

A literature review of supply chain development: Evidence from agricultural industry

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Abstract. In the context of the increasing demand for safety and quality of fresh produce, currently two major supply chain models for agricultural products are analyzed (E-commerce Platforms and Agricultural-Supermarket jointing model) and thus a dual-channel agricultural supply chain is proposed by combining the advantages of both. First of all, this paper analyzes the characteristics of different agricultural-supermarket jointing models in the United States, Japan and China, and at the same time compares the advanced agricultural products circulation models in the United States and Japan, puts forward the shortcomings of agricultural-supermarket jointing models in China, and makes suggestions for its future development, then analyze several current e-commerce operation models of fresh produce in China and point out the advantages and disadvantages of e-commerce platforms. Finally, using the case study of Freshippo, we further demonstrate that the dual-channel model plays a huge role in fresh produce.

Keywords: Dual- Channel, Agricultural Products, E-commerce Platforms, Agricultural-Supermarket jointing model.

1. Introduction

1.1 Background

China is a major agricultural producer in the world and a major producer of fresh agricultural products, in recent years in China, with the improvement of people's living standards, people have higher requirements for the quantity and quality of fresh produce [1]. However, China's agricultural products distribution infrastructure has been weak for many years, and the decay and spoilage of agricultural products in the process of distribution is serious. Direct losses of agricultural products due to freshness and spoilage problems reached 275 million tons in 2019 [2]. The current situation in China is that information on fresh agricultural products is poorly and untimely transmitted between production and consumption, which leads to problems in quality and quantity. From a macro point of view, it affects both the market supply and demand, threatens the health and safety of consumers, and is detrimental to the export trade of fresh agricultural products [3]. Under the guidance of market economy and sustainable development, China urgently needs to reform the outdated mode of fresh produce production and operation and make use of modern information technology to unblock the information channels of the supply chain network between production and consumption. Finally, it can help achieving harmonious and mutually supportive development for mutual benefits [4].

1.2 Contributions

The agriculture-supermarket jointing model is an advanced model of ASC (agriculture supply chain) development. Routroy found that this model facilitates the strengthening of linkages among smallholder farmers to form large-scale organized retail, thus enabling ASC's sustainable development [5]. Nowadays, people are demanding higher quality of life, and Opara found that in order to meet consumer demand for safe and nutritious food, the design and implementation of a complete traceable supply chain from the farm to the end user has become an important part of the system to ensure food safety [6]. On top of this, information technology has driven ASC'S traceability

system. Routroy further stated that the operation of electronic platforms is becoming increasingly popular in integrating agricultural procurement processes, which can effectively improve efficiency and responsiveness [5].

1.3 Objective

Under the single channel of fresh agricultural products, the agriculture-supermarket jointing model and single e-commerce platform have different advantages, but there are also many problems. In order to optimize the agricultural product supply chain and combine the advantages of agricultural-supermarket jointing model with the low price and high efficiency of e-commerce platform, this paper will analyze the "agriculture-supermarket jointing model + e-platform" dual-channel supply chain model of Freshippo as a case study, and propose some inspirations and difficulties for the promotion of this model.

1.4 Remaining structure

This paper analyzes the two main agricultural supply chains and proposes dual channels, and proves that dual-channel supply chains play a positive role for agricultural products. The remaining paper structures as follows: Section 2 shows China's agricultural-supermarket jointing model and compares it with other countries to point out the shortcomings. Section 3 shows several major e-commerce models for agricultural products in China, and points out the advantages and disadvantages. Section 4 uses a case study to further support the analysis. Section 5 concludes.

2. Agriculture-supermarket jointing model

2.1 The concept of agriculture-supermarket jointing model

There are many problems in the traditional supply chain model of agricultural products from the production area to the consumer through the wholesale market, such as long circulation time, high loss, high logistics cost and lack of scale in production and operation. Since the traditional supply chain of agricultural products cannot meet the requirements of consumers in terms of safety, health and timeliness, the proposal of agriculture-supermarket jointing came into being.

As a new type of supply chain for agricultural products, it links production and sales through the signing of agreements between farmers and supermarkets, using market demand to guide the source planting, thus optimizing all aspects of agricultural products from production to consumer circulation. This model outwardly reflects the separation of produce and sale, but its inner mechanism actually tends to be unified, which is a more efficient circulation method [7].

