

### IMPROVEMENT OF EQUIPMENT FOR MANUFACTURE OF VEGETABLE CONVENIENCE FOODS (p. 4-8)

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In view of the difficult ecological situation in Ukraine and other European countries, there is an increasing demand for vegetable convenience foods, including fruit and vegetable raw materials that contain significant amounts of biologically active substances. To improve vegetable raw material processing, technical modernization of enterprises with effective and reliable equipment that has high performance, efficiency and reliability that will allow to substantially eliminate damage and loss of foods due to short duration and low-temperature conditions of their heat treatment with simultaneous sterilization is proposed. The studies allow to improve manufacturing equipment of the canning industry for the production of fruit powders. Efficiency of thickening fruit puree in a rotary film unit to the dry matter (DM) content of 30–40 % by creating a sustainable turbulent mood of the coolant in the heating membrane of the unit was increased. Further final drying of the fruit paste is carried out in the modernized roller IR dryer to the DM content of 85...92 %. Thus, the studies allow to upgrade existing equipment of canning plants for vegetable raw material conversion into high-quality powder convenience foods with high content of biologically active substances that can be used in almost all food industries, pharmacology as an impurity and in kind.

**Keywords:** convenience foods, intensification, rotary-film unit, roller IR dryer, vegetable.

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### ANALYSIS OF MEAT PRODUCTION OF FUNCTIONAL USE FOR CORRECTION OF IODINE DEFICIENCY (p. 9-14)

**Larisa Agunova**

The article contains a review of the available literature on nutrition problem of people that live in ecologically unfavorable conditions and regions with iodine deficiency. The issues of the possibility of iodine deficiency correction by introducing a diet of meat products of functional use are discussed in details. The possibility of using these products as part of a variety of sources of organic and mineral iodine. It was found that the most affordable way is to use the iodized salt, but this approach has a number of controversial issues, which are completely eliminated while using the organic iodine.

One of the most accessible sources of organic iodine in Ukraine are the algae, which also contain a molecular iodine synergist – selenium, which is actively involved in the production of thyroid hormones. Ratio iodine:selenium is 1.0:0.7 that is optimal for synthesis of thyroxine (T<sub>4</sub>) and triiodothyronine (T<sub>3</sub>). The author of the report is focuses on the use of algae as well as on preparations based on it with the technologies of meat products production with functional ingredients to eliminate the risk of goitrogenic diseases.

**Keywords:** functional meat products, iodine deficiency, algae, kelp, fucus.

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## RESULTS OF POTENTIOMETRIC AND OPTICAL PROPERTIES OF SHABO TERROIR WINES (p. 15-19)

Eldar Iukuridze

The RO-potential value is of particular importance in the production of dry and sparkling wines. Compliance of wine products with regulatory requirements characterizes the quality features and individual characteristics of different bulk wines. These include potentiometric and optical characteristics of bulk wines and wines.

The purpose of the work is to conduct research for determining the potentiometric and optical characteristics of bulk wines, provided by the “PTK Shabo” LLC.

For determining the optical and potentiometric characteristics, techniques, developed by the National Institute for Vine and Wine “Magarach” were used in the paper. Samples of white table, champagne (Aligoté, Green Sauvignon, Riesling, Traminer Rot, Chardonnay, Telti-Kuruk, Rkatsiteli, White Pinot Noir) and red (Cabernet Sauvignon, Merlot) bulk wines of the “PTK Shabo” LLC were studied, indicators such as oxidation value of phenolic compounds of wine; optical characteristics of bulk wines (color intensity, color hue; yellowness index) were determined. The variation ranges of indicators (RO-potential; oxidation value; yellowness index, yellowness gain), characteristic of bulk wines, produced at the “PTK Shabo” LLC were set. Analysis of the results shows that the indicators correspond to the current regulatory documents of Ukraine.

**Keywords:** wine, bulk wines, Chabot terroir, potentiometric characteristics, optical characteristics, redox potential.

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## DEVELOPMENT OF ANTIHUNT SYSTEMS OF SAUCES IN THE TECHNOLOGY OF FISH PRODUCTS (p. 19-24)

Tatiana Nikitchina, Tatiana Manoli, Yana Barysheva

Despite the well-known research and application of plant and microbial polysaccharides in food technology, including canned fish technology as thickeners and jelling agents for various fillings, there is a certain deficiency in this assortment, caused by the complexity of technological processes that would allow to obtain high-quality finished products.

