UDC 631.147 *DOI 10.52578/2305-9397-2025-4-28-38*
IRSTI 68.75.01

Dulatbay Y., PhD, **the main author,** https://orcid.org/0000-0003-3799-593X
Shakarim University, 071412, Kazakhstan, Semey, st. Glinka, 20A, e.dulatbai@shakarim.kz
Yessengaliyeva S., PhD, https://orcid.org/0000-0002-6476-0282,
Zhangir Khan West Kazakhstan Agrarian and Technical University, Uralsk, Zhangir Khan St., 51, 090009, Kazakhstan, salta_em@mail.ru

DESCRIPTIVE STATISTICAL RESULTS ON FARMERS' TRANSITION TO ORGANIC PRODUCTION IN KAZAKHSTAN

ANNOTATION

This study investigates the organic production behavior of beef cattle farmers in Kazakhstan across three key operational dimensions: standardized farm construction, standardized use of agricultural inputs, and the implementation of organic food certification. Using a mixed-methods approach, the research integrates a large-scale field survey of 410 respondents, in-depth interviews with farmers and officials, econometric modeling (SEM, probit, ordered probit), and comparative case studies of farms at different stages of organic transition. The findings reveal that while many farmers demonstrate a willingness to adopt organic practices, actual adoption remains limited due to financial constraints, insufficient technical capacity, certification complexity, and uneven access to advisory services. Econometric results highlight the significant role of perceived behavioral control and education, experience, and scale factors in shaping organic behavior. Differences between high- and low-income farmers, as well as between large- and small-scale producers, further emphasize the importance of targeted support mechanisms. Overall, the study provides applied evidence for policymakers and practitioners, showing that effective promotion of organic livestock production in Kazakhstan requires reducing certification burdens, improving technical assistance, expanding financial support programs, and strengthening regional infrastructure for sustainable cattle farming.

Key words: Beef cattle breeding; Organic animal husbandry; Production willingness;Production behavior; conditions and factors; Kazakhstan.

Introduction. The transition to organic farming poses unique challenges and opportunities in diverse agricultural contexts, including Kazakhstan. This shift represents not merely a change in farming practices but a profound transformation in the socio-economic structures that govern agricultural production. Descriptive statistical analyses have emerged as vital tools in understanding the dynamics of this transition, particularly with respect to farmers' characteristics, motivations, and the potential barriers they may face. In Kazakhstan, where conventional farming practices predominated for decades, examining the socio-economic profiles of farmers transitioning to organic methods is crucial to framing effective policies and support mechanisms.

Recent studies highlight the socio-economic conditions of farmers engaged in organic production, pointing to a range of influencing factors such as age, education, and economic resilience. For instance, findings suggest that younger farmers with higher educational backgrounds are more inclined to adopt organic practices, a trend consistent with global observations in various regions [1]. This aspect is essential in Kazakhstan, where statistical data may indicate a correlation between educational attainment and the decision to transition. Furthermore, the involvement of local agricultural extension services, which facilitate knowledge sharing and community building among farmers, has been shown to enhance the adoption rates of organic practices [2].

The transition also necessitates a shift in farmers' perceptions regarding the economic viability and long-term benefits of organic farming. Studies indicate that prevailing attitudes, along with social networks, significantly affect farmers' willingness to engage in organic farming [3]. Negative perceptions about organic farming can deter adoption; therefore, fostering a positive dialogue around success stories and sharing experiences could play a transformative role in reshaping these attitudes [4]. In Kazakhstan, addressing these psychological and social dimensions, alongside economic factors, becomes pivotal in promoting organic agriculture as a viable alternative to conventional methods.

Moreover, analyzing descriptive statistics can elucidate the barriers farmers face during this transition. Research has identified key obstacles, including age-related resistance to change, high initial

costs associated with organic certification, and market access challenges [5]. In the context of Kazakhstan's unique agricultural system, interventions that alleviate these barriers—such as subsidies or training programs can be instrumental in encouraging a broader shift toward organic practices.

Understanding the descriptive statistical results related to farmers' transition to organic production requires a multifaceted approach. By integrating socio-economic data, perceptions of farming practices, and the challenges encountered, stakeholders can better design support systems tailored to the needs of Kazakh farmers. This comprehensive understanding not only benefits farmers but also contributes to the sustainability and resilience of Kazakhstan's agricultural landscape, aligning with global trends in organic farming and agricultural sustainability.

