Strategy Research on Perfecting the Cold-chain Logistics System of Fresh Food

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Abstract: This paper simply introduces the related concepts of fresh food cold-chain logistics, analyzes the current situations and existing problems of fresh food cold-chain logistics in China, puts forward effective methods and measures of perfecting fresh food cold-chain logistics, and looks into the future developing tendency of fresh food cold-chain logistics in China, hoping to provide reference and help in a certain sense for relevant researchers.

With the constantly developed social economy, increasingly promoted living standard and gradually quickened pace of city life, people pay more and more attention to problems of healthy diet. Therefore, fresh food which is pure and natural with low processing degree is greatly favored by people. However, the loss of fresh food in transportation process is rather serious because it is fresh, alive and perishable. In China, the loss rate of fresh food has reached 40%-50%, so merely relying on production to ensure China's fresh food quality is far from enough. We must perfect the logistics transportation of fresh food and lower the loss rate of fresh food in transportation process.

1. Introduction of Related Concepts of Fresh Food and Cold-chain Logistics

(1) Fresh Food

The concept of fresh food originates from foreign retail enterprises. With the development in recent years, fresh food has won general consent of sale groups at home and abroad, but relevant academic circles don't give specific definition to fresh food. Three Fresh Food and Five Fresh Food are prevailing in China. Three Fresh Food refers to fruit and vegetable, seafood and meat, while Five Fresh Food refers to fruit and vegetable, seafood, meat, bread and cooked food. Three Fresh Food as the most basic ones can be shelf-ready to sell only by taking foundational fresh-care measures and simple arrangement.

(2) Cold-chain Logistics

Cold-chain logistics is defined as a product logistics network adopted on condition of taking products' attributes as basis and ensuring products' quality. The whole process, constantly kept in low temperature, contains product materials, product production, product processing, product storage, product transportation, product sale, and product consumption. Cold-chain logistics is a systematic project which guarantees product quality and lowers product loss; while cold-chain logistics of fresh food means the whole transportation process of fresh food from production place to consumption place, taking logistics network which is constantly kept in low temperature with specialized equipment as basis. Fresh food's characteristics of being fresh, alive and perishable raise relatively higher requirements for logistics which must ensure that fresh food can be presented in front of consumers with the least transport links in the shortest time. In addition, loss of fresh food in transportation process must be lowered to the minimum to save cost, and consumers must be guaranteed to buy fresh, healthy and safe fresh food.

2. Current Situations and Existing Problems of Cold-chain Logistics Transportation of Fresh Food in China

(1) Independent and complete cold-chain logistics transportation system is not formed yet

In China, most fresh food still does not have cold-chain logistics transportation system, so the

loss in transportation process is rather serious. In many developed countries, the cold-chain logistics transportation of fresh food has taken more than 50%. The ratio even reaches 80% in America and Japan but merely about 15% in China. Compared with developed countries, the cold-chain logistics transportation of fresh food in China does not yet form a system and its development is very outdated. At present, the transportation of most meat product, dairy product and sea food still does not adopt cold-chain technology. Furthermore, in supply chain of fresh food, China is short of comprehensive planning and overall coordination of supply chain as well as professional cold-chain logistics talents who have strong comprehensive capacity, which causes serious influences on the resources integration of fresh food cold-chain transportation and hinders the establishment of cold-chain transportation system.

(2) The logistics technology is comparatively outdated

At present, cold-chain transportation, storage and preservation, and grading packing technique are the influencing factors of fresh food logistics. According to relevant information, the loss rate of fruit and vegetable in picking, transportation and storage process in America is just 1% to 2%. However, the loss rate in China is up to 20% to 30%. Fruit and vegetable in China mostly receive simple cold storage and preservation, so its storage capacity only takes 20% of total output and the proportion of controlled atmosphere storage in storage capacity is as little as 2%. In addition, some fresh food which is loose-packed, exposed and not frozen may suffer secondary pollution, greatly reducing its own freshness and quality.

(3) Hardware equipment of cold-chain logistics is not enough and perfect

The existing cold-chain logistics equipment in China is relatively old-fashioned. Its distribution and development are so uneven that it can not realize constant low temperature situation of fresh food in the whole transportation process. Relevant data has showed that refrigerator trucks in China only take 0.3% of the total amount, while the refrigerator trucks in Germany have taken 3%. Moreover, China is still lack of professional refrigerators and can not provide sufficient fresh-care places for fresh food. This is also another critical factor which causes China's outdated transportation technology.

