

# Research on Optimization of fruit and vegetable cold chain logistics based on supply chain

Haibo Li

Jose Rizal UNIVERSITY of the Philippines, Mandaluyong City, Metro Manila, 1550

Wuyishan Vocational College, Nanping 354300, China

**Abstract:** With the continuous improvement of living standards, people put forward higher requirements for the freshness and safety of fruits and vegetables, and the cold chain logistics of fruits and vegetables has a closer connection with People's Daily life. Through the optimization of the existing fruit and vegetable cold chain logistics, the level of fruit and vegetable logistics can be greatly improved. In view of this, this paper will analyze the fruit and vegetable cold chain logistics based on supply chain, and put forward some optimization strategies for your colleagues' reference only.

**Key words:** supply chain; National tax; Cold chain logistics; optimization

## 1. Analysis of current situation of fruit and vegetable cold chain logistics

(1) The cold chain logistics system has not yet been built and perfected

At this stage, when many cities carry out supply chain construction, they often focus on normal temperature logistics, and pay insufficient attention to the construction of cold chain logistics for fruits and vegetables, and have not yet formed a more specific concept of cold chain logistics. In the fruit and vegetable supply chain, few people can use the self-operated cold chain or the third-party enterprise cold chain to carry out the transportation and storage of fruits and vegetables. At the same time, the fruit and vegetable cold chain logistics itself has a greater difficulty in operation, and the standards for the whole logistics industry are relatively high, and each link has relatively strict requirements. Therefore, if you want to achieve fruit and vegetable cold chain logistics, it is necessary to build a more perfect cold chain logistics system, so as to further improve the level of the supply chain.

(2) Backward equipment loss rate is large

In fact, the fruit and vegetable industry and the categories are very diverse, and different types of fruits and vegetables have different temperature requirements. Therefore, in the cold chain logistics, cold storage and refrigerated trucks play a very key role. Through the cold storage, enterprises can more efficiently carry out fruit and vegetable storage, the use of refrigerated trucks can realize the cold chain transportation of fruits and vegetables, which greatly improves the safety and freshness of fruit and vegetable logistics. If there is a "broken chain", it will be difficult to provide a favorable storage environment for perishable fruits and vegetables, which is extremely unfavorable to the operation of cold chain logistics. At present, the number of refrigerated trucks in many enterprises is insufficient, the storage conditions of the cold storage are not ideal, and the refrigeration effect has a lot of room to improve, which will adversely affect the cold chain storage and transportation of fruits and vegetables. Some small cold chain enterprises lack of sufficient funds, it is difficult to effectively transform and update the existing equipment, the refrigeration equipment used has low power, functional aging and other problems, it is difficult to achieve the ideal refrigeration effect. In addition, some enterprises in the cold chain transportation, always load and unload the work in the normal temperature environment, which will increase the damage rate of goods virtually. In the external sales, some fruit and vegetable sales market does not have special refrigerator equipment, some fruits and vegetables will be traded at room temperature, which will also have an impact on its freshness.

(3) Lack of cold chain logistics professionals

The late development of China's logistics management industry has led to a lack of corresponding talents, and very few talents engaged in cold chain logistics management, which has greatly hindered the optimization of fruit and vegetable cold chain logistics. If we want to promote the further development of fruit and vegetable cold chain logistics industry, we should pay attention to the training of cold chain logistics talents, and set up more courses and majors related to it. However, at present, many colleges and universities only set up logistics management, logistics engineering and other majors, and there are very few schools that set up cold chain logistics majors, which is extremely unfavorable to the training of cold chain logistics professionals. Different from ordinary logistics majors, cold chain logistics majors not only involve logistics management knowledge, but also have refrigeration technology, cold storage technology and other courses. At this stage, many technical personnel engaged in cold chain logistics usually only receive a certain pre-job training, and have not received systematic cold chain logistics education, they can only work with their own experience, it is difficult to complete a higher level of cold chain logistics activities. Fruit and vegetable cold chain logistics requires staff to have a high level of professionalism and operation, the lack of cold chain logistics professional foundation of staff is difficult to promote the further development of fruit and vegetable cold chain logistics.

## 2. The optimization of fruit and vegetable cold chain logistics model based on supply chain

(1) Build a supply-chain-based fruit and vegetable cold chain logistics network

If we want to improve the optimization quality of fruit and vegetable cold chain logistics, we must pay attention to the construction

of a perfect supply chain. Therefore, fruit and vegetable cold chain logistics enterprises should try to connect upstream and downstream enterprises more fully, which can effectively avoid a lot of unnecessary problems. In the fruit and vegetable cold chain logistics, warehousing is an extremely important core, low temperature storage is also the basis of fruit and vegetable cold chain logistics work. Therefore, we should take the construction of central cold storage as the core enterprise of fruit and vegetable cold chain logistics, and strictly grasp the last kilometer.