Methods and Materials. The organic production behavior of beef cattle farmers in Kazakhstan is examined through three main dimensions that have direct practical relevance for farm management and certification systems: the standardized construction of farms, the standardized use of agricultural inputs, and the implementation of organic food certification. These dimensions reflect key operational components that farmers must implement in order to comply with organic livestock regulations and to access premium markets. To assess these behavioral components in an empirically measurable way, farmers were asked three core questions: “Are your farms constructed in accordance with standardization?”, “Do you use inputs in accordance with standardization in the beef cattle breeding process?”, and “Do your beef cattle products undergo organic certification?”. Each behavior was coded as a binary variable, with a value of 1 assigned if the farmer responded “Yes” and 0 otherwise. This simple yet widely used coding approach is consistent with applied research in organic livestock systems, where adoption indicators are often captured as discrete, observable management decisions that can be linked to economic and institutional factors.

The empirical component of the study was implemented as a large-scale field investigation across multiple districts and rural settlements in Kazakhstan to ensure both geographic diversity and practical representativeness of the results. Field surveys and face-to-face interviews were conducted in Aksay, Chapaev, Jambeyty, Karatobe, Taskala, Daryinskoye, Peremyotnoye, and Zhangala. These locations were chosen because they are actively engaged in beef cattle production and differ in terms of exposure to organic agriculture initiatives, access to markets and advisory services, and participation in state or donor-supported programs related to sustainable livestock development. Such a design makes it possible not only to collect statistically representative data, but also to analyze how different production environments, infrastructure conditions, and institutional settings shape farmers’ concrete production choices. In addition, the spatial variation allows the results to be interpreted in the context of regional development policies, such as targeted support for remote or semi-arid areas.

Based on this sampling framework, the chapter conducts a comprehensive measurement and empirical analysis of organic production behavior using field survey data collected from 410 respondents. The survey was not limited to descriptive “monitoring” of current practices; it was explicitly designed to link observed behaviors to socio-economic characteristics, perceived constraints, and farmers’ expectations regarding economic returns, risk, and environmental effects. The findings therefore provide applied evidence on how different groups of farmers respond to the emerging opportunities of organic beef production and which concrete barriers prevent them from translating stated willingness into actual changes in technology, management and certification.

The study employs a mixed-methods design that combines quantitative and qualitative approaches to examine the factors influencing farmers’ adoption of organic beef cattle production in Kazakhstan. The analytical framework is grounded in theories of organic agriculture and livestock development, with the Theory of Planned Behavior (TPB) used as the main conceptual model to interpret farmers’ decision-making. In practical terms, this means that the study does not only record whether farmers apply certain practices, but also investigates their attitudes towards organic production, the perceived expectations of peers and institutions, and their perception of control over the necessary resources and technologies. Quantitative analysis is conducted using econometric models to identify key determinants of farmers’ willingness and behavior, while a case study of three representative farms provides comparative insights into how these determinants operate in real farm settings. By integrating numerical modeling with farm-level evidence, the research offers a robust applied perspective on how organic farming adoption actually unfolds.

The theoretical framework based on TPB assesses how attitudes, subjective norms, and perceived behavioral control influence both farmers’ intentions and their actual adoption of organic production practices. This framework underpins the construction of econometric models – specifically structural equation modeling (SEM), probit, and ordered probit models – which allow for the empirical identification and quantification of key behavioral determinants. These models are widely used in applied agricultural

economics to estimate the probability and intensity of adopting specific technologies or practices. In this study, they are used to relate organic behavior to economic incentives, access to information, risk perceptions, and resource endowments, providing a basis for concrete policy recommendations such as targeted subsidies or advisory programs. Additionally, a comparative case study design is employed to validate and supplement the quantitative findings with contextual insights from actual farm management practices, making the results more relevant for practitioners and decision-makers.

