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# DIGITAL CERTIFICATION AND TRACEABILITY OF ORGANIC PRODUCTS: INTERNATIONAL LEGAL ASPECTS OF IMPLEMENTATION IN THE REPUBLIC OF KAZAKHSTAN

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Amid the rapid growth of the global organic product market and the tightening of requirements for product authenticity and origin transparency, the integration of digital technologies into organic product certification and traceability processes has become particularly relevant. This article analyzes the international legal aspects of implementing digital certification and traceability systems in the Republic of Kazakhstan, taking into account international standards and practices, including the Codex Alimentarius, Regulation (EU) No. 2018/848, the guiding principles of IFOAM, and other global initiatives.

The research aims to identify legal and institutional mechanisms for harmonizing Kazakhstan's national organic product certification system with international requirements, as well as to determine key barriers to the digital transformation of certification procedures in the agricultural sector.

The research methodology is based on comparative legal and normative-legal analysis of international and national sources, case studies of foreign digital certification and traceability platforms, and the application of legal forecasting elements.

The scientific novelty of the article lies in the comprehensive assessment of the applicability of international digital certification models in Kazakhstan's legal and technological context, considering the Law No. 89-VIII of June 10, 2024, "On the Production and Turnover of Organic Products", which came into force, as well as the justification for the need to institutionalize digital certificates as legally binding tools for quality control and export.

The practical significance of the research consist in the proposals for improving national legislation and integrating digital certification and traceability systems, which can help enhance the export potential of Kazakhstani organic products and strengthen trust among consumers and international trading partners.

*Key words: organic agriculture, food security, digital certification, blockchain technology, product traceability, international law, Kazakhstan, China, organic products, sustainable development*

## Introduction

Over the past decades, organic agriculture has gained consistent international recognition as an environmentally oriented, economically viable, and socially responsible model of food production. The growing demand for organic products on the global markets is accompanied by stricter requirements for verifying their authenticity, origin transparency, and compliance with environmental standards. In this context, digital technologies have become crucial, serving as tools for automating certification procedures, ensuring supply chain traceability, and enhancing trust among consumers, regulators, and trading partners.

International practice shows that the digitalization of organic product certification has become an integral part of modern agricultural and food regulation. The European Union, the People's Republic of China, India, Australia, and a number of other countries are actively implementing electronic registries, QR coding, blockchain solutions, and cross-border electronic certificate platforms (TRACES, ePhyto).

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These tools minimize the risk of counterfeiting, ensure end-to-end control of the entire supply chain, and reduce administrative barriers in international trade.

In the Republic of Kazakhstan a new stage in the legal regulation of organic agriculture is associated with the adoption of Law No. 89-VIII "On the Production and Circulation of Organic Products" (June 10, 2024), which came into force in 2025 (hereinafter referred to as the Law)[1]. This Law replaces the Law No. 423-V 2015, which had become outdated amid the transformation of agricultural markets and the need to harmonize national legislation with international standards [2]. The new normative act establishes a more comprehensive regulatory model aimed at ensuring the transparency, accountability, and traceability of organic products.

An important innovation is the normative enshrinement of digital traceability elements based on a state information system operated by the Ministry of Agriculture of the Republic of Kazakhstan. The Law also incorporates approaches established in European Union law (Regulation (EU) 2018/848) and the standards of the International Federation of Organic Agriculture Movements (IFOAM), including the expansion of the conceptual framework and the introduction of Participatory Guarantee Systems (PGS).

However, despite these positive developments, the digitalization of organic product certification in Kazakhstan remains predominantly framework-based and fragmented. There is a lack of detailed regulation of digital certification mechanisms, platform operating algorithms, and procedures for the mutual and international recognition of electronic certificates. Insufficient institutionalization of digital solutions, limited IT infrastructure, and lack of integration into international systems (TRACES, ePhyto) create barriers to Kazakhstani organic products accessing foreign markets, particularly the European Union and the People's Republic of China.