After the completion of fruit and vegetable picking, it is necessary to do a good job of pre-cooling and cooling work, and then the simple packaging of it, and combined with market demand, choose whether it needs to be frozen storage. If it is not needed, the fruits and vegetables can be directly sent to supermarkets, catering enterprises, etc. If it is necessary to freeze fruits and vegetables, you can simply process them and send them to the central cold storage, and then the distribution vehicle of the cold storage will send them to various supermarkets and retailers.

Compared with the traditional fruit and vegetable cold chain logistics, we should try to introduce the integrated operation of logistics distribution, which can effectively reduce the waste of resources and reduce the cost of cold chain logistics. With the help of Internet technology, big data technology and other means, the real-time monitoring of the status of fruits and vegetables can be achieved, so as to reduce the damage rate of fruits and vegetables and increase the freshness of fruits and vegetables. Through the introduction of Internet of Things technology, it can effectively reduce the probability of “broken chain” of fruit and vegetable cold chain logistics, so as to improve customer satisfaction.

#### (2) The construction of information traceability system

With the development of The Times, people will not only pay attention to the freshness of fruits and vegetables, but also prefer pollution-free and pollution-free products. Therefore, in addition to the sharing of logistics information, fruit and vegetable cold chain logistics can also combine Internet technology, communication technology and other means to let consumers feel the safety of fruit and vegetable products at the end of cold chain logistics. In the process of fruit and vegetable picking and preliminary processing, we can use the RFID system to establish a basic information system for fruit and vegetable products, and then record the temperature and environmental refrigeration data of the products. In the distribution process, RFID technology can be combined with 5G technology to update the dynamics of mobile cold storage in real time. In the sales link, RFID technology can be combined with the POS system to realize the tracking of logistics information, upload sales information, and avoid the situation of broken chain of fruits and vegetables. If consumers find problems in the eating process, they can find the temperature information of fruits and vegetables in each link of the cold chain logistics through information tracing. If there is no problem in storage, distribution, circulation and processing, it is the reason why consumers are not properly preserved after purchase. At the same time, enterprises can integrate tracking data information into the two-dimensional code, and consumers can use wechat and Alipay to query various information of fruits and vegetables to ensure the safety of fruits and vegetables from the field to the tip of the tongue.

### **3. The development strategy of fruit and vegetable cold chain logistics based on supply chain**

#### (1) Pay attention to the training of high-quality cold chain logistics talents

Under the background of the new era, the competition between enterprises has changed from the previous technical competition and knowledge competition to talent competition. If you want to let enterprises get more long-term development, you must pay attention to the introduction and training of high-quality talents, so as to gain advantages in the increasingly fierce competition. The development of fruit and vegetable cold chain logistics also needs professional talents as assistance. In order to further improve the training effect of cold chain logistics talents, the local government can combine the actual situation, formulate a talent gathering plan, and use the advantages of its own platform to better attract fruit and vegetable cold chain logistics talents. After attracting talents, the government should do a good job in the corresponding talent service work, in the settlement policy, housing subsidies, education and enrollment, family placement, living subsidies and other aspects to give concessions, so as to produce a stronger attraction to talents, with sincere service for the cold chain logistics construction to leave more right talent. In attracting and retaining talents, the government should also create a platform to help the development of talents and increase the corresponding capital investment, so that talents can really take root in the local area, thus providing a huge boost to the further development of the local economy.

Fruit and vegetable cold chain logistics talents should not only understand the relevant knowledge of logistics, but also master a certain knowledge of e-commerce. At the same time, when developing talent training, in addition to teaching talents some theoretical knowledge of cold chain logistics, they should also help them form certain practical skills. Local governments can organize some educational institutions to set up fruit and vegetable cold chain logistics training courses, and regularly carry out training activities for relevant practitioners, in order to continuously improve the comprehensive level of fruit and vegetable cold chain logistics talents. In addition, the government can also cooperate with colleges and universities to establish corresponding cold chain logistics majors, so as to improve the cultivation of fruit and vegetable cold chain logistics talents. Through the organization of school-enterprise cooperation activities, students can learn more theoretical knowledge in school and master more practical skills in enterprises, so as to promote the combination of theory and practice and improve the effect of talent training.

