

Research on Logistics Transportation of Fresh Cut Flowers in Cold Chain System

-- Take the Development of Fresh Cut Flower Logistics in Yunnan Province as an Example

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Abstract

With the development of China's modernization and great strides in the economy. Socialism with Chinese characteristics has entered a new era, and the main social contradictions in our country have also been transformed into contradictions between the people's increasing good life and unbalanced and insufficient development. The quality of life of the people is increasing, and the demand for flowers is also increasing. The consumption of flowers is gradually recognized by the people, and the flower industry is also developing rapidly. The logistics system of the flower industry is particularly important. The current logistics operation efficiency of China's flower industry and fresh food industry is low, and there is no corresponding one-stop flower cold chain supply system. These problems will become the bottleneck hindering the flower industry and related industries. Promoting the development of flower industry logistics is an important step in the flower logistics industry. This article will first explain the current status of logistics and cold chain with Kunming International Flower Auction Center in Yunnan Province as an example. After that, it analyzes the developed regions of foreign flower logistics, taking the American flower logistics system and the Dutch flower cold chain system as examples. After comparison, find the direction of development, take its essence and remove its dross.

Keywords

Fresh cut flowers; cold chain; logistics; electronic information platform.

1. INTRODUCTION

1.1. Research Background

The rapid economic development of our country and the advancement of science and technology have promoted the happy life of our people, and the pursuit of spiritual satisfaction has been pursued on the basis of improved quality. Now the popularity of flowers has also increased, embellishment of life, embellishment of mood, has become a kind of recreational entertainment and best choice for each other. Flowers and plants are also agricultural products and have ornamental value. They are different from grains, fruits and vegetables. They are items that enrich people's spirit and improve the quality of life and consumption level. The fresh flowers include fresh cut flowers, potted flowers, seedlings and ornamental, and this article focuses on fresh cut flowers.

The main flower trade exchange center in China is located in the Dounan International Flower Auction Center in Kunming City, Yunnan Province. The development of flower logistics followed

closely, but the logistics development has not kept up with the needs of the times. There are various problems in flower logistics, such as backward logistics technology, lack of central management information electronic platform, and lack of cold chain system protection for fresh cut flowers throughout the process, resulting in low flowering rate, large losses, and increased costs. However, China's logistics quality is gradually improving, and international logistics also has a certain development space and potential. Therefore, the development of fresh cut flower logistics is imperative.

Due to the delicate and perishable physiological properties of fresh cut flowers, flower logistics becomes crucial, and time means the life cycle. Therefore, the storage and transportation of fresh cut flowers becomes extremely important. Strict packaging, anti-vibration, anti-extrusion and anti-collision transportation, strict control of temperature and humidity, etc., a series of problems to be studied. According to statistics, the loss rate of fresh flower logistics products transportation is 30%, while the loss rate of fresh flowers in developed countries is only 2%, including more than 40% long-distance transportation. How to do our best to preserve high-loss products, logistics is the decisive factor. The lag of logistics development in China's flower industry has restrained the rapid development of China's fresh cut flower industry. Therefore, the development of the fresh cut flower logistics industry is a difficult problem that needs to be solved urgently. In view of the shortcomings of the development of China's fresh flower logistics, it is of great practical significance to propose reforms and development directions for the development of China's fresh cut flower industry.

