Research on the Current Situation and Countermeasures of Urban Fresh Product Cold Chain Logistics Distribution

Yuwei He*
Business School, Shandong University of Technology, Zibo, Shandong, China
**Corresponding Author.*

Abstract: With the development and progress of society, people have increasingly strict requirements for cold chain logistics. At present, there are still many deficiencies in the development of China's cold chain logistics industry, such as inconsistent industry standards, a shortage of professional cold chain logistics talents, and incomplete investment and construction of infrastructure and equipment. Due to these problems, enterprises cannot meet customer needs well and can only seek solutions and gradually optimize. Enterprises should discover problems through practical investigations and research, and then solve specific problems based on theoretical knowledge and practical experience. This article first introduces the research status of cold chain logistics at home and abroad and relevant theoretical knowledge of cold chain logistics distribution as theoretical support. Then, taking Company X, a cold chain logistics enterprise engaged in fresh products, as an example, it analyzes the entire cold chain logistics industry, studies the current situation of the enterprise's cold chain logistics distribution, and proposes practical and feasible optimization suggestions, providing reference for the development of the cold chain logistics industry.

Keywords: Fresh Products; Cold Chain Logistics; Distribution; Optimization

1. Introduction

Fresh products are rich in a large number of nutrients required for the basic metabolism of the human body and are products that people need to consume every day. Therefore, people not only pay attention to the freshness of fresh products but also pursue high - quality products that are beneficial to physical health [1]. However, fresh products are difficult to maintain freshness at room temperature and are perishable. Therefore, higher requirements are placed on distribution time, transportation equipment, warehousing, packaging, and other aspects. In the era of such convenient Internet access, people's shopping methods are no longer limited to offline consumption in markets and physical stores. The consumption method of online shopping has gradually penetrated into people's lives. However, in today's new retail era of the co - development of online and offline, the growth rate of online fresh product sales is constantly decreasing. Judging from the statistics of the increasing output of fresh products year by year, people's demand for fresh products has not decreased. Instead, they have put forward higher requirements for the quality of fresh products.

Research shows that fresh products spend most of the time in the transportation and distribution link from the raw material supply place to the hands of consumers through the entire logistics process. Each type of fresh product has its own suitable refrigerated transportation temperature and humidity. Appropriate refrigerated temperature and humidity can not only ensure the quality of fresh products but also save resources, increase sales revenue for enterprises, and reduce energy consumption [2]. Compared with Western countries, the cold chain logistics industry in China started relatively late. At present, a complete cold chain logistics management system has not been formed. Irregular transportation equipment, sub - optimal distribution routes, and unreasonable personnel operations have led to frequent damage and spoilage of products during the cold chain logistics transportation and distribution process. According to relevant data, technologically advanced Western countries not only pay attention to the quality of fresh products but also focus on product safety during the transportation and distribution process [3]. All perishable fresh products are completely transported in refrigerated trucks for preservation, and the loss

rate of fresh products is controlled below 5%, with a good circulation rate. Compared with Western developed countries, China's circulation efficiency of fresh products is relatively low, and there is still much room for improvement.

Because China's cold chain logistics started later than that of Western developed countries, although the logistics industry has developed rapidly in recent years, cold chain logistics remains a relatively weak link in the development of China's logistics industry. Therefore, studying the distribution of the cold chain logistics industry is of great significance for cost - saving, efficiency - improvement, and accelerating the development process [4]. This article conducts research on urban fresh product cold chain logistics distribution enterprises, analyzes problems such as imperfect cold chain logistics systems, lack of cold chain transportation and storage equipment, and unreasonable cold chain logistics distribution route planning, explores a set of strategies suitable for the development of enterprises themselves, effectively reduces enterprise logistics distribution costs, formulates a scientific and standardized management system, and thereby improves enterprise distribution efficiency and customer service levels.

2. Current Situation and Existing Problems of Urban Fresh Product Cold Chain Logistics Distribution

Due to the late development of China's cold chain logistics, many difficulties were encountered in the cold chain logistics distribution of fresh products in the initial stage of enterprise establishment. For example, there were no regional refrigerated warehouses to support the distribution of fresh products by enterprises. Enterprises could only invest funds, allocate personnel, and equip equipment to build these warehouses for development. At the same time, the perishability and short life cycle of fresh products have increased the difficulty of enterprise distribution. Therefore, enterprises have adopted various methods to solve problems such as high distribution costs and great distribution difficulties.

2.1 Imperfect Cold Chain Transportation Infrastructure and Equipment

In the economic market, when the logistics industry initially developed, most of its organizational structures were relatively simple. At that time, national policies were relatively complete, which could better supervise logistics enterprises and played a certain positive role in the economic development at that time. However, with the progress of society, the construction of relevant laws and regulations has not been updated enough and has always been in a lagging state. Although there are rules and regulations regarding the logistics link in the legal provisions of some enterprise - related departments, there is no complete set of systems. The times are changing, and everything is being renovated. Many old regulations should be revised to keep up with the trend of the times [5]. Otherwise, in the long run, it will be difficult to maintain the situation of the logistics economic market. China's cold chain logistics industry started late, and a mature and complete operation system has not been formed yet. For cold chain logistics enterprises, if they want to develop rapidly, they must have a flexible logistics business system that suits them. If the hardware facilities and equipment cannot keep up with the development rhythm during the enterprise development process, it will still be difficult for enterprises to expand their development space and speed.