2.2 Agriculture-supermarket jointing in different country

2.2.1 Agriculture-supermarket jointing model in America

It is estimated that 80% products are sold by the method of figure 1 in America. Under this model, agriculture products are transported from large farm to distribution center, where they are distributed to each supermarket according to the market demand.

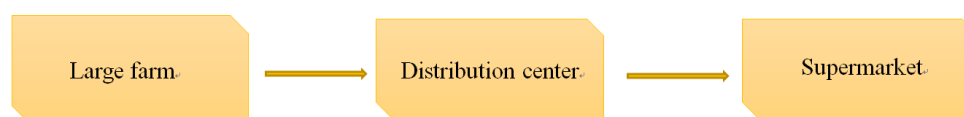


Figure1: Agriculture-supermarket jointing model in America

The producing method of agriculture in America is mainly based on large-scale farms as production units. During the process from sowing to harvesting, the level of mechanization is very

high, even some part realizing automation, which owns specialized storage, packaging and sorting factories and equipments [8]. Farm-based organization for large-scale production, accompanied with technical specialization and mechanization, which not only makes US agricultural production more efficient, but also gives the farms a high position in the markets.

America owns developed infrastructure and complete transportation network. Nearly all of the America populations in urban areas live within 8km of the national highway network, covering approximately 90% of the US population [9]. As a result, the US has a well-developed transportation system that facilitates logistics between farms and supermarkets, allowing producers to supply retailers with fresh products in a timely manner and eliminating the need for intermediaries. In addition, the modern transport and preservation facilities in the USA are well developed, with a sufficient number of advanced cold chain logistics equipment and distribution technology, which ensures the freshness of the produce during transport.

2.2.2 Agriculture-supermarket jointing model in Japan

Since the 1990s, the supply chain of agricultural products in Japan has been transformed from a multi-level wholesale market to an agriculture-supermarket model, which is showed in figure 2. The farmers' association collects the agricultural products produced by the farmers and, using its organizational system to process, treat, grade and pack them, and at last, transport them to the supermarkets.

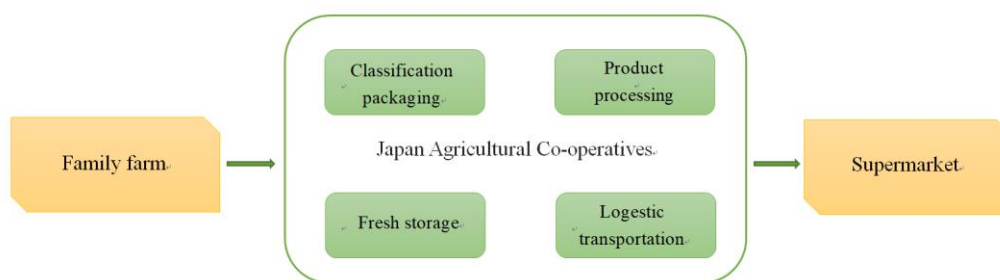


Figure 2. Agriculture-supermarket jointing model in Japan

Japan is an island nation with poor soils, small plains, very limited arable land and a population density of 2,924 people per square kilometer [10]. So there are no prerequisites for agricultural development, agricultural products are mainly produced on a small scale by families. Many farmers have difficulty accessing markets and the distribution of agricultural products faces big challenge. In this context, JA have been created to not only collect the produce produced by farmers, but also to act as intermediaries between farms and supermarkets, using their organizations to preserve, process, grade, pack and transport the produce, providing a full range of services to bring products to market. According to statistics, about 97% of farmers in Japan have joined a farming association, 80% of agricultural products are purchased by JA and 90% of agricultural products are sold by it [11]. The entry of JA has not only increased farmers' incomes and improved the organizational network of the agricultural supply chain, but it has also contributed to the modernization of agricultural distribution.

2.2.3 Agriculture-supermarket jointing model in China

Although china is a big agriculture country, the producing method of agriculture products is similar to the way in japan. In contrast to Japan, China's agricultural population is large, agricultural production technology is backward, and agricultural operators are scattered, making it difficult to form large-scale operations. In accordance with the requirements of the central government, the Ministry of Agriculture of China has launched a pilot project of content in figure 3, which has enabled the model to be spread rapidly throughout the country [12].



