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APPLICATION OF BIOFORTIFICATION OF GRAIN CROPS TO CREATE RAW MATERIALS FOR FUNCTIONAL FOOD

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Introduction. Unbalanced nutritional value and low nutrient content in cereals is a global problem, the most widespread today in the food industry [1]. To solve it, approaches and activities are being developed aimed at increasing the level of vital components, such as proteins, vitamins, and minerals, in the consumed parts of crops. The most promising aproach is called biofortification [2]. The goal of this process is the production of raw materials with increased nutritional value for food products. Biofortification allows the cultivation of nutrient-rich crops in areas with depleted and poor soils. The most studied target micronutrients in agricultural biofortification are zinc, selenium, copper, iodine, and gamma-aminobutyric acid (GABA) [3, 4]. Among the plant crops with these trace elements, it is worth noting the grain of wheat, rice, rye, oats, and barley. Domestic and foreign researchers in their studies note that foliar treatment of plants, preliminary soaking in micronutrient solutions and grain processing by physical methods (ultrasound, infrared irradiation, microwave waves) are effective as biofortification measures [5].

Main part. The ongoing research on plant biofortification allows us to study and analyze the following factors of influence:

1) The effect of solutions with a controlled chemical composition containing exogenous GABA on the processes of wheat grain germination and the efficiency of biologically active substances accumulation, as well as the nutritional value of the raw materials obtained.
2) Dependence of the influence of ultrasonic waves on the intensity of wheat grain germination in GABA solutions.
3) The influence of solutions containing selenium and thiamine on the processes of wheat grain germination, the nutritional value of the obtained raw materials in combination with ultrasonic waves.
4) Study of the chemical composition of the obtained raw ingredients from germinated grain raw materials, determining the possibility of placing them in the food product matrix.

Conclusions. Various methods of biofortification have been evaluated, the most effective of them have been selected. The influence of the selected methods of biofortification on the nutritional value of both the raw materials obtained and the functional food products made from it was studied. The author made an assumption that the use of various methods of influencing grain will increase the nutritional value of food ingredients.

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