(4) Distribution processing technology needs urgent development

In accordance with current situation, the production value of fresh food in China is mainly conducted in surrounding areas of original places. Most fresh food is sold in its original form. The processing technology in distribution process needs urgent development.

3. Effective Methods and Measures of Perfecting Fresh Food Cold-chain Logistics

(1) Setting and perfecting cold-chain transportation standards

In recent years, China's logistics industry has achieved certain development and formed multiple patterns such as supermarket store, wholesale market, third-part logistics, etc. Concept of cold-chain transportation is gradually formed. However, the development of cold-chain transportation technology is still very outdated, needing constant development and perfection.

With the gradual increase of fresh food market requirement and the rapid participation of various enterprises, cold-chain transportation enterprises now have better development platform. At present, even though all sectors of society have paid attention to the development of cold-chain transportation industry, most of them are still at the macroscopic level without specifically carrying out the formation of fresh food standards. Only such a tiny part of large-scale food manufacturing plants have set corresponding standards. For the deficiency of standards, all fresh food industries urgently hope that our country can introduce corresponding cold-chain transportation standards which are embodied in relevant laws and regulations of National Commerce Department and Agriculture Department. For example, Agricultural Products Cold-chain Logistics Development Planning introduced in recent years has caused huge influences on relevant industries and has played correct leading role. However, there are still many loopholes and blank spots in these laws and regulations. A complete system is not formed yet, giving rise to many coincident or contradictory technical parameters. Lacking unified standard and regulation causes consequences that management loses its order, blank arises in supervision and quality of fresh food products is

uneven.

For the reason that cost of cold-chain logistics is much more than that of general logistics, distribution of more than 70% fresh food adopts general transport vehicle. Consequently, fresh food is repeatedly unfrozen and has huge potential safety hazard. Secondly, the logistics process can not be reflected on the surface of supply chain. Consumers can only see the basic index like expiration date and material of products, neglecting the logistics link. Moreover, it is another significant reason that cold-chain logistics does not have government supervision and administration. For example, China's relevant policies have specifically pointed out the standards and requirements of some certain fresh food cold-chain logistics, but some departments neglect their duty of supervision and indulge some disqualified or even illegal operation. As a result, some enterprises will pay no attention to it. Therefore, if we want to establish quality safety system of cold-chain logistics and promote the healthy development of cold-chain logistics industry, relevant systems with market access and professional accreditation must be strictly carried out.

(2) Establishing Supply and Marketing Integration System of Cold-chain Transportation

Establishing integration system of cold-chain transportation must begin from the following aspects:

1. Cultivating third-party cold-chain transportation industry

First of all, it is to cultivate large-scale cold-chain transportation enterprises with powerful core competence, strong economic strength, vast development prospect, favorable management efficiency, advanced management style, scientific management idea and relatively strong emissive driving force. Secondly, it is to encourage enterprises' behavior of setting low temperature fresh-care equipment at production place and sale place, to conduct low temperature control at the original place, to build logistics system with enterprises as operation core, and to prompt quick and effective docking of product cold-chain transportation at production place and sale place. Thirdly, it is to innovate logistics service, to strengthen resources integration, to expand logistics network, and to conduct corresponding intensification to asset restructuring and strategic cooperation. Finally, it is to encourage some large-scale enterprises to set up fresh food distribution centers, providing excellent service for third-party cold-chain transportation.

2. Building perfect and scientific industrial chain

It is to build an industrial chain which contains product materials, product production, product processing, product sale, product storage and product transportation, and to improve the efficiency of whole logistics process and each logistics link. By setting cooperative partner relationship with production units and distributors, reinforcing and steadying the relationship with various enterprises, and forming interest community of cold-chain transportation enterprises, can production and marketing integration system of cold-chain transportation be built.

