

Scientific Aspects of the Formation of the Logistics System of Agricultural Companies

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The use of research in the field of logistics management of agricultural companies allows increasing the level of information access and transparency of information on the economic feasibility of logistics systems of agricultural companies in China. We need leverage to influence the dissemination of science and the ability to obtain initial data on the logistics management of agricultural enterprises. This article analyses the work of representatives of international scientific schools and Chinese scientists on research of the logistics management system in the work of agricultural companies. The main elements of scientific research, containing theoretical provisions, methodological support in the study of logistics systems of agricultural companies. The concept of scientific research in the formation of the logistics system of agricultural companies, which contains the theoretical provisions of logistics management, methodological support for monitoring the product potential of logistics systems of agricultural companies, the formation of a system of indicators of logistics systems. Scientific principles of formation of logistic system of agricultural companies are offered, which include principles of system integrity, principles of voluntariness, principles of balance, principles of adaptation to peculiarities of agricultural production, principles of increasing basic competitiveness of agricultural enterprises, principles of integration and new construction. The volumes of the main agricultural products in physical terms of China, Japan, USA, Canada, France, Germany and the main indicators of efficiency of agricultural products of China and developed countries in terms of costs, productivity, capital turnover, stock, value added in GDP. The general conclusion of scientific research and prospects of further scientific researches are formed.

Key words: enterprises, logistic, agro-industrial sector, principle.

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Introduction.

It should be noted that open science is an umbrella term for the movement, the purpose of which is to make research, scientific data and their dissemination available to all levels of society, both for amateurs and professionals. It includes activities such as publishing open research, campaigns in support of open access, encouraging scientists to use «open notebook science», and generally facilitating the publication and circulation of scientific knowledge [1]. The main hypothesis of the research is the formation of the concept of transparency of access to information on the results of research in the field of logistics management of agricultural companies in China, as this information may be closed and controlled only by public authorities in the country. And it should be available to all interested parties in the research data.

Problem statement.

Logistics is of great significance in economic development. Drucker Peter, a leading American business scientist, likens logistics to «a virgin land». Lambert Douglas pointed out that the warehouse cost is the largest part of the total cost of logistics activities [2].

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From the perspective of transaction cost economics, Li Xuewei, Zeng Jianping, Lu Bo and others studied the selection theory of logistics transaction nature and transaction mode. Duanwu Yan, Chunjuan Huang, Yunfeng He et al studied the foreign logistics mode, especially the American logistics mode [3].

Ling Wang and Hongrui Cao analyzed the impact of economic globalization on China's logistics industry organization from the perspectives of China's entry into China's logistics market and transnational logistics companies' entry into China's logistics market from three aspects: the market structure, enterprise behavior and market performance of China's logistics industry. Xinli Wang studied the relationship between agricultural logistics and agricultural industrialization and believed that one of the important reasons for the slow development of agricultural industrialization in China was that he neglected the role of agricultural logistics in the process of agricultural industrialization and the backwardness of China's agricultural logistics system [4].

Ya Wang believes that China's WTO accession requires further liberalization of the domestic grain market and its integration into the international grain market with trade liberalization as soon as possible [5].

Wenhui Xia studied the operation mode of agricultural products logistics under the e-commerce platform. McKinnon Alan analyzed the transportation efficiency of the British food supply chain [6].

Velychko Oleksandr from the Angle of the agricultural industry logistics management at the same time, put forward agricultural industry logistics management should through the agricultural materials chain management and distribution management, agricultural industrialization management and to develop agricultural products logistics management, and puts forward the class in our country agricultural logistics operation mode of agricultural materials enterprise chain operation mode, order pattern, the industrialization of agricultural production, agricultural products wholesale. Jian Sun and Yanjun Li studied the vertical integration of agricultural products logistics system between producers and intermediaries, Chao Chen investigated the supply chain of pork supply chain from the perspective of pork supply chain, and Yingchun Dai studied the cooperative relationship of Jiangsu pork supply chain [7].

From the enterprise point of view, Peixiu Xie proposed speeds up the agricultural logistics need to transform state-owned grain enterprises with modern enterprise system, cultivate a variety of ownership agricultural logistics enterprise, cultivate construction of modern logistics enterprises, improve and cooperate with the regional distributor of organization and distribution pattern of agricultural products, and on the basis of modern logistics and marketing operation system of food security [8].