It was found that low-esterified pectin substances of plant raw materials, obtained by biotechnological method allow to make structured products, expanding the assortment of fish products with improved organoleptic and functional properties.

A comprehensive evaluation of the properties of pectin substances and pectinmethylesterases used for jellied vegetable sauces in the manufacture of fish products was performed in the paper. The optimal conditions for the biotechnological sauce jellification method were obtained, and organoleptic characteristics of canned fish in the jelling sauce were investigated. The results of organoleptic evaluation showed that the analyzed canned products had identical high points on almost all counts. All samples had a pleasant taste and flavour, delicate texture of fish meat in a uniform structured sauce.

**Keywords:** pectin substances, degree of esterification, pectinmethylesterase, jellification, vegetable sauces, canned fish.

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#### APPLICATION OF SWOT ANALYSIS IN THE DEVELOPMENT AND PROMOTION OF ENRICHED DRINKS (p. 25-31)

Inna Ustenko

Technological factors are one of the four PEST analysis components. The purpose of their research is to identify trends in the technological development, which are the causes of market changes and losses, and emergence of new products. The advantages of new enriched drinks compared to traditional nectars were considered to compile SWOT analysis. Fillers production technology, based on gentle non-thermal physical separation of a water share from apple pomace and pumpkins, and enriched drinks based on them was given. The developed enriched drinks based on fruit and vegetable fillers contain about 10 times more dietary fibers, 30 times more carotene and 11 times more calcium than nectars produced by traditional technologies.

The studies were aimed at developing the competition tactics and providing competitive advantages of enriched drinks using SWOT analysis to promote enriched drinks. Thus, market technological factors, namely the strengths and weaknesses of enriched juice drinks based on fruit and vegetable fillers that can facilitate or inhibit the promotion and position

consolidation of this product in a certain market segment were analyzed. It was found that by processing apple pomace, apple juice production wastes and pumpkins, prices of juice drinks remain similar to prices of nectars produced by traditional technologies. As primary directions for the effective promotion of enriched drinks in the market of juices and soft drinks, merchandising should be highlighted – without the possibility to use direct advertising to promote a new product it is advisable to stimulate sales through indirect communications, which are less expensive but equally effective.

**Keywords:** SWOT analysis, enriched drinks, non-thermal concentration, strategic decisions, promotion threats, consumer.

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#### INFLUENCE OF AROMATIC RAW MATERIALS ON THE ANIMAL FAT QUALITY (p. 31-35)

Iryna Markovych

Manufacture of new meat products requires paying attention to raw meat processing methods, aimed at ensuring the

reliable spoilage protection, and performing precise control over the state, stability of food properties and preservation degree of quality indicators. Various natural or synthetic antioxidants are widely used for inhibition of oxidative processes in products.

The degree of oxidative spoilage of fat was determined by peroxide number (number of grams of iodine, extracted from potassium iodide by peroxides, contained in 100 g of the product). Quantitative determination of the content of carbonyl compounds (aldehydes) was performed by determining the benzidine number based on measuring the color intensity that develops in the interaction of aldehydes with benzidine, shows the content of aldehydes in terms of cinnamic aldehyde in mg per 100 g of fat.

To investigate the antioxidant properties of aromatic plants, 4 experimental samples were formed: control sample № 1, containing 100 g of pork belly fat, black pepper and allspice in the ratio, g – 1: 0.9, sample № 2 – 100 g of pork belly fat, black pepper: thyme: juniper – 0.9: 0.8: 0.1 g; sample № 3 – 100 g of pork belly fat, black pepper: thyme: juniper – 0.9: 0.7: 0.2 g; sample № 4 – 100 g of pork belly fat, black pepper: thyme: juniper – 0.9: 0.6: 0.3 g.

Aromatic substances of thyme herb and juniper fruit combined with black pepper have better antioxidant properties than black pepper combined with allspice and increase the shelf life of animal fats by 2.1 times. In samples with higher concentrations of thyme, spoilage processes run slower (sample №2 – 100 g pork belly, black pepper: thyme: juniper – 0.9: 0.8: 0.1 g). Thus, replacement of allspice by juniper combined with black pepper guarantees efficient spoilage inhibition of animal fats, and, therefore, their use in the production technology of smoked sausages to lengthen shelf life is possible.