2.2 Serious Losses of Fresh Products

During the transportation and distribution of fresh products, the high product loss rate has always been an important factor restricting the development and profitability of fresh product enterprises. The loss rate during the cold chain logistics distribution process in China is as high as 20% - 25%. Among them, the logistics loss rate of fresh products on fresh e - commerce platforms is more than 10%, and the loss rate of some e - commerce platforms even exceeds 30%, while the loss rate of fresh products in developed countries from the time of original product picking until they are delivered to consumers is only 5%. A certain degree of product loss is inevitable during the transportation and distribution process. However, enterprises will also incur many additional costs due to serious product losses. Therefore, enterprises should find ways to reduce the product loss rate during the transportation and distribution process. Because fresh products have different growth regions and growth habits, the preservation methods for each product are also different. Temperature and humidity have their specific suitable values, which is

undoubtedly a factor that must be considered to increase the business volume of enterprises. How to reduce the loss rate of fresh products during the transportation and distribution process is an urgent problem for enterprises to solve.

2.3 Insufficient Distribution Network Planning

Insufficient network route planning during the distribution process will lead to traffic problems and ultimately reduce the distribution efficiency of fresh products. On the one hand, most distribution vehicles lack scientific equipment for route planning, so the distribution process is easily affected by the subjective consciousness of distribution personnel. Distribution personnel may take incorrect routes driven by experience. These situations highlight the importance of distribution network planning [6]. On the other hand, not taking the optimal route will also cause energy waste of distribution vehicles and increase enterprise distribution costs. In the long run, it will have a serious negative impact on enterprises and is not conducive to the long - term development of enterprises. In addition, fresh products have strict requirements for timeliness. In this way, even if there is no overtime distribution, due to the detours and repetitions of routes caused by insufficient distribution network planning, the freshness of products will be reduced to a certain extent, and customer satisfaction will also be affected accordingly. At the same time, the "last - mile" distribution of enterprises is also affecting the development of enterprises. Since the distribution link is directly facing end - consumers, it can obtain the first - hand feedback information of customer satisfaction. It is also an important link to help establish the corporate image. However, with the continuous advancement of urbanization, the traffic congestion phenomenon has become more and more serious. In the future, in order to improve the "last - mile" distribution efficiency, enterprises have to increase the investment in distribution vehicles. At the same time, other fresh product enterprises in the city also adopt the same strategy and increase the investment in distribution vehicles, which further exacerbates the traffic congestion phenomenon. How to coordinate and solve this problem is also a major challenge for enterprises.

2.4 Shortage of Professional Cold Chain Logistics Talents

To achieve the professional and rapid development of enterprises, human resources are also crucial. Since the cold chain logistics industry involves not only logistics - related professional knowledge but also relevant professional knowledge in food safety, medicine, information technology, etc., which is determined by the categories of fresh products. High - quality talents with a professional background will undoubtedly contribute to the development of enterprises. On the contrary, it is difficult for enterprises to achieve rapid development without relevant professional knowledge talents. However, there is currently a serious shortage of such talents in China, and there is a lack of education in this regard. Although many universities offer relevant logistics courses, most of them only involve logistics - related knowledge and do not cover such a wide range of aspects.

3. Research on Countermeasures for Urban Fresh Product Cold Chain Logistics Distribution

3.1 Strengthen the Construction of the Basic Platform and Achieve Diversified Enterprise Profits

In view of the slow development of the current cold chain logistics industry and the imperfect infrastructure and equipment, to achieve the optimization and development of fresh product enterprises, it is essential to strengthen the construction of the basic platform. On the premise that enterprises have sufficient strength to support their own operations and development, they can consider building regional refrigerated warehouses to improve the regional layout of refrigerated warehouses and lay a foundation for the future large - scale development of enterprises themselves. In the context of this information age, scientific and reasonable planning is carried out by using big data and the enterprise's own technical support. After comprehensive consideration, the location and quantity of cold storage are determined to avoid problems such as unreasonable layout planning and cold storage waste. These cold storage can not only serve the enterprise itself but also be used as a cold chain logistics platform to provide services for third - party enterprises, realizing diversified enterprise profits. At the same time,

enterprises also need to pay attention to the optimization of cold chain logistics infrastructure and equipment, introduce new refrigeration technologies, refrigerated trucks, refrigeration equipment, temperature and humidity control devices, and eliminate aging facilities and equipment to ensure the quality of products during the transportation and distribution process.

