



# Research on the innovation mode of agricultural product circulation system under the background of the construction of a unified national market

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**Abstract.** The circulation system of agricultural products is related to the national economy and people's livelihood. Problems in circulation affect people's livelihoods, increase farmers' income and hinder rural revitalization. China's agricultural circulation system currently has issues such as a low information level, an unsound market system, a small main scale, and an imperfect supply chain. How to construct a modernized agricultural circulation system under the background of the national unified extensive market construction is the urgent need to solve the problem. In this paper, by making the agricultural products trade and industrial park, the circulation of agricultural products supply chain traceability system, urban wisdom digital platform as the core of circulation system innovation model of farm products, ensure food safety, improve circulation efficiency of agricultural products, promote the supply chain and agriculture structural reform, achieve precise scientific management, finally complete the construction of modern agricultural products circulation system, We will help revitalize rural areas.

**Keywords:** National unified market; Circulation of agricultural products; Innovation mode

## 1 Introduction

The distribution of agricultural products is a matter of national importance, and problems in the distribution of agricultural products will affect the income of farmers, which could be more conducive to the revitalisation of the countryside[1][2]. The impact of the new global pneumoconiosis has highlighted the problems in the distribution of agricultural products. 2022's Central Document No. 1 proposed that we must focus on the country's agricultural development, stabilise the fundamental plate of agriculture, do an excellent job in the "three rural areas", continue to promote the revitalisation of the countryside, and promote steady and sustained social and economic growth[3]. Amid the unprecedented changes of the century, the Party Central Committee has proposed to speed up the construction of a unified national market, requiring a smooth cycle

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L. Moutinho et al. (eds.), *Proceedings of the 2023 International Conference on Management Innovation and Economy Development (MIED 2023)*, Advances in Economics, Business and Management Research 260, [https://doi.org/10.2991/978-94-6463-260-6\\_43](https://doi.org/10.2991/978-94-6463-260-6_43)

based on domestic demand. As an essential link in building a unified market, the circulation of agricultural products is the "artery" of the economic cycle. As one of the leading forces, it should grasp the situation in this significant change, play to its strengths while making up for its weaknesses, and open up a new pattern from it. The construction of a modern agricultural products distribution system is the key to promoting the steady development of the rural economy, doing an excellent job in the "three rural areas", and promoting comprehensive rural revitalisation[4].

Through the construction of an agricultural products trading and traceability system, the construction of an urban intelligent supply chain industrial park and the construction of a digital platform for agricultural products circulation, this paper aims to improve the industrialization, marketization, standardization, informatization, security and intelligence of agricultural products circulation system, providing theoretical guidance to improve agricultural products circulation system, innovate agricultural products circulation mode and improve agricultural products circulation efficiency[5][6],it is of practical significance to promote industrial upgrading in the agricultural field, promote the steady development of rural economy and promote rural revitalization.

## **2 Agricultural product distribution system innovation model construction**

With the vigorous development of network information technology in the 21st century, the distribution model led by e-commerce has significantly impacted the traditional offline trade docking of agricultural products, opening up new channels for the efficient circulation of agricultural products. China's agricultural products market has the advantages of good scale effect, ample space for domestic demand enhancement, high efficiency of factor marketization and abundant innovation resources. However, at the same time, many problems, such as poor infrastructure, unsound circulation system, low level of informationization, circulation efficiency to be improved, information asymmetry, lack of trust between upstream and downstream, low efficiency of supply chain coordination and difficulty in quality and safety traceability have not yet been effectively solved[7]. According to the characteristics and problems of the existing circulation system, how to build a scientific and efficient circulation system for agricultural products in the new era is a crucial concern for the whole society.

E-commerce has reduced the circulation of agricultural products and increased efficiency while expanding the consumer market for agricultural products. E-commerce platforms can transcend regional limitations to quickly and easily present information about agricultural products to consumers<sup>[8]</sup>. At the same time, producers can use sales data to make timely adjustments to production service decisions, thus solving the central problem of information asymmetry that plagues the circulation of agricultural products. At the same time, reducing circulation links in the e-commerce environment can reduce circulation costs, improve circulation efficiency and protect the interests of farmers and consumers.

With emerging technologies such as 5G, big data, cloud computing, artificial intelligence, and the Internet of Things, intelligence, digitisation, and informatisation will

be a significant trend in the agricultural products distribution industry<sup>[9]</sup>. Analyse consumer demand through big data and cloud computing to achieve scientific production and accurate marketing. The use of the Internet, the Internet of Things, cloud computing and other technologies to achieve traceability of agricultural products, the construction of intelligent cold chain logistics to protect food quality<sup>[10]</sup>.