Figure 3. Agriculture-supermarket jointing model in China

The participation of agriculture cooperative can help farmers overcome the disadvantages of having difficulty in entering the market competition, effectively integrate scattered farmers, increase the participation of the model, and improve the scale of production. At the same time, cooperatives are able to improve farmers' agricultural skills through financial support and tax incentives given by the government, reduce production risks and establish a safety traceability system for fresh agricultural products. As cooperatives have information on both the market and the farmers, they can also avoid wastage of resources caused by over-cultivation and improve the stability of agricultural products in terms of marketing [13].

2.3 The shortcomings of China's model compared to the American and Japanese models

As a new way of distributing agricultural products in China, it is difficult for farmers to understand and accept the model and their willingness to participate is low. At the same time, the scale of cooperatives is far less than that of JA, which is mainly concentrated in the countryside, and some of them are not established in strict accordance with the law, so their construction is not standardized and backward.

In reality, the supermarkets are generally not be responsible for the transportation of agricultural products, so cooperative need complete transport and storage equipment to realize the link between the farm and supermarket [14]. Due to the small scale of operations, ordinary cooperatives can't afford the expensive freight and equipment costs. Meanwhile, the infrastructures are imperfect in the countryside, which can't support the cooperatives in terms of transportation and communication.

Supermarkets hold a high demand of the quality of agricultural products, while cooperatives are mostly in their infancy and cannot reach the mechanization and scale of production like the level of American farms, so the products produced by their members can hardly meet the standards of supermarkets.

In addition, there may be fraudulent practices. On the one hand, cooperatives take advantage of farmers' poor access to information to quote low prices by fabricating false information, and then sell to supermarkets at the original price, earning the difference [14]. On the other hand, supermarkets can take advantage of cooperatives' poor knowledge about the operation of supermarkets to impose them to give in on price.

2.4 Outlook for china's agriculture-supermarket jointing model

China's model is the most consistent with national conditions and can be widely promoted, but from the perspective of future development, there are still gaps with other developed countries' models.

In the future, the model should try to overcome existing problems, drive farmers' enthusiasm to achieve large-scale production, eliminate direct unequal relationships between supermarkets and cooperatives, and ensure the development of an efficient and stable agricultural supply chain.

The future solution to these difficulties is not to create a single organizational model, but to develop a symbiotic and co-productive system of multiple organizational forms. The emergence of e-commerce offers new possibilities for agricultural supply chain. Cai found that adding a channel to a

single channel benefited both suppliers and retailer [15]. This simultaneous campaign across two channels is known as a dual channel. In this context, the dual-channel approach means that the agricultural products are distributed in the form of "agricultural-supermarket jointing+ e-commerce platform". For large-scale production, Pu found that the dual-channel model could motivate cooperatives to produce and incentivize them to expand production [16]. Cai further notes that the addition of an online e-commerce channel can also improve the bargaining power of both parties [15]. Therefore, the introduction of e-commerce channels can coordinate and optimize the supply chain of the agriculture-supermarket model, and dual channels are an inevitable choice for the development of China's agricultural supply chain.

3. Agricultural Products E-Commerce Platform

3.1 Fresh food e-commerce origin and current situation

China's e-commerce originated in the 1990s, compared with Europe and the United States and other developed countries, China's e-commerce started late, but the momentum of development is very strong. Especially in the 21st century, the rapid development of the Internet, e-commerce is to penetrate into people's lives at an alarming rate. With the continuous progress of society and the improvement of people's living standards, consumers' demand for fresh agricultural products is increasing and their requirements for quality are rising, so the packaging, transportation, storage and distribution of fresh agricultural products are getting more and more attention from the society [17]. Fresh produce e-commerce refers to the sale of fresh produce on the Internet based on the Internet platform. Based on the development of market economy, the operation mode of fresh produce e-commerce has become a hot research topic in the academic field [18].

3.2 The operation mode of e-commerce for fresh produce

As a new e-commerce field, from the perspective of e-commerce, most of the existing e-commerce models of fresh food e-commerce enterprises are B2C models, and the following are the main operational models of fresh food e-commerce in China [18].

B2C mode is a business through the network marketing for consumers to provide products or services, its convenient interface on the network to attract many consumers to buy, which is also the preferred mode of operation of many e-commerce platforms.

