

# Fresh electricity business cold chain logistics development and countermeasures research

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## ABSTRACT

Under the background of new retail, fresh electricity business as a rising star of electricity business is developing rapidly, how to improve the service quality of fresh cold chain logistics, transportation efficiency, and further improve the market competitiveness of fresh cold chain logistics industry has gradually become the focus of attention. This paper expounds the necessity of the development of fresh electricity logistics, analyzes the main problems in the development of fresh cold chain logistics, the current fresh electricity cold chain logistics development strategy, how to promote the green and healthy development of fresh electricity cold chain logistics to provide countermeasures.

## KEYWORDS

Fresh food; E-commerce; Cold chain logistics; Green development

## 1. INTRODUCTION

With the social and economic development of China and the improvement of income level, urban and rural residents are paying more and more attention to the quality of life and paying more attention to the quality and safety of three meals a day. The construction of efficient fresh food cold delivery logistics system is an important measure to improve the quality of agricultural products, help the standardization, scale and branding of agricultural products out of the countryside, promote the development of rural economy, increase the income of rural residents, and ensure the safety of urban consumption. The implementation of the rural revitalization strategy, the development of rural e-commerce and the promotion of the "express delivery to the countryside" project have accelerated the modernization of agriculture and rural areas, laid a foundation for the construction of the cold-chain express logistics system of fresh food, and provided unprecedented opportunities for development [1].

## 2. THE NECESSITY OF THE DEVELOPMENT OF THE COLD-CHAIN LOGISTICS OF FRESH ECOMMERCE COMPANIES

### 2.1. Expansion of Fresh Electricity Business Market Scale

With the improvement of the social and economic development level and the acceleration of the pace of people's life, most people are faced with the problems of overtime work and extended working hours, leading to the reduction of free time after work every day. However, with the comprehensive popularization of the Internet, online shopping and other e-commerce are loved by the people, and the time and space distribution of people's consumption of goods is expanding, which has also

promoted the rapid change of transportation capacity and logistics technology. For a populous country, fresh products are necessities in people's daily life, and their purchasing power is huge [2]. After the intervention of e-commerce, the sales channels and transportation means of fresh products are increasing, the online market demand for fresh products is gradually increasing, the share of the consumer market is increasing, and the market size of fresh electricity business is also increasing.

## **2.2. Market size and demand of cold chain logistics increase**

Fresh products themselves have problems such as short shelf life and perishable products, and although people like to buy them online, the requirements for fresh products also want to reach the same level of freshness as offline purchase. Therefore, cold chain logistics plays a crucial role in its transportation. However, the development of cold chain logistics in China has been in the rapid development stage and is not complete, so the research on the development of cold chain logistics is very urgent. According to the official website of the National Bureau of Statistics, by the end of 2020, China's total output of meat, fruits, vegetables and aquatic products reached 234.43 million tons, many of which were used to meet the material needs of China's growing population, and a few were used for export trade. Due to the backward cold chain logistics equipment construction, distribution path planning is not reasonable, lead to fruit and vegetable cold chain logistics application accounted for only 30%, decay rate of 15%, meat cold chain logistics application accounted for only 50%, decay rate of 8%, aquatic products cold chain logistics application accounted for 65%, decay rate of 10%, the developed countries cold chain logistics application of 90% and the average decay rate of 5% still has a larger gap [3]. According to data, the scale of cold chain logistics market is to growing from 2016 to 2022, as shown in Figure 1.1. In 2016, China's market size reached 221 billion yuan, and the total demand for cold chain logistics was 12,500 tons; the outbreak in 2020 affected all walks of life, but the online demand further increased, such as fruits and vegetables. By the end of 2021, the market size of cold chain logistics will increase to 491.6 billion yuan, and the corresponding total demand will increase to 325 million tons, with year-on-year growth of 7.2% and 6.6% respectively. According to the forecast of research scholars, by the end of 2023, the market size and total demand will reach 560.1 billion yuan and 325 million tons, respectively.

To sum up, in the Internet environment, the sales channels and transportation means of fresh products are increasing, the online market demand for fresh products is gradually increasing, the share of the consumer market continues to increase, the market size of fresh electricity business is also growing. Consumers' focus on buying goods is no longer limited to the price, but more attention to the quality and safety of products, safety, and the timeliness of delivery services, which is a huge challenge to the development of cold chain logistics of fresh e-commerce.