Taking the first batch of leading agricultural product processing enterprises in China as the object, Feng He made a preliminary study on the basic situation and development trend of agribusiness supply chain practice in China, and emphatically analyzed five important driving forces and general mechanism of promoting agribusiness supply chain practice [9].

Zongcheng Zhang proposed that the grain circulation industry should restructure its assets, expand its functions and develop itself into a modern logistics center and distribution center [10].

The research of McKinnon Alan shows that logistics capability has a positive effect on the performance of agricultural product supply chain, and the external integration and internal integration of enterprises are highly correlated [11].

Dinghuan Hu et al. proposed that leading supermarket enterprises could adopt the mode of agricultural product supplier farmers in China to guide thousands of small-scale farmers into

the supermarket supply chain and accelerate the pace of popularization of safe and high-quality agricultural products [12].

Argues that by centralizing the purchase of agricultural products by supermarket chains with hundreds of stores, it not only reduces operating costs but also increases control and bargaining power upstream of the supply chain [13].

The main problem remains the lack of a transparent mechanism for access to information on the results of research in the field of logistics management of Chinese agricultural companies, due to the secrecy of information and its use for official purposes for government regulators.

The purpose of the research is scientific research and its role in formation of the logistics system of agricultural companies.

Results of the research. In terms of research methods, this article adopts the method of combining qualitative and quantitative, normative and empirical analysis. Through literature review, the logistics and supply chain theory, circulation theory, agricultural products logistics and supply chain management of agricultural products and other related theories are deeply studied, and the development of agricultural products logistics in developed countries and its reference significance to the development of agricultural products logistics in China are analyzed [13].

On the basis of analysis of agricultural products logistics development in country, adopt the method of questionnaire investigation and case analysis on our country agricultural industrialization leading enterprises of agricultural products, agricultural products logistics related enterprises of third-party logistics of agricultural products, supermarket chain, agricultural products logistics activities as the main research object of empirical analysis, based on this, advances some countermeasures for developing the agricultural product logistics in our country and policy Suggestions. The specific method is as follows:

1. Theoretical analysis. Through reading relevant literature, make full use of relevant economic management theory, analyze the development of agricultural products logistics.
2. Questionnaire survey. Through the scientific design of the questionnaire, on the basis of the pre-survey, questionnaire survey of agricultural leading enterprises, third-party logistics and other enterprises, so as to obtain relevant first-hand data for the study.
3. Case analysis. Select typical cases to make up for data deficiency and confirm relevant theories.
4. Study the relationship between related variables using quantitative economic analysis methods such as uncorrelated regression.
5. Comparative study. Through the summary of the development of foreign agricultural products logistics and the development of China's agricultural products logistics research, looking for China's agricultural products logistics development countermeasures.

Data mainly comes from the China agricultural yearbook since 2000, China statistical yearbook, China logistics yearbook national agricultural products cost benefit compilation of data and the national agricultural prices survey yearbook, part from the national bureau of statistics (NBS), bureau of Henan province, Xinxiang bureau website statistics.

A questionnaire survey was conducted on the logistics of agricultural products enterprises of leading agricultural industrialization enterprises in Henan province, and 217 enterprises of leading national and provincial enterprises in Henan province were selected as the survey samples for household questionnaire survey.

Take Xinxiang market as an example to conduct questionnaire survey and in-depth interview on the third-party logistics of agricultural products.

Conduct case investigation on chain supermarkets to obtain relevant data.

Journals and dissertations over the years. Second hand data were obtained from related magazines, China journal network and excellent master and doctoral dissertation database of the school library and reference room.

This article will be to produce relevant theory and literature review, studied the logistics of agricultural products at home and abroad, analysis of China's agricultural products logistics development space, on the basis of the agricultural product logistics in our country for empirical research from the Angle of enterprise: agriculture leading enterprise logistics research, supermarket chain, agricultural products logistics, agricultural products logistics development of the research, finally puts forward some countermeasures for developing agricultural products logistics in our country (Fig. 1).