A safe and efficient agricultural products circulation system should be characterised by industrialisation, marketisation, standardisation, informatisation, security and intelligence to guarantee food safety, reduce transaction costs and circulation losses, improve circulation efficiency and enhance agricultural informatisation. On this basis, it should address the information asymmetry in all aspects of agricultural production and trade activities, actively promote the optimisation and upgrading of supply chains and agricultural supply-side reform, use big data to implement scientific management, improve the level of governance in agricultural distribution markets, and promote farmers' income and rural revitalisation. Summarising existing research and practical experience, this paper proposes to build an innovation model for the circulation system of agricultural products, as shown in Figure 1.

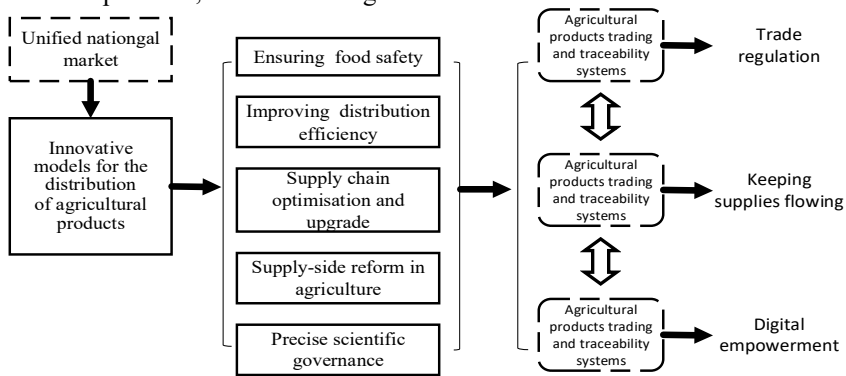


Fig. 1. Model diagram of agricultural product distribution system innovation model

### 2.1 Agricultural products trading and traceability system construction

Through the operation mode of "government guidance, enterprise main body, data linkage and information supervision", the company uses the concept of "Internet +", relies on the Internet of Things, big data, cloud computing, blockchain, two-dimensional code and other new generation Internet technologies, and implements the national meat and vegetable circulation traceability system technical standards. The platform mainly serves catering units, restaurants, food service providers, and suppliers. The platform mainly serves the food procurement management of catering units, school canteens, hospital restaurants, hotels and restaurants, production and processing enterprises, supermarkets and retail operators, etc. It connects relevant data directly to the government's safety supervision platform, which further changes the traditional supervision thinking and supervision mode while enhancing the enthusiasm of enterprises to implement traceability. It forms an interoperable, fast-operating and fast-responding intelligent platform covering the whole range of food safety information. This has resulted in

the formation of an interconnected, interoperable, fast-operating, fast-responding and intelligent sensing and response system, which has enabled government departments to supervise, market players to implement, all sectors of society to cooperate, and individual enterprises to actively participate in the management of the entire Internet, effectively promoting the complete automation of food production and safety management, the full scientific station of management methods, and the complete modernisation of governance capabilities. The specific practices are as follows:

First, establish an e-commerce service platform. Using mobile internet technology, we adopt the O2O model to establish an e-commerce service platform for food distribution and traceability (such as the "Source Fresh" platform). The platform includes functions such as shelving of goods, convenient order placement, transparent transactions, billing enquiries, mobile payment, traceability enquiries, pesticide residue testing, and data uploading to the central management platform of the Ministry of Commerce.

Second, the service group unit food procurement. Food companies, school canteens, hospital restaurants, hotel restaurants, manufacturers, supermarkets and retail operators use mobile phone APPs, WeChat public accounts, WeChat mini-programs or through mobile website clients to log on to the Source Fresh e-commerce website to scan codes to purchase meat, vegetables and fruits and other food, with product manufacturers taking orders and carrying out food collection, traceability records, pesticide residue analysis and logistics distribution. These big data analytics have had a positive impact on guiding industrial manufacturing and government control practices.

Thirdly, food testing is monitored. The e-commerce platform has developed a food safety prevention and control mechanism through a four-tier prevention and control system of enterprise self-inspection, platform sampling, third-party agency re-inspection and government department risk and supervision sampling to achieve food safety prevention and control and to eliminate the delivery of unqualified ingredients. The purchaser checks the logistics sheets and pesticide residue monitoring statements and carries out goods inspection; the e-commerce platform realises the supervision of the supplier's logistics, information flow and pesticide residue monitoring process and records each link's relevant data and information. At the same time, the e-commerce platform publicises the traceability and testing data to consumers through QR codes, public numbers and displays. It simultaneously uploads the traceability data to the central management platform of the Ministry of Commerce.

Fourthly, it is connected to the government regulatory platform. The traceability e-commerce platform connects all aspects of the agricultural market from the field to the table. It generates massive amounts of information based on the operation of the market mechanism. This allows government departments to establish a comprehensive food safety risk monitoring system, classify, track, detect and evaluate food safety hazards in dynamic monitoring, and warn of potential significant food safety hazards, thus effectively preventing major food safety incidents.