1.2. Literature Review

According to the literature search, we can find that the research on the direction of the supply chain of fresh cut flowers in China is rare. The supply chain cold chain system was first proposed in the United States in the 20th century. At present, the United States, the Netherlands, South Korea and other countries have formed a complete cold chain logistics system, but China has not yet launched a relevant system. Over-reliance on high-cost air transportation in transportation. In general, there is a lack of professional third-party cold chain logistics enterprises. It also proposes the cultivation of standardization and introduction of fresh flowers and the establishment of professional third-party cold chain logistics companies and personnel training, plus an important step-effective marketing methods. Wang Keshan (2010) [1] obtained through a systematic study that the transaction system for flower logistics in China is in the initial formation stage, and its logistics quantity and circulation system are also in an increasingly complete process. In order to better promote the logistics system of China's flower market, it needs to be carried out from economic organization, building a "production to consumption" cold chain logistics system, reintegrating social resources, promoting the construction and improvement of corporate strategies, and exerting market trading capabilities. Work hard. Li Xiaogang (2010) [2] bought a new water-based fresh flower packaging technology and isolation protective packaging method for the transportation and packaging status of fresh cut flower logistics in China. Wang Jing et al. (2019) [3] put forward constructive opinions and suggestions based on improving the added value of fresh cut flowers in China, improving the logistics facilities of fresh cut flowers and the protection of new varieties and pregnant seeds, so as to promote the summary competition of foreign trade of fresh cut flowers in China force. Li Qin et al. (2019) [4] through systematic research found that China's fresh-cut flower-related industries have relatively concentrated exporting countries, lack of fresh-cut flower varieties, incomplete export processes, and excessive concentration of product cultivation space. At the same time, they put forward targeted suggestions to promote The export of fresh cut flowers is booming. Cheng Shiguo et al. (2020) [5] explored the mechanism of the synergy of benefits in the logistics system based on the research perspective of fresh cut flowers as an example, and verified and studied the theoretical model through analysis of

examples. The logistics system of fresh cut flowers has the theoretical conclusion of benefit synergy between the cost input in the functional elements.

2. DEVELOPMENT STATUS AND PROBLEMS OF COLD CHAIN OF FRESH CUT FLOWERS IN YUNNAN PROVINCE

2.1. The Current Situation of Fresh Cut Flower Logistics in Yunnan Province

So far, Dounan Flower Trading Auction House in Kunming City, Yunnan Province, China has become the largest fresh cut flower auction trading market in China, where 80% of the fresh cut flowers come from the country. Kunming holds an international flower exhibition every year, which promotes the economic growth of the flower industry in Yunnan. At present, the flowers and flowers produced in Yunnan, China are sold farthest to more than 40 countries and regions such as Europe and Southeast Asia, and they are domestically supplied to the wholesale market of flowers in more than 70 large and medium cities. With the rapid development of Yunnan's flower industry, China's flower logistics has also improved. At present, the air transportation volume of fresh cut flowers in Yunnan Province accounts for more than 80% of the daily air transportation volume, which is the main transportation business of air logistics. There are a total of 52 registered logistics companies in Yunnan Province, but only 12 of them have separate refrigerated transport vehicles, cold storage and other infrastructure. Although air transportation occupies the main position in the transportation of fresh cut flowers, various logistics companies are still actively looking for other transportation methods. For example, the expressway from Kunming to Bangkok has greatly improved the timeliness of transportation of fresh cut flowers from Yunnan to Thailand, reduced transportation costs, and also realized the international trade of fresh cut flowers from Yunnan.

But so far, the transportation of fresh flowers in China is still in the traditional mode. The main form of natural logistics makes the fresh flowers consume a lot. As a special fresh product, flowers are also perishable and time-sensitive. The lifespan of flowers is closely related to storage conditions and transportation conditions. Therefore, the top priority of the fresh cut flower industry is the establishment and integration of the supply chain. The logistics link is a vital step in the logistics of flowers, and it runs through the physical dynamic process from consumers in the flowers industry. It also includes production, disposal, transportation, storage, handling, handling, packaging, processing, distribution, information platform, etc.

2.2. Problems in the Logistics of Fresh Cut Flowers in Yunnan Province, China

(1) Fresh cut flower packaging technology is not refined

China's fresh flower packaging often uses "extrusion" packaging. There are quilt insulation methods, traditional water-insertion insurance methods, ice block methods, and cotton wool methods. The ice cubes melt into water after long-term temperature changes, and the cotton wool cleanliness needs to be improved and is not easy to take care of. The insulation method is unscientific and unreasonable, but the cost is low, the operation is simple, and each piece of goods can save dozens of yuan in transportation costs. The result is that when the flower material reaches the end of the chain, it needs to bear severe wear and tear and build its own brand image. In the end, the quality of flowers will be hurt in the logistics export section. In addition, there is no standard size for fresh cut flower transport boxes in China, and there is no clear pressure test. The load capacity is not enough to meet the length of transportation and capacity needs. In contrast, the Dutch flower box can bear the weight of an adult. The failure of the cabinet and the saving of transportation costs will ultimately affect the survival rate and quality of the flower material.