3. Building cold-chain transportation system of major product areas and major product variety

It is to encourage the development of meat product cold-chain logistics, to rapidly popularize sea food cold-chain logistics system, and to promote the rapid development of fresh food cold-chain logistics. In addition, meat product cold-chain logistics system from southern part of China, central part of China to coastal areas as well as from northeast areas to Beijing and Tianjing should be actively developed; sea food cold-chain logistics system from China's South-East coastal areas, Huang-Huai-Hai area and Yangtze River area to central and western regions should also be developed. Finally, it is to develop the fruit cold-chain transportation system from characteristic fruit producing areas to large and medium size cities in China, and the cold-chain transportation system of east-to-west vegetable transfer and south-to-north vegetable transfer.

4. Promoting positive teamwork of behavior subjects in cold-chain transportation

In accordance with the planning requirements of national cold-chain transportation and the layout of superior product resources, cold-chain transportation system of characteristic agriculture products must be greatly popularized. At the same time, cold-chain transportation experimental units which aim to significant agricultural variety should be built. Firstly, we should build cold-chain transportation experimental units like "production place-distribution station-supermarket" and "production place- wholesale market- distribution station- supermarket" in large and middle size

cities. Secondly, we should build cold-chain transportation experimental units like “processing-production” and “processing-production- third-party transportation” in agricultural product areas with export superiority. When the experimental units of small size play their role, this pattern can then be radiated and popularized throughout the country.

(3) Building quality tracking system of cold-chain transportation

The building of this system can realize real time monitoring of points of logistics process, conduct tracking for the whole logistics chain of products, and grasp the overall process of product transportation. Therefore, we should build quality tracking system, strengthen the propaganda of the significance of cold-chain transportation on product safety assurance, encourage enterprises to adopt advanced modern logistics technology such as GPS technology, automatic vehicle temperature control technology, etc, conduct transformation and upgrade for product technology from production to sale, control the temperature of fresh food products in transportation process, promote omni-directional leap of China cold-chain transportation, and ensure low temperature operation in whole transportation process. Additionally, we should boldly bring in and popularize technologies such as refrigerated storage automation, vacuum pre-cooling, automatic vehicle temperature control, zero damage inspection, depot management, commercialization management, etc, improve ability of technological reformation and update, and make sure the safety and controllability of fresh food in transportation process.

(4) Building fundamental facilities of cold-chain transportation

We should mainly perfecting the freezing equipment of transportation nodes like fresh food production place, low temperature distribution station, wholesale market, etc. Firstly, it is to quicken the pace of building refrigerated storage project, and encourage relevant enterprises to buy advanced, environmental, energy-efficient, appropriate and high-efficiency refrigerated storage. Secondly, it is to reform the fundamental facilities of major transportation routes and their affiliated sites, and to construct comprehensive storage and delivery equipment and logistics network. Thirdly, it is to encourage enterprises to construct and perfect the engineering projects of low temperature distribution center, and to build integrated cold-chain transportation system. Fourthly, it is to strengthen the construction of refrigeration equipment and cold-chain transportation vehicles, to encourage large-scale transportation enterprises to buy cold-chain transportation vehicles, and to encourage sea food and meat product enterprises to buy cold-chain equipment in order to improve their cold-chain processing ability. Fifthly, it is to greatly strengthen commercial management and cold chain, and to perfect the facility conditions of fruit and vegetable in cold-chain transportation process. Sixthly, it is to facilitate the development of refrigerated transport, to perfect facilities construction in distribution process and to realize centralized purchasing and cross-regional distribution of distribution stations.

(5) Government should play the role of macroscopic readjustment and control

The development of cold-chain logistics enterprises is closely linked with government. Therefore, government in process of carrying out relevant projects should make correct decision and regulation, and conduct strict market supervision. Chinese government must behave in accordance with policies and laws. However, because of market’s dynamic development, relevant departments must implement policies and planning, conduct favorable interaction and communication with market and enterprises, introduce high-efficiency supporting policies and measures, and build healthy and stable marketing environment. Firstly, government should reinforce its support and capital investment. Secondly, diversified investment mechanism with enterprises as center should be constructed, government should energetically act as its guide, and various parties should join in. Finally, linkage mechanism as “government-leading enterprise-industry association” should be built to make future planning for cold-chain transportation .

4. Conclusion

Through relatively systematic research in this paper, it has been learned that the vast development prospect of fresh food cold-chain transportation market in China has huge potential

and business opportunity, waiting for related researchers to dig and explore. However, there are also many problems in operation process of China fresh food cold-chain transportation like unsound management system, deficiency of technical standard, etc. These problems still remain for China government and related industries to research and solve.

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