**Keywords:** pork belly, thyme, juniper, spilage, antioxidant properties, storage, peroxide, benzidine, number.

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### STUDY OF POSSIBILITIES TO GROW BIOFORTIFIED VEGETABLES AS A SOURCE OF CAROTENOIDS (p. 36-40)

Gregoriy Deynichenko, Olha Yudicheva

Micronutrient deficiency significantly affects the nutritional status and population health in both well-developed and

developing countries. This deficiency causes growth inhibition in children, various diseases, mortality, brain damage, reduced cognitive abilities and working capacity of people of all ages. The global prevalence of micronutrient deficiency in the food ration, including vitamin A deficiency has led to the action program development to mitigate the negative effects of micronutrient malnutrition. Solving the problem by implementing biofortification and fortification strategies in our country is aimed at reducing specific deficiencies of iron, zinc and vitamin A in the food ration, especially of people with low living standards.

Biofortification in growing vegetables is one way to increase the content of important minerals and vitamins, which in turn affects the food ration balance. A study of carotenoid content in different varieties of eggplant, sweet pepper, pumpkins and melons was performed. The studied samples of vegetables were grown using environmentally friendly fertilizer “Riverm”, which provides a natural increase in the content of vitamins and minerals in vegetables (agronomic biofortification) and control samples – using traditional growing technology. The research results allow to conclude that the carotenoid content in agronomically biofortified vegetables that have been grown using environmentally friendly liquid fertilizer “Riverm” exceeds the carotenoid content in control samples. In particular, the studied eggplant samples contained by 27 % more carotenoids than vegetables grown by traditional technology. Oleshkivskiy pumpkins that have been grown with fertilizer “Riverm” had by 22.8 % higher carotenoid content than in control samples. The studied melon samples contained by 23,3–26,9 % more carotenoids than the control samples. Thus, biofortified vegetables can be used in special micronutrient diets and, along with fortified food, can be used to solve the micronutrient malnutrition problem.

**Keywords:** vegetables, biofortification, carotenoids, micronutrients, fertilizer, “Riverm”, food, control, study, growing.

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### THE AROMA PECULIARITIES OF SOME WHITE WINES FROM AUTOCHTHONOUS GRAPES VARIETIES FROM WESTERN EUROPE AND UKRAINE (p. 40-45)

Oksana Tkachenko, Olha Trynkal

The paper considers significance of using local grapes varieties in manufacturing local wines that are important for enotourism. We have researched white dry wines from autochthonous grapes varieties from Western Europe and Ukraine that are presented on the Ukrainian wine market. We have submitted statistical data on propagation of aboriginal grapes varieties in Western Europe and Ukraine from 2000 to 2010. Autochthonous grapes varieties are a valuable genetic heritage owing to their productivity and biological resistance as tokens of authenticity and specificity.

The major criterion in characterizing the researched wines was aromatic complex, since it is largely predetermined by the grapes variety. We have researched an aromatic complex of wines from autochthonous grapes varieties from Spain (Albarino, Verdejo, and Garnacha Blanca), Italy (Vermentino, Garganega, Grillo, and Cortese), Greece (Moskhofilero and Asirtiko), and Ukraine (Kokur white and Telti Kuruk); the sensor analysis of wines was made under ISO international standards. The obtained data have laid the basis for organoleptic profiles; we have determined and assessed major descriptors of the researched wines depending on their intensity. During the research of wines from European aboriginal varieties, we outlined distinctive features and peculiarities of the aromas and proved the expedience of using autochthonous grapes varieties in manufacturing modern local wines.

**Keywords:** autochthonous varieties, local wines, aroma, descriptor, flavour, organoleptic profile, sensory analysis, terroir.

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### EFFECT OF VEGETABLE POWDER ON THE PROPERTIES OF PANCAKE BATTER AND SEMIFINISHED PRODUCTS (p. 45-49)

Alexandra Niemirich, Tetiana Tarasenko, Oksana Petrusha, Oksana Vasheka, Andrew Havrysh, Vera Zayets

Today, fast food restaurants are very popular among young people. In the assortment of culinary products of “Bistro” type restaurants, a significant share is occupied by pastry and confectionery, namely, crepes and pancakes. In modern conditions, the problems of creating dietary food products, including a reduction in energy and the improvement of the nutritional value, enrichment with biologically active components become important. One of the ways to solve this issue is using fruit and vegetable powders in manufacturing culinary products.

