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Original article

THE REGIONAL COMMUNITY'S REQUEST FOR THE QUALITY OF FARM FOOD (BASED ON THE EXAMPLE OF RESIDENTS OF THE STAVROPOL KRAI, RUSSIAN FEDERATION)

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Abstract

The article is devoted to the definition of the regional community's request for the quality of farm food products through their perception models. The topic of food quality assessment from the consumers' point of view is relevant and is widely discussed in the scientific community. The directions of modern discourse in the subject area are: systematic state control over compliance with regulatory requirements for the production and food quality; strengthening consumer confidence and ensuring public health through nutrition; characteristics of a food product in terms of the information load of packaging, its environmental friendliness for high-quality product storage, subsequent disposal of packaging materials; promotion of modern technologies for processing, storage, and waste disposal. In the empirical part of the study we developed model for studying the request of the regional community for the quality of farm food. It was used in a survey of the population of Stavropol Krai (Russia). The survey of 812 respondents was organized in electronic form. The database was processed by the SPSS Statistics program (version 27) – factor analysis, Rotation Method: Varimax with Kaiser Normalization. The actual model of consumer request for the quality of farm food consists of 2 structural components: commitment to certain producers – the choice of farm food products based on trust in the brand, official information and labelling; situational choice of farm food prod-

ucts based on a visual assessment of the product, packaging and current price. The obtained research data will help the farming community to position their products correctly and consider the prospects of going beyond the region.

Keywords: quality; regional community's request; quality of farm food; food quality assessment

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Научная статья

ЗАПРОС РЕГИОНАЛЬНОГО СООБЩЕСТВА НА КАЧЕСТВО ФЕРМЕРСКИХ ПРОДУКТОВ ПИТАНИЯ (НА ПРИМЕРЕ ЖИТЕЛЕЙ СТАВРОПОЛЬСКОГО КРАЯ)

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Аннотация

Статья посвящена изучению запроса регионального сообщества на качество фермерских продуктов питания через модели их восприятия. Тема оценки качества продуктов питания с точки зрения потребителей является актуальной и широко обсуждается в научном мировом сообществе. Направлениями современного дискурса в предметной области являются: системный государственный контроль за соблюдением нормативных требований к производству и качеству продуктов питания; укрепление доверия потребителей и обеспечение здоровья населения через питание; характеристика продукта питания с точки зрения информационной нагрузки упаковки и ее экологичности для качественного хранения продукта и последующей утилизации упаковочных материалов; продвижение современных технологий переработки, хранения, утилизации отходов. В эмпирической части исследования разработанная теоретическая модель изучения запроса регионального сообщества на качество фермерских продуктов питания была использована в опросе населения Ставропольского края (Россия). Опрос 812 респондентов организован в электронной форме. База данных обработана программе SPSS Statistics (версия 27) – факторный

анализ, выполнен Rotation Method: Varimax with Kaiser Normalization. Фактическая модель потребительского запроса на качество фермерских продуктов питания состоит из 2 структурных компонентов: приверженность определенным производителям – выбор фермерских продуктов питания, обусловленный доверием к бренду, официальной информации и маркировке; ситуационный выбор фермерских продуктов питания, основанный на визуальной оценке продукта, упаковки и текущей цене. Полученные данные исследования помогут фермерскому сообществу правильно позиционировать свою продукцию и рассматривать перспективы выхода за пределы региона.

Ключевые слова: качество; запрос регионального сообщества; качество фермерской еды; оценка качества продуктов питания

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Introduction

Government support for rural areas and the development of small businesses in Russia have had a positive impact on the production of farm products. Farm food in Russia is not just a tribute to fashion or a commitment to organic (natural) food. There are traditional national products that, through daily food consumption, preserve the health of the nation, strengthen the bond of generations, and help raise healthy children. In 2022, Russians ordered more than 600 billion roubles worth of food products online (40% more than in 2021) [1]. According to the estimates of the Rosselkhoznadzor (The Federal Service for Veterinary and Phytosanitary Supervision), by the end of this year 2023, the volume of the Russian online food sales market will amount to more than 700 billion roubles, of which 50 billion may be orders for farm products [1]. The role of online marketplace is extremely important for farmers as they provide producers with direct access to customers [19]. The sale of food products online is considered more environmentally friendly: when selling goods on marketplaces, manufacturers regulate the supply chain independently and adjust supply to demand, minimizing storage losses.

