Academic Journal of Management and Social Sciences
ISSN: 2958-4396 | Vol. 2, No. 1, 2023

Research on the resilience system of agricultural products supply chain under the blockchain

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Abstract: As one of the daily necessities of residents, the running state of the whole chain of agricultural products has been widely concerned. By searching domestic and foreign "agricultural product supply chain risk, agricultural products supply chain integration blockchain technology" and other documents, this paper understands the common risk problems and generating factors in the agricultural products supply chain, and analyzes the operation mode and function of block chain technology in the agricultural products supply chain. In order to achieve the organic integration of the agricultural product supply chain and the block chain technology, so as to ensure the smooth and orderly operation of the whole chain.

Keywords: Supply chain resilience; Agricultural supply chain; Blockchain; Resilience system.

1. Overview of domestic theory development

For the research on the resilience of agricultural supply chain, most of the current literature focuses on the recovery strategies after interruption, and there is little literature research on the prevention of agricultural supply chain interruption. Therefore, this paper sorts out the domestic research literature on the resilience of agricultural supply chain, agricultural supply chain and risk issues, and agricultural supply chain integration of block chain, and then comments on the existing research status.

2. Domestic literature review

2.1. Research on agricultural products supply chain and risk issues

The so-called agricultural products supply chain refers to the supply chain system with agricultural products as the object. The supply chain system includes agricultural products consumers, agricultural products processing enterprises, distributors, agricultural products producers and suppliers, etc. Agricultural products producers are the beginning of the supply chain, and through the distribution, processing, retail and many other links to build a vertical network system.

On the research of agricultural products supply chain, many scholars have explored from different aspects. Zhao Jie (2022), based on the operation mode of traditional agricultural products supply chain of e-commerce, built a live supply chain of "supply side-live end, platform end-consumer end", focusing on the analysis of the operation mode and effect[1]; Chen Ke (2022) explores from the perspective of supply chain finance[2]; Zhao Xiaofei (2022) studied the digital transformation of the agricultural products supply chain[3]; Zeng Qingju (2022) studies the agricultural product supply chain from the perspective of live delivery[4]; Zan Linga (2022) studies the level of information sharing in the supply chain of agricultural products[5]; Zheng Jindu (2022) analyzed the factors influencing the quality and safety risk of agricultural products supply chain[6]; CAI Guojian (2022) combines social e-commerce with maintaining the freshness of fresh agricultural products, and studies the current situation of the entire supply chain system that considers preservation efforts in the context of social e-commerce[7]; Wang Hongchun (2022) establishes decentralized and centralized decision-making models of different government subsidy methods around the secondary supply chain of farmers and live-streaming merchants[8]; Chen Qiwei (2022), based on the characteristics of the e-commerce supply chain of agricultural products in the new retail era, analyzed the existing problems of the supply chain of agricultural products, and provided improvement strategies for e-commerce enterprises to improve the supply chain layout, improve the efficiency and flexibility of the supply chain[9].

Many scholars combine the supply chain of agricultural products with specific regions and specific industries for analysis. Deng Minyi (2021) Based on the perspective of supply chain management, by studying the current situation and existing problems of agricultural products logistics mode in Guizhou mountainous areas, and learning from the supply chain logistics mode in remote areas at home and abroad, we put forward suggestions for the optimization of agricultural products logistics link in mountainous areas[10]. Zhang Mei (2022) took Chongqing as an example to explore its willingness to integrate into the supply chain of agricultural products in Chengdu-Chongqing economic circle[11]; Zhao Wende (2022) took Guangdong as an example to analyze the research status of the supply chain channels of agricultural products at home and abroad[12]; Ran Wenxue (2022) Based on digital twin technology, build a structure to promote the development of plateau characteristic agricultural products enterprises and their supply chain[13]; Zhai Honghong (2022) started with the development status of agricultural products supply chain in Henan poverty-stricken areas, analyzed the existing problems and constraints, and then put forward suggestions for its future development[14]; Ding Jue (2022) proposed the path selection to promote the optimization of cross-border agricultural products supply chain model in Zhejiang Province, so as to promote the development of export-oriented agriculture in Zhejiang Province[15]; Wei Yingqin analyzed the existing basic operation mode of Guangxi agricultural products supply chain, and explored the

collaborative framework and mode construction path of Guangxi agricultural products supply chain under the background of new business forms [16].