In this regard, a comprehensive study of international legal standards for digital certification and traceability of organic products, their comparison with national legislation, and the development of an adapted legal model for implementing digital solutions in the Republic of Kazakhstan have become particularly relevant.

## Main Provisions

### *International Legal Framework for Digital Certification of Organic Products*

In modern scientific doctrine organic agriculture is considered one of the key elements of sustainable development and global food security. For example, researchers note that organic agriculture contributes to sustainable food systems by reducing environmental pressures, restoring ecological cycles, and enhancing food security, thereby reinforcing national resilience in the context of globalized markets [3]. This approach is further developed in legal research, which research emphasizes that the sustainability of agri-food systems is closely linked to digital traceability and e-certification mechanisms, which enhance transparency and market participation in agricultural trade [4].

In this context digital certification and traceability of organic products are viewed in scientific literature as functional elements of international trade that ensure trust among states, economic entities, and consumers. According to Charlebois, the implementation of digital traceability systems not only enhances quality control but also strengthens interaction between public regulators and private actors in agricultural field [5].

The formation of the international legal framework for digital certification of organic products occurs at the intersection of agricultural, trade, environmental, and digital law norms. A central role in this system is played by the Codex Alimentarius, developed by FAO and WHO. Despite its recommendatory nature, Codex standards possess quasi-international binding force due to their recognition by the World Trade Organization (WTO) under the Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement). Guidelines CAC/GL 32-1999 establish the principles of organic production and labeling, including the admissibility of using electronic means to verify authenticity, which provides a legal basis for the digitalization of certification procedures at the national level [6].

The most developed model of digital certification is demonstrated by European Union law. Regulation (EU) No. 2018/848 on organic production and labeling of organic products institutionalized mandatory digital traceability of the entire supply chain, including the registration of operators and the use of the TRACES electronic platform for exchanging certificates [7]. This approach has effectively transformed

digital certification into a prerequisite for accessing the EU market, endowing electronic certificates with legally significant status in cross-border trade.

Non-state regulators, particularly the International Federation of Organic Agriculture Movements (IFOAM), play a significant role in shaping international standards. Although IFOAM standards are not contractual, their widespread recognition makes them de facto global benchmarks. Of particular importance is the Integrity Systems concept, which involves digital verification of organic status, maintenance of electronic registries of producers and inspectors, and the use of distributed ledgers (blockchain) to prevent counterfeiting [8].

The practical feasibility of cross-border digital certification is demonstrated by the ePhyto system, operated under the auspices of the International Plant Protection Convention (IPPC) [9]. Covering more than 100 countries, ePhyto confirms the possibility of functioning unified digital certification platforms that ensure the legal validity of electronic documents in international trade.

An additional element of the international legal framework is the obligations of states under the World Trade Organization, the Eurasian Economic Union, and the Paris Agreement on Climate Change. The TBT and SPS Agreements require transparency and justification of national measures, while the Paris Agreement strengthens the focus on environmentally sustainable production, which indirectly stimulates the introduction of digital control and certification mechanisms.

Thus, the international system of digital certification of organic products is formed as a multi-level and functionally interconnected set of legal and institutional mechanisms: Codex Alimentarius standards [10] establish minimum universal requirements for food safety, quality, and traceability, which are used by states as a guide in developing national certification systems and recognized under the WTO SPS Agreement.

European Union law, particularly Regulation (EU) 2018/848 and the TRACES system, establishes a legally binding model of digital certification of organic products based on electronic registries, intergovernmental data exchange, and end-to-end supply chain traceability.

IFOAM standards and guiding principles form internationally recognized non-state mechanisms for verifying the organic status of products, including Participatory Guarantee Systems (PGS), which are applied in countries with varying levels of institutional and technological development.

Digital electronic document management platforms, such as the ePhyto system, demonstrate the technological possibility of replacing paper certificates with legally significant electronic documents recognized by the competent authorities of various states.

International trade and climate obligations of states under the WTO, the Paris Agreement, and the UN Sustainable Development Agenda necessitate the introduction of digital certification and traceability tools as conditions for accessing international organic product markets and verifying the sustainability of production chains.