The quality of food is an important component of the life of society. Russia is ranked 42nd in the world in terms of food quality (food security index – 67) [25]. The index structure contains 3 evaluation criteria: food availability, sufficiency, and food quality. In Russia, the index of food availability is 70.5, suffi-

ciency – 61, quality – 75.2 [25]. Thus, the quality indicator is slightly higher in value than the rest, which indicates a lot of attention to it. Despite the proximity of producers of farm products to consumers due to low production volumes and orientation to the local market, the question of the perception of farm products by the population and their willingness to purchase them remains open.

In this regard, our study is devoted to determining the regional community's request for the quality of farm food through models of their perception.

The topic of food quality assessment from the point of view of consumers is relevant and is widely discussed in the scientific world community. The authors of the study S. Felletti, N. Marchetti, Ch. De Luca, et al. speak about the dangers of pesticides that are detected during food quality control [12]. The authors' conclusion is related to the strengthening of food quality control and safety assessment based on the analysis of liquid chromatography data. In general, such conclusions confirm the relevance of the study of the issue of food quality, including farm products.

The authors of the article Sh. Qi, E.M. Hamed, P. Ma, et al. link food safety issues with a public health problem [30]. According to the authors, systematic state control over compliance with regulatory requirements for food production and quality strengthens consumer confidence and is an important measure to ensure public health.

Modern technologies are widely used in the production, processing, and packaging of food products. One of these technologies is the use of nanoscale materials. The study by Y. A. Wahab, L.A. Al-Ani, I. Khalil, and et al. presents a systematic review of the use of nanomaterials as packaging additives [45]. The results show that this leads to an improvement in the safety and shelf life of food products. The fact of low environmental impact is also important. The generalized conclusions of the authors are important for ensuring the quality, safety and control of the food industry. The value of the completed research also lies in a broader view of the problem of ensuring food quality through environmentally friendly packaging. For our research, it is important to characterize the food product in terms of the information load of the packaging and its environmental friendliness for high-quality product storage and subsequent disposal of packaging materials [13; 44].

In the discussion on the application of modern technologies in ensuring food quality, we turn to the results of the study by N. Luo, D. Xu, B. Xing, et al. [21]. The authors show the possibilities of spectroscopic technologies for assessing the quality of food products. Among the advantages is a non-destructive procedure for diagnosing the food quality, which is carried out quickly and is convenient to use.

In the future, it is planned to create a database reflecting the relationship between spectral indicators and specific target values of food quality. Thus, it is possible to judge the importance of modern technologies in ensuring food quality control (nanotechnology, spectral analysis technologies, etc.). The issue is not only the use of these technologies, but also the consumers' awareness of the possibilities of ensuring and controlling the quality of food products.

Another emerging area of improving the quality of food storage is technology using a magnetic field. The authors of the study S. Zhao, J. Wu, Zh. Guo, et al. conducted a systematic review of publications that address the effectiveness of cooling and freezing technologies using a magnetic field to improve the quality of various food products, including fruits and vegetables, meat, rice, emulsions and products made from them [48]. As a result of the analysis they determined the influence of various types of magnetic field, its intensity, processing time and other conditions on the quality of food products. The scientific discussion describes the trend towards the industrial application of cooling and freezing technologies using a magnetic field and strategies for optimizing this process in the food industry.

Summarizing the information block in the literature review devoted to the use of modern technologies in ensuring food quality, we can conclude that they are of high importance [20; 34].

Consumer opinion plays an important role in assessing the quality of food. It is necessary to conduct systematic work in the organization of monitoring the quality of food by consumers at the regional level (in working with regional brands), to ensure the independence and representativeness of such monitoring. Among the scientific papers provided in the science-intensive Scopus database, we would like to draw attention to the results of a nationwide survey conducted among 987 consumers throughout the Slovak Republic. The authors of the study L. Bartková, L. Veselovská (based on the experience and opinions of consumers) formulated recommendations for brand owners to improve the quality of food [6].

Speaking about the long-term effect of food quality on the population, we turn to the discussion about products with an edited genome. Some authors emphasize in their research that there is a heterogeneous opinion about the use of gene modification technologies in relation to food. Among the constructive proposals is to improve consumer awareness of the impact of this technology on the consumer properties of food and consumer health. Improved communication with consumers provides an understanding of the ways to improve the work on food quality assurance [3; 8].