Because agricultural products are perishable and short life cycle, they are easily subject to the interference of external environment, which leads to the risk of agricultural supply chain. Gan Yanyan (2017) classifies the supply chain risks of agricultural products into three categories, one is the risks brought by production farmers, processing enterprises, distributors and consumers; the second is the information, logistics and credit risks generated in the connecting link of supply chain; the third is the risks generated by external environment such as natural environment and government policies[17]; Fu Zhuo (2018) specifically studied the transmission of logistics risks in the agricultural products supply chain, and summarized five logistics overdue risk factors, such as logistics operation standard, management level, environment, logistics delay and spatial risk transmission[18]; Qin Ying (2019) focused on the risk factors of cold chain logistics in the supply chain of fresh agricultural products, and put forward relevant risk avoidance suggestions[19]; Zhou Jixiang (2020) made an in-depth discussion on the procurement risk in the supply chain of fresh agricultural products, indicating the importance of demand risk to the whole supply chain[20]; Ma Ming (2020) analyzed the risk influencing factors of the supply chain of fresh agricultural products under two different circulation modes of "agricultural and super docking" mode and "Internet +" mode[21]; Zhang Linqing (2021) uses the SCOR model to identify the supply chain risks of fresh agricultural products. On the basis of the traditional internal and external risks, the internal risks are divided into internal overall risks and internal operational risks [22].

2.2. Research on the combination of agricultural products supply chain with blockchain technology

Combining blockchain technology with the agricultural supply chain can effectively solve the risk problems existing in the agricultural supply chain. Huo Hong (2022), aiming at the uncertainty of the quality and safety of agricultural products, established an evolutionary game model of agricultural products suppliers and processors based on the investment of blockchain technology[23]; Wan Yachen (2022) applies blockchain technology to agricultural supply chain finance, aiming to better solve the problems faced in agricultural supply chain finance[24]; Lin Xiuli (2022) takes the quality and safety of agricultural products as the entry point, and applies blockchain and consensus algorithm to solve the problems of information opacity, information island and high data maintenance cost in the supply chain system[25]; Jingxu (2022) proposed a cluster traceability model of agricultural products supply chain based on blockchain relay technology to open up the information island between alliances and realize the information connection of the whole supply chain[26]; Woodlen (2022) designed the differentiated sharing model of agricultural product blockchain information credibility evaluation for the low data differentiation sharing and traceability efficiency of the existing agricultural product blockchain traceability system, which is difficult to guarantee the problem of the credibility of the on-chain data[27].

Yang Chenxue (2020) has designed a supply chain data management system for agricultural products based on blockchain technology, which can ensure that the whole supply chain is fully safe and transparent and trusted information sharing [28]; Zhang Yin (2021) proposed the development path of using blockchain technology to enhance the mutual trust level of the agricultural product supply chain, and to rebuild the trust system and interest pattern [29]. Tan Yanwen (2022) combined with the functions and characteristics of blockchain technology, theoretically analyzed the internal mechanism of blockchain technology to reduce the transaction cost of agricultural products, and systematically elaborated the role of blockchain technology in driving the development of agricultural products supply chain and the international practice status [30].

In the context of industry 5.0, there are also many scholars studying the application of blockchain technology in the supply chain of agricultural products. Xu Miaomiao (2020) has designed a blockchain-based 5G-IoT agricultural product traceability platform suitable for multi-subject products, which plays a positive role in improving the sustainable quality management of agricultural products [31]. Zhang Pengrui (2022), on the premise of the design of agricultural product quality traceability system based on blockchain and Internet of Things technology, proposed the relevant mechanism to ensure its normal operation[32]; Jin Jianfeng (2022) put forward the agricultural products supply chain information collaborative mode based on "block chain+platform", using block chain distributed storage, smart contract, consensus mechanism, agricultural products supply chain autonomy, improve the information sharing degree while ensure the security and transparency of data, solve the problems of information island and lack of trust in the agricultural products supply chain[33]; Hao Li (2022) proposed to build the fresh supply chain information security sharing scheme driven by the smart contract (SCIPB), break the previous single information barrier pattern, build the intelligent fresh supply chain warning system, and realize the ecological civilization of mutual trust and win-win[34].

