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CULINARY NUTRITIONOLOGY AS A NEW SCIENTIFIC DISCIPLINE: KEY ASPECTS AND SUBJECT OF RESEARCH

Summary. *In this article, culinary nutritionology is considered as an evolving, interdisciplinary field of science that combines the knowledge and approaches of nutritionology, nutrition science, and culinary traditions. The theoretical and methodological foundations of culinary nutritionology are revealed, including nutriological, technological, cultural-behavioral, interdisciplinary, and systemic approaches. Within the framework of this work, culinary nutritionology as a scientific discipline was conceptualized. Its main characteristics were determined, and the object and subject of the study were highlighted. Special attention was paid to the study of the effect of culinary processing on the structure of the food matrix and the assimilation of biologically active substances. The paper considered the main directions and tasks of culinary nutritionology, as well as the areas of its practical application, including educational, advisory, and digital formats. Some problems and limitations that arise during the development of this scientific field have been identified. In conclusion, the conclusion was made about the high scientific and practical importance of culinary nutrition and the need for its further development.*

Key words: *culinary nutritionology, nutrition, nutritional value, bioavailability of nutrients, culinary processing, food matrix, nutritional behavior, food literacy, interdisciplinary approach, healthy nutrition.*

Relevance of the study. In recent years, there has been a growing interest in nutrition in scientific circles and society as a whole, as one of the most important factors determining human health and quality of life. An unbalanced diet is recognized as one of the main risks of developing non-communicable diseases, including cardiovascular diseases, obesity, and diabetes mellitus. This highlights the importance of careful study of not only the composition of food products, but also the factors affecting their nutritional value.

Modern scientific research in the field of nutrition demonstrates that the biological value of food is determined not only by the initial content of nutrients, but also by how it was prepared. Thermal and mechanical treatment, storage conditions, and the combination of ingredients can significantly affect the amount of vitamins, minerals, and other biologically active compounds, as well as their bioavailability.

At the same time, there is a growing interest in gastronomic traditions as part of everyday culture. This is due to the spread of ideas of a healthy lifestyle, functional nutrition, and conscious consumption. Scientific research shows that culinary customs and modern cooking technologies significantly affect eating behavior and diet formation, and hence human health.

Despite extensive research in the field of nutrition and food technology, these areas often develop in isolation from each other. This leads to the fact that many issues related to the effect of culinary processing on the nutritional properties of food remain insufficiently studied. In this regard, there is an urgent need to create an interdisciplinary scientific field that will combine the approaches of nutrition and cooking.

Thus, the relevance of the research topic is due to the need to systematize knowledge about the relationship between cooking methods and its nutritional value. It is also important to scientifically substantiate the principles that will help preserve and enhance the biological value of the human diet.

The purpose of the study. The purpose of this study is to theoretically substantiate culinary nutritionology as a new interdisciplinary scientific field, to determine its conceptual foundations, object, subject, main directions, and practical significance.

Materials and research methods. The research materials used were scientific articles in the field of nutrition, nutrition science, culinary practices, and the study of eating behavior, published in peer-reviewed journals and open scientific sources.

The following methods became the methodological basis of the research: analysis and synthesis of scientific literature, systematization and generalization of data, comparative analysis of scientific approaches, interdisciplinary and systemic approaches.

The results of the study. The theoretical and methodological basis of culinary nutritionology is formed at the junction of several sciences: nutritionology, nutrition science, cooking, and research on eating behavior. In modern scientific literature, nutrition is considered as a complex system of interrelated elements, in which not only individual nutrients are important, but also their combinations, the structure of products, and methods of their processing. This leads to the fact that scientists are moving from the analysis of individual substances to the study of holistic nutrition patterns and eating habits [6].

Nutritionology is the basis of this field, as it defines the key categories for food analysis: nutritional value, bioavailability, and biological activity of nutrients. It has been proven that the process of technological processing of products has a significant impact on the preservation of vitamins, minerals, and biologically active compounds, as well as on their assimilation by the body. Therefore, when assessing the quality of food, it is necessary to take into account not only the initial composition of raw materials, but also the changes that occur during cooking and digestion.

From a scientific point of view, cooking is a set of practical and technological actions aimed at transforming food products. Modern research emphasizes that the integration of nutrition and cooking is interdisciplinary and based on data from food chemistry, gastronomy, and medicine. This allows us to consider the cooking process as an important factor that directly affects the nutritional properties of the diet [3].

An important aspect of the methodology is to take into account the cultural and behavioral characteristics of nutrition. Food culture is shaped by a variety of social norms, habits, and conditions that determine a person's diet. These factors influence the choice of products and how they are prepared. Thus, culinary practices represent not only a technological but also a socially determined process.