Another important aspect of working with food consumers is optimizing consumption to reduce the amount of discarded food. In the study the authors Ch. Sharma and J.M. Deutsch analyze the possibilities of recycling waste (discarded food) and the use of biotechnologies for the benefit of the environment. Among the important conclusions made by the authors of the article is the need to study communication and consumer perception of biotechnologies, which will provide a positive impetus to the development of waste recycling [36].

There is an interesting discussion is about the benefits of biotechnologies, which not only have an economic effect for agricultural producers, but also have a positive effect on the environment and human health [23]. In the process of studying the opinions of food consumers, scientists have identified a number of contradictions. Thus, Canadian consumers say that they do not trust GM (genetically modified) products, but when consumers make decisions about buying food in grocery stores, price is a key factor determining the purchase. Genetically modified foods are important because of their ability to increase yields, resist disease and adverse weather conditions, and improve nutritional quality. However, their use is controversial due to concerns about food safety, benefits and risks associated with their consumption [24].

A number of publications highlight the issue of consumers' attitude to food quality, various characteristics that are important when choosing products, evaluating their usefulness, and trusting brands, including farm (organic) food [4; 10; 18].

Modern society is faced with the problems of new diseases of a complex nature, unexplored viral infections. In this regard, there is an increasing interest in the possibilities of achieving a speedy recovery or prevention of systemic diseases and epidemics through nutrition. The authors confirm the public's interest in various aspects of medicinal products [40]. Feedback from consumers helps to promote products that are healing for physical well-being based on the request [11; 29; 41].

Due to the development of network trading companiesretail chains, there is a risk of reducing agro-biodiversity in food chains due to the unification of products. A study conducted by the authors Y. Chiffoleau, T. Dourian, G. Enderli, et al. showed that consumers do not think about this problem and their choice of food in supermarkets does not affect the reduction of biological diversity of crops, which generally negatively affects the sustainability of agriculture [9, 46]. Despite the opinions of the respondents, it remains an important task to monitor market trends, create a food environment conducive tothat supports agro-biodiversity, as well as inform modern consumers about the benefits of new technologies in the agricultural sector [31].

Monitoring the perception of food quality and safety by consumers in social supermarkets contributes to decision-making aimed at reducing food poverty and reducing food waste, optimizing the process of purchasing food using various digital solutions [5; 7; 14; 15; 17; 35].

According to the results of a number of studies, residents are reluctant to change their usual food structure and switch to new formats, for example, alternative protein foods [47]. This underlines the relevance of offering organic, farm-grown food products using modern technologies for processing, storage, packaging and labelling of these food products. According to the authors J. Aschemann-Witzel, D. Asioli, M. Banovic, et al. – ensuring the prospects for protein demand in a sustainable food system occurs through several alternative and new sources [2]. But currently, consumers are not prepared for their perception. According to the results of a survey of 2,405 respondents in five European countries, consumers have mostly positive emotions about eating processed foods. A more pronounced positive effect is observed in the socio-demographic groups "youth" and "women". For our study it is important to conclude about the most significant socio-demographic groups for the promotion of farm food.

In connection with new offerings in the traditional food line, assessments of the readiness to consume food innovations are important consumer opinion studies. The scientific group conducted a study of the opinions of 1,064 German consumers and concluded that one third of the sample demonstrates openness to combining products to obtain new tastes [37]. What is very important for our research is that the most open consumers are active adherents of organic/farm food products.

Social networks represent a huge information field, which reflects, among other things, information about people's consumer preferences. It is possible to determine people's attitude to food and the main trends in its consumption through the analysis of social media texts. The study presents a secondary analysis of data based on the results of surveys of food consumers and an analysis of trends in consumer statements on social networks (the PRISMA program was used). An important conclusion of the authors is the statement about the significant influence of social networks on consumer preferences of modern society in the field of choosing products for everyday nutrition [16].

In general, the analysis of publications devoted to the assessment of food quality, farm (organic) food products, innovations in the production and processing of agricultural products, the attitude of consumers to modern trends in food and the assessment of their quality allows us to formulate a number of conclusions:

1. Issues of food quality, including farm products, remain on the relevant research agenda regardless of the region of the world and the level of socio-economic development of the regions.