3. Review of foreign literature

3.1. Research on agricultural products supply chain and risk issues

Kamble (2020) Based on the literature review method, an application framework for participants in the agricultural supply chain, identifying supply chain visibility and supply chain resources as the main drivers for the development of data analysis capabilities and sustainable performance [35]. T rivedi (Through investigation and analysis, 2020) proposed a model of agricultural supply chain integrating ICTs into operation, which can connect all participants without having to rely heavily on the physical interaction of transactions and easily cope with uncertainty [36]. Routroy Put forward inventory policy, demand forecast and agricultural supply chain integration are important areas of agricultural supply chain [37]. Sharma (2020) proposed that intelligent agriculture and precision agriculture can solve many challenges in the agricultural supply chain [38]. Nayal (2022) Based on the literature review method, the Internet of Things and ICT play an important role in addressing food security, traceability and food quality, and help to achieve the Sustainable Development Goals [39].

The research on the risk of agricultural products supply chain is as follows: Ali et al et al. (2017) After the right and small and medium-sized fresh products, the analysis found

that most of the risk factors come from within the supply chain[40], For example: transportation risk, i. e. transportation interruption or cargo loss during transportation; financial risk, i. e. labor shortage or high labor cost; climate risk, i. e. drought, rainstorm and other natural disasters; supply and demand mismatch, i. e., the predicted demand varies greatly from the actual demand. Yang, et al. (2018) [41] It is pointed out that the imbalance between supply and demand, the bottleneck of transportation capacity and the seasonal cycle are the important factors that lead to the fragile supply chain of fresh agricultural products and even the risk of interruption. Zhai (2022) uses the PF-MEREC-RS method to calculate the subjective and objective weights of the main risks, and then evaluates the SME investment of the agricultural supply chain [42]. Tuzemen (2022) proposes ways to identify risks and deployed methods and tools to mitigate risks and uncertainty to make supply networks resilient [43]. Sharma (2022) Survey results show that supply, demand, financial, logistics and infrastructure risks, management and operations, policies and regulations, and biological and environmental risks have a significant impact on the agricultural supply chain [44].

3.2. Agricultural products supply chain integration of blockchain technology related research

The emerging blockchain technology is constantly integrated with industry 5.0 technology, building the technical pillar of the current traceability system.Tian (2016)[45]And Mondal (2019)[46]The traceability system mainly relies on RFID technology to realize data collection, circulation and sharing in the production, processing, storage, distribution and sales of agricultural products supply chain. Blockchain technology is used to ensure that the information shared and published in this traceability system is reliable and true. Their traceability system not only covers every enterprise in the agricultural supply chain but also includes strong sectors, such as government departments and third-party regulators. Caro (2018) and other scholars have proposed a traceability scheme, AgriBlockIoT, which uses Ethereum and Hyperledger Sawtooth and seamlessly integrates Internet of Things devices that produce and consume data in the supply chain for agricultural supply chain management [47]. Baralla (2019) believes that the centralization can be eliminated by promoting the trust between enterprises in the supply chain, and consumers can verify the quality of products through simple QR code scanning, so as to realize the traceability of agricultural products information [48]. To ensure food safety from farm to table, Alons o (2020) [49] And Bumblauskas (2020) [50] Blockchain systems are used to achieve the full traceability of milk and egg production.

Casino (2019) [51] And Salah (2019) [52] The application of smart contracts to the traceability system further integrates the direct trust relationship in each link of the supply chain. Among them, Casino's blockchain and smart contract traceability model divide the main body of the supply chain into two parts: the data of the upstream members (such as farmers, food producers, manufacturers) are stored in a central server or Interstellar file system (IPFS); and the downstream members (wholesalers, distributors, retailers) use smart contracts to provide better consumer services and quality assurance.

In terms of practice, many foreign commercial companies have made active exploration, Leng (2018) [53] The agricultural supply chain with "user information chain" and "transaction chain" double chain structure is proposed, which greatly improves the credibility of the public service platform and the overall efficiency of the system. This architecture can realize the openness and security of transaction information, and take into account the privacy of enterprise information, can complete the rent-seeking and matching of resources adaptively, and make the mutual trust between the supply chain cooperative enterprises. Longo (2019)[54]A software connector was designed to connect the Ethereum blockchain to the enterprise information system, so that companies can share information with partners with different visibility levels, and build trust by checking the authenticity, integrity, and invariance of the data through the blockchain. Kamilaris (2019) et al [55] Use smart contracts to manage the small-scale local cooperatives, facilitating sales of their cereal products. First, the cooperative formulates its terms of sales through a smart contract, which is verified by each node of the blockchain network after the buyer signs the contract to pay for the token. If verified, the buyer will automatically receive the access code of the grain warehouse smart lock to get the grain. Buyers and sellers build trust through smart contracts, and the transaction process becomes more transparent and just.