### *Digitalization as a Means of Enhancing Law Enforcement Effectiveness in Organic Agriculture*

The digitalization of certification procedures in organic agriculture is of particular importance amid the globalization of agricultural and food markets and the tightening of requirements for environmental sustainability and supply chain traceability. International experience shows that the introduction of digital tools into the certification system performs not only a technological but also a law enforcement function, ensuring a reduction in counterfeiting risks, increased transparency of control, and enhanced consumer trust.

The most institutionally developed model of digital certification has been formed in the European Union. Regulation (EU) No. 2018/848 enshrines digital traceability as a mandatory element of organic product control, providing for the registration of all supply chain participants in a unified digital system and the use of the TRACES NT platform for electronic exchange of certificates. This system allows for near real-time monitoring of product movement and automatic detection of non-compliance with established requirements. As a result, digital certification in the EU serves not as an auxiliary tool but as a full-fledged law enforcement mechanism supported by the administrative and judicial practice of member states.

The People's Republic of China demonstrates a different model, where digital certification is integrated into a centralized state management system. The legal basis is provided by the PRC Law on Certification and Accreditation and subordinate acts on organic product certification [11]. China's organic product certification program is a state initiative regulated by the national standard GB/T19630-2019. A central element is a national digital platform requiring the mandatory use of QR codes and electronic certificates. A distinctive feature of the Chinese model is the combination of strict administrative control with economic incentives, including subsidies and tax benefits, which has facilitated the accelerated introduction of digital technologies and their integration into export-oriented supply chains. In China the digitalization of the agricultural food sector, particularly organic agriculture, has undergone systematic development due to the active integration of blockchain technologies into state registries, traceability platforms, and certification procedures. Unlike the predominantly private-sector-driven initiatives observed in Western countries, in the PRC blockchain-based systems have become an integral component of state regulation and the national digital strategy for food security. As noted by Huanhuan Feng, "blockchain is an advanced technology with enormous potential to enhance traceability efficiency by ensuring security and full transparency" [12]. Studies by Chinese scholars (Tian, 2018; Li & Zhang, 2022) demonstrate that blockchain-based platforms: (a) reduce transaction costs by 30–40%; (b) increase export potential by 20–25%; (c) enable consumers to scan a QR code and access the complete "product history" from seed to packaging; and (d) provide legal protection in the event of disputes, both in administrative proceedings and international trade disputes [13].

In the Republic of Kazakhstan the formation of a digital model for organic product certification is at an early stage. The adoption of the Law "On the Production and Circulation of Organic Products" and the approval of subordinate acts by the Ministry of Agriculture have created legal prerequisites for the introduction of digital traceability. Since January 1, 2025, a state information system for recording organic products has been in operation. However, the current regulation is framework-based and does not require the mandatory use of advanced digital tools such as blockchain platforms, international digital codes, or integration with global certification systems. The lack of economic incentive mechanisms further slows down the digitalization of the sector.

A comparative analysis reveals key differences between digital certification models. First, in the EU and China, digital requirements are enshrined in law and detailed in subordinate acts, while regulation in Kazakhstan remains fragmented. Second, institutional organization varies from the decentralized supranational model of the EU to the centralized state system of China, while the Kazakhstani model is characterized by limited institutionalization. Third, participation in international digital platforms (TRACES, ePhyto) is a mandatory element of the EU and Chinese models, while Kazakhstan is not yet integrated into these systems.

Special attention deserves the issue of the legal nature of the digital certificate. Modern legal doctrine indicates the need to rethink the certificate as a legal fact in the context of digitalization. For example, in contemporary legal doctrine digital certificates based on distributed ledger technologies are regarded as legally significant electronic facts possessing evidentiary value comparable to traditional notarization mechanisms, provided that reliable authentication, data integrity, and immutability are ensured [14].