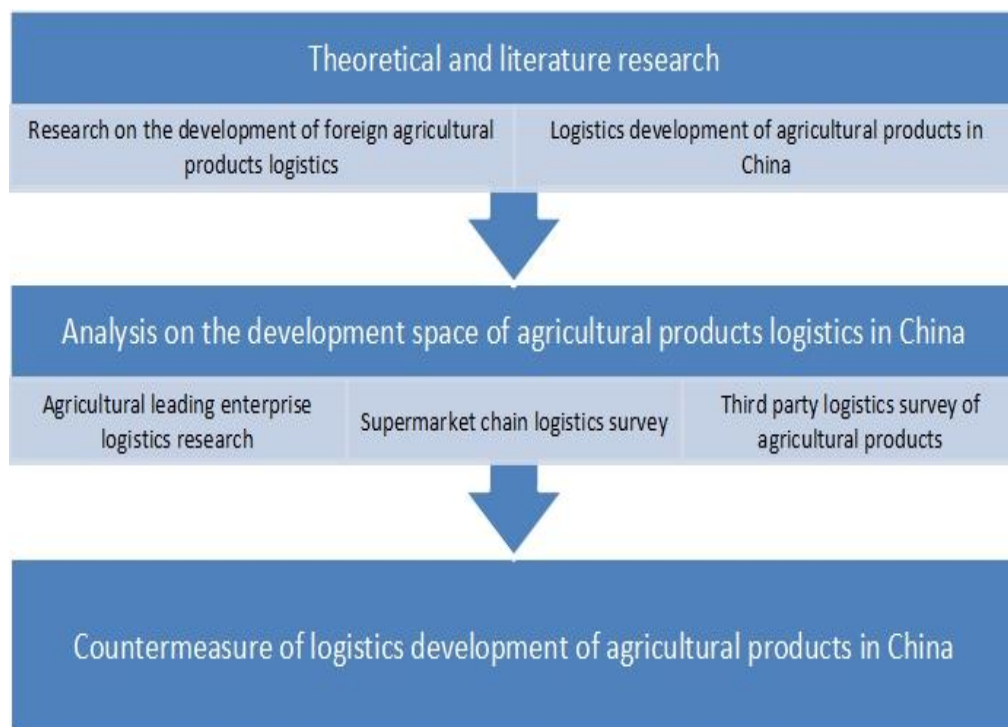


Figure 1. Concept of scientific research of formation of the logistics system of agricultural companies (Qiu's own method)

Compared with similar researches, this paper may be innovative in the following aspects:

1. Relevant theories of agricultural products logistics are summarized, and the theoretical basis of agricultural products logistics is comprehensively summarized.

2. This article studies the development of agricultural products logistics from the perspective of enterprises, and conducts empirical research on the logistics management of agricultural leading enterprises (including wholesale market and processing enterprises), chain supermarkets and agricultural products third-party logistics by means of field questionnaire survey and in-depth interview.

Due to the limitation of data and time, this study still needs to be further improved. The research of agricultural product logistics is a new topic, because it involves a wide range of

fields, due to my lack of experience and ability, may affect the research, in addition, because a lot of data involves business secrets, so the data can't be obtained, can only be used for research, the research may lack of detailed and comprehensive.

It is also necessary to propose scientific principles of formation of the logistics system of agricultural companies, which should include:

1. *Principles of system integrity.* Enterprise logistics is an integral part of the overall system of social logistics, therefore, the construction must start from the overall situation and the whole. It is necessary to fully consider and make full use of the existing logistics resources in the society, such as logistics and warehousing centers, logistics and distribution centers, transportation routes and tools, etc., to avoid the repeated construction and waste of resources as far as possible, and to determine the best plan from the needs of overall coordination.

2. *Principles of voluntariness.* Agricultural products logistics enterprises as a bridge connecting agricultural products production and consumption, for agricultural economic development and agricultural industrial structure upgrading, the central government and local government to the agricultural products circulation system optimization and innovation, attracted a large number of labor and funds into the field of agricultural products circulation, agricultural products circulation system as a system, has many participants, including farmers, agricultural economy, agricultural professional cooperatives, agricultural wholesale market, agricultural processing enterprises, agricultural logistics agencies, agricultural sales terminals, agricultural consumption, etc., if plus for these agricultural products circulation services And regulatory circulation carrier, circulation industry association and relevant government departments, the relevant elements of agricultural flow system, different positions in agricultural circulation system, different circulation resources, in the agricultural circulation system is different, these subjects through interests, information, funds, logistics and other media, intertwined, form a complex operation system, the connection between them is established on the basis of voluntary, if we are voluntary principle outside the government consciousness and other external conditions dominate the relevant subject behavior, Then the connection must be short-term and transitional Unstable, therefore, in the process of optimizing the circulation system of domestic agricultural products, it must be carried out on the voluntary principle of all parties.

