International scientific conference

ProConferenceOrg

International scientific conference (Germany, Karlsruhe)

Conference program

The current stage of development of scientific and technological progress '2023

FEBRUARY 20-21, 2023

Organizing Committee:

Chairman:

Shibaev A.G. Academician, Doctor of Technical Sciences, Professor

Scientific Secretary:

Kuprienko S.V. candidate of technical sciences

Members of the organizing committee:

More than 200 doctors of sciences in all areas of the conference.

Learn more at www.proconference.org

February 20, 2023: The beginning of the sections of the Conference.

Innovative technique, technology and industry

THE PRACTICE OF IMPLEMENTATION OF METHODS OF PROBLEM-BASED TRAINING OF MECHANICAL ENGINEERS	Kisietov Jurii, candidate of technical sciences, associate professor, National University of Shipbuilding
USE OF INGREDIENTS OF DOMESTIC PRODUCTION IN RECIPES OF MARZIPANE MASSES	Stadnuk I.Y., Doctor of Technical Sciences, Professor, Ternopil lIvan Puluj National Technical University
	Piddubnyi V.A., Doctor of Technical Sciences, Professor, Kyiv National University of Trade and Economics
	HushtanT.V., candidate of economic sciences, associate professor, Uzhhorod Trade and Economic Institute of SUTE
	Havrylko P.P., candidate of economic sciences, associate professor, Uzhhorod Trade and Economic Institute of SUTE
	Kahanets-havrylko L.P., Senior Lecturer, Uzhhorod trade and economic professional college of the State trade and economic university
INFLUENCE OF DEFORMATION IN THE LIQUID-SOLID STATE ON STRUCTURAL TRANSFORMATIONS DURING CHEMICAL-THERMAL TREATMENT IN SYNTHETIC CAST IRON	Movchan Oleksandr, candidate of technical sciences, Ukrainian State University of Science and Technologies
	Chornoivanenko Kateryna, candidate of technical sciences, associate professor, Ukrainian State University of Science and Technologies
THE MAIN PROVISIONS OF THE MODEL OF EXTRUSION PROCESSING OF PLANT MASS IN THE AREAS BEFORE ENTERING THE EXTRUDER MATRIX AND IN THE EXTRUDER MATRIX	Radchenko N. L., candidate of technical sciences, Institute of Engineering Thermophysics of the National Academy of Science of Ukraine
	Ivanitsky G. K., Doctor of Technical Sciences, National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute", Ukraine; Institute of Engineering Thermophysics of the National Academy of Science of Ukraine
	Tselen B. Ya., candidate of technical sciences, Institute of Engineering Thermophysics of the National Academy of Science of Ukraine

	Nedbailo A. Ye., candidate of technical sciences, Institute of Engineering Thermophysics of the National Academy of Science of Ukraine
WAYS OF MODERNIZATION OF ELECTRICAL EQUIPMENT AND ENERGY SAVING AT OIL PRODUCTION ENTERPRISES	Fedoriv Mykhaylo Yosyfovych, candidate of technical sciences, associate professor, Ivano-Frankivsk National Technical University of Oil and Gas
APPLICATION OF THE PRINCIPLE OF NONRESONANT EFFECT OF THE INFLUENCE OF THE MICROWAVE FIELD IN THE TECHNOLOGY OF JUICE BLENDING	Kolianovska Liudmyla Mykolaivna, candidate of technical sciences, Vinnytsia National Agrarian University
STUDY OF THE TECHNOLOGICAL MODE OF THE PROCESS OF PORIZATION OF LIQUID GLASS GRANULAR MATERIALS FOR THERMAL INSULATION UNDER THE CONDITIONS OF UHF RADIATION	Rymar Tetyana, Doctor of Technical Sciences, Professor, Volodymyr Dahl East Ukrainian National University
VIBRATION DEFORMATION DURING THE RESTORATION OF WORN PARTS	Ivankova Olena Volodymyrivna , candidate of technical sciences, associate professor, Poltava State Agrarian University
	Bartosh Vitaliy Yuriyovych, Automotor company, Poltava
	Obshchiy Yaroslav Olegovich, Poltava State Agrarian University
	Kysil′ Yuriy Yuriyovych, Poltava State Agrarian University