4. A brief summary and evaluation

Through the introduction of the literature review, we can sewe that academic research of supply chain toughness, mainly from the evaluation of supply chain toughness index, build manufacturing toughness supply chain and repair problems after the supply chain interruption to explore, and about the agricultural supply chain, focus on the value of loss and food safety, of course, these two problems are very important in the agricultural supply chain. However, the outbreak of COVID-19 in 2020 requires us to pay attention to the resilience and stability of the agricultural supply chain. Based on the above relevant literature, this paper believes that the following aspects need to be studied:

1) The research on the resilience of agricultural products supply chain urgently needs to be improved. Most of the existing literature starts from industrial, manufacturing and logistics enterprises, and builds the supply chain resilience system based on various theoretical bases, without deeply studying the agricultural products supply chain resilience system.

2)The prevention of interruption of agricultural supply chain needs to be studied. Most existing scholars take "optimizing the agricultural supply chain" as the starting point, combine the existing risks of agricultural supply chain and construct the system of agricultural supply chain model, and rarely study the prevention of agricultural supply chain interruption.

3)The supply chain system is lack of quantitative research, and most of the existing literature conducts qualitative analysis of the constructed supply chain system, but the lack of quantitative research, it is difficult to verify the regulatory effect of blockchain technology after the integration of agricultural supply chain system, and it is difficult to prove that blockchain technology is conducive to the improvement of supply chain benefits.

Based on the above analysis, this article will be to prevent agricultural supply chain interruption as a starting point, to explore the fundamental factors affecting the supply chain interruption and based on block chain and industrial 5.0 take

effective measures to improve the toughness and stability of the supply chain, hope to achieve agricultural products supply chain smooth and uninterrupted, and improve the supply chain system of agricultural products.

Acknowledgment

Major project of Liaoning Provincial Social Science Planning Fund: Research on the impact of agricultural product supply chain information interaction on the improvement of operation quality, approval number: L21ZD007.

References

[1] Zhao Jie, Tan Linyuan. The operation mode and development countermeasures of live-streaming e-commerce embedded in the agricultural products supply chain under the digital economy [J]. Business Economics Research, 2022 (22): 107-110.

[2] Chen Ke. Research on Countermeasures to Promote the Digitization of Agricultural Supply Chain Finance under the Background of Financial tech [J]. Agricultural economy, 2022 (11): 119-121.

[3] Zhao Xiaofei, Lu Nan, Li Ming. Digital transformation of agricultural products Supply chain: Theoretical Framework and Implementation Path [J]. Yunnan Social Science, 2022 (06): 59-67.

[4] Zeng Qingju. Research on supply chain optimization of agricultural products based on live delivery [J]. Storage and Transportation in China, 2022 (10): 34-35.

[5] Zan Lin jia. Research on agricultural products supply chain information sharing based on AHP-fuzzy comprehensive analysis-omni-channel perspective [J]. Value Engineering, 2022,41 (27): 40-42.

[6] Zheng Jindao. Structure analysis of influencing factors of agricultural supply chain based on ISM [J]. Journal of Taiyuan City Vocational and Technical College, 2022 (07): 45-48.

[7] Guo-Ji'an CAI. Research on the current situation of agricultural products supply chain considering preservation efforts under the background of social e-commerce [J]. Logistics and Purchasing in China, 2022 (12): 95-97.

[8] Wang Hongchun, Gong Ziqi. Pricing decision of agricultural products supply chain of live streaming e-commerce based on different government subsidy models [J]. Supply Chain Management, 2022,3 (04): 46-55.

[9] Chen Qiwei. Research on the efficiency improvement strategy of e-commerce agricultural products supply chain in the new retail era [J]. Business, 2022 (06): 131-134.

[10] Deng Minyi, Liu Weijun. Research on supply chain logistics of agricultural products in mountainous areas of China - Take Guizhou as an example [J]. Logistics and Purchasing in China, 2021 (23): 35-36.

[11] Zhang Mei, Jiang Qiong, Peng Jie. Research on the willingness of farmers to integrate into the supply chain of agricultural products in Chengdu-Chongqing Economic Circle —— Take Chongqing as an example [J]. Logistics Engineering and Management, 2022,44 (10): 70-72 + 79.

[12] Wen-de zhao. Research on the supply chain channel of agricultural products in the Guangdong-Hong Kong-Macao Greater Bay Area in Guangzhou under the rural revitalization strategy [J]. Logistics Technology, 2022,41 (08): 14-19 + 64.