(2) Fresh cut flower market has low international competitiveness

Fresh cut flowers in China rely primarily on air transportation. Among them, the air freight prices of major domestic logistics routes such as Yunnan to Beijing, Shanghai and other first-tier cities have declined, and the people are within acceptable levels. However, the price of shipping routes to the northwest of China and outbound routes remains high. Impeding the development of the flower industry and the expansion of sales, the market capacity has weakened. As a result, China's flower market is in a weak position.

3. AN ANALYSIS OF THE DEVELOPMENT STATUS OF FRESH CUT FLOWER COLD CHAIN SYSTEM ABROAD

3.1. American Fresh Cut Flower Logistics System

In order to improve the professionalism and operational reliability of the fresh flower logistics industry in the United States, the Miami Herman Fresh Storage Logistics Company (HPL) was established because the American flower industry implements a "farm direct" logistics model. Packaging is carried out at the enterprise site to achieve "door-to-door" fresh-keeping delivery service. HPL constructs a fresh-keeping warehouse of approximately 70,000 square meters at Miami International Airport, and pre-cools it with standardized specifications and packaging methods. For areas with suitable distances, the United States uses trucks with refrigeration technology. If it is loaded overnight, most of the flowers produced in California can reach the transportation destination of New York within 24 hours. For international transportation, the United States established a professional international freight forwarding company in Seattle.

And in 2002, it set up flower logistics offices in Chile, Australia, New Zealand, Peru, London and other places. At the same time, establish an Internet management operation, make full use of information technology to concentrate the origin of flowers, logistics, containers, markets, and consumers on its management platform, and improve the reliability and timeliness of flower logistics.

3.2. Cold Chain Transport in the Dutch Flower Market

The main consumption area of the Dutch flower industry is the neighboring countries, such as Virtue, Japan, Italy and other places. Every day, nearly 2,000 container trucks, large and small, enter and exit the Asmir Flower Market. Because most of its consumers are close neighbors, most of the transportation uses container trucks with refrigerated functions to transport by road, or by rail: remote areas use air transportation. Its advanced electronic trading platform will now send logistics information to key management offices in real time. Carry out inspection, package transfer, quarantine, customs, logistics and other related procedures for customers in the first time, and strive to reach the end in the shortest time.

The Netherlands also continues to advance on the road of flower logistics. At present, a new type of high-speed train through the airport has been opened, and every minute and a half will complete the loading and unloading tasks of different levels of automated loading and unloading platforms. The efficiency of a high-speed train with a speed of 200 kilometers per hour is much higher than that of truck transportation. At the same time, this transportation system is also practical for other fresh products with high environmental impact requirements.