2. Active systematic involvement of consumers in food quality assessment is an important task in the organization of independent monitoring in national systems for ensuring the quality of agricultural products, their processing, and storage of food products.

3. Monitoring the perception of food quality and safety by consumers in social supermarkets contributes to decision-making; it is aimed at reducing food poverty and reducing food waste, optimizing the process of purchasing food using various digital solutions.

4. A small proportion of food consumers track and confidently understand modern technological innovations in food processing, packaging and storage, which makes it difficult to positively assess and consumer demand for such food. In this regard, it is necessary to conduct systematic educational work in the consumer environment and seek the adoption of innovations that ensure modern food quality, including taking into account the specifics of the work of chain stores.

5. The agro-ecological systems of the regions are linked to consumer trends in the field of food, support is needed not only for diversity, but to preserve the sustainability of agriculture and ecology, for the traditional production of organic/farm food in the frame of rural areas' sustainable development.

Purpose. Our study is devoted to determining the regional community's request for the quality of farm food through models of their perception.

Materials and methods

The study of the regional community's request for the quality of farm food was conducted in Stavropol Krai (Russia) by electronic questionnaire in April-May 2024. A total of 812 people took part in the survey. The stratified sample was implemented in 7 municipalities of Stavropol Krai, covering the territory according to the typification of the socio-economic situation (Stavropol, Nevinnomyssk, Pyatigorsk, Izobilnensky district, Kochubeyevsky district, Budennovsky district, Ipatovsky district). The theoretical model of the request for the quality of farm food reflects important, from the point of view of theoretical analysis, criteria related to the price of the product, trade dress, brand, information about the GOST (regulated standards) or TS (technical specification), imported or domestic production, the presence of preservatives, chemicals, nitrites, GMO, the availability of information about the benefits and naturalness,

the quality of packaging and packaging. The survey participants from among the residents of Stavropol Krai assessed each criterion for its importance in choosing farm food. A five-point scale was used for measurements, where 1 point indicates the lowest significance of the selection criterion and 5 points indicate the highest significance. The respondents could put any value from 1 point to 5 points, depending on their opinion.

Results

The results of a survey in which participants – representatives of the regional community of Stavropol Krai – evaluate farm food products depending on the significance of the characteristics: product price; trade dress; brand; information about GOST or TS; import or domestic production; without preservatives, chemicals, nitrites, GMO; availability of information about benefits and naturalness; packaging and packing.

The use of statistical factor analysis procedures to develop a structural model of significant criteria for evaluating farm food products makes it possible to determine the full explained variance. According to the results of statistical processing of the database of the expert survey in the SPSS Statistics program (version 27), the full explained variance was 84.286% and was determined by 2 components. The data is presented in table 1.

Table 1.

Full explained variance of the expert assessment

Component	Initial eigenvalues			Sums of squares of extraction loads			Sums of squares of rotational loads		
	Total	Discrepancy %	Cumulative %	Total	Discrepancy %	Cumulative %	Total	Discrepancy %	Cumulative %
1	5.469	68.361	68.361	5.469	68.361	68.361	3.667	45.833	45.833
2	1.274	15.925	84.286	1.274	15.925	84.286	3.076	38.453	84.286
3	0.448	5.594	89.881						
4	0.333	4.166	94.047						
5	0.299	3.743	97.790						
6	0.082	1.031	98.822						
7	0.053	0.659	99.481						
8	0.042	0.519	100.000						

Compiled by the authors

The listed 8 components in the theoretical model of criteria for choosing farm food were evaluated by the participants of the expert survey on a five-point scale. As a result of the factor analysis performed by Rotation Method:

Varimax with Kaiser Normalization (Rotation converged in 3 iterations), the criteria were grouped into 2 structural components.

Table 2.

The selection of farm food by the regional community (a matrix of rotated components describing the criteria's structure)

Criteria for the selection of farm food	Component	
	1	2
1. Product price	0.216	**0.904**
2. Trade dress	0.147	**0.938**
3. Brand	**0.953**	-0.086
4. Information about GOST or TS	**0.774**	0.503
5. Import or domestic	**0.803**	0.336
6. Free of preservatives, chemicals, nitrates, GMO	**0.684**	0.531
7. Availability of information on the benefits and naturalness	**0.765**	0.470
8. Packing	0.625	**0.709**

Compiled by the authors

The data on the interpretation of the structural elements of the model describing the criteria for the selection of farm food by the regional community are presented in the table 3.