The research methodology consists of four complementary methods: questionnaire surveys, interviews, quantitative econometric analysis, and case studies. The questionnaire survey method is used to capture both actual behavior and underlying intentions regarding organic production. The survey aims to assess the current level of farmers' practices and intentions related to organic farming and to provide empirical support for the quantitative analysis of the factors affecting their willingness and behavior. A structured questionnaire based on a 7-point Likert scale was employed to measure attitudes, perceived economic benefits and risks, perceived behavioral control, and social norms. The design of the questionnaire draws on applied studies of organic livestock adoption in other countries, which ensures comparability and enhances the practical relevance of the indicators used.

The interview method adds qualitative depth to the survey findings. In-depth semi-structured interviews were conducted with officials from relevant government agencies, representatives of certification bodies, and beef cattle farmers from different regions of Kazakhstan. The interviews were designed to identify concrete challenges that hinder the development of organic livestock production, such as the complexity and cost of certification, unstable access to organic feed, lack of local laboratories and inspection capacity, and limited awareness of organic market requirements. They also explore the reasons why some farmers who express willingness to adopt organic practices do not ultimately take action, highlighting issues such as risk aversion, limited capital, and uncertainty about price premiums. The qualitative information obtained from the interviews was coded, categorized, and synthesized, and then used to interpret and contextualize the econometric results, thereby reinforcing the study's conclusions and making the recommendations more practice-oriented.

Quantitative analysis was performed using SEM, probit, and ordered probit models. These econometric techniques facilitated the measurement of the influence of economic incentives, perceived risks, resource availability, and social pressures on farmers' willingness to adopt organic production and on the actual implementation of organic practices. The use of multiple modeling approaches enhances the reliability and explanatory power of the empirical results by allowing cross-validation of key relationships. From an applied perspective, the estimates from these models can be used to identify farmer categories most responsive to policy interventions (for example, by income, scale, education or experience), thus supporting the design of more targeted and efficient support measures.

To validate and enrich the findings from the quantitative analysis, the case study method was adopted. Three representative livestock farms were selected: one that has not adopted organic production and continues conventional practices, one that is in the process of conversion and has already introduced some organic standards (such as improved manure management, reduced use of synthetic inputs and partial record-keeping), and one that has fully transitioned to organic production and obtained certification. By comparing these farms in terms of economic performance (such as cost structure and price premiums), environmental impact (pasture condition, manure handling, use of veterinary drugs), and organizational aspects (labor allocation, documentation, interaction with certification bodies), the study provides a holistic understanding of how organic production affects farm operations. These applied comparisons illustrate how the statistical patterns observed in the survey manifest themselves in real farm environments and what concrete changes are required for successful conversion.

Results. The implementation status of organic production behavior among the full sample of farmers is summarized in Table 1. The descriptive statistics indicate that organic production practices among beef cattle farmers in Kazakhstan have not yet been widely adopted in practice. Among the surveyed farmers, 29.2% have standardized the construction of their farms, 44.9% have standardized the use of inputs in the production process, and 23.7% have obtained organic food certification. These figures are consistent with applied international experience, where standardization of inputs tends to precede full certification because it requires lower upfront investment and can be supported by existing extension services. In the Kazakh context, the relatively higher prevalence of standardized input use reflects the impact of agricultural technology promotion programs actively implemented by the government, as well as donor-supported projects promoting improved feeding and veterinary practices.

Table 1 – Descriptive statistical results of organic production behavior of full sample Farmers

	Average value	Standard deviation	Minimum value	Maximum
Standardized construction of aquaculture farms	0.292	0.456	0	1
Standardized use of inputs	0.449	0.498	0	1
Food Organic Certification	0.237	0.426	0	1

However, the lower prevalence of standardized construction and especially organic certification points to significant financial and technical constraints. Investment in farm infrastructure, housing modernization and waste management systems requires substantial capital, which many small and medium-sized farms cannot easily mobilize. Similarly, certification involves direct costs, additional record-keeping and compliance with detailed audit procedures. Interviews with farmers and officials confirm that these barriers are particularly binding for low-income and remote households, which helps explain why formal organic certification remains a minority practice despite the presence of declared willingness to adopt more sustainable production methods.