Chemistry and pharmaceuticals

SELECTION OF SAMPLE PREPARATION CONDITIONS IN THE DEVELOPMENT OF A TOP-METHOD FOR IDENTIFYING PHENOLIC COMPOUNDS IN THE GRASS OF CREEPING THYME AFTER HYDROLYSIS	Zarivna Nadiya Orestivna, candidate of pharmaceutical sciences, associate professor, I. HORBACHEVSKYTERNOPIL NATIONAL MEDICAL UNIVERSITY
	Horlachyk Natalija Viktorivna, candidate of pharmaceutical sciences, associate professor, I. HORBACHEVSKYTERNOPIL NATIONAL MEDICAL UNIVERSITY

STUDY OF THE QUALITY COMPOSITION OF MODERN WOUND-HEALING AGENTS BASED ON DECAMETOXIN AND METHYLURACIL	Solomennyi Andrii Mykolayovych , candidate of pharmaceutical sciences, associate professor, Ukrainian Military Medical Academy
ASSESSMENT OF SENSITIVITY OF PROBIOTIC MICROORGANISMS IN ANTIBIOTIC RESISTANCE	Chervetsova Veronika Hennadiivna, candidate of biological sciences, associate professor, Lviv National Polytechnic University
	Shved Olha Vasylivna, Candidate of Chemical Sciences, associate professor, Lviv National Polytechnic University
	Hubrii Zoriana Vasylivna, Candidate of Chemical Sciences, associate professor, Lviv National Polytechnic University

Medicine and healthcare

THE METHOD OF CHOOSING COLLOIDAL SOLUTIONS FOR INTENSIVE CARE IN VIOLATIONS OF THE WATER-SALT BALANCE OF THE BODY	Keldigulova Umit, Astana Medical University
	Nazhar Shoukat Ahmad, Republican Diagnostic Center for Corporate fund UMC
	Dar Suhail Ahmad, Astana Medical University
	Orynbek Orazkhan, Astana Medical University
	Tazhimetov Bekzat, Astana Medical University
	Shayakhmetov Dulat, Astana Medical University

Biology and ecology

THE DANGER OF EXPOSURE TO THE AIR ENVIRONMENT ON HUMAN HEALTH	Shutyak Iryna Anatoliivna, associate professor, Leonid Yuzkov Khmelnytskyi University of Management and Law,
	Yankov Serhii Volodymyrovych, Senior Lecturer, Leonid Yuzkov Khmelnytskyi University of Management and Law,

Agriculture, forestry, fisheries and water management

ASSESSMENT OF THE IMPACT OF HONEY PLANTS IN THE GARDEN ON BEEKEEPING PRODUCTIVITY	Padalko Tetiana Alexandrovna, Candidate of Agricultural Sciences, Higher educational institution "Podillia State University"

Economy and trade

CREDIT RISKS OF A COMMERCIAL BANK: CAUSES AND METHODS OF MANAGEMENT	Shylo Zhanna Stepanovna, candidate of economic sciences, associate professor, National University of Water and Environmental Engineering
SOCIAL RESPONSIBILITY OF BUSINESS IN UKRAINE	Kozmuk Nataliia Ihorivna, candidate of economic sciences, associate professor, Lviv Ivan Franko National University
POSSIBILITY OF IMPLEMENTATION OF INNOVATIVE CITIES	Zhuravska N.Y., candidate of technical sciences, associate professor, Kyiv National University of Civil Engineering and Architecture
	Starovoit O.Y., Kyiv National University of Civil Engineering and Architecture
REGULATION OF OFFSHORE CENTERS AS A MECHANISM FOR DE-SHADOWING INTERNATIONAL BUSINESS	Tetiana Chernytska, candidate of economic sciences, associate professor, Kyiv National Economic University named after Vadym Hetman
	Kharlov Volodymyr, graduate student, Kyiv National Economic University named after Vadym Hetman