#### (2) Cultivate the concept of fruit and vegetable cold chain logistics system

If you want to improve the optimization level of fruit and vegetable cold chain logistics, it is necessary to pay attention to the training of producers, middlemen and sellers of cold chain logistics awareness, so as to greatly improve people’s cognition of fruit and vegetable cold

chain logistics, so as to better realize the optimization of field pre-cooling, the last kilometer and other work. At this stage, many enterprises for fruit and vegetable cold chain logistics lack of correct cognition, therefore, we should according to the various links of the supply chain, logistics staff, sales staff and other fruit and vegetable cold chain logistics training, in order to create a more perfect, reasonable, scientific cold chain logistics management system. At the same time, combined with the current market development trend, the government can introduce some cold chain logistics regulations to effectively restrict the corresponding enterprises to avoid their malicious competition, which can effectively curb the occurrence of unreasonable phenomena by legal means, so as to better coordinate the relationship between the upstream and downstream of fruit and vegetable cold chain logistics.

### (3) Develop cold chain logistics enterprises to enhance the vitality of agricultural production

By cultivating high-quality fruit and vegetable cold chain logistics enterprises, the quality of fruits and vegetables in the market can be greatly improved. The government can combine the local actual situation to create a number of high-quality fruit and vegetable cold chain logistics enterprises, and let them play a leading role accordingly, through the demonstration effect, effectively connect the upstream and downstream enterprises, so as to better integrate various services on a large platform. In this way, the reasonable allocation of resources can be effectively realized, the cost of fruit and vegetable cold chain logistics can be reduced, and the problems of small, chaotic and scattered traditional cold chain logistics can be solved. In addition, enterprises should continue to explore new cold chain business, by creating a leading enterprise to better support platform services, so as to better realize the further optimization of other logistics links. The government should do a good job in promoting enterprise cooperation, through the establishment of fruit and vegetable cold chain alliance, so that each enterprise can better realize the sharing of resources, so as to achieve a win-win situation for many enterprises. Combined with Internet technology, big data technology and other means, the government can build a better quality fruit and vegetable cold chain logistics platform, create a resource sharing digital ecosystem, so as to promote the long-term development of fruit and vegetable cold chain market.

In order to promote the rapid development of local fruit and vegetable cold chain enterprises, the government can introduce some large enterprises to the local, such as YTO, SF Express and other express delivery enterprises, which can provide greater help for the development of fruit and vegetable cold chain logistics enterprises, and effectively solve the technical problems, financial problems and talent problems of enterprises. In terms of policy, the government can provide tax relief policies for fruit and vegetable cold chain logistics enterprises, which can promote the more rapid development of cold chain logistics enterprises. In terms of financing, banks should relax the scope of credit, so that more fruit and vegetable cold chain logistics enterprises can raise more funds in combination with their own development, which is also an important driving force for the long-term development of fruit and vegetable cold chain logistics enterprises.

### (4) Establish a more complete Internet diversified sales platform

In the past, the fruit and vegetable logistics distribution chain is long, which is easy to cause damage to fruits and vegetables. The distribution party also needs to rely on cold chain technology to carry out corresponding sales work. In the era, we can try to build an “e-commerce + self-management” sales model, consumers can buy products online, and then place an order for third-party cold chain logistics enterprises to transport fruits and vegetables to offline stores, in order to improve sales efficiency. Not only that, through this way can better ensure the freshness of fruits and vegetables, reduce cold chain logistics links, is conducive to the improvement of cold chain logistics optimization level.

## Summary

To sum up, if we want to improve the optimization effect of fruit and vegetable cold chain logistics based on supply chain, we can pay attention to the training of high-quality cold chain logistics talents; Cultivate the concept of fruit and vegetable cold chain logistics system; Develop cold chain logistics enterprises to enhance the vitality of agricultural production; Establish a more perfect Internet diversified sales platform and other aspects of analysis, in order to virtually promote the optimization quality of fruit and vegetable cold chain logistics to a new height.

## References:

- [1] Yongli Wen. Empowering Ningxia fresh fruit and vegetable cold chain logistics with “Internet +” [J]. *Foreign Investment in China*, 2022(17):64-67.
- [2] Lizhi He. Research on optimization of multi-stage fresh fruit and vegetable e-commerce logistics node layout [D]. *Central South University of Forestry and Technology*, 2022.
- [3] Xiao Fu. Research on Consumer Demand of Fruit and Vegetable Cold Chain Logistics in Henan Province [D]. *Henan Agricultural University*, 2021.
- [4] Yun Hu. Research and Application of recommendation for fruit and vegetable cold chain suppliers with minimum risk [D]. *Chongqing University*, 2021.