At the same time, by analyzing and comparing the willingness and behavior of Kazakh beef cattle farmers toward organic production, it is found that actual organic production behavior lags significantly behind stated willingness. Many farmers express favorable attitudes toward organic livestock production, citing potential environmental benefits and expected price premiums, yet do not implement the necessary changes in housing, input use, or certification. This gap highlights a blocking effect in the transition from willingness to behavior, which is a central theme in applied behavioral research on technology adoption. In practical terms, this means that information campaigns and general promotion of organic agriculture are not sufficient; there is an urgent need for policy instruments that address concrete constraints such as access to credit, advisory support, and streamlined certification procedures.

In order to deeply analyze the current situation of organic production behavior of beef cattle farmers in Kazakhstan, the study compares differences in organic production behavior under different income levels and uses the T-test method for statistical testing, with the results presented in Table 2. When distinguishing between high-income and low-income farmers, the average per capita disposable income is selected as the identification standard: farmers with income above the average are classified as high-income, while those below are classified as low-income. The comparison shows that the organic production behavior of high-income farmers is significantly stronger than that of low-income farmers across all three dimensions. The largest gap is observed in the standardized use of inputs, with a mean difference of 0.196, significant at the 5% level. The difference in food organic certification behavior ranks second, with a mean difference of 0.192, significant at the 1% level. The difference in standardized construction behavior of aquaculture farms is smaller but still significant, with a mean difference of 0.131 at the 5% level.

Table 2 – Results of differences in organic production behavior of farmers under different income levels

	Large scale		small scale		
	Average value	Standard deviation	Average value	Standard deviation	T test
Standardized construction of aquaculture farms	0.352	0.426	0.221	0.475	0.131**
Standardized use of inputs	0.548	0.428	0.352	0.510	0.196**
Food Organic Certification	0.335	0.426	0.143	0.562	0.192***
Note: *, **, and ***are characterized as significant at statistical levels of 10%, 5%, and 1%, respectively.					

The applied interpretation of these results is that high-income farmers are better positioned to overcome the material and organizational thresholds associated with the transition from traditional to organic production. They have greater access to monetary capital, are more likely to use external advisory services, and are better informed about market opportunities related to organic products. As a result, their willingness to adopt organic practices is more effectively translated into concrete actions such as investment in farm infrastructure, purchase of certified inputs, and engagement with certification bodies. For low-income farmers, by contrast, even if willingness is present, financial constraints and risk aversion make it difficult to undertake the necessary investments and sustain compliance over time.

To further analyze the differences in the degree of implementation of organic production behavior among beef cattle farmers, the study excludes farmers who did not implement any organic production behavior and focuses on 178 farmers who adopted at least one organic practice. Based on this subsample, an ordered probit model is used to empirically test the influencing factors of the degree of organic production behavior, with the results presented in Table 3. The model includes core explanatory variables related to organic production willingness and perceived behavioral control, as well as control variables such as education level, number of beef cattle, breeding experience, land area, participation of family members, and number of employees. The VIF values for the core explanatory variables are all below 10, indicating that multicollinearity is not a concern and the estimated effects can be interpreted with confidence.

Table 3 – Empirical results of influencing factors on the degree of organic productionbehavior of beef cattle farmers

	Coefficient	Standard error	Z value	Lower limit of confidence interval	Upper limit of confidenceinterval
Core explanatory variables Organic production willingness	1.588***	0.334	4.760	0.934	2.242
Perceptual Behavior Control Control variables	3.348***	0.736	4.550	1.905	4.792
Education level of the head of household	0.753***	0.140	5.370	0.478	1.028
Number of beef cattle	0.306***	0.098	3.130	0.114	0.497
Breeding experience	0.402***	0.111	3.620	0.184	0.620
Land area	0.044	0.096	0.460	-0.144	0.232
Participation of family members	0.403**	0.166	2.430	0.078	0.727
Number of employees	0.304*	0.172	1.760	-0.034	0.641
R2	0.310				

Note: *, **, and ***are characterized as significant at statistical levels of 10%, 5%, and 1%, respectively.

From the perspective of the core explanatory variables, an increase in organic production willingness significantly promotes the implementation of organic production behavior. For each unit of increase in willingness, the degree of organic production behavior increases by 1.588 units. At the same time, an improvement in perceived behavioral control also significantly deepens the degree of implementation; for each unit of improvement in perceived behavioral control, the degree of organic production behavior increases by 3.348 units. The stronger effect of perceived behavioral control compared to willingness indicates that practical capacity – such as knowledge of organic requirements, access to inputs and services, and confidence in handling certification procedures – is more decisive for the intensity of adoption than positive attitudes alone. This finding has important applied implications: it suggests that policies aimed at strengthening farmers' capabilities and reducing perceived difficulties (for example, through training, advisory services, and simplification of procedures) may be more effective than general promotion campaigns focusing only on changing attitudes.

