Research on Supply Chain Management Model of Agricultural Products Logistics Based on Knowledge Base

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Keywords: Agricultural Products; Logistics; Supply Chain; Management

Abstract: Agricultural product logistics supply chain is a new mode of operation under the increasingly competitive environment in the agricultural product market. With the continuous development of the logistics industry, agricultural product logistics has also become an important field in the development of modern logistics in China. The implementation of agricultural product supply chain management mode should first choose agricultural product supply chain mode, which includes agricultural product wholesaler-oriented mode, agricultural product processor-oriented mode and large retailer-oriented mode. Agricultural product logistics in China is still in its infancy. How to use the idea of supply chain management to guide the operation of agricultural product logistics in China and make it efficient, sTable and orderly is the top priority of developing agricultural product logistics in China at this stage. In order to maintain competitiveness, agricultural logistics enterprises must constantly shorten the time of product development and improve product quality. Constructing a modern logistics platform for agricultural products and changing the traditional operation mode are the main issues faced by agricultural logistics enterprises.

1. Introduction

With the development of economy and the improvement of living standards, people's consumption concept of agricultural products has changed from traditional singleness and fussiness to modern diversity and rapidity, which puts forward higher requirements for agricultural products logistics industry [1]. Supply chain is a modern and new concept rising in the context of world economic integration and knowledge economy era. It is a typical operation mode of modern enterprises [2]. The supply chain of agricultural products covers all business activities from “suppliers of suppliers” to “customers of customers” concerning the formation and delivery of final products or services. In recent years, the export of agricultural products in China has been restricted, and the safety of agricultural products has become increasingly serious, which is largely related to China's current agricultural product logistics circulation system [3]. Agricultural product logistics supply chain is a new mode of operation under the increasingly competitive environment in the agricultural product market. With the continuous development of the logistics industry, agricultural product logistics has also become an important field in the development of modern logistics in China [4]. In recent years, the government has continuously put forward policies and guidelines conducive to the development of agricultural product logistics. Who can make full use of the resources in the supply chain to realize the optimization and integration of the supply chain will stand out in the fierce competition [5].

Logistics and distribution of agricultural products is a new modern circulation format in recent years. The concept of supply chain management is a typical representative of the idea of horizontal integration management [6]. It emphasizes the concept of core enterprise, through cultivating the core competitiveness of enterprises and forming a strategic partnership with enterprises in the supply chain, it makes full use of resources inside and outside the enterprise to achieve win-win results for all enterprises in the supply chain [7]. In order to maintain competitiveness, agricultural product logistics companies must continuously shorten product development time, improve product quality, reduce production costs, and shorten lead times. From the perspective of supply chain distribution, it can be divided into the supply chain within the agricultural enterprise, the supply

  DOI: 10.25236/ismeem.2019.005

chain of the agricultural large group, the extended supply chain including the third-party logistics enterprise, and the global network supply chain based on the Internet [8]. The state's emphasis on agricultural product logistics has made the development of China's agricultural product logistics industry clear, and also provides a strong guarantee for the development of agricultural product logistics, which is conducive to the rapid development of agricultural product logistics [9]. In order to maintain competitiveness, agricultural product logistics enterprises must continuously shorten product development time and improve product quality [10]. Constructing a modern logistics platform for agricultural products and changing the traditional mode of operation are the main issues facing agricultural product logistics enterprises.

2. Main Characteristics of Agricultural Product Supply Chain

2.1. Logistics Characteristics of Agricultural Products

Agricultural product logistics refers to a series of logistics activities arising from the production, sales and processing of agricultural products. There are differences in the supply chain network chain structure of various agricultural products, each with its own characteristics. Nowadays, supply chain management has become a hot spot for domestic and foreign enterprises. China's agricultural product logistics should also be guided by supply chain management. With the development of the concept of supply chain, the extension of the concept of supply chain has been continuously expanded, and its connotation has been continuously enriched. The logistics supply chain is a whole. It requires mutual cooperation, coordination and trust in all aspects to achieve the best operational results. The competitive advantage of the logistics system depends mainly on its integration. China has a vast territory, a large population, and abundant agricultural resources. Many agricultural products have a leading position in production and variety worldwide. The emergence of the agricultural product logistics supply chain has subverted the previous monotonous agricultural development model, which broke through the boundaries of agricultural supply enterprises and logistics enterprises. The agricultural product supply chain breaks through the boundaries of individual enterprises and integrates the logistics, information and capital implementation of all enterprises in the upstream and downstream of the entire supply chain.

