Analysis on the Cause and Countermeasure of Cold Chain Logistics of Fresh Agricultural Products

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Abstract: During the continuous development of e-commerce, we analyze the fresh food e-commerce market and the reported data in recent years, and explore the selection of fresh agricultural products in the cold chain, transportation and distribution, storage and sales. Meanwhile, countermeasures have been made to solve the problem of cold chain disconnection of fresh agricultural products through supply services, infrastructure construction and information management. Ensuring the continuous chain of the cold chain process needs to rely on the collaboration of users, businesses, cold chain logistics and other parties, and the cold chain logistics of fresh agricultural products e-commerce requires more in-depth research to maintain no “broken chain”.

Keywords: Fresh Agricultural Products; E-commerce Cold Chain Logistics; “Broken Chain”; Coping Strategies

1. Introduction

With the emergence of a new economic model of fresh food e-commerce, the demand for fresh fresh food is rising rapidly, and the distribution volume is increasing. Fresh food e-commerce logistics needs to strictly control the quality of goods to ensure that fresh food is not corrupted or deteriorated until the last link in the hands of consumers fresh food must also have great freshness to ensure food quality. To improve operational efficiency and enhance consumer experience, fresh food e-commerce and cold chain logistics systems are integrated with each other[1].

2. Market analysis of cold chain logistics for fresh agricultural products

With the rapid development of fresh forward warehouse model, platform to home model, community group model and other new models continue to emerge. The front warehouse mode is mainly used in the scene of heavy assets, heavy operation and closer to consumers; the platform to home mode is light assets operation mode online drainage and offline distribution; the community group mode takes WeChat as the carrier with community resources, pre-sale plus group purchase of a new model.

According to the report, the market transaction scale of China’s fresh food e-commerce industry reached 279.62 billion yuan in 2019, an increase of 36.7% over the previous year. Affected by the epidemic in 2020, consumers’ demand for fresh food will increase rapidly, and the transaction scale of the fresh food e-commerce market will increase significantly[2]. It is estimated that by 2023, the transaction scale of the fresh food e-commerce market will exceed 800 billion yuan. From the perspective of market concentration, the top 5 companies in the fresh food e-commerce industry accounted for 57.2% in 2019[3]. The cold chain circulation rate of fresh agricultural products in China is serious-
ly lower than that of European and American. The sum of the cold chain circulation rates of fruits, vegetables, meat and aquatic products is less than 50%. It can be seen that the risk of “broken chain” in the transportation of fresh agricultural products is high, and the loss severe corruption[3].

3. “Broken Chain” factor of cold chain logistics

3.1 Improper selection of logistics operation modes

The main operating mode of the fresh agricultural production level is self-operated logistics, third-party (3PL) logistics, and self-operated + third-party logistics. The choice of logistics providers often greatly affects the quality of cold chain logistics. The problem is that the wrong start causes the cold chain process to fail to “cold” to the end. Regarding the cold chain of fresh agricultural products, general self-operated logistics rarely invests capital costs in advanced facilities and equipment, and even reverse logistics with cold chain will add a cost of investment to doubt whether it can bring benefits[4]. Usually, in order to develop its core competitiveness, companies generally outsource cold chain services to a third party to share the risk and pressure brought by the cold chain. However, the cost of third-party cold chain services is higher than that of self-operating, and small business cannot afford.

3.2 Transport and distribution issues

Fresh agricultural product e-commerce mainly relies on the cold chain logistics operation system, which requires cold chain transportation and distribution. Cold chain transportation and distribution are the most important and critical part of the entire cold chain.

In the process of vehicle transportation, it will be transported from the source of goods to the processing and distribution center to the seller and then to the consumer. Among them, the circulation processing, loading and unloading, the fresh incubator frequently opens and closes, and the temperature difference inside and outside the box affects the microbes. Although short-time opening and closing operations will not cause excessive deterioration of the goods, repeated opening and closing will cause an “accumulation” effect, and the impact of quantitative changes will produce a qualitative change. It is difficult to guarantee the quality of fresh food.

3.3 Storage issues

The storage link in cold chain logistics is equivalent to providing a cold storage room (cold storage) or insulation room for fresh agricultural products. The storage link is a link with a large investment cost, and the cold storage location planning is carried out for it. Moreover, its facilities and safety will affect the rate and quality of fresh food. In addition to basic operations, the refrigeration infrastructure and technical equipment in the cold storage are also rigid conditions that cannot be ignored. It is necessary to ensure that normal temperature control facilities and equipment can reduce production. The loss caused by the decrease in the freshness of fresh agricultural products, while prolonging the fresh-keeping period, the time of delivery can be adjusted at any time[5].

