Section 3. IMPROVEMENT OF FOOD PRODUCTS QUALITY

ON SCIENTIFIC FOUNDATIONS FOR THE CREATION OF FLOURY PRODUCTS FOR NUTRITION SYSTEMS

O. Cherevko, G. Krutovyi

The systematic, mathematized and computerized approach to the formulation and solution of interrelated totality of the problems concerning the creation of unconventional floury products for dietary systems is proposed.

It is found that scientific foundations for the creation of floury products should contain scientific substantiation of modern principles of their projecting; suggestions regarding the development of the recipes’ mathematical models, recommendation to the application of mathematical methods and computer software for the most effective recipes origination; the ways for the provision of nutrients balance, creation of qualitative factors for the nutrients balance, creation of the approaches to the generalized evaluation of biological value of the projected floury products, in particular, the factors of protein approximation to standard ones into the products, etc.

Keywords: mathematical modeling of floury products recipes, functionals of nutrients balance and aggregated limitations, factor of protein approximation to standard, qualitative and quantitative evaluation of nutrients balance.

THREE PRINCIPLES OF PROJECTING RECIPES OF FLOURY PRODUCTS FOR NUTRITION SYSTEMS

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The problem of providing daily diets with the deficient nutrients such as selenium, fluorine, boracium, manganese and others is actual for the creation of nutrition systems for dietary therapy. Floury products are considered to be among the perspective sources of enriching the diets with the named nutrients.

The article is devoted to the substantiation of the following principles of projecting floury products for the recipes of nutrition systems.
The first principle is mathematical modelling of the ingredients content in the products’ recipes because it is impossible to project the best recipe concerning the quality criterion without mathematical modelling of the ingredients content; it is impossible to guarantee fulfilment of the required correlations between the nutrients, certain limitations, conditions, etc.

The second principle is projecting floury products as the elements of a definite nutrition system.

The third principle is application of mathematical methods and modern computer programs for the creation of the recipes, especially non-traditional, floury products.

Realization of the formulated principles will promote the increase of the scientific level of projecting floury products, the level of their nutritive and biological value, the raise of the effectiveness of various nutrition systems for dietary therapy.

Keywords: floury products, projection, mathematical models, nutritional systems.

CONSUMER PROPERTIES OF A SEMI-FINISHED PRODUCT ON THE BASIS OF VEGETABLES AND FRUIT DURING THEIR LOW-TEMPERATURE STORAGE

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The aim of the article is the development of a semi-finished product with the increased nutritive value on the basis of vegetables and fruit, as well as the research of organoleptic, physical-chemical and microbiological quality indices during the long-term storage for 12 months at temperature $-35^\circ$C.

Carrots, pumpkins and apples were taken for the research as raw material. The technological manufacturing process of a semi-finished product included the following stages: the choice of raw material, sorting, washing, paring, blanching, and addition of oat flour, mass homogenization, packing and fast freezing to the temperature $-35^\circ$C in a low-temperature refrigerated cooler.

On the grounds of experimental data we made the conclusion regarding the slight changes of physical-chemical quality indices of a semi-finished product after its low-temperature storage. So, mass particle of dry substances reduced declined to 1,6%, general titrated acidity increased to 0,11%. The changes in the amount of vitamin C in the process of long-term storage of a semi-finished product equal 1,19%, which is also insufficient.
Freezing with the addition of oat flour with anti-oxidant properties counteracts the oxidation of vitamin C and prevents changes in a semi-finished product quality.

It is found that storage of the elaborated semi-finished product at temperature -35°C doesn’t practically change either organoleptic parameters or nutritive value; microbiological indices do not exceed the predetermined standards even after 12 months storage.

DETERMINATION OF THE STRENGTH OF ADSORPTION LAYERS IN FOAM-EMULSIVE SYSTEMS

S. Omel'chenko, A. Goralchuk, O. Grinchenko

The authors specify the conditions for the formation of interfacial adsorption layers in whipped emulsion systems containing lacto-proteins and low molecular surface-active substances. The main aim of the research is to determine the concentrations of surface-active substances and proteins of dehydrated fat-free milk in the formation of interfacial adsorption layers. It gives an opportunity to specify the major ingredients providing the obtention of stable whipped emulsion systems, received from the emulsions with the subsequent fluffing.