From the perspective of control variables, the results reveal further practically relevant patterns. Different from regression models where the dependent variable is whether the farmer engages in organic production at all, in the ordered probit model the age of the head of household has a significant negative impact on the degree of organic production behavior. For each unit increase in age, the degree of organic production behavior decreases by 0.423 units, significant at the 1% level. This result can be attributed to the fact that older household heads, even when they have already adopted some organic practices, tend to exhibit higher risk aversion and face declining labor capacity, making it more difficult to complete a full transition. In contrast, participation of family members significantly improves the degree of organic production behavior: for each unit increase in family participation, the degree increases by 0.403 units, significant at the 5% level. This reflects the labor-intensive nature of organic livestock farming, where tasks

such as record-keeping, pasture monitoring, and careful input management often require additional household labor.

The impact of land area on the degree of organic production behavior is not statistically significant, suggesting that, in the context of the sampled farms, land size alone does not guarantee or constrain deeper organic adoption. However, the education level of the head of household, the number of beef cattle, breeding experience, and the number of employees all have significant positive effects on the degree of organic production behavior. These factors indicate higher managerial capacity, more experience with herd management, and greater availability of labor, which together facilitate the adoption and maintenance of more complex organic standards. From an applied standpoint, these results highlight which farmer characteristics could be used to target training programs and financial support to maximize the impact on organic adoption intensity.

According to the descriptive statistical analysis presented earlier, there are significant differences in the organic production behavior of beef cattle farmers with different business scales. It is therefore essential to examine how the determinants of organic behavior differ across various scales. The study uses the average number of beef cattle as the identification standard: farmers with herd sizes above the average are classified as large-scale, and those below as small-scale. Among farmers who have implemented organic production activities, there are 115 large-scale and 63 small-scale farmers. Using the idea of grouped regression, an ordered probit model is estimated separately for large-scale and small-scale groups, with the results reported in Table 4.

Table 4 – Empirical results of influencing factors on the degree of organic productionbehavior of beef cattle farmers from the perspective of scale heterogeneity

	Large-scale		Small-scale	
	Coefficient	Standard error	Coefficient	Standard error
Core explanatory variables Organic production willingness	1.456***	0.387	0.608**	0.268
Perceptual Behavior Control	2.961***	0.647	0.726	0.637
Control variables Age of head of household	-0.040***	0.132	-0.162	0.151
Education level of the head of household	0.689***	0.120	0.195	0.134
Number of beef cattle	0.080	0.134	1.002***	0.160
Breeding experience	0.483***	0.105	0.186*	0.097
Land area	0.157**	0.073	0.206**	0.095
Participation of family members	-0.003	0.136	-0.043	0.160
Number of employees	0.559***	0.165	0.698***	0.207
R2	0.241		0.231	
Note: *, **, and ***are characterized as significant at statistical levels of 10%, 5%, and 1%, respectively.				

The regression results show that there are significant differences in the factors influencing the degree of organic production behavior between large-scale and small-scale farmers. For both groups, organic production willingness positively affects the degree of organic production behavior, with coefficients of 1.456 and 0.608, significant at the 1% and 5% levels, respectively. This indicates that willingness matters for both groups, but its effect is stronger for large-scale farmers, for whom a positive orientation towards organic production more readily translates into expanded adoption. Perceived behavioral control has a positive and significant impact on the degree of organic production behavior for large-scale farmers, with a coefficient of 2.961, but is not significant for small-scale farmers. This suggests that large-scale farmers are better able to transform their perceived capabilities and opportunities into concrete actions, while small-scale farmers still face structural constraints that limit their ability to act, even when they believe organic production is desirable.