## **3. PROBLEMS EXISTING IN THE COLD CHAIN LOGISTICS OF FRESH ELECTRICITY SUPPLIERS**

### **3.1. The Technical Level Of Facilities And Equipment Is Relatively Backward And Evenly Distributed**

Thanks to the dual role of national policy support and encouragement and market demand traction, the cold-chain express logistics of fresh food has developed rapidly in recent years. Fresh food category and frequent consumption, source planting throughout the vast rural areas, scattered production layout, and consumption is relatively concentrated in cities and towns, combined with the early development threshold is low, cold-chain fresh food facilities construction lag, insufficient investment, technical level is not high, the lack of intensive, large-scale operation of cold chain logistics hub facilities. The existing cold chain facilities and equipment are unevenly distributed in the east, central and west, the north and south and between urban and rural areas, and there are structural imbalance contradictions, which is more prominent in the rural areas of the central and

western regions. The imbalance of cold chain facilities and equipment construction directly affects the efficiency and efficiency of fresh food cold chain express logistics services [4]. With the increasing demand for high-quality fresh agricultural products, the shortcomings of China's cold chain logistics facilities construction are gradually revealed. In developed countries, the loss rate of fruits and vegetables and other food is about 5%, while China reaches 20% -30%, there is still a big gap compared with developed countries. The main problem is that the whole chain cold chain transportation has not been realized in China. Most of the transportation of fresh agricultural products in China relies on road transportation. The transportation process is long and takes a long time, which is easy to lead to the loss of agricultural products on the way, resulting in a serious waste of resources. In addition, China has a vast area, the distribution of agricultural products is relatively scattered, the transportation and agricultural products logistics in some remote areas are not developed, and there is still a chain break in the process of cold chain logistics of agricultural products.

### **3.2. Low degree of collaborative construction between cold chain logistics and industrial chain**

China's cold chain logistics industry involves the primary, secondary and tertiary industries, and is an important industry to promote rural revitalization and consumption upgrading. In recent years, residents' requirements for the quality of fresh agricultural products have been constantly improved, and China's cold chain logistics enterprises have also continuously strengthened their production capacity. The cold chain logistics industry requires that all links of the cold chain industry chain need a high level of organizational coordination. At present, China's cold chain industry has not yet formed a complete development system, which leads to the insufficient integration of the cold chain resources of agricultural products, and the lack of cooperation and coordination between the upstream and downstream links. For example, it only attaches attention to the refrigeration facilities of the pharmaceutical industry, but ignores the refrigeration facilities of agricultural products; the cold storage layout of vegetables and fruits and other main production bases is not reasonable and uneven distribution, and the reserve of agricultural products in some areas is overloaded and the whole reserve is insufficient; compared with the cold storage, the cold chain facilities of transportation, packaging, distribution and cold chain of agricultural products are not perfect [5]. Due to fresh food cold-chain express logistics development started late, the overall level has a gap compared with developed countries, stock resources integration and comprehensive utilization rate is low, industry operation network, organizational degree is not high, covering the whole process of cold chain express logistics network is not fully formed, and planning of "channel + hub + network" modern logistics operation system is insufficient, lead to rural and small and medium-sized cities fresh food cold chain express logistics network is not sound, especially the production front end of rural areas and sales of community group since the end of the short board is more prominent. Engaged in fresh food cold-chain express logistics service enterprises generally attaches great importance to warehousing, transportation or distribution of a cold chain link of a single function, rarely from the agricultural products supply chain as a whole to overall planning, fresh food cold-chain express logistics service lack of unified coordination between upstream and downstream enterprises, the whole link quality control level is low, difficult to accurately control the whole temperature, increased the risk of "broken chain off cold".

### **3.3. The imperfect standardization construction of cold chain logistics**

Affected by the development of weak foundation, fresh food cold-chain express logistics enterprise specialization, scale, standardization development degree is not high, professional training, informatization, automation technology application standard popularization is not wide enough, fresh food cold chain express logistics standard system construction relative lag, low degree of standardization, and more for industry recommended standards, the lack of industry mandatory standards. In the logistics industry, transportation has the greatest impact on low-carbon logistics.