The methodological basis of the study consists of several complementary approaches presented in Table 1.

Table 1

The main methodological approaches in the study of culinary nutrition

Approach	Content	Meaning
Nutritional	Analysis of the composition, bioavailability and activity of nutrients	Assessment of the physiological value of food
Technological	Studying the effects of cooking methods	Determination of losses and preservation of nutrients
Cultural and behavioral	Analysis of eating habits and norms	Understanding the factors of food choice
Interdisciplinary	Integration of various sciences	Comprehensive food research
The system	Considering nutrition as an integrated system	Analysis of food–behavior–health relationships

Source: author's development

Modern research also includes methods for analyzing eating habits and system modeling. This allows us to take into account the influence of individual, social and external factors on the formation of nutrition.

In modern scientific literature, culinary nutritionology is considered as a developing interdisciplinary field that combines nutritionology, nutrition science and culinary practices. Research shows that this field has emerged as a response to the need to move from analyzing individual nutrients to studying complex food structures, ready meals, and eating habits. After all, it is their complex effect that determines the bioavailability and physiological effect of food [4].

The main theoretical postulate is that cooking significantly affects the nutritional properties of foods. It transforms the structure of raw materials, the degree of release of substances, and their safety. Scientific studies demonstrate that thermal and mechanical effects can both increase the availability of individual compounds and reduce the level of thermolabile components. This makes it necessary to study the processes of cooking from the point of view of science [2].

Table 2 presents the main conceptual features of culinary nutrition.

Table 2

The main characteristics of culinary nutrition

Sign	Content	Meaning
Interdisciplinarity	Combining the science of nutrition, cooking and nutritionology	Formation of a new scientific field
Focus on cooking	Analysis of culinary processing methods	Highlighting cooking technology as an object of research
Accounting for the food matrix	Transition to the analysis of dishes and diets	Comprehensive food assessment
Treatment effect	Changes in bioavailability and composition	Substantiation of the role of cooking in nutrition
Incompleteness of terminology	Lack of a single definition	The stage of scientific formation

Source: author's development

In culinary nutritionology, food is considered an integrated system that includes a product, dish, food matrix, and processing methods. Scientific research shows that the level of ready meals and diets is most significant for assessing nutrition. This is due to the fact that the interaction of components and the conditions of their preparation determine the final nutritional value.

Culinary nutritionology studies how cooking affects nutritional properties. It explores how nutrients are preserved during cooking, as well as their bioavailability and biological activity. It has been established that cooking processes change the structure of products; the release of substances and their stability directly affect their assimilation [5].

Research is conducted on several levels: biochemical (studying changes in composition), technological (studying the influence of cooking methods), behavioral (considering eating habits), and applied (developing more rational cooking methods). This demonstrates the interdisciplinary nature of the field being studied.

The figure below shows a block diagram of culinary nutrition. It demonstrates the process of converting food raw materials into a ready-made dish during cooking, and shows how this process affects the bioavailability of nutrients.

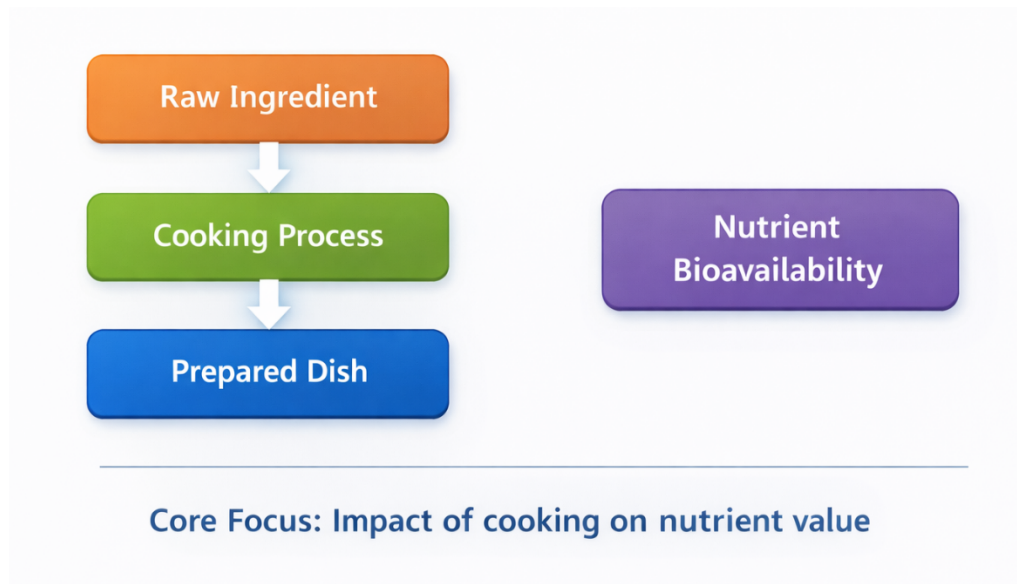


Fig. The structure of the object and the subject

In the scientific literature, culinary nutritionology is defined as an interdisciplinary field that combines nutrition knowledge with cooking skills and the study of eating behavior (Table 3).