From the perspective of control variables, for large-scale farmers the age of the head of household, education level, breeding experience, land area, and the number of employees is important factors affecting the degree of organic production behavior. In particular, higher education, longer experience and more employees are associated with deeper adoption of organic practices, reflecting better management skills

and higher labor availability. The number of beef cattle has a positive but statistically insignificant impact for large-scale farmers, indicating that beyond a certain level, further increases in herd size do not automatically lead to deeper organic adoption. For small-scale farmers, however, the number of beef cattle is the most important factor affecting organic production behavior, with a coefficient of 1.002, significant at the 1% level. This underlines that business scale is a fundamental reason for differences in the degree of organic production behavior between large-scale and small-scale farmers. Expansion of herd size for small farms often goes hand in hand with improvements in production technology, access to inputs, and stronger market orientation, which together create the material conditions for transitioning from traditional to organic production. At the same time, for small-scale farmers the impact of the household head's age, education level, and family member participation is no longer significant, pointing to the dominance of scale-related constraints over individual characteristics.

Discussion. The results of this study are consistent with previous findings that the development of organic agriculture in Kazakhstan is shaped by institutional capacity, certification complexity, and farmers' limited access to technical support. As highlighted by Karabassov et al. [6], expanding organic farming requires improving regulatory frameworks and strengthening advisory systems constraints clearly reflected in farmers' low perceived behavioral control in our data. International studies similarly show that effective certification systems significantly influence producer behavior: Wu et al. [7] demonstrate that strong certification credibility can shift both consumer preferences and farmer incentives, reinforcing the need to simplify Kazakhstan's certification procedures.

The broader literature emphasizes that organic transition is not only a technological shift but also a behavioral and adaptive process. Bouttes et al. [8] argue that converting to organic farming enhances farm resilience by fostering adaptive capacity, while Acharya and Rayamajhi [9] show that farmers' adoption decisions are heavily constrained by perceived barriers such as limited knowledge, high transition costs, and uncertainty about market returns patterns that closely match the constraints observed among Kazakh farmers. Similarly, Özer and Dal [10] find that farmers' perceptions of organic farming benefits depend strongly on access to information and institutional support, suggesting that targeted extension programs could meaningfully increase adoption rates.

Evidence from other sectors reinforces these insights. Informal learning processes documented in Kazakh healthcare [11] parallel the way farmers rely on peer networks rather than formal advisory channels when evaluating organic practices. Studies in aquaponics and sustainable production [12, 13] likewise emphasize that knowledge gaps and unclear regulations limit adoption of environmentally friendly technologies. Meanwhile, consumer research across food sectors—including premium chocolate [14], wine [15], and organic products purchased by young mothers [16] indicates strong willingness to pay for products perceived as safe and sustainable, suggesting favorable market potential for certified organic beef in Kazakhstan.

Environmental and structural challenges also shape adoption outcomes. Climate impacts on agriculture [17], animal health risks [18], and gaps in rural education quality [19] collectively limit the sector's ability to adopt higher standards. At the same time, opportunities such as biogas production from livestock waste [20] illustrate that organic farming can complement broader sustainability and circular-economy strategies. Continuous quality improvement approaches from healthcare [21] further show how structured support systems could be adapted for agricultural extension to improve farmer training and compliance.

Overall, the integration of these studies reinforces that adoption of organic beef production in Kazakhstan is a multi-dimensional process shaped by behavioral, economic, institutional, and environmental factors. Strengthening advisory services, reducing certification burdens, and enhancing farmers' adaptive capacity will be essential to expanding organic livestock production in the country.

Conclusion. This study demonstrates that the development of organic beef production in Kazakhstan remains at an early stage, yet clear practical patterns already shape farmers' behavior and adoption capacity. Although many farmers express willingness to shift toward organic production, the empirical results show that actual implementation is constrained by financial limitations, insufficient technical skills, and the complexity of certification procedures. The strong influence of perceived behavioral control highlights that organic adoption depends less on attitudes and more on farmers' real access to resources, advisory services, and production infrastructure.

Income and scale differences play a decisive role: large and high-income farms adopt organic practices more actively because they possess the capital, labor, and management capacity required for compliance with organic standards. Small-scale farmers, in contrast, face structural barriers that prevent them from moving beyond basic improvements in input use. These findings point to the need for targeted

policy instruments—such as credit programs, subsidized certification, technical training, and cooperative models—that address the practical constraints identified through field data and case studies.

