development of cold chain logistics in Canada is very mature, especially the cold chain logistics of agricultural products occupies a large part in the economic development of Canada. The comprehensive cold chain logistics transportation system composed of road, water, railway, air and other transportation modes has created a broader

transportation network for Canadian cold chain logistics. At present, Canada has built three cross-regional cold chain logistics and transportation systems. Cold chain resources are effectively allocated and developed in cooperation with each other, jointly creating an all-round coverage of Canada's cold chain logistics system within the country.

Canada's cold chain logistics has a high level of data informatization. Through a unified standard data management system and data exchange system, real-time dynamic monitoring in all aspects of cold chain logistics can be achieved^[4]. In the cold chain logistics of agricultural products, the whole process of low temperature control, information data exchange, and temperature monitoring of the whole process of cold chain transportation have been realized, which has effectively controlled the incidence of cold chain logistics risks and strengthened the supervision of cold chain logistics. Under the environment of effective application of temperature control facilities and whole-process cold chain temperature monitoring, the loss rate of Canadian cold chain logistics is only 5%, and the logistics cost is less than 30%, which greatly avoids the risk of chain disconnection in cold chain logistics and reduces logistics costs. ,to ensure the safety, high quality and high efficiency of cold chain products.

2.5. Japan

Japan's land is small, the area of available arable land is small, and the distribution of farmers is scattered. However, under the condition of lack of natural resources, Japan's annual export output of agricultural products is at a high level. In response to the difficulty of centralized management of agricultural resources, Japan concentrated the scattered agricultural products in the central wholesale market for unified supply. Under the unified and standardized management of the Agricultural Association, it effectively made up for the congenital defect of the scattered distribution of farmers. As an island country, Japan has inherent advantages in the scale, quantity and quality of seafood. The high-standard cold chain logistics system provides a reliable guarantee for the transportation of fresh Japanese products. Every year, a large amount of high-quality seafood is exported from Japan to many countries around the world. Japan's high-tech and R&D level is in a leading position in the world. In terms of cold chain logistics, it is equipped with temperature control equipment that can be controlled by grades, world-leading automated three-dimensional

warehouses, and transportation vehicles with location tracking and real-time temperature monitoring functions. Facilities and equipment. Starting from the pre-cooling link at the origin, the entire cold chain logistics and transportation operations in Japan are strictly regulated, and the damage rate of products is as low as 5% or less. There is no risk of chain breakage during the cold chain transportation of agricultural products, which further ensures the safe and efficient cooling of agricultural products. chain transport.

3. Status Quo of Cold Chain Logistics Development in China

In 2020, the scale of the cold chain logistics market will exceed 380 billion yuan, the cold storage capacity will be nearly 180 million cubic meters, and the number of refrigerated trucks will be about 287,000, which are 2.4 times, 2 times, and 2.6 times that at the end of the "Twelfth Five-Year Plan" period, respectively. The quality of development has been continuously improved. A cold chain logistics service system integrating origin and sales, integration of transportation and warehousing, and integration of logistics and industry has been initially formed. The service functions of cold chain logistics facilities have been continuously expanded, and the temperature control of the whole chain and the traceability of the whole process have been continuously improved. The development of cold chain drop and pull transport and multimodal transport is accelerated. The efficiency of customs clearance at cold chain logistics ports has been greatly improved, and the organizational capacity of international cold chain logistics has been significantly enhanced.

3.1. Strong demand for cold chain logistics

With the development of the food industry and e-commerce, the demand for cold chain logistics of agricultural products in China continues to grow, and the output of fresh agricultural products such as vegetables, fruits, meat, eggs, and aquatic products ranks first in the world for many consecutive years. Statistics on the annual output of vegetables, fruits, meat products, aquatic products, liquid milk and quick-frozen rice and noodles, and combined with the cold chain circulation rate of each category, it is announced that the cold chain circulation of China's agricultural products in 2019 is 233 million 10,000 tons, a year-on-year increase of 24%. In 2020, the cold chain circulation in the field of agricultural products is 287 million tons, a year-on-year increase of 23%. See Figure 1 for details.