Table 3.

Interpretation of the structural elements of the model

The structural component of the model	Variables that determine the content of the structural component with a coefficient of factor loading	Interpretation of the structural component of the model
1st structural component	Brand (**0.953**); import or domestic (**0.803**); information on GOST or TS (**0.774**); availability of information on benefits and naturalness (**0.765**); without preservatives, chemicals, nitrites, GMO (**0.684**).	Commitment to certain producers is the choice of farm food products based on trust in the brand, official information and labelling.
2nd structural component	Trade dress (**0.938**); product price (**0.904**); packaging (**0.709**).	Situational selection of farm food products is based on a visual assessment of the product, packaging and current price.

Compiled by the authors

Thus, the implementation of factor analysis by the method of selecting the main components distributed 8 criteria for choosing farm food products into

2 structural components of the current model of preferences of the regional community:

1. Commitment to certain producers is the choice of farm food products, based on trust in the brand, official information and labelling. The share of component 1 in the fully explained variance is 45.833%.

2. Situational selection of farm food products is based on a visual assessment of the product, packaging and current price. The share of component 2 in the fully explained variance is 38.453%.

The conducted research shows a mathematically based structural model of the choice of farm food by the regional community.

Conclusion. The conducted research of the regional community's request for the quality of farm food makes it possible to draw theoretical and applied conclusions.

In the theoretical part, based on the traditional review of publications, it was established:

– issues of food quality, including farm products, remain on the relevant research agenda regardless of the region of the world and the level of socio-economic development of the regions;

– active systematic involvement of consumers in food quality assessment is an important task in the organization of independent monitoring in national systems for ensuring the quality of agricultural products, their processing, storage and food products;

– monitoring the perception of food quality and safety by consumers in social supermarkets contributes to decision-making, it is aimed at reducing food poverty and reducing food waste, optimizing the process of purchasing food using various digital solutions;

– a small proportion of food consumers track and confidently understand modern technological innovations in food processing, packaging and storage; it decreases a positive assess and consumer demand for such food. In this regard, it is necessary to conduct systematic educational work in the consumer environment and seek the adoption of innovations that ensure modern food quality, taking into account the specifics of the work of chain stores.

– the agro-ecological systems of the regions are linked to consumer trends in the field of food and it is necessary to support not only diversity to preserve the sustainability of agriculture and ecology, but also the traditional production of organic/farm food for the rural areas' sustainable development.

In the empirical part, an actual model of consumer demand for the quality of farm food products has been developed, which consists of 2 structural components:

– commitment to certain producers – the choice of farm food products based on trust in the brand, official information and labelling;

– situational choice of farm food products, based on a visual assessment of the product, packaging and current price . Packaging allows the consumer to notice the product on the counter among others and helps to make a first impression about it. Package appearance (shape, size, color, texture, image) it is able to draw attention to the product and influence the purchase decision [48].

The price also affects the choice: it is more likely to choose a product whose price is clearly visible, the price tag is located exactly under the product, corresponds to the size of the product and carries elements of the corporate identity of the store where the product is sold.

The obtained research data will help the farming community to position their products correctly and consider the prospects of going beyond the region.

Ethics Committee Conclusion. The survey was conducted on the principles of anonymity in accordance with the ethics of sociological research. Personal data or individual opinions of survey participants are not mentioned. The analysis uses generalized data (digital database) processed in the SPSS Statistics program (version 27).

Заключение комитета по этике. Опрос проведен на принципах анонимности в соответствие с этикой организации социологических исследований. Персональные данные или отдельные мнения участников опроса не упоминаются. В анализе использованы обобщенные данные (цифровая база данных), которые обработаны в программном пакете SPSS Statistics program (version 27).

Informed consent. Not applicable to mass sociological research conducted on an anonymous basis.

Информированное согласие. Не применимо для массовых социологических исследований, проведенных на условиях анонимности.

Conflict of interest information. There are no conflicts of interest.

Информация о конфликте интересов. Конфликт интересов отсутствует.

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