2.2. Logistics of Agricultural Products

Participants in agricultural supply chains should include producers, wholesale markets, retail terminals and final consumers. In view of the blankness of theoretical research on the operational level of agricultural products logistics distribution, it is necessary to study agricultural products logistics distribution from the perspective of supply chain management. In the supply chain management of agricultural products logistics enterprises, it is required that important data such as demand forecasting, inventory status and production planning distributed among different supply chain organizations can effectively, real-time and quickly respond to user needs. Except for a small part of farmers'self-produced and self-sold agricultural products, most of the other agricultural products enter the circulation field through various channels, thus forming a huge logistics of agricultural products in China. The investment of advanced technology and high-end logistics equipment has directly and effectively shortened the production cycle, reduced the inventory and reduced the trading channels.

The processed products of agricultural products do not pass through the intermediate link of traditional wholesalers, but are directly sold to retailers at all levels by processors that dominate the supply chain. For example, the relationship between core enterprises and suppliers, suppliers of suppliers and even all forward relationships, and the relationship between core enterprises and users, users of users and all backward relationships. Agricultural products have high requirements for product preservation and logistics distribution. Under the current logistics conditions in China, they are generally sold in a small range. For products, it is also necessary to locate the product mode. For products with relatively large value, they are basically sold through retail. The product mode positioning is shown in Fig. 1.

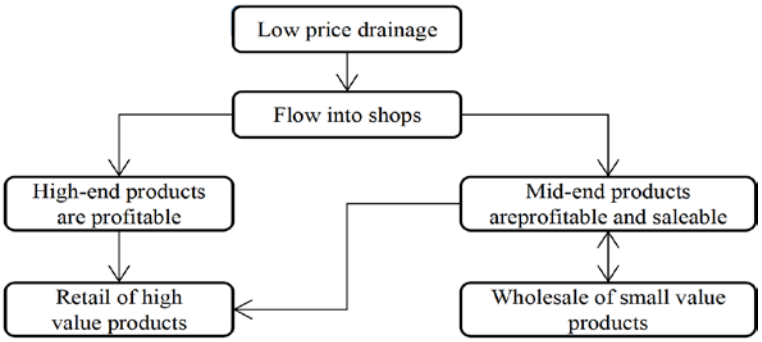

Fig. 1. Product mode location map

3. Main Countermeasure of Implementing Supply Chain Management Model of Agricultural Products

From an economic point of view, specialization is conducive to reducing the long-term average cost of enterprises. Agricultural product supply chain management is based on grasping the inherent laws and links of each link of agricultural product supply chain, using the planning, organization, command, coordination, control and incentive functions of management. From an objective point of view, the quality of the producers of agricultural products is relatively low, and the distribution is relatively scattered, lacking negotiation ability. They are often excluded from the circulation chain, unable to fully grasp all the information in the circulation of agricultural products, let alone arrange production according to these information. In the whole logistics chain, because the unprocessed fresh-selling products of agricultural products account for the vast majority, and such multi-link circulation chain, whether in terms of time and circulation efficiency, or the existing means of fresh-keeping, can not adapt to the fresh-selling form of agricultural products. Bound by traditional ideas, farmers are more easily satisfied with the status quo. Even if their rights and interests are violated, they lack the awareness and ability to protect themselves. It is not enough to develop the agricultural product logistics only with the supply chain thought, but also to establish a good agricultural product supply chain management strategy.

As there are many and miscellaneous factors affecting the agricultural product logistics system, the evaluation system does not require to cover all the factors and indicators of the research object, which is neither possible nor necessary. In the circulation of agricultural products, different levels of information among enterprises lead to poor information circulation. The logistics system has strong dynamics, and each functional element of the logistics system changes and develops with the change of logistics demand. If the time consumed in the cold chain logistics transportation and distribution exceeds the time window set by the customer, then although the products may still be edible at this time, the probability of sale is greatly reduced. Low cost is not only the goal pursued by enterprises, but also the supply chain. Cost still has an unshakable strategic position. The value of agricultural products lies in keeping their freshness. This requires not only effective preservation, but also efficient processing and transmission of information in all links. In the overall sales analysis of fresh agricultural products, it is necessary to specifically analyze the customer unit price, year-on-year month-on-month changes and other links. A preview of the transaction is shown in Fig. 2.