Scholars also note that digital trade policy within the WTO legal framework is undergoing gradual evolution and is increasingly adapting to the use of electronic certificates and paperless trade, thereby enhancing interoperability and transparency in cross-border supply chains [15].

Similar conclusions are contained in the works of domestic researchers, who point to the need for legislative recognition of digital certificates under Eurasian Economic Union (EAEU) law and national information law. Yerkinbayeva et al. (2025) note that the current legal regulation of organic agriculture in the Republic of Kazakhstan contains significant gaps when compared to international standards and requires comprehensive modernization in order to ensure sustainability and harmonization with global quality and certification criteria [16].

Bektenov O. emphasized that "digitalization should contribute to enhancing transparency and efficiency of state support measures. It is essential to introduce IT tools into the accounting and management of agricultural land" [17].

In this regard, the legal transfer of certain elements of the EU and Chinese models appears promising for Kazakhstan. Borrowing mandatory digital traceability and integration into international platforms, on the one hand, and centralized management with economic incentives, on the other, will make it possible to form a stable legal structure for the digital agricultural certificate, legally equivalent to a paper document and complying with international standards such as IFOAM and ISO 22005.

### *Legal Framework of the Republic of Kazakhstan for Organic Agriculture in the Context of Certification Digitalization*

In recent years, the Republic of Kazakhstan has been actively introducing digital technologies into the agro-industrial complex, primarily at the level of production and technological processes. According to data from the Ministry of Agriculture of the Republic of Kazakhstan, by 2025, precision agriculture technologies, satellite monitoring, automated irrigation, livestock management, as well as solutions based on artificial intelligence and unmanned aerial vehicles will be applied in agriculture [18]. These processes contribute to increasing production efficiency and the rational use of natural resources.

However, the digital transformation of the agro-industrial complex is predominantly technological and managerial in nature and is not accompanied by the formation of a similarly developed legal and institutional infrastructure for digital certification and legally significant traceability, especially in the organic product segment. As a result, a situation of asymmetric digitalization arises, where the introduction of agricultural innovations outpaces the development of legal mechanisms for quality control, verification of product organic status, and its recognition in cross-border trade.

This gap is of fundamental importance in the context of Kazakhstan's international obligations. As shown in previous sections, access of organic products to the markets of the European Union and other countries is determined not so much by the actual application of digital technologies at the enterprise level as by the existence of legally recognized digital certification mechanisms comparable to systems such as TRACES and ePhyto operating in the EU and a number of third countries (Regulation (EU) 2018/848; IPPC, ePhyto Solution).

Significant changes in the legal regulation of organic agriculture in the Republic of Kazakhstan occurred in 2024 with the adoption of the Law. The Law aimed to update the sector structure and bring national legislation in line with international standards. To develop this act, the Ministry of Agriculture approved the Rules for the Production and Circulation of Organic Products (Order of the Ministry of Agriculture No. 385 of November 26, 2024), which came into force on December 12, 2024. Since January 1, 2025, a state information system for recording and tracking organic products has been operating in Kazakhstan, marking the first attempt to institutionalize traceability at the national level.

Despite these positive developments, an analysis of the current legislation reveals a number of systemic legal gaps that hinder the full implementation of digital certification:

Digital certification mechanisms are insufficiently institutionalized. The Law establishes the mandatory certification of organic products but does not contain comprehensive regulation of digital tools ensuring supply chain transparency. Unlike Regulation (EU) 2018/848, which explicitly provides for the use of electronic control systems and data exchange, Kazakhstani legislation is limited to framework norms that do not enshrine the mandatory use of digital platforms, international product codes, or distributed ledger technologies (blockchain).

Gaps remain in the law enforcement system. The Law does not establish specific obligations for certification bodies and economic entities regarding the maintenance of a unified digital database. In practice, this leads to information about certified products being stored in fragmented registries, which significantly limits the possibility of their integration into international trade systems. As a result, Kazakhstan faces the risk of its organic products being denied access to the markets of the European Union and other countries where the operation of transparent digital tracking systems is a mandatory requirement.