Management and marketing

DEVELOPMENT OF FRANCHISING IN POLAND	Kohut Maryana Volodymyrivna, candidate of economic sciences, Lviv National University of Nature Management

Education and pedagogy

KNOWLEDGE EXTRAPOLATION OF EDUCATIONAL-DIGITAL AND ADMINISTRATIVE «MECHANISMS» OF TEACHING IN HIGH SCHOOLS: MOTIVATION AND ORGANIZATIONAL CONSTRUCTIVISTICS OF EDUCATIONAL AND SCIENTIFIC PRACTICES IN THE PROCESS OF TRAINING FUTURE SCHOOL TEACHERS	Salahub Lyudmila Ivanivna, Candidate of Historical Sciences, Horlivka Institute of Foreign Languages of Donbas State Pedagogical University
	Bodyk Ostap Petrovych, Candidate of Philology, associate professor, Mariupol State University
ELECTRIC CURRENT AND ITS PROPERTIES	Anisimov Nikolay Viktopovych, doctor of pedagogical sciences, Professor, At the Flight Academy National Aviation University

GAMING TECHNOLOGIES AND PROBLEM-SEARCH TRAINING IN TRAINING AND EDUCATION OF A PROFESSIONALLY COMPETENT SPECIALIST	Kulaeva Zalina Aslanbekovna, student, The National University of Physical Education and Sport of Ukraine
EDUCATION IN THE CONDITIONS OF INDUSTRY 4.0	Karnaushenko Alla, candidate of economic sciences, associate professor, Kherson State agrarian and economic University
	Kononenko Lesia , candidate of economic sciences, associate professor, Kherson State agrarian and economic University
	Savchenko Vira, candidate of economic sciences, Professor, Kherson State agrarian and economic University
METODICAL PRINCIPLES AND METHODS OF FORMATION OF SINGING SKILLS OF PRESCHOOL CHILDREN	Viktorova Margarita, candidate of pedagogical sciences, associate professor, Kryvyi Rih State Pedagogical University
	Varnavska Larisa, candidate of pedagogical sciences, associate professor, Kryvyi Rih State Pedagogical University
	Serhieieva Viktoria, Senior Lecturer, Kryvyi Rih State Pedagogical University
FORMATION OF INCLUSIVE COMPETENCE OF EDUCATORS DURING FACE-TO-FACE CLASSES AT ADVANCED TRAINING COURSES	Shopina Maryna Oleksandrivna, candidate of psychological sciences, Institute of post-graduate education of Kiev University after Boris Grinchenko
	Yakunin Yaroslav Yuriyovych, Candidate of Chemical Sciences, Institute of post-graduate education of Kiev University after Boris Grinchenko

Psychology and sociology

MODELING OF "SOFT SKILLS" IN THE SYSTEM OF MANAGERIAL COMPETENCE	Cherusheva Halyna , candidate of pedagogical sciences, associate professor, National Academy of Statistics, Accounting and Audit
SOCIAL AND PSYCHOLOGICAL FACTORS OF INTERPERSONAL COMPATIBILITY IN MARRIED COUPLES	Bohdan Julia Anatolyivna, student, National University of Life and Environmental Sciences of Ukraine
	Teslyuk Valentina Mikhailovna, candidate of psychological sciences, associate professor, National University of Life and Environmental Sciences of Ukraine

Legal and political sciences

LEGAL REGULATION OF INTEGRITY IN LAW ENFORCEMENT BODIES: EUROPEAN STANDARDS	Pysmenna O., candidate of legal sciences, associate professor, Vasyl Stus Donetsk National University, Ministry of Education and Science of Ukraine, Vinnitsa
ADMINISTRATIVE AND LEGAL REGULATION OF PUBLIC	Grutsenko Yu., Armed Forces of Ukraine, major

February 21, 2023: Summarizing. Recommendations for the publication of materials in the conference proceedings. Closing of the annual scientific-practical conference.