[13] Ran Literature, Hu Yimin, Yang Zhi. Research on the digital twin system structure of the plateau characteristic agricultural products supply chain [J]. Supply Chain Management, 2022,3 (08): 41-48.

[14] Zhai honghong. Research on the development of agricultural products supply chain for inclusive small farmers in poverty-stricken areas in Henan province [J].rural area.agriculture. Farmer (version B), 2022 (07): 15-17.

[15] Ding Jue. Optimize the cross-border agricultural products supply chain to promote the development of export-oriented agriculture in Zhejiang Province [J]. Business Theory of China, 2022 (13): 21-23.

[16] Wei Yingqin. Research on the framework and mode of Guangxi Agricultural product Supply Chain Cooperation under new business forms [J]. Logistics Engineering and Management, 2022,44 (02): 56-58.

[17] Gan Yanyan, Zheng Yaqin. Risk analysis and countermeasures of fresh agricultural products [J]. Journal of Liaoning University of Technology (Social Science Edition), 2017,19 (2): 37-40.

[18] Fu Zhuo, Yan Yusong, Guo Qian, et al. Risk transmission mechanism and control of fresh agricultural products supply chain logistics [J]. Journal of Southwest Jiaotong University, 2018,53 (3): 654-660.

[19] Qin Ying. Supply chain quality risk study of fresh agricultural products based on AHP [J]. Agriculture in Henan Province, 2019 (23): 58-61.

[20] Zhou Jixiang, Wang Yong, Qiu Hanguang. Research on the procurement and outsourcing of fresh agricultural products under some information [J]. Management Science of China, 2020,28 (7): 122-131.

[21] Ma Ming. Supply chain analysis and control optimization of fresh agricultural products [J]. Business, 2020 (31): 135-136.

[22] Zhang Linqing, Zhao Zhong. Research on risk identification and prevention of fresh agricultural products supply chain [J]. Logistics Engineering and Management, 2021,43 (2): 52-55.

[23] Huo Hong, Zhong Haiyan. Evolutionary analysis of blockchain technology input in the quality and safety of agricultural product supply chain [J/OL]. Operations research and management: 1-8 [2022-12-01].

[24] Wan Ya Chen. The effective application of blockchain technology in agricultural products supply chain finance [J]. Modernization of the shopping mall, 2022 (15): 12-14.

[25] Lin Xiuli. Research on the application of blockchain technology in agricultural product information traceability system [J]. Computer Knowledge and Technology, 2022,18 (17): 114-116 +119.

[26] Jing Xu, Liu Ziyu, Qin Yuanze. Cluster agricultural products supply chain traceability model based on blockchain relay technology [J]. Journal of Agricultural Engineering, 2022,38 (11): 299-308.

[27] Woodlen, Rao Yuan, Xu Lei, Shu Yali, Ling Nuojuan, Shi Yulong. Design and implementation of a differentiated sharing model for trusted evaluation of agricultural product blockchain information [J]. Journal of Agricultural Engineering, 2022,38 (11): 309-317.

[28] Yang Chenxue, Sun Zhiguo. Design of data management system for agricultural products based on blockchain technology [J]. Journal of Agricultural Big Data, 2020,2 (02): 74-83 + 4.

[29] Zhang Yin. Research on the path of blockchain to enhance the mutual trust level of agricultural products supply chain [J]. Journal of Jilin Industry and Business College, 2021,37 (01): 55-60.

[30] Tan Yanwen, Li Congxi, Song Qing. Application of blockchain technology in agricultural products supply chain - theoretical

mechanism, development practice and policy enlightenment [J / OL]. Problems of agricultural economy: 1-12 [2022-12-01].

[31] Xu Miaomiao, Sun Xiaoyue, Lu Yao, Zhou Yiping. Research on agricultural product Supply Chain traceability Platform based on 5G-IoT and blockchain [J]. Cyberspace Security, 2020,11 (11): 91-97.

[32] Peng-rui zhang. Research on the quality, safety and efficient traceability System of agricultural products based on "Blockchain + Internet of Things" [J]. Technology Information, 2022,20 (16): 110-112 + 144.

[33] Jin Jianfeng, Wang Lin. Research on Agricultural Product Supply Chain Information Coordination under the mode of "Blockchain + Platform" [J]. Logistics Technology, 2022,45 (06): 128-131.

