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ABSTRACTS

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Section 1.
Biotechnologies in Food Industry

ALTERNATIVE SOURCES FOR PLANT-BASED PROTEIN FOOD PRODUCTS

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Abstract:
Nowadays, food industry is interested in the use of nutritional compounds from plant sources in order to replace animal proteins. This concern comes in support of sustainable foods and biodiversity.
Sorghum Oryzoidum (soryz), a hybrid of sorghum, could be considered one of such raw materials, based on its chemical composition and high productivity, despite the poor climatic conditions in Republic of Moldova.
In the present work, the content of starch and proteins in the soryz grains was analyzed, using standard methods of analysis. This is a vegetable raw material with a high starch content between 74-82% starch in which the amylopectin fraction prevails. Due to the higher amylopectin content, soryz starch is characterized by a high viscosity and a lower gelling tendency. Proteins constitute the second important component of soryz grains. The value of the protein content, 13.07%, can vary depending on the changes that occur in the distribution of protein fractions and in the composition of amino acids. The distribution of protein fractions in the total protein content was 5.20% for albumins, 11.95% globulins, 49.32% prolamins, 18.23% glutelins and 13.86% for stroma. Glutamic acid is the major amino acid in the soryz proteins. It constitutes 34% of all amino acids, followed by the content of asparagine, alanine, leucine and arginine.
Soriz can be used in various composite food products, improving their nutritional and biological value.

Key words: *amino acids profile, biological value, chemical composition, proteins, sorzy, starch.*
Acknowledgments. The authors would like to thank the bilateral project *23.80013.5107.3TR* Sustainable Nutrient-Rich New Generation Food Products Development: evaluating the relationship between ingredients, processing methods used, and techno- and bio-functional properties.

THE USE OF LENTILS IN THE COOKIES PRODUCTION

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Abstract:
Lentil flour is considered a stabilizer of weak flours through the supply of proteins, food fibers, by fortifying the food product with iron, molybdenum, B group vitamins. All of these contribute to increase the biological value of the product, lower the energy value, increase the shelf life of the finished product, reduce the consumption of wheat flour, and increase the quality of confectionery products.
The partial replacement of wheat flour with lentil flour improves the quality of cookies. The product acquires an original taste, smell and color, there is an increase in swelling capacity and a decrease in the cookie hardness, which is due to the composition and properties of lentil flour protein substances.
In this paper, results are presented regarding the substitution of wheat flour with lentil flour in concentrations of 1, 5, 10 and 15%, in the cookies recipe. The cookies quality was analyzed during the storage period of 35 days, at a temperature of 20-22°C and a relative air humidity of 78%. There is an increase in swelling capacity of about 10%, a 14% decrease in cookie hardness, and a 1-4% decrease in product humidity, during the first 10 days,. In the third week of storage, the cookies hardness increases, and the swelling capacity decreases, due to the changes in gluten proteins.
The analyzed quality indicators showed appreciable results for the sample with 10% lentil flour substitution.

Key words: *quality indices, flour substitution, hardness, legumes, lentils, proteins.*

Acknowledgments. The authors would like to thank the Moldova State project *20.80009.5107.09 Improvement of food quality and safety by biotechnology and food engineering*.

AN OVERVIEW OF WINE WASTE VALORISATION IN THE REPUBLIC OF MOLDOVA

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Abstract:
The Republic of Moldova is a country in which the main part of the economy related to agriculture, namely vinification. The land surface covered by vineyards is about 147,000 hectares, of which 102,500 hectares are used for commercial purposes. According to FAOSTAT, the Moldovan grape production in 2021 reached the value of 536829 tones. It is estimated that 75% of grape production is used in wine industry, thus generating 20-30% waste. The morphological parts of wine waste are used as sustainable products to obtain different compounds with biological active potential such as: enocolorants and polyphenols that exhibit antiradical activity from grape skin, polyunsaturated fatty acids from grape seeds, tartaric acids from grape mark and others.
Nowadays in Republic of Moldova, wide researches are done concerning the posibility of valorisation of wine waste. On one hand, the majority part of the studies are based on the extraction of biologicaly active compounds in order to obtain sustainable food products and enhance the potential use of wastes. Thus, products like ice-cream, marshmallow or bread have been used as food matrices in order to increase their functionality by incorporating grape skin extracts in their formulations. On the other hand, the wastewater from wine industry has been proven to be an energy source when applying anaerobic digestion. In the same context, wine waste is used in order to enrich soil fertility and consequently to increase the productivity of field crops.