For B2B model, usually e-commerce companies want to balance the expensive delivery costs by having enough volume per transaction, but this is not the case. As shown by the expensive delivery costs of fresh produce e-commerce, it is actually not cost effective compared to.

The O2O model has become the focus of many fresh produce e-commerce companies for cost and logistics reasons. As a combination of online and offline commerce, this model allows the web to become a front for offline transactions. As a result, consumers can use online to filter services and settle transactions online.

3.3 Features of e-commerce for fresh produce in China

In recent years, the consumption structure has changed dramatically, online shopping has become more and more popular, consumers have a strong demand for fresh agricultural products, and are particularly concerned about the safety and high quality of fresh food, coupled with government departments. In addition, government departments attach great importance to the innovation of agricultural products circulation and other factors, China's fresh agricultural products e-commerce is booming. At present, China's agricultural products e-commerce mainly has the following characteristics:

Deep integration of traditional agriculture and modern technology. Commerce for agricultural products bridges the gap between urban and rural areas, and between small production and large markets. E-commerce of agricultural products provides a new circulation method and circulation channel for buying and selling agricultural products, realizes the direct sale and purchase of

agricultural products across geographical areas, reduces the loss and deterioration due to excessive circulation links, and especially importantly, solves to a certain extent the problem of difficulty in buying and selling agricultural products, forms a brand and increases income [19].

Convenient and intuitive transactions and continuous innovation in business models. Commerce of fresh produce has changed the traditional face-to-face choice of purchase. Online transactions not only have a certain degree of transparency and a huge amount of information, but are also more convenient, fast and efficient. Fresh produce e-commerce breaks the space limitation, consumers can quickly and comprehensively understand the information of fresh produce online, and make multiple comparisons according to their needs [19].

3.4 The positive impact of e-commerce for fresh produce

3.4.1 Promoting rural economic development

The development of e-commerce for fresh agricultural products has further prompted the relevant departments to increase policy support and financial investment in the construction of information facilities in rural areas, which has greatly improved the information environment in rural areas. For example, the development of e-commerce for agricultural products has not only prompted agricultural administrative departments to speed up the construction of local area networks and agricultural information websites, but also promoted the construction of agricultural monitoring and warning systems, agricultural product supply and demand and referral service systems, agricultural price information systems, joint agricultural science and technology information service systems, and agricultural market supervision information systems [20].

3.4.2 Breaking the regional nature of agricultural products

The most important feature of fresh produce e-commerce is that it can quickly connect to the consumer market and meet the demand of consumers for distinctive, high-quality fresh produce from different regions. This ensures customer satisfaction and also stimulates the demand for those regional fresh produce.

3.5 The main problems facing the development of e-commerce for fresh agricultural products

3.5.1 Low rural literacy level

In rural areas, influenced by lower education level, closed living area and unwillingness to accept new things as well as keeping traditional life concept, people in rural areas are lagging behind in cognition and utilization of network technology, some farmers think that as long as they finally sell their agricultural products, e-commerce can't see money and don't know who to sell to, so they might as well sell directly. As a result, many farmers are still accustomed to going to local farmers' markets to set up stalls and not applying online sales mode.

3.5.2 Insufficient development of cold chain logistics

From the current development of China's agricultural products cold chain logistics, cold chain logistics is still the main problem faced by fresh produce e-commerce. Although the cold chain circulation rate of fruits and vegetables and meat reached 22%, 34% respectively in 2015, and the refrigerated transportation rate was 35% and 57% respectively, there are still problems such as weak professional service capability, low industry concentration, low transportation efficiency and lack of integrated cold chain logistics operation. According to the research in Beijing in 2015, all the villages in the agricultural products production area have poor logistics conditions, only 20% of the villages have the conditions to use professional logistics, while 100% of the villages have no cold chain logistics conditions. The logistics conditions of farmers' cooperatives are relatively good, but they also do not have cold chain conditions. Among the cooperatives that carry out agricultural products e-commerce, 58% of them have the conditions of using professional logistics, while 33% of them lack the conditions of professional logistics; while only 14% of the cooperatives have the conditions of cold chain logistics [21].