Interaction with international standards is declaratory. Although national legislation mentions IFOAM principles and FAO recommendations, there is no normatively established procedure for their implementation into the digital certification system. Unlike the practice in China, where digital certificates are integrated into national platforms with international verification, Kazakhstan has not yet

developed mechanisms for the cross-border recognition of electronic organic product certificates.

Legislation lacks legal and economic incentives for the introduction of digital solutions. Law No. 89-VIII does not provide for tax benefits, subsidies, or public-private partnership mechanisms aimed at digitalizing certification procedures. As a result, the use of digital tools remains largely voluntary, which reduces the interest of producers and slows down sector development.

Digital certification of organic products is insufficiently linked to related normative acts. Its effective functioning is impossible without systematic interaction with the Law of the Republic of Kazakhstan "On Informatization"[19], the Law "On Electronic Documents and Electronic Digital Signatures"[20], legislation on personal data, and Eurasian Economic Union law. The lack of harmonization with EAEU technical regulations and unified digital solutions at the supranational level creates additional barriers to regional integration and cross-border trade.

Accordingly, the legal regulation of digital certification of organic products in the Republic of Kazakhstan is at the formation stage and is characterized by fragmentation and insufficient institutionalization. Addressing the identified gaps requires a comprehensive approach, including the development of subordinate regulation, integration into international digital certification systems, and the creation of mechanisms to stimulate economic entities. Otherwise, the digitalization of the organic sector risks remaining a technological phenomenon without full legal force and international recognition.

### *Discussion on the Applicability of International Digital Certification Models in the Republic of Kazakhstan*

A comparative analysis of international digital certification models for organic products leads to the conclusion that their direct borrowing into national legal systems is not always an effective solution. In the case of the Republic of Kazakhstan, this problem is particularly evident when considering the possibility of implementing the European model, based on the operation of the TRACES platform and detailed supranational regulation within the European Union.

Despite the high level of normative development and technological maturity of the European system, its full reproduction in Kazakhstan faces a number of objective constraints. First, the legal system of the Republic of Kazakhstan lacks institutional equivalents to the control and coordination bodies operating at the European Union level, making it impossible to replicate the supranational digital certification management mechanism. Second, the level of digitalization of agricultural producers, especially small and medium-sized enterprises, remains uneven, which complicates the introduction of complex digital procedures requiring constant real-time electronic data exchange. Third, Kazakhstani certification bodies currently have limited international recognition, which reduces the effectiveness of even the formal introduction of digital tools without their integration into globally recognized control systems.

These circumstances are confirmed in domestic scientific literature. For example, S.Zh. Zhumagaliyeva rightly notes that one of the key problems of digital certification of agricultural products in Kazakhstan is the gap between the technical possibilities of digitalization and the institutional readiness of the legal system to recognize electronic certificates in cross-border trade [21]. Similar conclusions are contained in FAO analytical materials, which emphasize that the successful digitalization of traceability systems is only possible if international models are adapted to national administrative and legal realities [22].

In this context the Chinese digital certification model appears more adaptable to Kazakhstan. Unlike the European approach, the Chinese system is based on centralized state management, where key certification, verification, and digital control functions are concentrated in the competence of specialized state bodies. This model is more consistent with Kazakhstan's legal tradition, characterized by a significant role of the state in regulating the agro-industrial complex and digital infrastructure. Moreover, the application of the Chinese model in Kazakhstan is possible and appropriate provided that legal adaptation is carried out rather than simple copying. The key elements of legal transfer should include: (1) enshrining the legal status of the digital certificate in law; (2) developing technical standards and data structure requirements; (3) establishing an institutional operator and management mechanisms; (4) ensuring international interoperability and legal admissibility of digital evidence. Such a transfer will increase export competitiveness, reduce counterfeiting risks, and improve consumer trust but will require a comprehensive reform of the normative and institutional environment.

