ABSTRACT

on the thesis of Karimova Gulmaida Konysbayevna on the topic "Improving the regulatory framework for standardization by developing new technologies (formulations) for the production of pasta", submitted for Doctor of Philosophy degree (PhD) by the educational program 8D07501 - "Standardization and product quality management"

Relevance of the thesis topic. In modern conditions, the struggle for consumers in domestic and foreign markets requires the creation and production of really competitive goods. In this regard, pasta producers face the problem of finding economically rational levels of competitiveness of goods. All this increases the role of management in the purposeful impact on the quality, and through it - on the competitiveness of products. In accordance with the Kazakhstan-2050 Strategy, seven long-term priorities are envisaged, including "Comprehensive support for entrepreneurship - the leading force of the national economy".

Strategic Development Plan of the Republic of Kazakhstan until 2025. The goal of the program is qualitative growth of the economy should be based on increasing the competitiveness of business and human capital, technological modernization, improving the institutional environment, as well as minimizing the negative impact of humans on nature. At the same time, the UN Sustainable Development Goals will be an important benchmark.

The state policy is aimed at the need to develop quality and safety in the food industry. Law No. 301 of the Republic of Kazakhstan dated July 21, 2007 "On the Safety of Food Products", Law of the Republic of Kazakhstan "On Standardization" dated October 5, 2018 was adopted No. 183-VI, Resolution of the Government of the Republic of Kazakhstan dated March 31, 2022, No. 178 "On Approval of the Food Security Plan of the Republic of Kazakhstan for 2022 - 2024", which considers the adoption of standards in accordance with the plan of national standardization in the field of food industry.

According to the Bureau of National Statistics, for the first 4 months of 2023 in Kazakhstan was produced 52.4 thousand tons of pasta, noodles and similar flour products. This figure is almost 7% lower than in January-April 2022. It should be noted that last year the dynamics of these indicators was positive. The growth of production volumes amounted to more than 10%.

Meanwhile, pasta prices rose by 30.5% over the year. A year earlier the figure was 23.4%, in April 2021 - 12.5%. Horns rose in price by 28% over the year, noodles and vermicelli - by 31%, spaghetti - by 37.3% at once.

Meanwhile, pasta consumption in the Republic of Kazakhstan remains one of the highest in the world, second only to Italy.

The most expensive pasta is sold in West-Kazakhstan region, there the growth amounted to over 60%. The second place is occupied by Pavlodar region with price growth by 44%. Mangistau is not far behind Pavlodar - the growth of 43.5%. Prices rose least of all in Akmola Oblast. However, even this is not insignificant - almost 16%.

However, due to the current situation both in the world and in the Republic of Kazakhstan, currently the enterprises have an urgent need to develop new technologies for the production of pasta products, which in turn will allow to maintain high productivity of enterprises and the quality of products with significant resource conservation. Problems of resource saving, control and optimization of resources are especially acute at pasta production enterprises due to overconsumption of flour from durum wheat varieties. It is also necessary to address the issues of improving the technological performance of production facilities.

The above problems need to be addressed and research needs to be conducted both in the field of technology and standardization.

Objective of the research. Improvement of the normative base of standardization on the basis of development of new technologies (recipes) for pasta production.

In accordance with the set goal, the following **challenges** were defined:

1. Study of properties of raw materials, mixtures and pasta products with the addition of millet flour.
2. Development of optimal technology (recipes) of pasta products with the addition of millet flour.
3. Experimental and industrial testing of pasta products with the addition of millet flour at production facilities.
4. Development of a standardization document for pasta products with the addition of millet flour.
5. Development of technological instructions for pasta products with the addition of millet flour.

Object of the research. Standardization of new products.

Subject of the research. ST LLP 050940010692-01-2023 “Baked pasta products of group A of the highest grade. Technical conditions”.

Scientific results within the scope of the thesis requirements.

Development of a document on standardization and technological instructions for pasta products with the addition of millet flour.

In the introduction. The relevance of the research topic, problems, purpose, objectives, object, subject, research methods, scientific novelty, main provisions submitted for defense, practical value, approbation of results, patents, personal contribution of the author, interrelated research projects, structure and scope of the dissertation are described.

In the first section. The technologies of pasta production in the world are presented, documents on standardization, interstate, national standards, modern trends in pasta production in the Republic of Kazakhstan are presented.

In the second section. The object and methods of research are described, experimental equipment and devices are presented (CHROMA METER CR-410, INFRAMATIC 8611 infrared analyzer, EX 31 SOP microscope, Alveograph-consistograph NG). The data of the experiments conducted to determine the quality indicator "humidity" by 4 methods according to GOST 31964-2012 "Pasta products. Acceptance rules and methods for determining quality".

In the third section. Studies of quality indicators of raw materials and mixtures and pasta in accordance with ART RK 1467-2005 "Grits and flour from durum wheat. General technical conditions", GOST 572-2016 "Millet millet. Technical specifications", CODEX STAN 170-1989 "Standard for flour from American millet", GOST 10444.12-2013 "Microbiology of food and animal feed. Methods for detecting and counting the number of yeast and mold fungi". The results of X-ray fluorescence analysis are presented.