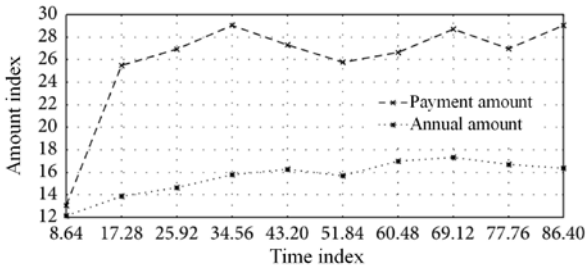

Fig. 2. Preview of the transaction overview

The demand for agricultural products logistics is large, the flow of goods is large, and the scope is wide. Therefore, the production logistics of agricultural products requires a reasonable layout and planning of the spatial scope of agricultural products. The traditional cold chain logistics is mainly based on the agricultural product market, using industrial logistics or enterprise logistics to transport to the market, consumers to the market to buy the products they need. A complete cold chain information system not only needs to collect, receive and display cold chain information, but also completes the quality assessment and diagnosis of the cold chain process. The cold chain process has the characteristics of parameter diversity and control index variability, and the traditional analysis model is difficult to achieve the expected quality evaluation results. In this study, the cold chain information is semantically processed, and an ontology model for reading information from the database is established. Fig. 3 shows the development process of the ontology-based cold chain quality assessment system.

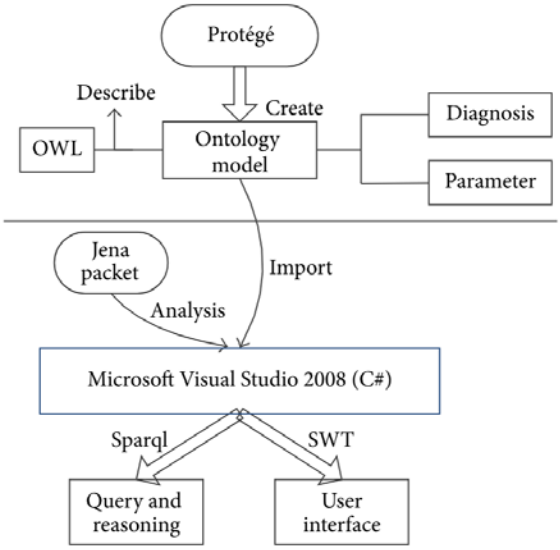

Fig. 3. Development process of the cold chain quality assessment system

Most markets are not equipped with information equipment, resulting in the failure to give full play to market information and intelligence functions. Under the background of continuously superior modern technological conditions, the logistics of agricultural products has also adopted more advanced science and technology and modern operation methods. The core of agricultural product logistics management is the products flowing in the supply chain. Suppliers, producers, wholesalers, processors and distributors of agricultural materials should strengthen their quality awareness, raise their moral standards and enhance their ability to implement quality standards. All enterprises should have a unified understanding of their management ideas and fully realize that the interests of the participants in the supply chain are the same. They should not only focus on their own interests, but also consider the interests of the entire supply chain. For the current agricultural products logistics enterprises in China, there are some small-scale, self-built distribution centers have financial difficulties. Supply chain can entrust the logistics operation such as warehousing, cargo collection, information management, freight payment and negotiation to the third party logistics enterprises to undertake, so as to maximize the efficiency of supply chain operation. In terms of mechanism environment, the change of system promotes the continuous evolution of agricultural products logistics supply chain mode. The changes of circulation channels and modes of agricultural products will have a direct impact on the operation mode of agricultural products logistics supply chain.

4. Conclusion

With the advent of knowledge economy and network era, in order to create our agricultural products brand and improve the international competitiveness of our agricultural products, the agricultural industry should make full use of advanced information resources and information

technology. Supply chain management of agricultural products logistics distribution is an integrated process of planning, organizing, coordinating and controlling information flow, material flow and capital flow in the functional network chain structure formed by the core organization of agricultural products logistics distribution and its upstream and downstream related organization carriers. Based on a comparative analysis of the current situation of agricultural product logistics operation in China and the development in foreign countries, this paper puts forward the operation mode of agricultural product logistics in China's supply chain environment. The non-disclosure of product sales, shipment and in-store information is often the bottleneck of the supply chain, and is also the main factor that makes cooperative operation difficult. It is very important for the agricultural product supply chain to carry out system construction such as information disclosure, sharing and business integration. We should give full play to the government's policy support and guiding role, and increase support to leading agricultural product logistics enterprises in terms of land, capital, taxation, etc. To create a good financing environment, formulate relevant policies and regulations to regulate the market order of agricultural products logistics leading enterprises.

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