3.5.3 High cost of fresh produce e-commerce

The perishability of fresh agricultural products inevitably leads to a high loss rate in the process of storage, transportation and terminal sales. In 2013, the loss rate of fresh agricultural products in logistics in China reached 25% for vegetables and fruits, and 12% for meat. Moreover, the construction cost and operation cost of cold chain are very high. The cost of building a medium-sized cold storage is at least 20 million yuan, while the monthly electricity consumption per square meter of cold storage operation is at least 20 yuan. In addition, the cost of cold chain transportation is 40% to 60% higher than that of ordinary vehicles [22]

4. A case study of Freshippo

Freshippo is a retail supermarket owned by Alibaba. For localized agriculture products, it has chosen a supply chain model of agriculture-supermarket jointing + e-commerce platform, which not only improves farmers' income, but also brings better product and service experience to consumers. The following table presents the business profile of Freshippo [23].

Table1: Freshippo's business profile

Name of store	Sales model	Floor area of each store	SKU	investor	Delivery speed	Coverage area
Freshippo	Online + Offline	3000 m ²	5000	Alibaba	30 minutes within 3 km	First or second tier city

According to the market forecasts of Freshippo, the head of the purchasing department will inspect and evaluate the farm bases and propose standards for the cultivation and harvesting of agricultural products for qualified bases, and finally sign the relevant contracts and include them as partners. After signing the contract, the base will transport the agricultural products that meet the standards to the distribution center, which will be responsible for processing or storing the agricultural products and delivering them to the stores according to their needs. Figure 4 below shows the Freshippo's basic supply chain process.

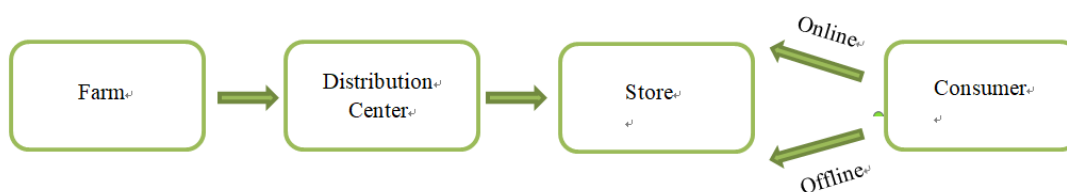


Figure 4. The supply chain model of Freshippo

The stores of Freshippo use an integrated store-warehouse model, whereby the shops not only act as a channel for offline purchases, but also act as warehousing, sorting and distribution centers for online sales [24]. In online consumption, consumers place orders through a dedicated app, and when the shop receives the order, the PDA (personal digital assistant) in the hands of the picker will receive the order information transmitted by the electronic sticky note system in the background. According to the PDA's optimal route navigation, the picker will sort the goods in the shortest possible time and put them into special insulated bags, then send them through the conveyor belt into the delivery area, and finally the takeaway will put the order goods into the delivery box and deliver them to the consumer. The diagram below shows the specific process.

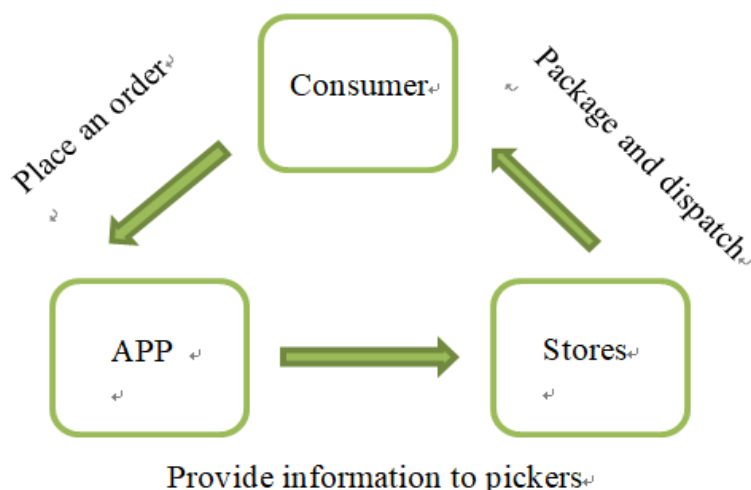


Figure 5. Freshippo’s online sales channel

By analyzing the supply chain process of Freshippo, we can see that the dual-channel model has advantages over a single channel.