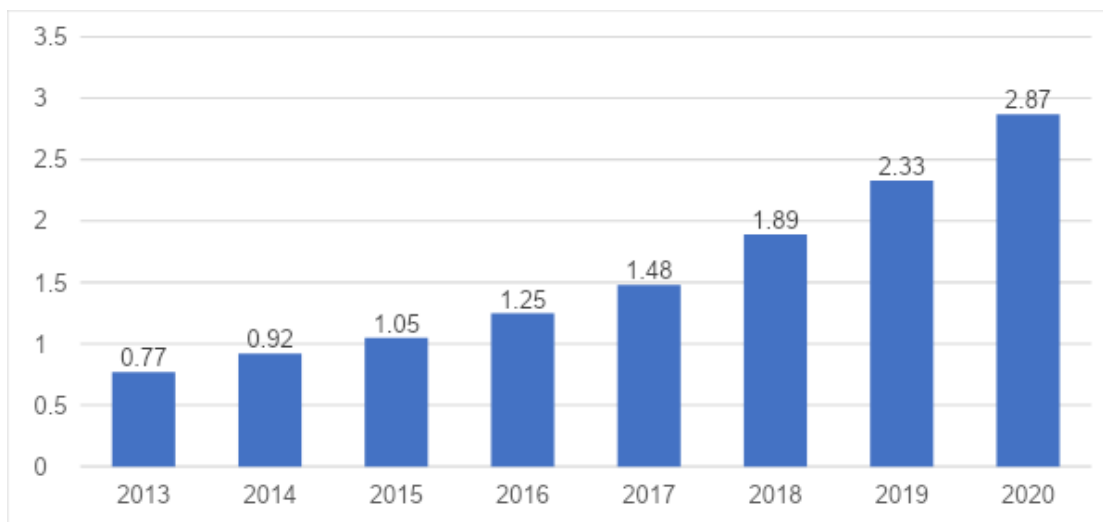


Figure 1 2013-2020 National Agricultural Products Cold Chain Logistics Demand (Unit: 100 million tons)

3.2. The scale of cold chain logistics continues to expand

With the continuous improvement of the income level of urban and rural residents in China, consumers' demand for food diversity, nutrition and taste has also increased significantly, coupled with the rapid rise of the fresh food e-commerce market, which has jointly promoted the cold chain logistics industry to enter the fast lane of development. According to public data, the domestic cold chain logistics market continued to expand from 2015 to 2019, with an average annual compound growth rate of about 17%. In 2019, the market size of the cold chain logistics industry reached 339.1 billion yuan, a year-on-year increase of 17.50%. The annual overall market size is expected to achieve the largest expansion in recent years, with an output value exceeding 400 billion yuan, and it is expected to exceed the 450 billion yuan mark by 2021. Considering that the future growth momentum will not decrease, according to this growth rate, by 2025 my country's cold chain The logistics market size will further jump to about 897 billion yuan. See Figure 2 for details.