3. *Principles of balanced balance.* Agricultural products logistics system contains many participants, such as farmers, agricultural professional cooperatives, agricultural wholesale market, sales terminal, etc., the different circulation and participants together, the main link of the body is interests, in the market economy, benefit maximization is the goal of each agricultural products circulation participants, can properly handle the relationship between the interests, reasonable interests between different subjects, is the key factor of stable, healthy and effective development of agricultural products circulation system. The circulation participants in the agricultural products circulation system can only develop and strengthen when the input and output reach balanced" Large, only when the interest distribution of each participant reaches a balanced state, the distribution system of agricultural products will be efficient and stable. But logistics related subjects in agricultural products circulation achieve complete balance is unrealistic, complete balance is an ideal state, balance and imbalance alternate, fluctuation around the balance is a normal state, therefore, in the process of optimizing the existing agricultural products logistics system, should adjust with the change of interest pattern and the change of logistics mode, make the relevant logistics subject interests tend to balance, establish a reasonable interest distribution mechanism is to optimize the

internal requirements of the agricultural products logistics system, is the whole agricultural production. The core problem of the operation of the product logistics system.

4. *Principles of adapting to agricultural production characteristics.* Logistics system took the lead in the large industrial enterprise use and gradually mature for experience and theory, but due to the seasonal characteristics of agricultural production and agricultural products itself, in the construction of our agricultural enterprise modern logistics management framework, not blindly copy big industrial model, must be combined with our agriculture, rural areas, agricultural products and other specific circumstances, business, local design organization, try for low cost, high efficiency, high quality of logistics services, in order to effectively can meet the needs of agricultural production.

5. *Principles of improving the core competitiveness of agricultural enterprises.* When agricultural enterprises engage in market competition, they should focus on the use of high-quality and cheap primary agricultural products for value-added processing of agricultural products, or timely provide high-quality means of agricultural production for agricultural production. Generally speaking, the core competitiveness is not put on logistics management, so for agricultural enterprises, should be in line with the principle of saving logistics management costs of business, do not affect the core competitiveness, logistics business to professional third-party logistics enterprises, which is also a problem that agricultural enterprises should consider when building their logistics management framework.

6. *Principles of combining integration and new construction.* In optimizing the existing agricultural products circulation system, to make full use of existing resources and advantages, using modern information technology and advanced management means, improve the existing resources, integrate and optimize agricultural circulation nodes, shorten circulation inches, make full use of idle circulation cost, idle circulation resources, idle resources including transportation infrastructure, transportation vehicles, storage center, etc., coordinate with logistics participants, produce a win-win situation. In addition, it is necessary to dig into the actual situation, invest appropriate funds, expand modern agricultural products circulation facilities, and build reasonable and perfect modern agricultural products logistics system.

To form open access to information on research of the logistics system of agricultural companies and the role of open science in it, we will conduct a comparative analysis, which contains comparative analysis of agricultural products logistics performance in developed countries and China.

The following index analysis [14] on the basis of China, the United States, Canada, France, Germany, and Japan from the number of major agricultural products, agricultural production index and main operating benefits of agricultural products (Fig.2).

	unit: ten thousand tons						
	The world	China	USA	Canada	France	Germany	Japan
Grain	279743.8	61368.2	4821.2	19170	8452.3	3170.3	1242.6
Rice	98414.7	21149.5	839.6	.....	.....	.....	1052.7
Wheat	107412.3	13361.1	5258.1	3266.9	4060.5	2306.2	.....
Corn	113383.7	26078.4	34701.3	1519.3	907.1	566.9	.....
Soybean	44111.8	18101.7	9666.7	614.5	42.85	.....	21.78
Fruit	81123.6	24838	2544.2	.....	868.1	245.4	308.3

Figure 2. Number of major agricultural products in 2019 (The quantity not included in the table are non-major agricultural products in the country) [14]

Agricultural production index is the relative number that comprehensively reflects the dynamic changes of all agricultural products output, and is an important index to reflect and study the speed of agricultural development. This table is calculated by calculating the agricultural production index by the weighted average of the physical output index of various agricultural products (Fig. 3).

The problem with updating data on China's agricultural production is that it is closed for widespread use in the global information space and for research.