Chairman of the Organizing Committee
Doctor of Technical Sciences, Professor, Academician **A.G. Shibaev**

SWorld Project Manager
Ph.D. **S.V. Kuprienko**

CONFERENCE PROCEEDINGS

THE CURRENT STAGE OF DEVELOPMENT OF SCIENTIFIC AND TECHNOLOGICAL PROGRESS

'2023

SERIES «SWORLD-GER CP»
BOOK 25

International scientific conference

ProConferenceOrg

International scientific publication

Conference proceedings

The current stage of development of scientific and technological progress '2023

FEBRUARY' 2023

Series Conference proceedings
SW-Ger conference proceedings

Published by:
Sergeieva&Co
Karlsruhe, Germany

*Series «**SW-Ger conference proceedings**»*

UDC 08
BBK 94

Reviewed and recommended for publication
The decision of the Organizing Committee of the conference
" **The current stage of development of scientific and technological progress '2023***"***
No 25 on February 20, 2023

Organizing Committee: More than 200 doctors of science. Full list on page: *https://www.proconference.org/index.php/gec*

DOI: 10.30890/2709-1783.2023-25

Published by:
ProConferenceOrg in conjunction with
Sergeieva&Co
Lußstr. 13
76227 Karlsruhe, Germany
Articles published in the author's edition

https://www.proconference.org/index.php/gec/article/view/gec25-01-016
DOI: 10.30888/2709-1783.2023-25-01-016

UDC 664.64

APPLICATION OF THE PRINCIPLE OF NONRESONANT EFFECT OF THE INFLUENCE OF THE MICROWAVE FIELD IN THE TECHNOLOGY OF JUICE BLENDING

ЗАСТОСУВАННЯ ПРИНЦИПУ НЕРЕЗОНАНСНОГО ЕФЕКТУ ВПЛИВУ МІКРОХВИЛЬОВОГО ПОЛЯ В ТЕХНОЛОГІЇ КУПАЖУВАННЯ СОКІВ

Kolianovska L./Коляновська Л.
C.t.s., senior lecturer / К.т.н., старший викладач
ORCID: 0000-0002-8645-3515
Vinnytsia National Agrarian University (Vinnytsia, Ukraine) /
Вінницький національний аграрний університет (Вінниця, Україна)

Abstract. *Technologies strive for improvement and this process is almost endless. In the technology of juice blending, not only the most optimal selection of components for blending remains relevant, but also the technological features of heat treatment processes.*

In this work, we have substantiated the improvement of the technological problem of pasteurization of blended juices by treating with ultra-high-frequency energy of a microwave field of nonresonant action [1-5].

For the preparation of juices, fruit and berry materials grown by FRUCTONA-VN LLC, Vinnytsia, were used. The technology of blending apple juice of the "Champion" variety with the remontant strawberry variety "Temptation" in a ratio (%) of 80:20 was chosen. The choice was made due to their high organoleptic and physicochemical characteristics.

Key words: *blending, juices, ultra-high frequency field, resonant effect.*

Анотація. *Технології прагнуть до вдосконалення і цей процес практично нескінченний. У технології купажування соків актуальним залишається не тільки найбільш оптимальний підбір компонентів для купажування, а й технологічні особливості процесів теплової обробки.*

В даній роботі обґрунтовано удосконалення технологічної задачі пастеризації купажованих соків шляхом обробки надвисокочастотною енергією НВЧ поля нерезонансної дії.

Для приготування соків використовували плодово-ягідну сировину, вирощену ТОВ "ФРУКТОНА-ВН", м. Вінниця. Було обрано технологію купажування яблучного соку сорту Чемпіон з ремонтантним сортом полуниці Спокуса у співвідношенні (%) 80:20. Вибір обумовлений їх високими органолептичними та фізико-хімічними показниками.