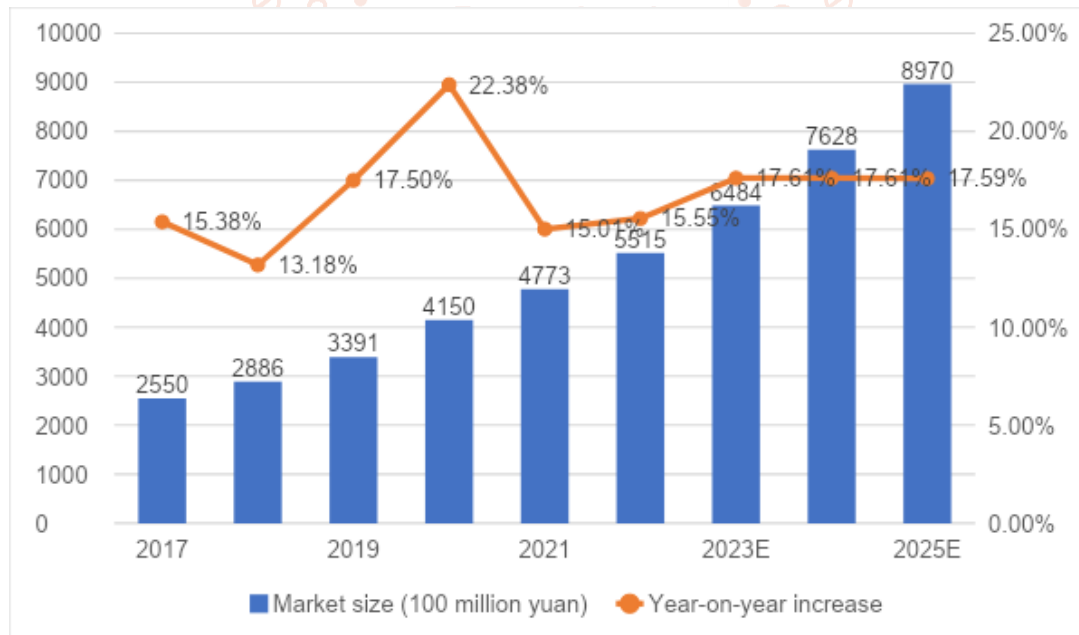


Figure 2 Market size and forecast of China's cold chain logistics industry from 2017 to 2025 (100 million yuan)

3.3. Good development of cold chain logistics facilities

With the continuous improvement of the income level of urban and rural residents in China, consumers' demand for food diversity, nutrition and taste has also increased significantly, coupled with the rapid rise of the fresh food e-commerce market, which has jointly promoted the cold chain logistics industry to enter the fast lane of development. According to public data, the domestic cold chain logistics market continued to expand from 2015 to 2019, with an average annual compound growth rate of about 17%. In 2019, the market size of the cold chain logistics industry reached 339.1 billion yuan, a year-on-year increase of 17.50%. The annual overall market size is expected to achieve the largest expansion in recent years, with an output value exceeding 400 billion yuan,

and it is expected to exceed the 450 billion yuan mark by 2021. Considering that the future growth momentum will not decrease, according to this growth rate, by 2025 China's cold chain The logistics market size will further jump to about 897 billion yuan. See Figure 3 for details.