[34] HaoLi, Feng Lu. Fresh supply chain risk control mechanism driven by the "Internet + blockchain" smart contract [J]. Logistics Technology, 2022,41 (03): 90-98.

[35] Kamble, S. S., et al. (2020). "Achieving sustainable performance in a data-driven agriculture supply chain: A review for research and applications." International Journal of Production Economics 219: 179-194.

[36] Trivedi, S., et al. (2020). "Impact of COVID-19 on agriculture supply chain in India and the proposed solutions." International Journal of Sustainable Agricultural Management and Informatics 6(4): 359-380.

[37] Routroy, S. and A. Behera (2017). "Agriculture supply chain A systematic review of literature and implications for future research." Journal of Agribusiness in Developing and Emerging Economies 7(3): 275-302.

[38] Sharma, R., et al. (2020). "A systematic literature review on machine learning applications for sustainable agriculture supply chain performance." Computers & Operations Research 119.

[39] Nayal, K., et al. "Integrated technologies toward sustainable agriculture supply chains: missing links." Journal of Enterprise Information Management: 51.

[40] Ali, Imran; Nagalingam, Sev; Gurd, Bruce (2017). Building resilience in SMEs of perishable product supply chains: enablers, barriers and risks. Production Planning & Control, 1–15.

[41] Yang, J., & Liu, H. (2018). Research of Vulnerability for Fresh Agricultural-Food Supply Chain Based on Bayesian Network. Mathematical Problems in Engineering, 2018, 1–17.

[42] Zhai, T., et al. "Assessment of the agriculture supply chain risks for investments of agricultural small and medium-sized enterprises (SMEs) using the decision support model." Economic Research-Ekonomska Istrazivanja.

[43] Tuzemen, A. and T. S. Yaprakli (2022). "The effect of supply chain orientation on supply chain risk and uncertainty: An application on members of dairy products supply chain in erzurum city in Turkey." Emirates Journal of Food and Agriculture 34(4): 304-315.

[44] Sharma, R., et al. "Agriculture supply chain risks and COVID-19: mitigation strategies and implications for the practitioners." International Journal of Logistics-Research and Applications.

[45] Tian F. An agri-food supply chain traceability system for China based on RFID & blockchain technology [C]/2016 13th international conference on service systems and service management (ICSSSM). IEEE, 2016: 1-6.

[46] Mondal S, Wijewardena K P, Karuppuswami S, et al. Blockchain inspired RFID-based information architecture for food supply chain [J]. IEEE Internet of Things Journal, 2019, 6(3): 5803-5813.

[47] Caro et al. Blockchain-based traceability in agri-food supply chain management: a practical implementation [C]//2018 IoT Vertical and Topical Summit on Agriculture- Tuscany (IOT Tuscany). IEEE, 2018: 1-4.

[48] Baralla G, Pinna A, Corrias G. Ensure traceability in European food supply chain by using a blockchain system [C]//2019 IEEE/ACM 2nd International Workshop on Emerging Trends in Software Engineering for Blockchain (WETSEB). IEEE, 2019: 40-47.Caro M P, Ali M S, Vecchio M,

[49] Alonso R S, Sittón-Candanedo I, García Ó, et al. An intelligent Edge-IoT platform for monitoring livestock and crops in a dairy farming scenario[J]. Ad Hoc Networks, 2020, 98.

[50] Bumblauskas D, Mann A, Dugan B, et al. A blockchain use case in food distribution: Do you know where your food has been?[J]. International Journal of Information Management, 2020, 52.

[51] Casino F, Kanakaris V, Dasaklis T K, et al. Modeling food supply chain traceability based on blockchain technology [J]. IFAC-PapersOnLine, 2019, 52(13): 2728-2733.

[52] Salah K, Nizamuddin N, Jayaraman R, et al. Blockchain-based soybean traceability in agricultural supply chain [J]. IEEE Access, 2019, 7: 73295-73305.

[53] Leng K, Bi Y, Jing L, et al. Research on agricultural supply chain system with double chain architecture based on blockchain technology [J]. Future Generation Computer Systems, 2018, 86:641-649.

[54] Longo F, Nicoletti L, Padovano A, et al. Blockchain-enabled supply chain: an experimental study [J]. Computers & Industrial Engineering, 2019, 136: 57-69.

[55] Kamilaris A, Fonts A, Prenafeta-Boldύ F X. The rise of blockchain technology in agriculture and food supply chains [J]. Trends in Food Science & Technology, 2019, 91: 640-652.