Particular interest for Kazakhstan is the practice of introducing blockchain certification elements in China, which ensure data immutability, supply chain transparency, and the formation of an electronic evidentiary base. The application of such technologies not only enhances consumer trust but also allows digital certificates to be used as legally significant evidence in resolving trade and administrative disputes. Considering the structure of agricultural sector management in the Republic of Kazakhstan, the creation of a centralized digital certification platform under the Ministry of Agriculture with the participation of national development institutions such as "National Information Technologies" and "QazTrade" appears to be the most realistic scenario.

Thus, the discussion on the applicability of international digital certification models in Kazakhstan leads to the conclusion that selective legal borrowing, rather than mechanical implementation of foreign solutions, is appropriate. The most promising direction is the formation of a hybrid model combining the normative rigor and international orientation of the European approach with the centralized management and technological adaptability of the Chinese system. This approach will ensure the legal consistency of digital certification of organic products in Kazakhstan, increase its international recognition, and create conditions for integrating national producers into global supply chains.

## Conclusion

The conducted research confirms that digital certification and traceability systems for organic products are integral elements of modern international legal regulation of the agricultural and food sector. An analysis of the practice of the European Union and the People's Republic of China demonstrates a steady trend toward the institutionalization of digital tools, their mandatory application, and integration into cross-border trade and control mechanisms. It is the combination of normative bindingness, technological unification, and international recognition of digital certificates that ensures the competitiveness of organic products on the global market and builds a high level of trust among consumers, regulators, and trading partners.

In the Republic of Kazakhstan, the adoption of the Law and the launch of a state information system in 2025 indicate the beginning of the formation of a national digital traceability model. However, the current normative framework is predominantly framework-based and does not provide for full-fledged legal mechanisms for digital certification. In particular, there are no provisions on the mandatory use of electronic certificates, the legal force of digital evidence of product origin, or the mutual recognition of digital certificates in international trade. An additional limiting factor is the lack of integration of the national system into international digital platforms such as TRACES and ePhyto, which reduces the export attractiveness of Kazakhstani organic products.

A comparative legal analysis leads to the conclusion that the formation of a hybrid digital certification model in Kazakhstan is appropriate. Borrowing the principle of mandatory digital traceability, normative detailing of procedures, and integration with international control systems from the European model is justified. From the Chinese model, the centralized nature of digital certification management and the use of state economic incentives to accelerate the introduction of digital technologies in the agricultural sector should be adopted. This synthesis corresponds to the institutional characteristics of Kazakhstan's legal system and allows for a balance between state control and market mechanisms.

In general, the digitalization of certification processes in organic agriculture should be considered not as an auxiliary technological measure but as a strategic tool for legal ensuring food security, sustainable development, and expanding the export potential of the Republic of Kazakhstan. The comprehensive development of the normative and legal framework, institutional infrastructure, and mechanisms for international legal integration is a key condition for Kazakhstan's successful inclusion in global organic product supply chains and the fulfillment of international obligations under the WTO, EAEU, and the Paris Agreement.

While the digitalization of agriculture in Kazakhstan is generally developing predominantly in the field of agrotechnology and production process management, digital certification of organic products – with its independent legal significance for domestic control and international trade – remains insufficiently institutionalized. Addressing this imbalance requires a targeted state policy aimed at recognizing the digital agricultural certificate as a full-fledged legal tool in the national and international legal systems.

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Әлемдік органикалық өнімдер нарығының қарқынды өсуі және өнімнің түпнұсқалығы мен шығу тегінің ашықтығына қойылатын талаптардың қатаюы жағдайында органикалық өнімдерді сертификаттау және қадағалау (traceability) процестеріне цифрлық технологияларды енгізу ерекше өзектілікке ие болуда. Бұл мақалада Codex Alimentarius, Еуропалық Одақтың № 2018/848 Регламенті, IFOAM-ның жетекші қағидаттары және өзге де халықаралық бастамаларды ескере отырып, Қазақстан Республикасында цифрлық сертификаттау мен қадағалау жүйелерін енгізудің халықаралық-құқықтық аспектілері талданады.

