

# INNOVATIVE FUNCTIONAL FOOD PRODUCTS FOR THE WORKERS OF THE MINING INDUSTRY

Valentyn Khorolskyi<sup>1</sup>, Aleksandr Bavyko<sup>2</sup>, Svitlana Yermak<sup>2\*</sup>, Yekateryna Riabykina<sup>3</sup>, Kostiantyn Khorolskyi<sup>4</sup>

<sup>1</sup>Department of General Engineering Disciplines and Equipment, Educational and Scientific Institute of Restaurant and Hotel Business, Donetsk National University of Economics and Trade named after Mykhailo Tuhan-Baranovskiy, Tramvaynaya Street 16, 50005 Kryvyi Rih City, Ukraine

<sup>2</sup>Department of Entrepreneurship and Trade, Educational and Scientific Institute of Economics and Entrepreneurship, Donetsk National University of Economics and Trade named after Mykhailo Tuhan-Baranovskiy, Tramvaynaya Street 16, 50005 Kryvyi Rih City, Ukraine

<sup>3</sup>Department of Economics, Organization and Management of Enterprises, Faculty of Economics and Business Management, State institution of higher education «Kryvyi Rih National University», Vitaly Matusevych Street 11, 50027 Kryvyi Rih City, Ukraine

<sup>4</sup>Department of Management and Administration, Faculty of Economics and Business Management, State institution of higher education «Kryvyi Rih National University», Vitaly Matusevych Street 11, 50027 Kryvyi Rih City, Ukraine

\*e-mail: kaf.econ.kr@gmail.com

## Abstract

The aim of this work is the experimental determination of the formula and the appropriate technology of production of pasta with enriched nutrient composition based on adding a suspension of chicken meat and pumpkin seeds. There has been developed a functional product, designed to help prevent the development of pathologies that are of production and alimentary origin among the workers of the mining industry, whose work is characterized by constant physical and mental strain, increased blood pressure, reduced aerobic fitness and physical performance of the body.

The determination of the pasta formulation was carried out by experimental determination of proportions of possible contents of chicken meat and pumpkin seeds suspension using standard technological equipment and generators for ultrasonic intensification of technological processes. To establish the physicochemical parameters of the obtained product there were used the following methods: establishing the strength of pasta with the Stroganov device, the titrimetric method for the determination of protein content according to Kjeldahl method, the method of ion exchange chromatography for the determination of amino acid composition.

It has been experimentally established that the proportion of the suspension of chicken meat and pumpkin seeds in the manufacture of pasta products while maintaining the required consumer indicators can make up to 35%. The resulting research product per 100 g of the mass contains: 18 g of protein, vitamins B, A, E, minerals (iron, potassium, calcium, magnesium, and phosphorus). Ultrasound dispersion provides a sealing effect that reduces porosity and water absorption. High temperature drying with ultrasound irradiation saves time, energy, increases strength, eliminates the increase of acidity, and microbial spoilage.

There has been established the possibility of expansion of a functional products range at the expense of combinatorics of enriching additives from chicken meat and pumpkin seeds in the recipe of pasta. The use of ultrasound provides an increased amount of nutrients while maintaining the indicators that provide the opportunity for a long-term storage. The cost of production is competitive for the domestic market of Ukraine, which allows to count on the possibility that the mining industry will buy them for the centralised feeding of the workers.

**Key words:** *Functional food products, Physiology of labour, Recovery, Prevention of pathologies, Enriching additives, Ultrasonic effects of cavitation.*