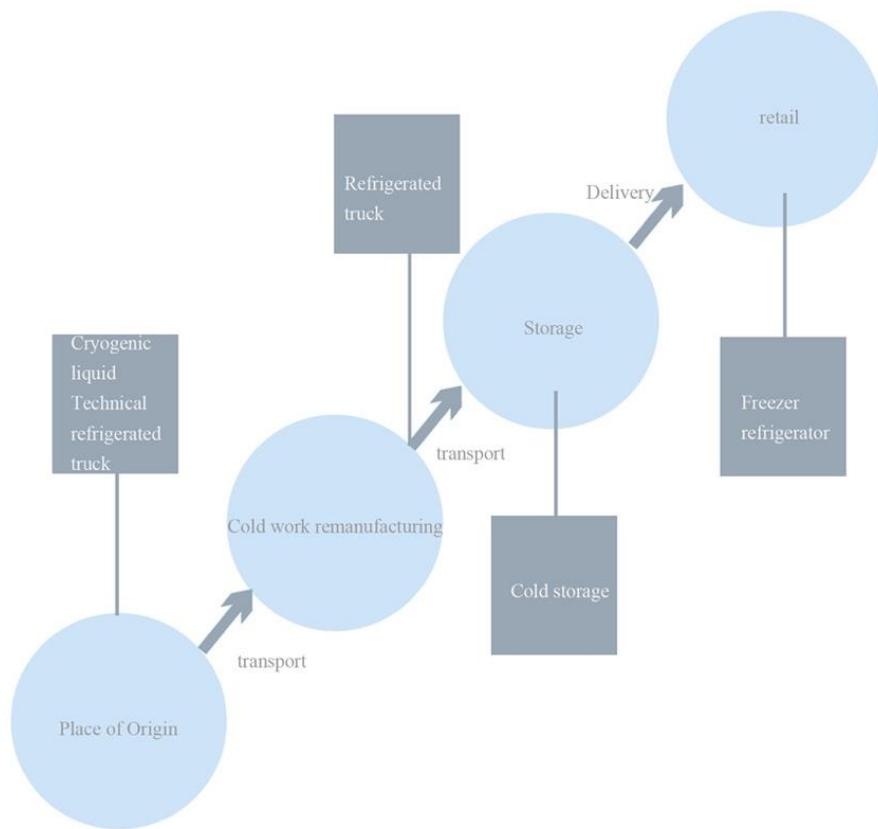


Figure 1. Basic composition of cold chain logistics process

3.3. Cold Chain Transportation in Japanese Flower Market

The Japanese Flower Center is not the same as the United States and Holland. It is sent to the logistics centers of various places by traditional flower distributors through traditional transportation. After a series of processes, the auction organization can handle it. In order to stand out in the flower industry, Japan focuses on the internationalization of flowers. Cooperate with the local large-scale plant transportation company, and professional plants or companies with professional flower transportation equipment are responsible for transportation. After the auction, some were sent to local florists for direct sales, and some were transported to various supermarkets and supermarkets through distributors. Choose the mode of transportation according to the distance. Choose ordinary trucks and professional cold chain transport trucks at close range, wet transport of flower cartons or use buckets to load the entire vehicle for transportation. If you have the sea condition, choose the shipping method to reduce the transportation cost. Import and export flower materials generally use air transportation.

At present, the most representative flower auction market in Japan is the Daejeon flower auction market. It is currently the largest and most mature flower auction base in Asia. It ranks among the top three in the world in flower sales with the Dutch Asmir auction market and the Dutch flower auction market.

4. DEVELOPMENT DIRECTION OF COLD CHAIN SYSTEM FOR FRESH CUT FLOWERS IN CHINA

4.1. Establish and Improve Information Platform

In view of China's current flower logistics situation, building a flower logistics information platform is an urgent task. For the development of global informatization and the rapid development of e-commerce, the establishment of an information platform is also an important

measure to link the world to go abroad. The information platform provides timeliness for international logistics services, and has also become one of the key factors affecting the success of logistics systems. Figure 4-1 shows the changes in China's flower industry e-commerce sales ratio in recent years. The data comes from the National Bureau of Statistics and Alibaba's white paper on e-commerce of agricultural products.

The flower logistics platform needs an information processing system to ensure that it can grasp the flower logistics status at any time and any place. In addition, enterprise employees also need to master certain information and knowledge, and configure different transportation and storage methods and packaging according to different varieties, characteristics and preferences.