Ключові слова: *купажування, соки, поле надвисоких частот, резонансний ефект.*

Introduction.

Champion apple juice contains 0,5% protein, 0,1% fat, and 10,3% carbohydrates (including starch, mono- and disaccharides) in terms of nutritional value. In addition, organic acids, tannins, phytosterols, polyphenols, essential oils, useful trace elements - iron, potassium, zinc, vitamins C, A, E, and K. Many minerals, trace elements, as

well as many enzymes - potassium, sodium, phosphorus, zinc, manganese, flavonoids, phytoncides, carotenoids, etc. In addition, malic acid, starch and proteins, glucose and fructose. And, of course, a number of vitamins, the main ones being E, A and C - natural antioxidants, a group of vitamins B, as well as H and PP. The total content of complex sugars: fructose, glucose and sucrose is about 6%.

Chemical composition of the remontant strawberry variety "Temptation". In addition to proteins, fats, carbohydrates, fiber and organic acids, strawberries and strawberry juice contain vitamins: A, Z, E, H, many B vitamins; macronutrients: potassium, calcium, magnesium, sodium, sulfur, phosphorus, chlorine; trace elements: iron, manganese, copper, fluorine, chromium, zinc, iodine, boron, selenium, nickel, vanadium, cobalt, molybdenum.

Only black currant berries contain more vitamin C than strawberries. For example, it is enough to eat 5 small strawberries to get the same amount of vitamin C as an entire orange.

Strawberry juice has more folic acid (vitamin B_9) than raspberry and grape juice, and the iodine contained in berries can make up for its lack in regular food.

Of course, such a rich and useful composition allows strawberries and their juice to be used as a preventive and therapeutic agent in many cases.

The effect of strawberry juice on the body. Strawberry juice has a beneficial effect on the entire digestive system, improves appetite and cleanses the entire body, as it has a mild diaphoretic and diuretic effect.

The antioxidant effect of strawberries is also pronounced, thanks to a significant amount of vitamins and flavonoids, so its consumption prolongs youth.

Strawberry phenolic substances - polyphenols, flavonoids - actively protect the structure of our cells from destruction, preventing the development of inflammation, cardiovascular diseases, age-related brain diseases, oncology, arthritis and other health problems. The antioxidant activity of these substances is 4-5 times higher than that of the well-known antioxidants - vitamins E and C. The content of amino acids is also important. Of the 20 natural amino acids, eight are essential. These are lysine, methionine, tryptophan, phenylalanine, leucine, isoleucine, threonine, and valine. Now they also include histidine and arginine, which are not synthesized in the child's body.

Research results.

Inactivation of microflora is one of the main challenges facing the production process of any food product. It is also problematic to preserve the native nutrients of the components of the fruit and berry blend during inactivation.

The main bacteria in juice production that require inactivation are acetic acid bacteria. In nature, they are found on flowers, fruits, honey bees, grape wines, cheese, beer, kefir, brewer's yeast, vinegar, sour fruit juices, sugar cane juice, kombucha, plant tannins, and soil.

Some members of the genus Acetobacter can cause pink rot of pineapples, apples, and pears. One species (A. diazotrophicus) is a microaerophilic nitrogen-fixing microorganism present on the roots and stems of sugar cane.

Methods that contribute to the inactivation of microflora are called preservation methods in the processing of fruits and vegetables and are classified into:

- physical methods - low temperatures, high temperatures, sterilizing filters, ultraviolet radiation, ultra-high and ultra-high frequencies, X-rays (gamma rays), ionizing radiation, ultrasonic waves;
- chemical methods - sulfuric acid (sulfitation), sorbic acid, benzoic acid, antibiotics, carbon dioxide, ozone;
- physical and chemical methods - drying, sugar, salt;
- biochemical methods - fermentation, pickling, soaking;
- Combined methods - cold smoking, hot smoking, electrostatic smoking, smokeless smoking, combination of several methods.