4.1 Compare to single agriculture-supermarket jointing model

Under the dual-channel model, supermarket managers can use the online sales volume on the Boxcar app to predict which products consumers prefer, and adjust production volumes with farmers according to the different sales volumes of different products, avoiding problems such as wasted resources, low land utilization and large areas occupied by stock due to over-planting. At the same time, online sales volumes can also help supermarkets adjust their offline promotion levels according to consumer preferences, combine targeted marketing and promotions with different consumer characteristics and psychological expectations, reduce offline promotion costs and effectively boost offline sales [25].

4.2 Compare to single e-commerce platform

Integrated store-warehouse structure under dual channels has advantages over traditional fresh produce e-commerce front-end warehouse structure. The number of front pods is high but the area is small, the SKU can only afford 300-500, which cannot meet the needs of the majority of consumers. Nowadays, the front-end warehouse of large e-commerce platform can ensure delivery within a day. During the transportation and distribution process, per single transaction is not high, but to bear a lot of logistics and transportation costs, so it is difficult to achieve profitability. For store-warehouse integration, the store has the dual role of warehouse and sales, with a large area of store, which can carry the number of SKU up to 4,000-5,000. Besides, the store is closer to the living area than the front-end warehouse, which can realize the electric car delivery within 3km and logistics and distribution costs are lower. From a profit perspective, offline retail revenue is responsible for the cost of store operations, while online order revenue can be turned into profit [23]. This model not only helps supermarkets increase profits, but also improves consumer satisfaction by providing diversified products and fast delivery services, ultimately increasing consumer loyalty to the brand.

4.3 Problems of the dual-channel supply chain model

Although the dual-channel supply chain model can help the chain achieve greater profitability, there are also some conflicts. For the distribution of benefits, the online purchase method is more convenient, consumers can get the goods they want within a certain period of time after placing an order in the mobile app, and the purchase of products will not be affected by space, which can save

consumers a large amount of time and energy. So many young consumers are now buying from offline to online channels, and this shift will inevitably have an impact on the revenue of offline channels. The transaction volume of offline stores is reduced, and the operation and construction costs of stores occupy a large amount of costs, which will easily lead to a large number of supermarkets closing their stores and devoting their main efforts to online channels, certainly bringing vicious competition and affecting the overall interests [26]. In addition, online users are not able to visualize the various features of the product and can only understand the product with the pictures selected by the supermarket. However, sometimes the pictures may have visual distortion, and they may not meet their expectations after receiving the actual products, which will reduce the shopping desire. In comparison, the advantage of offline purchase is that you can see the products for yourself, and you can select the desired agricultural products by communicating with the sales staff, which increases customer satisfaction.

5. Conclusion

This paper present that the purpose of the dual channel is to optimize the fresh production supply chain, so that the advantages of agriculture-supermarket jointing and online trading can be efficiently combined. Compared with the single agricultural-supermarket jointing model, the dual-channel model can help farmers reduce all kinds of resource waste through online sales forecasting, and can improve online and offline promotion methods and reduce promotion costs through statistics on consumer preferences. Compared with the single e-commerce platform model, the store structure of store-warehouse integration under dual channels can withstand a large number of SKU, but also ensure the timeliness of commodity delivery and improve customer satisfaction. However, conflicts also existed, which lie in the problem of profit distribution and customer experience of each body in online and offline channels. To this end, it is recommended that the dual-channel model use a core enterprise as the lead, through a large enterprise to manage each channel. Large companies have sufficient funds and resources to help improve the work of the supply chain upstream and downstream. A cross-organizational information platform can be built to dynamically update the information, so as to ensure that all parts in the supply chain can get the most current and real information, and finally reduce the bullwhip effect and coordinate the dual-channel supply chain efficiency.

Reference

- [1] Zhou Tao, Lv Yuanyuan, Zhou Yaping. Research on the coordination of fresh agricultural products supply chain through dual channels of "agricultural super docking"-based on the perspective of freshness preservation efforts of different subjects[J]. *Management Modernization*,2022,(01):8-16.
- [2] TAN Benyan, WEN Ya. The current situation and countermeasures for the development of fresh agricultural products e-commerce in China[J]. *World Agriculture*,2016,(03):181-184.
- [3] Zhang Jing. Research on fresh produce supply chain coordination based on information sharing [D]. Harbin University of Commerce, 2015.
- [4] Wang Jing. Coordinated management of dual-channel supply chain for fresh produce [D]. Nanjing University,2017.
- [5] Routroy S, Behera A. Agriculture supply chain: A systematic review of literature and implications for future research [J], *Journal of Agribusiness in Developing and Emerging Economies*, 2017, 7(3):275-302
- [6] Opara L U. Traceability in agriculture and food supply chain: a review of basic concepts, technological implications, and future prospects [J]. 2003.
- [7] Jiang Zengwei. "Supermarkets + professional cooperatives + farmers" is an effective model of "agriculture-supermarket jointing. *China Farmers' Cooperative*, 2010(01):34.