Зерттеудің мақсаты Қазақстанның органикалық өнімдерді сертификаттау жөніндегі ұлттық жүйесін халықаралық талаптармен үйлестірудің құқықтық және институционалдық тетіктерін айқындау, сондай-ақ аграрлық сектордағы сертификаттау рәсімдерін цифрлық трансформациялауға кедергі келтіретін негізгі факторларды анықтау болып табылады.

Зерттеу әдістемесі халықаралық және ұлттық дереккөздерге салыстырмалы-құқықтық және нормативтік-құқықтық талдау жүргізуге, шетелдік цифрлық сертификаттау және қадағалау платформаларына қатысты кейс-талдауға, сондай-ақ құқықтық болжау элементтерін қолдануға негізделген.

Мақаланың ғылыми жаңалығы Қазақстанның құқықтық және технологиялық жағдайында халықаралық цифрлық сертификаттау модельдерінің қолданылу мүмкіндігін кешенді түрде бағалауда, сондай-ақ 2024 жылғы 10 маусымдағы № 89-VIII «Органикалық өнімдерді өндіру және айналымы туралы» Қазақстан Республикасының Заңын ескере отырып, сапаны бақылау мен экспорттық қызметте заңдық күші бар құрал ретінде цифрлық сертификаттарды институционализациялау қажеттігін негіздеуде көрініс табады.

Зерттеудің практикалық маңыздылығы ұлттық заңнаманы жетілдіру және цифрлық сертификаттау мен қадағалау жүйелерін интеграциялау бойынша ұсыныстар әзірлеуде, бұл қазақстандық органикалық өнімдердің экспорттық әлеуетін арттыруға және тұтынушылар мен халықаралық сауда серіктестерінің сенімін нығайтуға ықпал етуі мүмкін.

*Түйін сөздер: органикалық ауыл шаруашылығы, азық-түлік қауіпсіздігі, цифрлық сертификаттау, блокчейн технологиясы, өнімнің қадағалануы (traceability), халықаралық құқық, Қазақстан, Қытай, органикалық өнімдер, тұрақты даму.*

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В условиях стремительного роста мирового рынка органической продукции и ужесточения требований к её подлинности и прозрачности происхождения особую актуальность приобретает внедрение цифровых технологий в процессы сертификации и прослеживаемости органической продукции. Настоящая статья посвящена анализу международно-правовых аспектов внедрения цифровой сертификации и систем прослеживаемости в Республике Казахстан с учётом международных стандартов и практик, включая Codex Alimentarius, Регламент (ЕС) № 2018/848, руководящие принципы IFOAM и иные глобальные инициативы.

Цель исследования заключается в выявлении правовых и институциональных механизмов гармонизации национальной системы сертификации органической продукции с международными требованиями, а также в определении ключевых барьеров, препятствующих цифровой трансформации сертификационных процедур в аграрном секторе.

Методология исследования основана на сравнительно-правовом и нормативно-правовом анализе международных и национальных источников, кейс-анализе зарубежных цифровых платформ сертификации и прослеживаемости, а также применении элементов правовой прогностики.

Научная новизна статьи состоит в комплексной оценке применимости международных моделей цифровой сертификации в условиях правовой и технологической среды Республики Казахстан с учётом вступившего в силу Закона № 89-VIII от 10 июня 2024 года «О производстве и обороте органических продуктов», а также в обосновании необходимости институционализации цифровых сертификатов как юридически значимых инструментов контроля качества и экспорта.

Практическая значимость исследования заключается в формулировании предложений по совершенствованию национального законодательства и интеграции цифровых систем сертификации и прослеживаемости, что может способствовать повышению экспортного потенциала казахстанской органической продукции и укреплению доверия со стороны потребителей и международных торговых партнёров.

*Ключевые слова: органическое сельское хозяйство, продовольственная безопасность, цифровая сертификация, блокчейн-технологии, прослеживаемость продукции, международное право, Казахстан, Китай, органическая продукция, устойчивое развитие*

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