Physical methods are based on the use of high and low temperatures, sterilizing filters, ionizing radiation, ultra-high frequency (UHF) and ultra-high frequency (UHF) currents, ultraviolet and ionizing radiation. When low temperatures are used, fruits and vegetables are cooled or frozen; when high temperatures are used, they are sterilized (above 100°C), pasteurized (below 100°C), or aseptic canning is used; when ionizing radiation is used, they are processed in inert gases or in a vacuum.

High temperatures are used to reduce the amount of microflora and inactivate oxidizing enzymes in food. Pasteurization is carried out at a temperature below 100°C to inactivate enzymes and partially destroy microflora (vegetative forms of microorganisms). There are two forms of pasteurization - short-term (85-90°C for 0.5-1 min.) and long-term (about 65°C for 24-30 min.). Sometimes, to extend the shelf life, multiple pasteurization is carried out - tindalization (repeated heat treatment of the product at intervals). Sterilization is the heating of food products at a temperature above 100°C in order to completely destroy the microflora, which allows to increase the shelf life of canned food at normal temperatures by several years. Sterilization somewhat reduces the taste and nutritional value of products due to the hydrolysis of proteins, fats, carbohydrates, destruction of vitamins, phenolic compounds, anthocyanins, some amino acids (lysine, histidine and arginine), etc. Aseptic canning is a more advanced method. It involves sterilizing liquid and pureed

food products by short-term high-temperature heating, cooling, packing them in sterile containers and sealing them under aseptic conditions. Low-temperature canning involves cooling and freezing. Cooling is the processing and storage of food products at temperatures from 0°C to 4°C, which are close to the cryoscopic temperature (freezing point of cell sap), depending on the composition and concentration of dry matter. The duration of food storage in the chilled state depends on the type of product (fruits and vegetables - 6-10 days. Freezing is a processing that results in the complete crystallization of the liquid phase and the formation of ice in the product. Freezing is carried out to a temperature in the product of -18, -20, -25°C. The most widely used method is rapid shock freezing of products in an intense stream of cold air in fluidization fast freezers (more often used for freezing small berries). Fluidization (pseudo-liquefaction) is the blowing of air from the bottom up at a certain speed through a layer of product. In this case, the dense layer of product becomes a suspension, the product particles are intensively mixed, resembling a boiling liquid, so sometimes such a layer is called «boiling». Canning using sterilizing filters helps to produce sterile food products with maximum preservation of vitamins, color, taste and aroma. The essence of the method is to pass the product through filters with a mesh size of 0.1 to 3 microns, which have pores so small that they retain microorganisms. This is how clear juices, grape wines, beer, etc. are freed from microorganisms. Canning with ionizing radiation gives a positive result without raising the temperature.

Preservation by ionizing radiation (60-400 nm wavelength) is sometimes called cold sterilization or cold pasteurization. X-rays, γ-rays, and a stream of accelerated electrons are used for food processing. The mechanism of action of ionizing radiation is based on the ionization of molecules and atoms of 24 microorganisms, which results in a decrease in their normal biological functions and their death. Preservation by ultra-high (UHF) and ultra-high (UHF) frequency currents (oscillations over 20 kHz) is based on the enhanced movement of charged particles under the influence of ultra-high and ultra-high frequencies, which leads to an increase in the temperature of the product to 100°C and above. Food products sealed in hermetically sealed containers and placed in the zone of action of ultrahigh frequency waves are heated to boiling in just 30-50 seconds. Chemicals used for food preservation should be harmless and not change the taste or color of the product. For canning, chemicals such as ethyl alcohol, acetic, sulfuric, benzoic, sorbic acids and their salts, some antibiotics, etc. are used. When canning with sulfuric acid (sulfitation), sodium bisulfate ($NaHSO_3$), potassium bisulfate (Na_2HSO_3), and a 5-6% solution (H_2SO_4) are used; acetic acid (marinating) - acetic acid 3-6%, vinegar essence 70-80%; benzoic

acid - sodium benzoic acid C_6H_5CO2Na, benzoic acid C_6H_5COOH; antibiotics - biomycin, nystatin, nisin.