The concentrations of major ingredients – dehydrated fat-free milk, low molecular surface-active substances (E472b, E472e, E322) are identified. They allow regulate the strength of interfacial adsorption layers and receive a stable whipped emulsion system.

Keywords: strength, stability, whipped, emulsion, foam.

PLANT EXTRACTED FLAVORS ON BIOFLAVONOIDS BERRY SYSTEMS

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The effect of plant extracted flavors on phenolic compounds’ integrity in berry systems has been investigated. The use of plant extracted flavors has a significant positive effect on bioflavonoids stability in raspberry and elderberry, and secures the further use of bioflavonoids in a sweet sauce technology in order to obtain a product with the increased micronutrients’ content of high organoleptic indicators.
**Keywords:** bioflavonoids, plant extracted flavors, stabilizing effect, berry masses, quality.

**SHELLED JELLED MEAT PRODUCTS AND PERSPECTIVES OF THEIR INDUSTRIAL TECHNOLOGY**

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The urgency of the technology of shelled jellied meat products manufacture is exposed in the article. Wide ranges of population eat a great diversity of dishes every day. They can be both useful and harmful for a human organism depending on his (her) individual features and food product composition. The assortment of dishes containing jelling agents is rather wide. It is impossible to imagine such dishes as aspic, jellied products, jelly, cakes, sweets, sauces and even some first dishes without gelatin. It is not the single hydrocolloid used due to its functional and technical properties for cooking dishes. Plant jelling gents like carrageenan, agar, gum, etc. are also used. Sufficient difference of gelatin is stipulated both by its functional-technical properties and its origin. A great number of questions can be considered due to the introduction of meat jellied products’ technology into manufacture. The authors consider it necessary to elaborate an integrated jelling agent for the improvement of a marketable state of a product, namely for close connection of meat component, storage terms, melting temperature and other features of a ready product.

**Keywords:** hydrocolloid, jelling, gelatin, carrageenan, agar, meat, gum.

**NATURAL ANTIOXIDANT PERSPECTIVES FOR APPLICATION IN MEAT PROCESSING INDUSTRY**

V. Pasichny, Y. Zheludenko

In response to recent claims that synthetic antioxidants have the potential to cause toxicological effects and consumers' increased interest in purchasing natural products, the meat and poultry industry has been seeking sources of natural antioxidants. Due to their high phenolic compound content, fruits and other plant materials provide a good alternative to conventional antioxidants. Plum, cranberry, pomegranate,
grape seed extract, black currant, green tea, oregano functions as antioxidants in meat and poultry products. Pomegranate, plum and grape seed extract have exhibited stronger antioxidant properties than some synthetic options. Plum products and grape seed extract have been shown to affect the color of finished meat or poultry products; however, in some products such as pork sausage or uncured meats, an increase in red color may be desired. When selecting a natural antioxidant, sensory and quality impact on the product should be considered to achieve the desired traits.

**Keywords:** natural antioxidant, lipid oxidation, preservation, meat products, extracts.

**QUALITY IMPROVEMENT OF GOAT CHEESE OF FUNCTIONAL PURPOSE**

S. Ivanov, T. Ryzhkova, A. Omelchenko

The article refers to the fact that there is a trend towards healthy nutrition. This is one of the causes of the development of technologies and the production and release of functional purpose, enhancing the body's resistance to the effects of adverse environmental factors. These products include goat cheese, enriched in grain supplement (wheat flour), code-named "Seed".

Use of goat cheese for the manufacture, a dietary supplement of wheat flour contributes to it in essential amino and fatty acids, compared to the same period in the product made by traditional technology. In this case, there is deterioration of its organoleptic characteristics (elusion of taste and smell) and the color of the product, which, instead of a bright white color becomes white with a gray tint. This reduces its merchandising properties and reduces consumer demand among dairy products' consumers. The improvement of organoleptic characteristics of cottage cheese "Zerninka" and colors contribute to its enrichment with the extracts of Aromatic herbs and vegetables (beets) for deodorized sunflower oil in the amount of 0.01...0.02 wt% is substantiated.