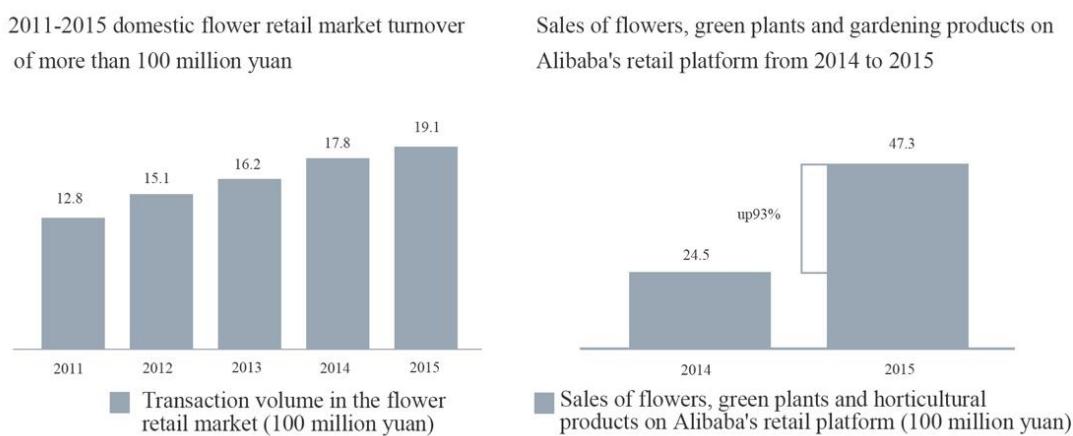


Figure 2. Changes in the proportion of e-commerce sales in the flower industry in recent years

4.2. Professional One-Stop Cold Chain Distribution System

What is a cold chain: It refers to a systematic project where refrigerated and frozen items are always in a specified low-temperature environment during production, storage, transportation, sales, and before consumption to ensure the quality and performance of items. It was 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. The logistics of fresh flowers refers to: the fresh, perishable fresh flowers are in a low temperature environment during the acquisition, storage, transportation, sales and other links and the logistics delivery. In order to reduce the rate of deterioration and damage. Starting from the place of origin, the establishment of cold storage storage, the entire logistics process to achieve the entire cold chain and distribution. The combination of dynamic and static transportation and storage is the only way to achieve the entire cold chain. At present, the number of cold storage in the flower production base in China is not fully utilized, and it is still transported at room temperature. As shown in Figure 4-2, increasing the dynamic management of the cold chain system and developing a diversified cold chain transportation system can better help the development of cold chain logistics.