The peculiarities of the heat treatment process accompanying the pasteurization and sterilization of products are undesirable reactions from polyphenols and anthocyanins contained in the fruit and berry raw materials. It is also known that vitamins, amino acids and carbohydrates are destroyed.

Compared to the classical heating, the use of microwave ultra-high frequency exposure is a more modern and economical process that is more sensitive to the chemical composition of raw materials during processing. This technology is widely used in food processing and agriculture.

The advantage of microwave heating compared to traditional methods of food processing is [1, 2]:

1) high process speed (e.g., drying time is reduced by 10 ... 30 times);
2) short time to reach the mode (not exceeding 1 ... 2 min.);
3) heat distribution over the entire volume of the material, regardless of its thermal conductivity;
4) selectivity of the process: wet particles of the material warm up faster than dry ones, which is not typical for convection heating;
5) possibility of full automation of the process with characteristic inertia of heating;
6) high efficiency of the process;
7) no need to use coolants, significant reduction of heat losses to the environment and reduction of its pollution;
8) reduction of production areas by 3...5 times;
9) high bactericidal effect of microwave energy;
10) high nutritional value of products, preservation of vitamins;
11) reduction of service personnel by 10...50%;
12) possibility of obtaining finished products with new properties.

But a significant drawback is the formation of so-called "standing waves" in the microwave chamber. They cause localized overheating zones in places of their maximum. And there are also underheating zones in the places of the waves' minima. Of course, this affects the chemical composition of the product and insufficiently inactivates the microflora.

Conclusions.

Therefore, to carry out the heat treatment process by microwave exposure, the principles of nonresonant action of the microwave field were used in the study. The improvement of this type of microwave apparatus is that the converter, i.e. the

absorber, of ballast field energy into thermal energy, which, along with the field concentrator in the product volume, is necessary to obtain a "traveling" wave in the chamber, has a high level (10 dB/mm) of the field transmission coefficient into the energy absorber. At the same time, there is no local overheating or underheating of the product. The technical realization of the non-resonant chamber was achieved by concentrating the field energy in the product volume, converting the ballast field energy into thermal energy and utilizing it. Selective heating of products in a non-resonant working chamber makes it possible to reduce the temperature required for guaranteed inactivation of microflora by 25...30 °C. This contributes to the preservation of product components due to the absence of overheating and reduced energy consumption. In addition, it ensures: the exclusion of harmful radiation from the working chamber; prevents generator overheating and eliminates the dependence of the chamber's energy efficiency on the level of its product load [3].

List of sources used

1. Kolyanovska, L., Palamarchuk, I., Sukhenko, Y., et al. (2019). Mathematical modeling of the extraction process of oil-containing raw materials with pulsed intensification of heat of mass transfer. Proceedings of SPIE – The International Society for Optical Engineering, 25 p. https://doi.org/10.1117/12.2522354.

2. Burdo, O., Bandura, V., Kolianovska, L., Dukulis, I. Experimental research of oil extraction from canola by using microwave technology (2017) Engineering for Rural Development, 16, pp. 296-302. http://doi.org/10.22616/erdev2017.16.n056.

3. U.S. PAT. 76346. Ukraine, IPC C12N1/16. Method for microwave stabilization of beverages / B.O. Demianchuk, Sh.R. Guliev, M.V. Olenev - No. 20041109096 applied for on November 05, 2004; Published on July 17, 2006, Bulletin No. 7.

4. Olenev M. V. Improvement of grape juice production technology using a uniform electromagnetic field of ultra-high frequency: Candidate of Science (PhD): 05.18.13. 2009.

5. Peng, J., Tang, J., Luan, D., Liu, F., Tang, Z., Li, F., Zhang, W. (2017). Microwave pasteurization of pre-packaged carrots. Journal of Food Engineering, 202, 56-64. DOI: https://doi.org/10.1016/j.jfoodeng.2017.01.003.

Теза відправлена: 17.02.2023 г.