	Wholesale and retail inventory rates	Number of turnover of working capital	Proportion of added value of agricultural products in GDP	The cost	Attrition rate	Processing proportion	Processing productivity	Precooling freshness retention rate
Developed country	0.8%-2%	18-25	23%	8.70%	1%-3%	85%	350%-400%	85%-100%
China	25%	3.2	9%	44.30%	17%-26%	20%	90%-170%	41%

Figure. 3 Main operating efficiency indexes of agricultural products in 2019 [14]

China produces advantages in absolute quantity, but first to meet the basic demand of the huge population base, Chinese agricultural products will be in a tight balance for a long time; limited by late start, weak foundation and agricultural logistics industry low modernization level, there is a large gap in inventory, cost, agricultural processing and other index performance and developed countries. In contrast, the population of the United States accounts for about 4% of the world's total population, and its agricultural working population accounts for about 2% of the national working population. However, the total volume of the major American agricultural products ranks first in the world, and the agricultural labor productivity also ranks the highest level in the world, with «large production and large circulation» Under the environment, agricultural products logistics presents the characteristics of large output, many types and frequent transfer. The integrated operation of mature agricultural products logistics service subjects makes the modernization level of agricultural products circulation very high. As the largest channel and hub of agricultural products logistics, the Japanese agricultural products wholesale market has solved the contradiction between small-scale agricultural production and large market and large circulation, and can meet the requirements of both buyers and sellers to expand the transportation and sales scale and transaction space and save transaction costs at the same time.

Conclusions and prospects of further research. The use of open science in the field of logistics management of agricultural companies allows increasing the level of information access and transparency of information on logistics systems of agricultural companies in China. We need leverage to influence the spread of open science and the ability to obtain initial data on the logistics management of agricultural enterprises. This will make it possible to disseminate the results of scientific research on this topic not only in the country but also abroad. Each discipline has its specific disciplinary personality and the way of thinking and method of constructing the logical framework of the discipline. Because of the cross and comprehensive characteristics of disciplines, the research ideas and methods of modern agricultural logistics must embody the characteristics of universality and uniqueness. Through the definition of the

connotation of modern agricultural logistics, as well as the differentiation and analysis of the function, characteristics, classification, management, development trend and modern agricultural logistics industry of modern agricultural logistics, based on the review and prospect of the development of agricultural logistics at home and abroad, the theoretical thinking of the development of modern agricultural logistics is constructed. Based on the theoretical development and practical application as the goal, with the experience of international agricultural logistics development for reference, analysis of the evolution and development of Chinese agricultural logistics present situation, influence factors, puts forward the development of modern agricultural logistics mode, with the concept of supply and demand of construction of modern agricultural logistics system, with reasonable agricultural logistics aiming to explore the innovation of the agricultural logistics organization, based on this, puts forward some countermeasures on the country's modern agricultural logistics development, strive to provide theoretical and decision-making basis for relevant departments.

The proposal for future research should be the development of economic tools to assess the quality of research in China's logistics system and their openness to the world scientific space.

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Наукові аспекти формування логістичної системи аграрних компаній

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Використання наукових досліджень в сфері логістичного управління аграрних компаній дає змогу підвищити рівень інформаційного доступу та прозорості інформації стосовно економічного обґрунтування логістичних систем аграрних компаній в Китаї. Потрібні важелі впливу на поширення науки та можливості отримувати вихідні дані щодо логістичного управління аграрними підприємствами. В даній статті проаналізовано праці представників міжнародних наукових шкіл та китайських науковців щодо досліджень логістичної системи управління в роботі аграрних компаній. Встановлено основні елементи наукових досліджень, що містять теоретичні положення, методичне забезпечення в дослідженні логістичних систем аграрних компаній. Сформовано концепцію наукових досліджень в формуванні логістичної системи аграрних компаній, яка містить теоретичні положення логістичного управління, методичне забезпечення моніторингу продуктового потенціалу логістичних систем аграрних компаній, формування системи показників розвитку логістичних систем. Запропоновано наукові принципи формування логістичної системи аграрних компаній до яких віднесено принципи системної цілісності, принципи добровільності, принципи збалансованості, принципи адаптації до особливостей сільськогосподарського виробництва, принципи підвищення основної конкурентоспроможності сільськогосподарських підприємств, принципи поєднання інтеграції та нового будівництва. Досліджено обсяги основної сільськогосподарської продукції в натуральному вимірі Китаю, Японії, США, Канади, Франції, Німеччини та основні показники ефективності діяльності сільськогосподарської продукції Китаю та розвинутих країн за показниками витрат, продуктивності, обіговості капіталу, норм запасу, доданої вартості в структурі ВВП. Сформовано загальний висновок наукового дослідження та перспективи подальших наукових пошуків.

Ключові слова: підприємства, логістика, агропромисловий сектор, принцип.

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