## **2.2 Construction of Urban Smart Supply Chain Industrial Park**

Using the concept of "Internet +" and relying on a new generation of mobile internet

technologies such as the Internet of Things, big data, cloud computing, artificial intelligence, 5G and blockchain, we will build an intelligent supply chain industrial park for urban agricultural products (e.g. Sichuan Whale Small Warehouse Technology Group Smart Supply Chain Project) to create a safe channel for edible agricultural products between farmland and table. The project will build a food supply platform based on extensive data analysis, integrating picking and selling, sorting, storage, processing, logistics and distribution, and financial services, reducing distribution layers, reducing distribution losses, improving distribution efficiency, ensuring food safety and helping rural revitalisation. The platform will form an all-round modern information technology that will enable government departments to supervise and manage, market players to fulfil their responsibilities, society to cooperate and individuals to actively participate. It will promote the wisdom of food safety governance, the technology of governance tools and the modernisation of governance capabilities. The specific practices are as follows:

First, to ensure the safe and efficient supply of agricultural products. Relying on the efficient rough processing and sorting, and packaging capacity of the Agricultural Products Supply Chain City Sharing Centre, we can meet the distribution needs of a sufficient number of direct supply outlets in institutions, schools, communities and hospitals to ensure safe and secure supply at the end, so that the general public can genuinely consume healthy and safe agricultural products and meet their consumption needs for safe and high-quality agricultural products.

Secondly, we will open up the sales of agricultural products in poor areas. By relying on the China Quality Agricultural Products Supplier City Information Sharing Centre, we can directly connect the quality agricultural products from poor areas across the country, realize the direct connection of agricultural bases in poor areas across the country to government agencies, companies, supermarkets, communities, hospitals, universities and other terminal outlets, effectively carry out the marketing of green agricultural products, comprehensively digest the agricultural products from poor areas across the country, and effectively promote the income enrichment of farmers in poor villages across the country.

Thirdly, to enhance the modernization and processing capacity of agricultural products supply. Relying on the professional agricultural products supply chain city sharing centre, all aspects of procurement - storage and transportation - process - sales are under control and can be operated with the current more advanced Internet of Things, artificial intelligence, sporting equipment, and quality is controlled in all aspects, providing quantitative standards and platform basis for providing residents with assured, safe and healthy ingredients. Real consumer upgrade.

Fourth, it will promote the upgrading of the agricultural products supply industry. Procurement intensification, storage standardization, distribution precision and loss control are the characteristics of the city-sharing centre of the agricultural products supply chain, which can form a new business model and require all links at the back end with social demand and finished product standards, contributing to the standardization of the entire production-consumption chain of agricultural products, laying the foundation for the three agricultural strategies and enhancing core competitiveness.

### 2.3 Construction of a digital platform for the distribution of agricultural products

The digital transformation of agricultural distribution is a systematic project involving manufacturing, production, distribution, branding, marketing and other aspects, and it must establish a comprehensive supply chain system. Digital transformation can connect the front and back ends of the supply chain and increase the distribution channels by linking them closely to the products. With digital transformation, the upstream and downstream industry chains are more closely integrated, and the various elements of production and circulation are better linked and integrated into the whole value chain, enabling the whole chain from product to commodity. The distribution of agricultural products is rooted in the whole process of the supply chain and is no longer just a supplement to the whole supply chain system but allows consumers to access the whole process of agricultural products from cultivation to sales.

Integrating the data from the agricultural products trading and traceability platform and the city's intelligent supply chain industrial park, applying the concept of "government guidance, market operation and social supervision" to the whole industry chain of agricultural products trading, food safety supervision and supply chain management, collecting agricultural products market trading data and government supervision data through the information platform, collecting enterprise data through the food circulation traceability trading platform, bringing together the primary business data, trading data, supply and demand data, traceability data and testing data generated in the course of market operation into an extensive database for government supervision and management, optimizing data source channels and serving scientific governance.

## 3 Conclusion

At present, China's agricultural products market has many problems, such as poor infrastructure, low level of informationization, lack of upstream and downstream trust, low efficiency of supply chain coordination and difficulty in quality and safety traceability, but also has potential advantages such as ample space for domestic demand enhancement, high efficiency of factor marketization and abundant innovation resources. The development of internet technology, the diversification of e-commerce models and the application of high technology have provided the necessary conditions for constructing a scientific and efficient agricultural products circulation system.

A safe and efficient agricultural product distribution system should be industrialized, marketized, standardized, informationist, safe and intelligent to ensure food safety, reduce transaction costs and distribution losses, improve distribution efficiency and enhance agricultural informatization. The agricultural products trading and traceability system, the city's intelligent supply chain industrial park and the digital platform for agricultural products circulation are three important platforms for building a modern agricultural products circulation system, which can effectively promote trade supervision and ensure smooth supply and digital transformation. At the same time, it can solve the problem of information asymmetry in various aspects of agricultural production and trade activities, actively promote the optimization and upgrading of the supply chain

and agricultural supply-side reform, implement scientific management using big data, improve the governance of the agricultural products circulation market, and promote farmers' income and rural revitalization.

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