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DEVELOPMENT OF NEW RESEARCH METHODS OF DISPERSION IN FOOD POWDERS (РОЗРОБКА МЕТОДІВ ДОСЛІДЖЕННЯ ДИСПЕРСНОСТІ ХАРЧОВИХ ПОРОШКІВ)

Affordable and balanced diet programmes gain popularity; hence major food manufacturers are interested in making inexpensive quality products.

Very often, production of dietary foods requires nutritional powders with higher percentage of healthy ingridients. Therefore, the development of functional food powders is very perspective for the food industry in Ukraine.

The variety of food powders allows their usage in production of different types of food. These food products are a source of biologically active substances such as vitamins, macro- and micronutrients. These elements are contained in an easily digestible form and in optimal proportions for the human body.

However, a certain part of micronutrients is destroyed during the process of production of powders hence the partial loss of powders‘ nutritional value. Therefore, it is important to choose the optimal production of food powders that will allow to keep most important elements in place at an affordable price.

For that reason, the main task of the production of food powders is to organize the most non-waste processing of raw resources and to keep intact food powders‘ constituent elements: vitamins, macro-and micronutrients, pectines for coloring, and other biologically active substances.

Taking into consideration the fact that in Ukraine they do not utilise secondary raw food resources, it is of utmost perspective to recycle these for environmental and economic reasons.

The research is topical as it is aimed at 1) the improvement of existing technologies of food powder processes with involvement of optimum approaches of recycling secondary raw food resources; 2) the fact that all derived powders will be utilised to design functional food products.

The main objective of this research is to design scientifically valid production methods of food powders from secondary food resources.

The study is based on a model food powder, which is divided into 4 portions (also mentioned below as powder samples or groups). One of the portions is a template; all four have identical ingredients but different degrees of grinding, i.e. different dispersion.

As an experiment, a number of micrographs of the model food powder was obtained (for that, USB Digital Microscope was used and the graphs were magnified 67 times).

The micrographs were processed using PhotoM v.1.2 which allowed determination of optical density and distances between objects and the area in the powder. The obtained experimental data was used for plotting (Mathcad was used for the latter task).

The approximation method has been deployed to construct the cumulative distribution function. The function analysis demonstrated differential distribution function of particle size for each group of food powders (including the template group). The nature of the peaks of differential distribution functions showed the average particle size of the average food powder for each of the samples. The nature of the differential distribution curves can be judged on the composition of the powder as a whole; therefore, comparison of several powders can be realized by analyzing different degrees of fineness of the four powder samples.

The results of the study are listed below:

1. Development of a new research method of composition of dispersion systems on the basis of food powders;
2. The productivity of the above method is proved by the results of microscopic research conducted on the food powder samples;
3. Both quantitative and qualitative analysis of the food powder ingredients were conducted;
4. For food powders, the most probable particle diameter was established;
5. An assessment programme for the food powder composition was designed. The programme calculates the integral and differential curves in the powder and therefore the powder composition can be analysed precisely.

This work was done under the theme –Investigations of state and structure of water in food products by the methods of NMR and EPR spectroscopy‘s № 211 ФБ‖.