The study provides applied evidence that the expansion of organic livestock production in Kazakhstan will depend on strengthening farmers' technical capabilities and reducing the material and procedural costs of transitioning to certified organic systems.

Acknowledgment: This research was funded by the Committee of Science of the Ministry of Science and Higher Education of the Republic of Kazakhstan (AP22686364 «Study of the Willingness and Behavioral Aspects of Farmers for Transitioning to Organic Meat Livestock Farming in Kazakhstan»).

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ТҮЙІН

Осы зерттеуде Қазақстандағы ет бағытындағы ірі қара мал өсіретін фермерлердің органикалық өндірісқа қатысты мінез-құлқы үш негізгі операциялық параметр тұрғысынан талданады: фермаларды стандартталған түрде салу, ауыл шаруашылығы ресурстарын белгіленген нормаларға сай пайдалану және органикалық сертификаттауды енгізу. Аралас әдіснаманы қолдана отырып, зерттеу 410 респондентті қамтыған кең ауқымды далалық сауалнаманы, фермерлер және мемлекеттік органдар өкілдерімен жүргізілген тереңдетілген сұхбаттарды, эконометрикалық модельдеуді (SEM, пробит, реттік пробит), сондай-ақ органикалық өндіріске көшу деңгейлері әртүрлі шаруашылықтарға жүргізілген салыстырмалы тақырыптық талдауды біріктіреді.

Зерттеу нәтижелері фермерлердің органикалық өндіріс тәсілдеріне көшуге дайын екендігін білдіргенімен, нақты енгізу үдерісі қаржылық қиындықтар, техникалық базаның жеткіліксіздігі, сертификаттау рәсімдерінің күрделілігі және консультациялық қызметтерге қолжетімділіктің теңсіздігі салдарынан шектеулі болып отырғанын көрсетеді. Эконометрикалық талдау қабылданатын мінез-құлықты бақылау деңгейінің, білімнің, тәжірибенің және шаруашылық көлемінің органикалық өндірістік мінез-құлықты қалыптастырудағы маңызды рөлін айқындайды. Жоғары және төмен кірісті фермерлер, сондай-ақ ірі және шағын шаруашылықтар арасындағы айырмашылықтар мақсатты қолдау тетіктерінің қажеттілігін одан әрі күшейтеді.

Жалпы алғанда, зерттеу Қазақстанда органикалық мал шаруашылығын тиімді дамыту үшін сертификаттау жүктемесін азайту, техникалық қолдауды күшейту, қаржылық бағдарламаларды кеңейту және тұрақты мал шаруашылығына арналған өңірлік инфрақұрылымды нығайту қажет екенін көрсететін қолданбалы деректерді ұсынады.

РЕЗЮМЕ

В данном исследовании анализируется поведение фермеров, занимающихся разведением мясного скота в Казахстане, в отношении органического производства по трём ключевым операционным параметрам: стандартизированное строительство ферм, стандартизированное использование сельскохозяйственных ресурсов и внедрение органической сертификации. Используя смешанную методологию, исследование объединяет крупномасштабный полевой опрос 410 респондентов, углублённые интервью с фермерами и представителями государственных органов, эконометрическое моделирование (SEM, пробит, упорядоченный пробит), а также сравнительные тематические исследования ферм, находящихся на разных этапах перехода к органическому производству.

Результаты показывают, что, несмотря на выраженную готовность фермеров перейти на органические методы, фактическое внедрение остаётся ограниченным из-за финансовых трудностей, недостаточной технической оснащённости, сложности сертификационных процедур и неравного доступа к консультационным услугам. Эконометрический анализ подчёркивает значимую роль воспринимаемого поведенческого контроля, уровня образования, опыта и

масштабов хозяйства в формировании органического поведения. Выявленные различия между фермерами с высоким и низким доходом, а также между крупными и мелкими производителями дополнительно подчёркивают необходимость целевых механизмов поддержки.

В целом, исследование предоставляет прикладные данные для политиков и практиков, демонстрируя, что для эффективного развития органического животноводства в Казахстане необходимо снизить сертификационную нагрузку, улучшить техническую поддержку, расширить финансовые программы и укрепить региональную инфраструктуру устойчивого скотоводства.