The purpose of the paper was to study the effect of vegetable powders on the properties of pancake batter and semi-finished products.

Doses of vegetable powders to the pancake batter recipe mixture were selected. The influence of selected doses of vegetable powders on the organoleptic assessment of ready semi-finished products was investigated. As rational, providing a high organoleptic rating of semi-finished products, powders from cabbage – 6 %, artichoke – 8 %, spinach – 4 % were taken. In this case, to improve the color of semi-finished products with artichoke powder, natural food dye, which gives a nice golden color to the product was added.

A study of the adhesion strength of experimental samples was performed. It is shown that adding vegetable powders - from artichoke and spinach allows to give antiadhesion property to the batter. When using cabbage powder, batter adhesion slightly increases compared with the other samples.

The forms of moisture binding in batter samples with vegetable powders were studied using nuclear magnetic resonance. It was found that moisture is bound and retained largely in batter systems with vegetable powders compared to the control.

The batter-making process optimization in terms of tensile strength of the baked semi-finished product (b) depending on the dose of vegetable powders ( $X_1$ ) and the batter stoving time ( $X_2$ ) was carried out. Extremum points for semi-finished products with vegetable powders: from cabbage –  $X_{1max}=5,1\%$ ,  $X_{2max}=4\text{ min}$ ,  $Y_{max}=7,8 \cdot 10^3\text{ Pa}$ ; artichoke –  $X_{1max}=7,9\%$ ,  $X_{2max}=20\text{ min}$ ,  $Y_{max}=9,3 \cdot 10^3\text{ Pa}$ ; spinach –  $X_{1max}=2,8\%$ ,  $X_{2max}=13\text{ min}$ ,  $Y_{max}=7,9 \cdot 10^3\text{ Pa}$  were found.



**Keywords:** vegetable powders, pancake batter, semi-finished product, sedimentation stability, adhesion, tensile strength, optimization.

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### QUALITY AND SAFETY CONTROL IN THE PRODUCTION OF RECREATIONAL-PURPOSE COTTAGE CHEESE (p. 50-57)

**Lyudmila Mostova, Tatyana Klusovych**

The paper deals with the relevant problem of implementing safety control systems according to HACCP principles for Ukrainian catering establishments in the integration of trade space. Taking into account high competition and consumer audience gaining priority, the work emphasizes the need to develop and implement safety control system according to HACCP principles as a precondition for leadership of catering establishments in the national market, and get significant competitive advantages in hospitality.

Due to the intensification of the dairy sector in the food market and a steady trend in creating new dairy products of increased food and biological value, a model of the system of basic principles and regulations of quality and safety control in accordance with HACCP in the production of cottage cheese with a high content of vitamin and mineral ingredients and restaurant products based on it to ensure recreational and safe nutrition in the catering network was developed for implementing in catering establishments.

Within this problem, the key measures on implementing the HACCP system in catering establishments were identified, and basic safety system elements were justified. The hierarchy of components and elements of the safety control system in manu-

facturing recreational products was proposed. Hazard analysis at all process stages of producing eco-friendly, safe cottage cheese in CE was performed; identification of critical control points (CCP) in the production was carried out and analysis of dangerous factors was conducted; critical control points according to each process stage of manufacturing recreational-purpose cottage cheese were determined.

The developed safety control system according to HACCP principles for innovative cottage cheese will allow to increase the competitive advantages of the product and solve one of the important issues of ensuring appropriate quality and safety of food.

**Keywords:** HACCP system, critical control points, safety control, potential risk areas.

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### USING INNOVATIVE EQUIPMENT FRYMAKORUMA MAXXD IN THE PRODUCTION OF MAYONNAISE (p. 58-64)

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Using the equipment of the FrymaKoruma MaxxD vacuum processing unit for liquid and pasty products is a topical issue today. The advantages of such equipment are highly efficient production with low operating costs and high performance, preset parameters ensure consistent quality of the product, the final product is stable, homogeneous, and air-free, versatility: the machine is able to manufacture a great variety of products of different volumes and with different technologies. The advantages of the Silverson mixing technology lie in the fact that one unit can perform tasks, for implementing which in the past several different pieces of production equipment could be used. Due to excellent operational adaptability, each unit can perform a wide

range of functions: blending, dispersion, emulsification and homogenization, particle size reduction and dissolution.

**Keywords:** innovative technologies, mayonnaise, homogenizer, FrymaKorumaMaxxD, Silverson.

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