Whether it is using air transportation or land transportation, it needs to consume a lot of energy, and will cause a lot of carbon emissions [6]. For example, in transportation, there is often the problem of vehicle overload, vehicle overload is likely to cause more waste and pollution, and this is also because the management personnel do not pay enough attention to the problem of vehicle overload.

Fresh food front planting and cold chain picking cold, production and cold chain storage transportation, the processing end sales and the cold chain distribution between standard cohesion is not close enough, even some lack of standard, resource sharing, across the season, cross-regional adjustment ability of the supply and demand is insufficient, lead to cold chain express logistics service process of "pseudo cold chain" occurs, affect the quality and safety of fresh food.

In the whole circulation process, the level of logistics information technology in China is still very low: first, the storage technology of fresh agricultural products still has great room for improvement, which cannot meet the high demand for storage information technology and the green development of modern logistics; second, it is difficult to promote the application in rural areas. In short, in the construction of logistics information technology, the problem of improving the level of logistics information has not been really solved, in the production, storage, transportation, sales and other aspects of the technology, but also need to be improved and upgraded. In addition, the application of GPS, automatic identification radio frequency technology, Internet and other logistics information technologies need to be put on the agenda as soon as possible.

## **4. FRESH ELECTRICITY BUSINESS COLD CHAIN LOGISTICS SUSTEM CONSTRUCTION OPTIMIZATION MEASURES**

### **4.1. Improve the construction of fresh food cold-chain express logistics network and facilities and equipment**

The construction of fresh food cold chain logistics facilities and equipment provides important support for the development of modern agriculture. Local government departments and enterprises should make full use of the national cold chain logistics and rural delivery logistics development of favorable policies, Relying on the national backbone cold chain logistics base, cold chain production and marketing distribution center and other infrastructure construction, Improve the "first one kilometer" pre-cooled fresh food, "many kilometers in the middle" whole temperature control, "the last kilometer" cold chain distribution network, Strengthen the construction of "integrated" cold chain express logistics facilities and equipment of fresh food "origin", "distribution and transit place" and "sales place", Promote the balanced development of the supply and demand of the whole process of fresh food infrastructure, Promote the efficient, intelligent and green operation of fresh food cold-chain express logistics. For the vast rural areas, especially in the main producing areas of fresh food, characteristic fresh food advantage areas and relatively backward development areas, we should accelerate the formation of an efficient connection of "county, township, village" three-level fresh food cold chain express logistics node facilities network [7]. To meet the "last kilometer" consumer demand of the city, operators such as wholesale centers of agricultural products, farmers' markets, supermarkets, community group buying and pick-up points should be guided to improve the terminal cold chain logistics network facilities and equipment.

The first is the cold storage of fresh products, one side, Most of China's cold warehouses lack energy saving and emission reduction facilities, The existing facilities and equipment of the cold storage of most cold chain logistics enterprises are not updated in time due to the relatively expensive price, Large energy consumption, Therefore, it is urgent to transform the existing facilities and equipment of local logistics enterprises, The application of new refrigeration host with low energy consumption, air cooler, cold storage box, automatic sorting and selection machine, special cold storage door group and other equipment, This will not only improve the efficiency of the operation, Flexible to meet the order requirements, It also reduces energy consumption; on the other hand, In order to completely

solve the problem of high carbon emissions of cold chain logistics facilities and equipment in the market circulation process of fresh products, To increase the number of professional cold-chain logistics facilities and equipment, Expand the scale of facility construction, Fully ensure the safety of fresh products circulation. Logistics enterprises with cold storage of local governments can give financial subsidies or preferential measures when purchasing new facilities and equipment, so as to improve the credit support for cold chain logistics enterprises to build cold chain infrastructure to purchase equipment, and reduce the financing difficulty of related logistics enterprises.