In the fourth section. The optimal compositions of pasta are presented based on the application of a mathematical model, the results of quality indicators are presented based on test reports of the accredited laboratory of the RSE at the Center for Sanitary and Epidemiological Expertise of the Medical Center of the Office of the President of the Republic of Kazakhstan for compliance with the requirements of GOST 31743-2017 "Pasta products. General technical conditions", the rheological properties of pasta made of wheat and millet flour are determined.

In the fifth section. Uncertainty was calculated for pasta with the addition of millet flour of 3.8%, 7.7% and 15.5%.

In the sixth section. Describes the economic effect in the production of pasta with the addition of millet flour.

In the seventh section. The article presents the developed on the basis of research ST LLP 050940010692-01-2023 “Baked pasta products of group A of the highest grade. Technical conditions”, approved by Ayan Mill and Pasta Plant LLP.

Scientific novelty.

Improving the regulatory framework for standardization by developing a new standardization document that applies to pasta with the addition of millet flour.

The main provisions submitted for protection.

- optimal formulations of pasta mixes with the addition of millet flour;
- ST LLP 050940010692-01-2023 “Baked pasta products of group A of the highest grade. Technical conditions”;
- technological instructions for pasta with the addition of millet flour.

Practical significance.

The results of the dissertation solve the problems of pasta manufacturers: the cost of production is reduced by adding millet flour, quality control of products is improved while optimizing technological indicators. The application of the new organization standard and technological instructions allows you to expand the product range, expand product sales markets.

The developed mathematical model made it possible to determine the optimal period of time and drying temperature required for pasta with the substitution of millet flour.

The economic efficiency of pasta with the substitution of millet flour has been calculated. The calculation showed economic profitability, which is certainly an important component for pasta manufacturers in production.

Based on the results of the study, the standard of the organization ST LLP 050940010692-01-2023 "Millet pasta products of group A of the highest grade" was developed and approved. Technical conditions".

The connection of the dissertation with other research papers.

IRN BR 12967830 "Development of technical regulation tools in order to improve the efficiency, safety, resource-saving of food production and eco-friendly packaging", RSE "Kazakhstan Institute of Standardization and Metrology" Committee for Technical Regulation and Metrology of the Ministry of Trade and Integration of the Republic of Kazakhstan.

Personal contribution of the author.

All the results and conclusions given in the dissertation were obtained and formulated with the direct participation of the applicant in accordance with the results of the conducted research.

The results of the dissertation are publications in 6 scientific papers, including 1 article in the journal "Potravinarstvo Slovak Journal of Food Sciences", included in the Scopus database (Impact factor 2.4, Q3, percentile 44), 5 articles in journals recommended by COXON, 1 patent, 1 PCT, 9 articles in the proceedings of international scientific and practical conferences. The doctoral student developed the standard of the organization ST LLP 050940010692-01-2023 “Baked pasta products of group A of the highest grade. Technical conditions” and implemented in the Mill and Pasta Plant LLP.

Approbation of the research results.

The results of the dissertation have been published in 6 scientific papers, including 1 article in the journal "Potravinarstvo Slovak Journal of Food Sciences", included in the Scopus database (Impact factor 2.4, Q3, percentile 44), 5 articles in journals recommended by COXON, 1 patent, 1 PCT, 9 articles in the proceedings of international scientific- practical conferences.

Publications.

1. Development of new technologies (recipes) to produce pasta with the addition of millet and the determination of organoleptic and physicochemical quality indicators.

2. Quality indicators and risks in the production of pasta with the addition of millet 23.3%.

3. Zygyr kunzharasyn macaron onimderinin kurylymdyk-rheology-lyk kasiteeterin aseri.

4. Determination of physico-chemical quality indicators of pasta with the addition of 3.8% millet.

5. Pasta onimderinin kurylymyn zertteu.

6. Standardization tools that determine quality indicators.

7. Analysis of normative and technical documentation on the technological properties of pasta.

8. Improving the quality control of pasta.

9. Macaron onerkasibinde mai zhane mai onerkasibinin kaldyktaryn paidalan mumkindigi.

10. Production of pasta in accordance with standardization documents.

11. Study of consumer demand for pasta.

12. Study of consumer demand for pasta with the addition of pumpkin, flax, soy, peanut and sunflower cakes.

13. Quality control and risk assessment in the production of food products with waste from the fat and oil industry.

14. Legislation, technical regulations, international standards and principles of HACCP, mechanisms and tools to ensure the quality of food products.

15. ISO 9001:2015 as a quality improvement tool in the production of pasta with the addition of millet

The structure and scope of the dissertation.

The volume of the dissertation is 151 pages of typewritten text. The dissertation consists of an introduction, a review of the literature, the object and methods of research, the results of the study and their discussion, conclusions and suggestions, information on the practical use of the results obtained, a list of references and applications. The dissertation includes 74 tables and 63 figures. The list of references includes 191 domestic and foreign scientists, including links to the doctoral student's own publications.