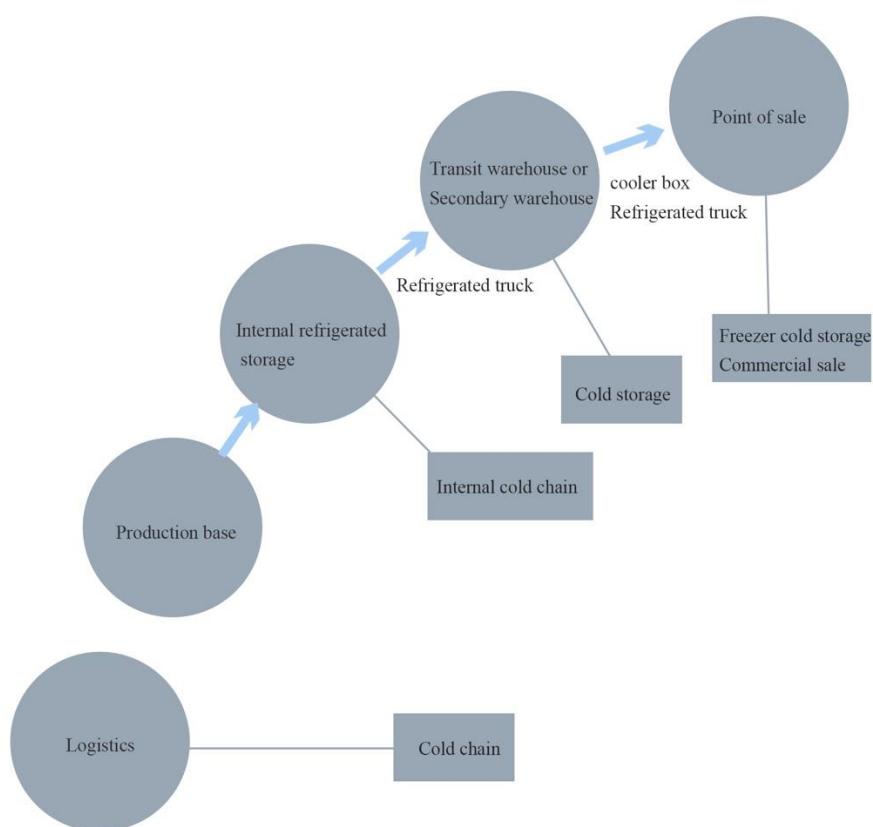


Figure 3. Basic composition of the one-stop cold chain logistics process

4.3. Cultivating Professional Talents to Realize Professional Management

Based on the development of the fresh cut flower industry, the informatization construction bears the brunt. A complete cold chain logistics system and information technology platform will make China's flower business develop more high-quality and more rapidly. The flower trading platform can realize trade links through the Internet and speed up the circulation of the flower industry. Unsmooth logistics information is one of the important reasons for the lagging development of cold chain logistics in Yunnan Province. The establishment of a flower information platform by the local government, combined with the integration of existing cold chain resources, can make the information platform more professional and modern. Better achieve resource sharing and timeliness of information, accelerate the circulation of fresh cut flower transactions, and reduce cold chain costs.

Professional cold chain systems are closely followed by professional cold chain system professionals. Senior talents engaged in cold chain system research will deal with the various characteristics of flowers. Cold chain logistics systems can also employ foreign professional teams to learn and train employees. Conduct joint school-enterprise training with local colleges and universities, orientate the cultivation of cold chain systems, and deliver talents to professional enterprises, thereby strengthening the transfer construction of China's cold chain system.

4.4. Train Professional Flower Logistics Companies

At this stage, the third-party professional flower logistics enterprise is a new type of contemporary development enterprise, and it has become the general direction of the development of logistics enterprises. The so-called third-party professional flower logistics companies can undertake professional flower logistics, transportation, packaging, processing, preservation, cold chain and other links and processes to improve the professionalism of flower

logistics. The local government should provide corresponding policy support to activate the competitiveness of the cold chain logistics market and also promote the healthy development of the local logistics industry. The flower logistics industry will also develop gradually, inspired by our generations of researchers, and promote the cold chain logistics business.

5. CONCLUSION

This paper makes a broad comparison of the research on the cold chain logistics of fresh cut flowers at home and abroad, draws on the shortcomings and gaps of China's flower logistics industry, and proposes relevant correction policies. From the organization form of the flower logistics industry to the improvement measures of cold chain logistics. The author considers the problems of logistics and transportation and the special nature of fresh products from the perspective of social, humanistic, and geographical conditions. At the same time, it is proposed to use electronic information platforms, online logistics, online transactions, etc. in order to reduce transportation costs and reduce wear rate. The establishment of China's own flower cold chain logistics enterprise can improve the integrity of China's logistics system and can also promote the development of China's flower industry. The research has made some improvements on the basis of other research scholars, and there is still some room for research.

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REFERENCES

- [1] Keshan Wang: Current status, problems and suggestions of Chinese flower cold chain logistics, China Business and Market ,Vol. 24 (2010)No.7, p.35-38.
- [2] Xiaogang Li: Analysis and Research on the Transport Packaging and Logistics Distribution of Fresh Cut Flowers ,Packaging Engineering, Vol. 31 (2010)No.13p.71-73+86.
- [3] Jing Wang, Jingjing Wang: Export characteristics, existing problems and countermeasures of cut flower products in China, Practice in Foreign Economic Relations and Trade,(2019)No.2p.48-51.
- [4] Qin Li, Defu Chen: The Status Quo, Problems and Countermeasures of the Development of Fresh Cut Flower Export in China, Practice in Foreign Economic Relations and Trade,(2019)No.7p.46-49.
- [5] Shiguo Cheng, Dongqing Zhu: Research on the Benefit Synergy Mechanism among the Functional Elements of the Logistics System: Taking Fresh Cut Flowers as an Example , Business Review, ,Vol. 32 (2020)No.3p.289-299.