Secondly, the construction of transportation network and the accessible road network provide an important support for the development of cold chain logistics. According to the data of the Ministry of Transport in 2022, the total mileage of China's highways has reached 5.28 million kilometers, forming a national road network with national roads as the main trunk, provincial roads as the context and rural roads as the extension, laying a foundation for the smooth operation of comprehensive transportation. To achieve cold chain logistics low carbon transportation, local governments should not only plan reasonable highway railway or waterway transportation network, realize fast unobstructed cold-chain logistics multimodal transport, to strengthen the construction of rural roads also, for the origin of cold chain transportation of agricultural products through "the last kilometer", and improve the construction of agricultural green logistics channel. In 2010, we began to promote the green channel of agricultural products on expressways. Now the road transportation of agricultural products is developing well. The green channel transportation network with low pollution and high efficiency should be further built, exempt some toll checkpoints, and ensure the transportation route of agricultural products as direct as possible.

#### **4.2. Improve the network system of fresh food cold chain express logistics**

The operation system of fresh food mainly includes four links: cold chain transportation, refrigeration, cold chain processing and cold chain distribution. A unified information platform needs information sharing to save communication costs and avoid false and unequal information. At the same time, the unified information management platform can realize the functions of transport vehicle scheduling management, paperless operation documents, electronic cost accounting and so on, and save manpower and resources. In order to improve the cold chain circulation rate, reduce the decay rate and logistics cost, meet the needs of residents 'consumption upgrading, promote agricultural efficiency, increase farmers' income, protect and protect the consumption safety, it is necessary to build a "whole chain, network and traceable" fresh cold chain logistics service system with high standards. Through the overall planning of the whole link and the high degree of organization and coordination, especially in the cold chain storage, storage, cold storage, in the cold chain processing, to adapt to the new demand of vegetable preparation, and the fine processing of fresh food, meat, meat, aquatic products and dairy products; In the cold-chain distribution link, mobile refrigeration equipment such as refrigerators and incubators should be used to ensure that fresh food is delivered to terminal stores or consumers in a low-temperature environment. Local government departments to the cold chain logistics industry chain design member information construction provide guidance policy, the development or application of sharing information platform of the third party logistics enterprise subsidies or tax incentives, build a complete information management system, reduce the cold-chain transport scheduling of each link of approval time, open the whole process of goods, positioning tracking and temperature monitoring, promote the information sharing between the main body.

#### **4.3. Strengthen the training of professionals in fresh food cold chain express logistics**

The government, enterprises, society and schools should jointly support the training of professional talents to provide talent guarantee for the high-quality development of fresh food cold-chain express logistics services. In order to better adapt to the needs of fresh food specialization development, the

school to deepen cooperation with enterprises, docking industry demand, through apprenticeship, order class, sharing professional, curriculum, practice teaching base, build different education level of talent training system, strengthen the professional practice ability and innovation ability training. Enterprises should make use of their own industry attraction and competitiveness, actively apply for the construction project of industry-education integration enterprises, deeply participate in talent training, play the main role of collaborative education, school and enterprise jointly formulate students' practice and teacher post practice plans, and provide convenient conditions for implementation. The government should encourage and support enterprises to participate in talent training in various ways, and promote the institutionalization and standardization of students' practice and teacher practice in enterprises.

#### **4.4. Use science and technology to realize the innovation and development of fresh cold chain logistics**

Science and technology is the fundamental driving force for the development of the cold chain logistics industry. Technological innovation is the key to ensure the "continuous chain" of fresh food cold chain express logistics. With the increasing maturity of intelligent logistics and digital technology, it is possible to track and monitor the whole temperature of the cold chain of fresh food express logistics service in real time. The consumption quality of fresh food is closely related to the level of cold chain express logistics technology. The use of technology enabling for fresh food cold chain transportation or cold chain warehouse distribution for professional customization, greatly improve the value-added of cold chain express logistics services [8]. For example, the relevant government departments and enterprises through the big data, cloud computing and other intelligent infrastructure construction, the development of intelligent transportation, intelligent storage, intelligent sorting technology, the use of environmental protection new material cold chain express logistics each link, online connection, offline linkage, promote the efficient operation of fresh food cold chain express logistics, reduce carbon emissions.

## **5. SUMMARY**

In summary, improving the cold chain express logistics network and facility equipment construction of fresh food, improving the cold chain express logistics network system of fresh food, strengthening the training of professional talents in cold chain express logistics of fresh food, and using technology to achieve innovative development of cold chain logistics of fresh food are reasonable countermeasures and effective measures to achieve the development of cold chain logistics of fresh food.

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