**Keywords:** cottage cheese, organoleptic characteristics, extracts of spicy herbs aromaticity, vegetables.
The merchandizing assessment of fruit-and-vegetable sauce during long-term storage was studied. Relying on the fact that similar fruit-and-vegetable sauces have some drawbacks, a new product from beetroot, root celery and apples was elaborated by means of mathematical modeling methods with certain functional and physiological properties, which maintain quality of the product during its long-term refrigeration.

At the initial stage an average chemical composition of the outgoing product for the manufacture of fruit-and-vegetable sauce, and its receipt was developed. The technology of fruit-and-vegetable sauce includes: raw material preparation, sorting, calibration, thorough washing, beetroot and celery poaching, apples blanching, their poaching, homogenization, addition of oat flour, packing, marking, and fast refrigeration in a low-temperature refrigerating chamber at temperature -35°C.

The changes in fruit-and-vegetable sauce quality by organoleptic features, main physical-chemical parameters, which directly influence quality of the product, namely: the content of dry substances, titrated acidity, active acidity, mass part of sugars, vitamin C, were systematically investigated for 12 months. According to the results of the fulfilled investigations the authors came to the conclusion that in the process of long-term storage (for 12 months) of the fruit-and-vegetable sauce at temperature -35°C its quality parameters didn’t practically change.

By its microbiologic parameters the developed sauce fully corresponds the requirements of the established standards.

Keywords: merchandizing characteristics, fruit-and-vegetable sauce, freezing, cold storage.
THE INFLUENCE OF VAPOR PERMEABILITY OF GUT CASINGS ON QUANTITATIVE CHARACTERISTICS OF COOKED SAUSAGE TECHNOLOGY

V. Onishchenko, V. Bolshakova, N. Grynchenko, I. Ostroverkh

It is proved that vapor permeability of sausage casings is a determining factor for quantitative characteristics of cooked sausages technology. Based on the conducted research of gut products from veal, pork and lamb it is determined that their vapor permeability is stipulated by the type of down-hole animals, their anatomic origin and vital functions. It differs more than two times that stipulates the reasonability of the differential approach to the forecasting and costs standardization. The regularities in the changes of the cooked sausages yield depending on the gut casings vapor permeability and the amount of the added water during chopping are specified and scientifically substantiated. It is shown that the maintenance of rationally added water due to the predetermined (low) permeability may reduce the possibility of the structure demerits (frangibility, poor cohesion), which appear in the result of a small amount of soluble protein in a continuous phase, and can be caused by overly added water.

**Keywords:** gut casings, cooked sausages, vapor permeability, outcome, quantitative characteristics.

THE FORMATION OF CUSTOMERS’ PROPERTIES OF BOILED SAUSAGES ACCORDING TO THE SAFETY INDEX

T. Kolesnyk, A. Kolesnyk, I. Yakovlev

The formation of color of boiled sausages on the base of nitrites increases their toxicity and makes possible the accumulation of carcinogenic nitrosamines as a result of residual nitrite reacts with amino groups of meat proteins. Frequent consumption of boiled sausages and other meat products contributes to humans’ body with food in one day of one mg nitrosdiethylamine nitrosdimethylamines and 5 mg nitrospyrroledine which are not only carcinogenic, but also have a synergetic and additional effect. It allows raise of the topical issue of safety of boiled sausages with addition of sodium nitrite in the process of production. The expediency of the use of the colouring agent from the blood of slaughtered animals in which hemoglobin transferred to stable state by attaching carbon monoxide – carboxyhemoglobin is proved. The samples of
boiled sausages are investigated; color formation of boiled sausages in the traditional pink-red color was achieved by introducing of carboxyhemoglobin with reduced fivefold concentration of sodium nitrite. Research results show that reducing the dose of nitrite in the recipe of boiled sausages by this way reduces the reaction of N-nitrosation, rational waste-free use of blood for food purposes and obtaining high-quality boiled sausages according to safety index.

**Keywords:** nitrosamines, sodium nitrite, natural colouring agent, carboxyhemoglobin, nitrospigments, safety, boiled sausage, carcinogenicity.