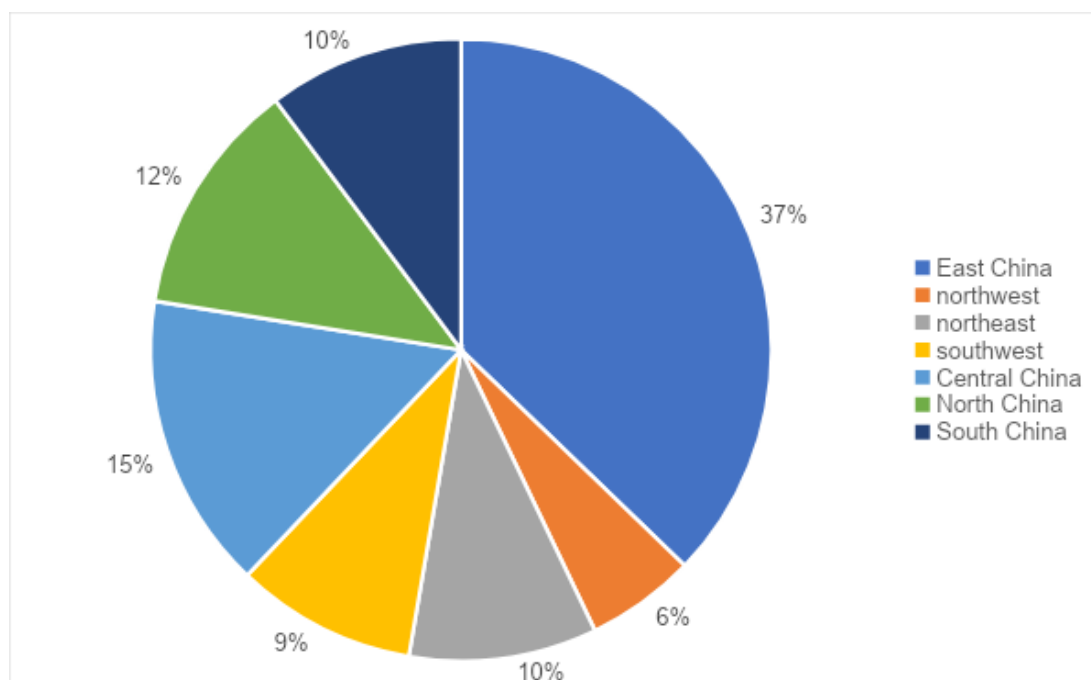


Figure 3 Proportion of Refrigerator Supply Areas in China in 2020

From the current situation and trend of supply of cold chain logistics facilities in China, it mainly presents the following characteristics. First, the scale of cold storage capacity has continued to grow rapidly. According to the relevant data of the Cold Chain Committee of the Internet of Things, the average annual growth rate of China's cold storage capacity in the past five years has reached about 12%, which is higher than the average growth rate of China's logistics industry. Second, the construction of cold chain warehouses in production areas has been accelerated, especially with the policy support of relevant national ministries and commissions, and driven by the demand for large-scale operations in agricultural production areas, cold chain logistics facilities have grown rapidly. The third is the large-scale development of cold chain logistics facilities. The storage capacity of newly built cold stores in cities is generally above 10,000 tons, which is conducive to intensive urban logistics land and promotes large-scale operation of cold chain logistics. However, China's cold storage also has problems such as unbalanced spatial distribution and mismatch of supply and demand, especially the shortage of cold chain logistics facilities in major consumption areas such as megacities and production areas.

4. There are Problems in China's Cold Chain Logistics

Although the cold chain logistics industry has a very broad market prospect, there are still many problems restricting its development in practice, mainly in the following aspects:

4.1. The technical facilities are relatively backward

Compared with developed countries, the core technology of cold chain logistics in China started late and developed relatively slowly. So far, China's cold chain hardware facilities are still lacking, and the equipment is unevenly distributed, mainly concentrated in coastal areas and developed cities, but the central and western regions are seriously lacking in equipment, and development is relatively lagging behind. The development of equipment types and functions is also unbalanced. There are more large-scale equipment constructions, while small and medium-sized cold storages are much less. In addition, the cold storage equipment is relatively old, and most of the storage equipment is not fully functional and cannot accurately control the temperature. In the process of docking, due to the poor quality of the equipment, it is difficult to meet the requirements.

4.2. The cost of cold chain logistics is high

The cost of cold chain logistics is relatively high, generally about 50% higher than that of ordinary logistics. In recent years, the price of energy has continued to rise, resulting in the rising cost of cold chain logistics. The equipment level of cold chain logistics is insufficient, which also greatly increases the logistics cost. Due to the high commodity prices of cold chain logistics and the lack of understanding of the market by dealers, many logistics industry personnel are forced to choose low-standard cold chain logistics or ordinary logistics, thus restricting

the development of cold chain logistics. See Figure 4 and 5 for details.

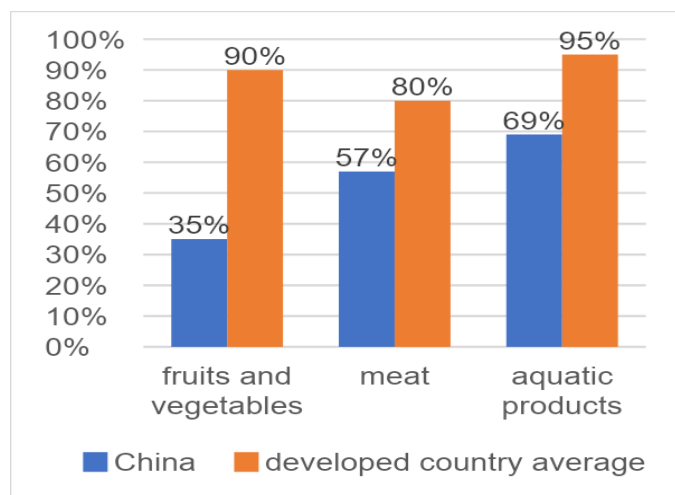


Figure 4 Comparison of cold chain transportation rates between China and developed countries (%)