- [8] Li Jinhong. Comparison of agricultural distribution channel models in the United States and Japan and the lessons for China [J]. *China Cooperative Economy*, 2005(05):61-62.
- [9] Yang Lulu. Reference to the U.S. agricultural supply chain model and policy recommendations [J]. *World Agriculture*, 2019(10):31-39.
- [10] Agricultural Research. What is the "precision" of Japan's exquisite agriculture [J]. *Contemporary Agricultural Machinery*, 2020(04):62-64.
- [11] Zhang Hongcheng, Han Honglian. Comparison of fresh agricultural products distribution systems in Japan and the United States [J]. *World Agriculture*, 2013(03):37-38+89.
- [12] Ministry of Commerce, Ministry of Agriculture. Ministry of Commerce and Ministry of Agriculture's Guidance on Comprehensively Promoting the agriculture-supermarket jointing [N]. *International Business Daily*, 2011-03-12(009).
- [13] Kong Xiangzhi, Liu Tongshan. The advantages, development ideas and prospects of "farm-society docking"[J]. *China Farmers' Cooperative*, 2013(09):21-23.
- [14] Wang Qi, Zhao Shuang. Research on the influence factors of agricultural-supermarket jointing--based on the model of "farmers + agricultural cooperatives + supermarkets"[J]. *Modern Business*, 2017(28):22-23.
- [15] Cai G. Channel selection and coordination in dual-channel supply chains [J]. *Journal of Retailing*, 2010, 86(1):22-36
- [16] Pu Xujin, Jin, Delong. Comparison of operational efficiency of fresh produce supply chain: single "farm-to-super" vs. dual channels [J]. *China Management Science*, 2017, 25(01):98-105.
- [17] Jiang Jingbo. Evaluation study of fresh agricultural products e-commerce logistics distribution model [D]. *Tianjin University of Technology*, 2021.
- [18] Wang, Mengbo, Yin, Yuting, Mo, Huiyin. Research on the operation mode of domestic fresh agricultural products e-commerce under the Internet of Things environment[J]. *Frontier Economy and Culture*, 2021(12):43-47.
- [19] Liu Jianxin, Wang Keshan, Zhang Chunlin. The main problems and countermeasures facing the development of fresh agricultural products e-commerce[J]. *China circulation economy*, 2016, 30(12):57-64.
- [20] Hong Tao, Zhang Chuanlin. Report on the development of electronic commerce of agricultural products in China from 2014 to 2015[J]. *China Business Journal*, 2015, (Z1):44-54.
- [21] Wang Shuguang. The historical evolution of farmers' cooperative organizations in China: An analysis based on contractual-property rights perspective[J]. *Agricultural Economic Issues*, 2010, 31(11):21-27+110.
- [22] Yang Luming, Ma Xiaoya. Research on the causes and avoidance paths of broken chains in fresh agricultural products cold chain logistics[J]. *Qinghai Social Science*, 2015, (06):66-70+82.
- [23] Chen Xilin. Exploration of fresh supermarket operation mode in the context of new retail [D]. *Nanjing University*, 2018.
- [24] Huang Yifan, Hu Fuzhao. Analysis and research on the new model of fresh food retailing in the context of "new retail"--The example of Freshippo [J]. *Market Week*, 2018(07):65-66.
- [25] Wang Gang. Coordination and optimization of dual-channel fresh food supply chain based on consumer preferences [J]. *Mathematical Practice and Knowledge*, 2021, 51(12):69-81.
- [26] Fan Linbang, Jiang Wen, Shao Chaoxia. Research on the coordination of dual-channel supply chain of fresh agricultural products with revenue sharing in e-commerce environment [J]. *Rural Economy*, 2019(06):137-144.