Fresh and perishable products must be placed in a dedicated fresh-keeping warehouse or cold storage, and the cost of building a cold storage is high. The domestic cold storage warehouses used by enterprises are very limited, and for e-commerce companies, the cost of self-built cold chain logistics is burdened. Very large, and currently there are few professional cold chain logistics companies in China, and the amount of services that can be provided only reaches 5% of the market demand. Therefore, these small and micro fresh agricultural products e-commerce platforms can only express at room temperature in most cases, and increase the loss rate of fresh products by putting ice packs in thermal insulation packages, but generally cannot guarantee whether the fresh products reach consumers will meet the requirements.

3.4 Sales issues

The sales link is the main reason for the cold chain logistics. E-commerce fresh food enterprises cannot clarify their purchasing needs, and rely excessively on the purchasing experience and data provided by the purchasing person-
nel, which will lead to insufficient inventory or overstocking. If the types of fresh agricultural products are single and the homogeneity phenomenon is serious, which cannot meet the needs of consumers, resulting in a small source of customers, the sales volume cannot be increased. Consumers use online e-commerce to place orders and send feedback to sellers, resulting in arranging transportation and distribution. However, once the sales link is hindered, a large number of fresh agricultural products will pass the “earlier” date even if they are stored in cold storage. The loss of fresh food is accumulated in the warehouse, facing the dilemma of not being able to sell it, resulting in the incomplete formation of the cold chain.

4. Countermeasures to cold chain logistics of fresh agricultural products

4.1 Selection of suitable supply services

The choice of source and supplier should consider its rationality and product quality and safety. Fresh food is not a standardized product. For the community O2O fresh food e-commerce platform, whether direct commodity procurement or production base cooperation must consider the most source supplier. Fresh agricultural products cannot be standardized during the planting and picking process. The state of uniformity, after all, the products supplied by suppliers will be uneven, making it difficult to guarantee quality, which not only increases the acquisition cost of platform operators, but also directly affects consumers’ final product experience and quality evaluation, and indirectly affects brand[6].

To ensure the cold chain logistics of fresh agricultural products, the most important thing is to control the source of the products. The cooperation between platform operators and selected fresh agricultural product suppliers needs to be screened and supervised, and quality inspections of cooperative farms are carried out from time to time. If problems are found, the cooperation should be stopped immediately. In addition, in order to solve the problem of uneven supply and demand caused by the unsatisfactory demand information of the original suppliers, the platform operator, as the core enterprise of the supply chain, should promptly inform the demand forecast information, market research situation, and actual order information of fresh products. Fresh food suppliers, guarantee the normal supply of suppliers, and ensure the normal profits of suppliers[7].

4.2 Increased investment in infrastructure

Most of e-commerce fresh agricultural products rely on normal temperature logistics or ice bag form lack of corresponding freezing facilities, which brings many inconvenience to the storage, processing, transportation and loading and unloading of fresh and perishable products, and cannot effectively guarantee the preservation and transportation process in the cold chain process. Small and micro e-commerce platforms do not have the ability to build their own cold chain logistics system. They can choose to cooperate with third-party cold chain logistics companies or encourage small and micro e-commerce to reduce the cost burden of infrastructure through shared cold storage systems. Although the construction of infrastructure in the early stage of capital investment will cause certain economic pressure, but for the long-term development of fresh e-commerce must not less, encourage e-commerce fresh enterprises speed up the standardization of the original cold chain distribution facilities, further upgrade and improve the equipment of existing warehouses, and promote enterprises to actively participate in the process of standardization of cold chain logistics[8]. Gradually spread from “point” to “surface”, forming an efficient operation system of cold chain logistics.

4.3 Promoting integration of information management

The information monitoring of normal temperature logistics is to monitor the location and progress of transportation. In addition to monitoring the general progress information, cold chain logistics also monitors the transportation environment of fresh products in real time to ensure the whole process of low temperature transportation. In addition, the e-commerce platform promises that all fresh agricultural products have traceability information of origin[9]. Like the identity card of the product, after the product is issued from the origin, the origin information can be inquired through QR code scanning, etc., to ensure that the traceability information can be followed. In the distribution link, a standard
supervision and control system should also be established to supervise the entire transportation process in real time. Timely feedback whether the temperature and humidity in the transportation equipment meet the preservation standards during transportation[10].

5. Summary

There are many fresh physical stores, and fresh e-commerce is also developing constantly. The improvement of brand service has allowed the public to choose fresh e-commerce products to believe in their quality and consume. Merchants provide detailed and intuitive information and improve cold chain services. Cold chain logistics only can meet the distribution needs of a small number of fresh agricultural product e-commerce platforms, and most fresh agricultural product e-commerce platforms continue to have high cost and low efficiency transportation and distribution. Consumers need to give merchants positive feedback to increase consumer stickiness, improve customer loyalty, further expand target customer groups, and increase customer repurchase rates instead of just focusing on marketing traffic to form a virtuous circle and ensure the quality and safety of agricultural products. Fresh food e-commerce companies can be evergreen undefeated.

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