Table 3

The main directions and tasks of culinary nutritionology

Direction	Content	Meaning
Culinary processing	The influence of cooking methods on the composition and properties of food	Preservation and enhancement of nutritional value
Educational interventions	A combination of nutrition knowledge and practical culinary skills	Development and implementation of training programs
Food literacy	Formation of cooking and mindful eating skills	Improving eating behavior
Interdisciplinarity	Integration of knowledge from various scientific fields	Training of qualified specialists
Effectiveness assessment	Analysis of the results of educational and practical programs	Confirmation of their effectiveness and sustainability

Source: author's development

In scientific publications, the practical application of culinary nutrition is mainly considered in the context of education, medicine, and society. Research shows that the so-called educational kitchens are comprehensive platforms that

combine nutrition education, practical cooking classes, the development of a conscious attitude to nutrition, recommendations on physical activity, and behavioral counseling. They are becoming not just a place for cooking but a multifunctional environment where scientific recommendations become part of everyday life. These cuisines contribute to the development of culinary skills, strengthen social ties, increase food security, and reduce the consumption of ultra-processed foods. This indicates that the practical value of culinary nutrition lies in combining scientific knowledge with real eating habits.

In the field of vocational education, the importance of practical skills is confirmed by the inclusion of relevant training modules in specialist training programs. According to scientific research, there is a widespread adoption of programs aimed at developing practice-oriented skills in the field of nutrition and cooking. These programs are implemented in various formats, from individual academic disciplines to specialized educational trajectories. This indicates the stable development of the applied component in the training of specialists in the field of nutrition.

Digitalization is a promising area. Research shows that distance learning programs increase the consumption of vegetables and fruits, as well as increase confidence in cooking skills and nutrition knowledge. Digital learning formats make it possible to effectively form healthier eating patterns and expand access to educational resources. Therefore, the further development of culinary nutrition is associated with a combination of traditional and digital forms of education [1].

The key problem faced by culinary nutritionology on its way to becoming an independent scientific discipline is the lack of elaboration of terminology. Scientific publications emphasize that the terms used to describe various aspects of this field require clearer differentiation and systematization for deeper scientific analysis, as well as for effective teaching and practical application. The need to develop a unified approach to defining the content and boundaries of this field is highlighted, which indicates the incompleteness of its theoretical design.

The second limitation is related to the variety of approaches to research and learning. Scientific reviews show that existing programs differ in duration, structure, methods of implementation, and criteria for evaluating effectiveness. This makes it difficult to compare the results of various studies and summarize the conclusions. In this regard, the scientific literature emphasizes the importance of conducting more standardized and methodologically accurate research using comparable indicators [2].

The third group of obstacles is related to practical implementation. Research shows that there are barriers caused by a lack of knowledge among specialists, lack of time and insufficient training. In addition, additional professional training and strengthening of interdisciplinary cooperation are needed. This indicates that the full-fledged development of this field requires institutional support, improvement of educational infrastructure, and training of qualified specialists.

Finally, it is worth noting that the evidence base on this issue is not uniform. Although there is evidence to support the positive impact of educational and culinary programs on knowledge and skills, not all studies demonstrate sustained changes in eating behavior. This highlights the need for a deeper study of the impact mechanisms and the identification of the most effective program components that can lead to long-term results.

Conclusions. In the course of the research, it was found that culinary nutritionology is a developing interdisciplinary field that has significant scientific and practical potential. It has been proven that culinary processing methods have a significant impact on the nutritional value of products, the bioavailability of nutrients, and the formation of eating behavior, which makes their study necessary. The object of culinary nutritionology is food as an integral system, and the subject is the patterns of changes in its nutritional properties during cooking.

The study showed that culinary nutrition is actively developing due to the integration of scientific knowledge and practical skills. This field is becoming

increasingly popular due to the expansion of educational and digital opportunities, as well as increased levels of food literacy. However, despite all the positive trends, the further development of culinary nutrition faces certain obstacles. Among them: the lack of a unified terminology, insufficient standardization of research, and a variety of practical approaches.

Thus, culinary nutritionology requires deeper study and methodological elaboration. This will make it possible to use scientific knowledge about nutrition more effectively in everyday life and, as a result, improve the quality of human nutrition.

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