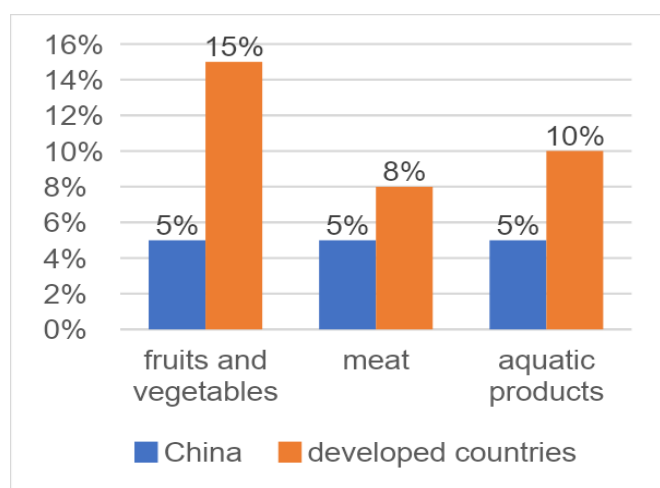


Figure 5 China's cold chain corrosion rate compared with developed countries (%)

4.3. Lack of cold chain technical talents

At the national level, there are relatively few colleges and universities offering cold chain logistics majors in China, which fundamentally cannot meet the training of large-scale professional talents. Although the logistics profession continues to maintain a high talent absorption capacity, the demand for logistics talents is also increasing day by day, but for the cold chain logistics industry, my country is almost blank in terms of talent training in cold chain logistics, and there are few cold chain logistics talents. Nearly blank. It is an indisputable fact that China's cold chain logistics industry lacks professionals who understand cold chain technology and management and cold chain logistics operations. At present, major cold chain companies use some experienced personnel with relatively little professional knowledge, but the logistics industry has relatively strong liquidity and serious brain drain. The premise of the development

of any industry is "people". Without the support of talents, the entire industry will be in trouble.

4.4. The legal system is not perfect

Sound laws and regulations can provide guarantee for the development of cold chain logistics. The development of cold chain logistics is inseparable from the strong support and guidance of the government. However, China's laws and regulations in the field of cold chain logistics are lacking, which leads to the insecurity of all subjects from production to sales in the process of product transportation. Therefore, the whole process of cold chain logistics is not recognized by the public, which also limits the development of cold chain logistics to a certain extent. In addition, the cold chain facilities used in China cannot achieve uniform standards in terms of production specifications and usage specifications.

5. China's Future Development Direction

5.1. Improve infrastructure construction

Compared with the current development, the infrastructure such as facilities and equipment of cold chain logistics cannot meet the needs of increasing development. It is an indispensable infrastructure to update the implementation and equipment of cold chain logistics to adapt to the development of the new era as soon as possible. Develop and build a cold chain logistics quality traceability and temperature control supervision platform, select some key cities and enterprises to carry out pilot projects, and monitor and supervise all aspects of cold chain production, storage, transportation, and retail. Through the construction of intelligent infrastructure such as big data and cloud computing, the information of each logistics link is digitized and connected online to promote the transparency of the cold chain logistics process. Through intelligent technology to empower every link of the cold chain, it is possible to improve quality, increase efficiency and reduce costs.

5.2. Pay attention to the construction of agricultural and fresh cold chain

China is a big agricultural country, ensuring national food security and ensuring food for 1.4 billion people are always the first people's livelihood issues to consider. On the one hand, China will build a moderately prosperous society in an all-round way by 2020. The development of cold chain logistics for agricultural products will greatly improve the living standards of the people, enable them to live a happier and healthier life, and finally achieve the goal of building a well-off society in an all-round way as scheduled; on the other hand, in order to avoid high-quality agricultural products due to inconvenient transportation and high transportation costs It can

only be rotten in the basket of the old farmers, actively go deep into the fields, expand the high-quality source of the supply chain, build the cold chain logistics of agricultural products, revitalize the rural agricultural economy, create receivables for the left-behind farmers, and effectively make contributions to winning the battle against poverty.

5.3. Create a flexible supply system

Strengthen the linkage and cooperation between the government and multi-party enterprises, sort out the food cold chain process and plan, establish a linkage and cooperation mechanism, and ensure the circulation of the food cold chain through various forces. Innovate the supply chain organization model, continue to optimize the cross-department, cross-region, cross-border, cross-industry information sharing and organization and coordination mechanism, create a diversified supply guarantee entity, continue to deepen cooperation with surrounding regions, and form an efficient global linkage. Establish a clear green channel and policy system, standardize operating procedures and standards for emergency links, and provide comprehensive policy support. Through multi-party collaboration, the full immunity of the food cold chain will be enhanced, and an elastic supply chain system of the food cold chain will be created.

