

ABSTRACT

of the dissertation work by Nurdan Dinash on the topic "Regulatory support of the technology for the production of pasta from non-traditional flour raw materials", submitted for the degree of Doctor of Philosophy (PhD) under the educational program "8D07501 – Standardization and certification (by industry)"

Relevance of the research topic.

The agro-food and processing sectors of the Republic of Kazakhstan have great export and raw material opportunities, and, most importantly, high potential for the introduction and promotion of innovations in domestic agricultural production markets.

In this regard, the improvement of the nation with natural nutrients is an important direction. At the same time, the processing of agricultural raw materials into a wide range of food products should be a priority.

The food and processing industry is a system-forming sphere of the economy of Kazakhstan, forming the agro-food market, economic and, first of all, food security. Employees of the processing sector of the country are faced with the task of forming a strategy for the development of the food and processing industry, providing a systematic solution to the problem of industrial development of food production, resource and financial support, as well as the implementation of mechanisms for the introduction of innovative technologies.

Along with the strategic objectives of the agri-food market, the problem of improving the quality and expanding the range of food products is acute, due to the development of new technologies for the production of products with high nutritional value, having a therapeutic and preventive effect. Modern technologies make it possible to obtain products enriched with targeted food additives; at the same time, artificial (biologically active substances of a chemical nature) and natural components are used. However, the opinions of domestic scientists on the issues of enriching mass-consumption products with artificial components differ.

Since substances of a chemical nature tend to break down during processing, their stability in food production, storage, and as a result of technological processes has been studied to a small extent. And the literature data provides incomplete and contradictory results.

The improvement of the nation with natural nutrients is considered an urgent problem, in solving which the priority is the processing of agricultural raw materials into a wide range of finished food products.

In the policy of healthy nutrition, much attention is paid to the physiology of nutrition. Along with a balanced amino acid composition and high protein digestibility, food products should contain complex carbohydrates, ballast substances (dietary fibers) that ensure the normal functioning of the digestive system.

In this regard, it is possible to increase the nutritional value of pasta by introducing natural ingredients such as corn, millet, buckwheat, barley or oats, as well as other cereals/legumes (peas and soybeans), which significantly differ in

chemical composition from traditional raw materials. Therefore, the production of pasta based on non-traditional poly-cereal raw materials is considered one of the promising areas for the creation of functional products.

Pasta made from non-traditional poly-cereal raw materials, in comparison with other types of flour products, have a number of advantages: high digestibility of basic nutrients, high consumer properties (each category of persons can satisfy their taste needs), long shelf life and accessibility for all segments of the population.

However, such products are not produced in our country. For the production of traditional pasta, durum wheat varieties are used (in some cases, bakery wheat varieties), the proteins of which are "poor" in chemical composition of the most important nutrients, which is the reason for the deficiency of the most important essential amino acids.

At the same time, the quality of any product is based on its compliance with generally recognized standards and sanitary norms and rules. The standard on the basis of which products are produced, provided that it is faithfully observed by the manufacturer, is a quality guarantee, that is, the level of quality of food products depends on the level of standardization.

Therefore, the regulatory and technical support of the proposed types of multi-cereal pasta from non-traditional flour raw materials and their production technology are an urgent and modern task.

The basis for the development of a recipe for the manufacture of poly-cereal pasta from homogeneous composite flour mixtures of whole grains of cereals and cereals is based on a methodology for designing their composition, which allows regulating the content of nutrients in the product, meeting the requirements of rational and adequate nutrition, providing a preventive orientation.

In this regard, the main scientific concept of the dissertation is to summarize the scientific results of the study of the process of making pasta with increased nutritional and biological value, increasing the nutritional value and consumer properties of pasta based on non-traditional multi-cereal raw materials.

The purpose of the dissertation research is to study the process of making pasta with an improved food structure, increased nutritional and biological value based on non-traditional multi-cereal raw materials.

Research objectives:

- analysis of the current state of production of the pasta industry in Kazakhstan and the problems of standardization of food products;
- development of a poly-cereal mixture formulation and study of the technological properties of the dough for the manufacture of pasta from non-traditional raw materials;
- investigation of the effect of weight dosages of various cereals and legumes on the main components of wheat flour: rheological properties, duration of kneading and pressing speed of pasta dough;
- investigation of the effect of different dosages of vegetable proteins of non-traditional raw materials on the drying speed and quality of finished pasta, including during storage;

- study of the technological process of pressing in the production of pasta from non-traditional raw materials;
- study of the technological drying process in the production of pasta from non-traditional raw materials;
- study of the microstructure of pasta made from non-traditional raw materials;
- research of microbiological and safety indicators of pasta products from non-traditional raw materials;
- assessment of the quality characteristics of the finished product;
- determination of the degree of preservation of biologically active substances during the technological process of production, cooking and storage of pasta;
- development of regulatory and technical documentation.

Substantiation of the novelty and practical significance of the results obtained.

Scientific novelty.

- the rheological properties of pasta dough from a multi-cereal flour mixture have been studied;
- rational parameters of kneading, pressing of pasta dough and drying of pasta from non-traditional raw materials of increased bioavailability are substantiated;
- pasta of stable quality with a low dry matter content in cooking water and a high coefficient of elasticity were obtained;
- the scientific and technological foundations of the production of pasta from non-traditional multi-cereal raw materials and its regulatory and technical support have been developed.

Practical significance. Expanding the range of new food products, improving the structure of nutrition, strengthening health, increasing the immune protection of the human body.

The author's personal contribution consists in setting the necessary tasks, planning and conducting experiments, statistical processing of the results obtained and their publication, conducting industrial testing of the proposed multi-slag pasta from non-traditional multi-cereal raw materials; participation in the development of regulatory documentation.

Compliance with the directions of science development or state programs:

Some results of the dissertation work were obtained within the framework of a grant research work funded by the Ministry of Education and Science of the Republic of Kazakhstan on the topic No. GR 0118RK00310 "Development of technology for the production of pasta based on non-traditional poly-cereal raw materials" (2018-2020).

Scientific provisions submitted for protection:

- scientific and practical bases of the use of an unconventional multi-cereal mixture to improve the nutritional structure of pasta;

– regulatory and technical support for the production of pasta from multi-cereal raw materials.

Approbation of the work.

The results of the research have been verified in the laboratory as well as in production conditions.

Standard and modern methods of statistical data processing were used, which show the reliability of the results of the work.

The results of the study were published in scientific journals with a non-zero impact factor and reported at international scientific and practical conferences.

Description of the doctoral student's contribution to the preparation of each publication: all the results and conclusions given in the dissertation work were obtained and formulated with the direct participation of the applicant in accordance with the individual research plans of the doctoral student. The doctoral student mastered the modern research methodology, took an active part in the discussion and publication of the results obtained, the preparation and design of scientific articles for publication in domestic and foreign scientific journals.

Publications. 7 scientific papers have been published on the topic of the dissertation, 5 of them in scientific publications recommended by the Committee for Quality Assurance in Science and Higher Education of the Ministry of Science and Higher Education of the Republic of Kazakhstan, 1 – in the materials of international scientific and practical conferences and 1 – in the journal included in the information resources of Scopus (percentile 44).

The structure and scope of the dissertation. The dissertation work consists of an introduction, four chapters, a conclusion, a list of 106 references and appendices. The dissertation is presented on 120 pages, contains 34 tables, 49 figures.