3.2 Strengthen the Quality Monitoring of Each Link in the Cold Chain Logistics and Reduce the Cargo Damage Rate

Fresh products are different from other products. They are perishable and cannot be compressed or collided during the circulation process. Otherwise, it is easy to cause product damage and subsequent poor sales, resulting in cargo damage costs. For the logistics of fresh products, enterprises should prevent and control from the source. Pack products according to their characteristics at the place of origin. During the transportation and distribution process, use different temperature and humidity for refrigeration. When fresh products are in the circulation process, select suitable refrigerated trucks for transportation and distribution, strictly control the temperature and humidity, track the vehicle location, and maintain smooth information communication with the enterprise management information system. At the same time, during the transportation and distribution process, loading and unloading operations are inevitable. Therefore, loading and unloading workers should pay attention to protecting products during operations, follow the principle of "handling with care," and not handle them randomly to avoid product damage caused by human factors. The same is true in the final distribution process. It is necessary to focus on cultivating the professional qualities of distribution personnel and strengthening their mastery of basic distribution knowledge to avoid waste caused by human factors. In the entire cold chain logistics process of fresh products, enterprises should strengthen the quality monitoring of each link. Because fresh products are different from other items, every link cannot be ignored. Attention needs to be paid to product quality in every link. If there are problems in any link during the transportation and distribution process, it will cause cargo damage and incur cargo damage costs for enterprises. Enterprises must pay attention to this.

3.3 Try Night - Time Distribution and Reasonably Plan the Distribution Route

With the continuous advancement of urbanization, the traffic congestion phenomenon has become more and more serious, which also increases the difficulty of enterprise distribution. Enterprises want to improve their distribution efficiency and have to increase the number of distribution vehicles. However, increasing the number of distribution vehicles not only increases the relevant management costs of enterprises but also exacerbates urban traffic congestion. To effectively improve the distribution efficiency, enterprises must seek other solutions. For fresh products with high demand the next day, such as dairy products, fruits, and vegetables, enterprises can try night - time distribution. There are fewer vehicles on the road at night, and traffic congestion rarely occurs. Enterprises can take advantage of this to conduct night - time distribution, delivering fresh products from nearby distribution centers or front - end warehouses to offline stores, which can effectively improve the distribution efficiency. For online orders during the day, enterprises can use small - sized distribution vehicles, such as electric tricycles and electric vehicles, which are not only environmentally friendly but also can effectively avoid traffic congestion and ensure that products can be delivered to consumers in a timely manner.

If enterprises reasonably plan their distribution routes on the basis of avoiding traffic peak hours, they can further improve distribution efficiency. During the morning and evening rush hours when traffic congestion is likely to occur, planning a reasonable route and avoiding congested sections can save a significant amount of distribution time. At normal distribution times, enterprises can use big data and their own advanced technologies to plan distribution routes rationally, reducing the distribution mileage and saving distribution costs. Shortening the distribution mileage also shortens the working hours of distribution vehicles, thereby reducing energy consumption and contributing to environmental protection, which is conducive to the development of green logistics.

3.4 Cultivate Talents with Professional Cold Chain Logistics Knowledge

China entered the cold chain logistics industry relatively late, resulting in a shortage of

professionals with cold chain logistics expertise. For fresh product enterprises aiming for specialized cold chain logistics development, it is essential to introduce or train professional cold chain logistics talents and adopt advanced technologies. Enterprises can appropriately bring in technologies and experiences from both domestic and international cold chain logistics industries. Hire top - notch cold chain logistics experts to provide professional training for internal staff and establish an incentive mechanism. Reward those who achieve good learning outcomes to encourage more employees to learn spontaneously. For talents cultivated for key company projects, secure better learning opportunities for them, enabling in - depth study of cold chain logistics knowledge and its effective application in practical work, thus realizing employees' self - worth.

3.5 Establish a Set of Management Standards Tailored to the Enterprise

Given the unique nature of fresh products, enterprises should establish standards right from the start of the logistics process. At the supplier end, unified standards regarding product volume, weight, and maturity should be formulated. Based on these standards, products are selected. If product standards vary, it will increase the complexity of the transportation process, making it challenging to maintain product quality and likely leading to product damage. When packaging products, different packaging materials and methods should be employed according to the characteristics of each product, and these should be standardized and quantified. During the distribution processing stage, there must be a clear measure for the degree of product processing to avoid random processing that could cause damage. In the transportation and distribution process, not only should relevant personnel be selected and trained following unified standards, but also transportation and distribution vehicles should be managed in a standardized manner. This allows the enterprise to track product information at any time and promptly report the transportation and distribution status. Moreover, a unified standard for relevant cold chain logistics technologies is necessary. These technologies cannot be used haphazardly, as each product has its own appropriate refrigeration method that should not be altered arbitrarily.

4. Conclusion

This article first analyzes the current situation of the cold chain logistics industry, then dissects the existing problems in the cold chain logistics distribution of fresh products, explores their causes, and based on this, proposes scientific, reasonable, and practical optimization strategies. It is hoped that these strategies can contribute to the development of the cold chain logistics industry and provide certain reference for the development of other fresh product enterprises.

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