5.4. Complete cold chain logistics talents

"Cold chain logistics talents" are controlled by people in all control systems. No matter how powerful facilities and equipment are, they need people to complete them. Without professional talents, the result is water without sources and trees without roots. Every enterprise wants to In the field of cold chain logistics, "talents" are indispensable to gain a place in the field of cold chain logistics. Talents are a must for every cold chain logistics. The development and support of talents is the core competitiveness of enterprises.

5.5. Improve and improve relevant policies

As early as 2017, the "General Office of the State Council on Accelerating the Development of Cold Chain Logistics" pointed out that the opinions on ensuring food safety and promoting consumption upgrading are systematically sorted out, revised and improved according to the principles of scientific, reasonable and easy to operate. In connection with international standards, scientifically determine the refrigeration temperature zone standard, and form a cold chain logistics technical standard and temperature control requirements covering the entire chain [6]. Since 2018, the state has issued a number of policies to mention the cold chain logistics industry of agricultural products. On the one hand, there is a

demand for the construction of the cold chain logistics industry in the relevant policies of the downstream industry of the industry. The introduction of these policies shows that the cold chain logistics industry of agricultural products, as an important means to ensure the safety of food and people's livelihood, has been deeply integrated into the core links of various industrial chains, and the value and status of the entire agricultural cold chain industry have become more and more prominent.

5.6. Moderate guidance to avoid monopoly

For now, the development scale and industry standards of China's cold chain logistics are far below the level of the developed countries. And most cold chain logistics companies in the industry are generally low in scale and lack leading companies. Cold chain logistics enterprises are characterized by large number, small scale and unbalanced regional distribution, making it difficult to form a scale effect. Very few companies with certain cold chain logistics strength are also established in companies that have done well in the field of general logistics. It is difficult for individual companies to drive the progress and development of the entire industry. Therefore, the government should improve relevant policies, maintain market order, create a fair business environment, give full play to the decisive role of the market, allocate social resources reasonably by dynamic enterprises, agree on industry rules and standards, and establish a good industry system. Promote the construction of cold chain logistics steadily. At the same time, the government should also stick to the bottom line, establish a list of negative behaviors in the industry, and always adhere to cold chain logistics, and even the entire logistics industry is a livelihood industry that serves the society.

CONCLUSION

At present, cold chain logistics has shown unprecedented development opportunities. Although the achievements made by foreign developed countries after a long period of development cannot be caught up by China overnight, the rate of preservation of goods value and the rate of damage to goods is much higher than that of China, which can be learned and developed first. In the big cake of cold chain logistics, business opportunities have shown a corner, the future is even more unlimited potential, the market is huge, the leap-forward development of the entire industry is coming, and all aspects of the country, society, industry and enterprises should Form a joint force to establish a complete cold chain logistics system and prepare for the rapid development of this industry.

References:

- [1] Wei Kejian, Lu Sheng. The practice of cold chain logistics management in Germany and its reference to my country—the second report on the overseas training project of the leader of the logistics management major of Guangxi Vocational and Technical College [J]. Journal of Guangxi Vocational and Technical College, 2012, 5(6):34-39.
- [2] Zhou Haixia. Foreign Agricultural Products Cold Chain Logistics Integration Experience and Reference [J]. World Agriculture, 2016, (5): 18-22.
- [3] Morning Whistle Group. Cold Chain Integration Opportunity: The global concentration of 450 billion US dollars is extremely low, and the good targets are here [EB/OL]. http://www.sohu.com/a/245442347_618572, 2018-08 -06/2019-12-27
- [4] Tian Hua, Zhou Ruiqi, Zhu Boqing. Successful Experience and Enlightenment of Cold Chain Logistics Development in Developed Countries [J]. Price Monthly, 2016, (4): 68-71.
- [5] Wang Weiwei. Comparison and reference of the development of cold chain logistics of agricultural products at home and abroad [J]. Foreign Economic and Trade Practice, 2012, (4): 90-92.
- [6] Opinions of the General Office of the State Council on Accelerating the Development of Cold Chain Logistics to Ensure Food Safety and Promote Consumption Upgrade Guoban Fa [2017] No. 29 [EB/OL]. http://www.gov.cn/zhengce/content/2017-04/21/content_5187961.htm, 2017-04-21