Key words: *fertilizer, grape pomace, grape skin, polyphenols, sustainability.*

Acknowledgments. *The authors would like to thank the Moldova State project 20.80009.5107.09 Improvement of food quality and safety by biotechnology and food engineering.*

INFLUENCE OF WATER INDICATORS ON QUALITY KOMBUCHA

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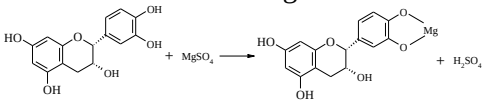
Abstract:
Kombucha is a fermented drink that is prepared by fermenting a sugar solution with tea infusion with a culture of microorganisms *Medusomyces gisevii.*
During the production of kombucha, it is necessary to take into account the physical and chemical indicators of water, in particular the hardness, the content of iron and chlorides, which affect the course of the fermentation process of the wort, quality indicators and the usefulness of the finished product. The effect of the general hardness of water on the content of polyphenolic substances in the tea solution is due to the formation of coordination bonds with calcium and magnesium salts:



In order to preserve the maximum amount of polyphenolic substances in the wort, and, accordingly, to increase the biological value of the fermented drink, the total hardness of water for the production of kombucha should not exceed 2,0 mmol/dm^3.
Iron, like hardness salts, affects significantly the biological value of kombucha and its organoleptic indicators. Residual free chlorine leads to oxidation of caffeine, which loses its biological activity and decomposes into dimethylsiloxane and methylurea. Caffeine and related xanthines in the tea solution have the ability to stimulate the synthesis of a cellulose film by Acetobacter bacteria, which strengthens the connection between bacteria and yeast and has a direct effect on the fermentation process. The content of residual free chlorine in water for the production of kombucha should not exceed 0,1 mg/dm^3.

Key words: *non-alcoholic fermented drinks; kombucha; water; water treatment.*

RESEARCH ON THE EXTRACTION OF CAROTENES WITH SOLVENTS FROM LYCOPERSICON ESCULENTUM TOMATOES

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Abstract:
The experimental study followed the extraction of lycopene, DPPH, polyphenols, flavonoids from the by-products of oxheart tomatoes (*Lycospericon esculentum*), the extraction was carried out with the help of solvents. The solvents used were acetone and ethanol, where a comparison was made to see which had the higher degree of extraction. After multiple extractions it was possible to make a comparison to see the best solvent extraction. Optimization of the solvent extraction process for maximum recovery of compounds from tomato pomace was achieved by selecting the appropriate solvent system and temperature-time-amount combination marc. After the solvent extraction was done, the results were determined using the UV-VIS spectrophotometer to see which is the best extraction.
The highest randament of lycopene extraction was achieved in the next conditions: solvent acetone at 40°C for 10 h and 0.1 g of pomace. The amound of lycopne after this operations was 4.53 g/100 g, while the best extraction with ethanol was at 50°C for 6 h and 0.1 g of pomace with a lycopene content of 4.04 g/100 g. It was observed that the best results for DPPH, polyphenols and flavonoids, were coducted by the ethanol extractions.
All the results are influenced by extraction temperature, time and in the same time by the amount of tomato pomace.

Key words: *tomatoes, solvents, extraction, by-products, lycopene, DPPH, polyphenols, flavonoids.*

STUDY ON THE UTILIZATION OF *PRUNUS* FRUITS IN THE BAKERY INDUSTRY

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Abstract:
According to FAO (2015), fruit and vegetables are among the foods that are wasted the most, with 12 million tons of fruit and 21 million tons of vegetables lost annually. National surveys conducted in EU countries show that more than half of food waste generated by families (21.1 kg / person / year) comes from fruits and vegetables. From an economic perspective, the most important tree crops now farmed worldwide belong to the genus *Prunus. Prunus* is a genus of tree fruits that are consumed extensively worldwide. It has 430 species, including both cultivated and wild varieties that are found in temperate zones across all continents. Utilizing fruit by-products is crucial from a sustainability perspective (FAO, 2020). Utilizing *Prunus* fruit by-products to increase their value for the food sector has emerged as a fascinating area of study in recent years. While the reuse of fruit components leads to improved nutrition and the quality of the finished product, their recovery prevents negative effects on environmental pollution. The use of *Prunus* fruit by-products in the food industry has been widely mentioned in specialized literature, for obtaining doughs for bakery and pastry products (bread, muffins, and cookies), creams, puddings, ice cream, extruded foods, etc. The paper presents a study of specialized literature regarding the utilization of *Prunus* fruit by-products in the bakery and pastry industry.

Key words: *bakery products, by-products, food waste, sustainability, valorisation*

THE VALORISATION OF CANNABIS SATIVA L. OIL CAKE BIOLOGICALLY ACTIVE COMPOUNDS

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Abstract:
Food industry produces a significant amount of waste annually, thus creating premises for researches focused on reducing and effectively handling this problem, promoting the idea of zero waste. Oil cakes are produced during the oilseed extraction process. These leftovers are a source of health-promoting bioactive substances.
Europe has been growing industrial hemp (*Cannabis sativa* L.) for hundreds of years. The poor performance of hemp (*Cannabis sativa* L.) oil cake on certain functional qualities limits its utilization in the food industry. Thus, the most recent processing techniques created to eliminate or reduce these limits were compared. All of the essential amino acids are present in hemp cake's proteins, with arginine (2.28...3.10% of whole seeds) and glutamic acid (3.74...4.58% of whole seeds) being the two most important amino acids. From a nutritional perspective, hemp seed protein is quickly absorbed and provides a decent profile of essential amino acids, comparable to casein.
Together with being high in nutrients, hemp seeds are also a good source of natural antioxidants and other bioactive substances such tocopherols, phenolic compounds, phytosterols, carotenoids, minerals and bioactive peptides. The development of "functional foods" with positive effects on human health was the goal of this work, which aims to valorize agricultural waste sources, particularly hemp (*Cannabis sativa* L.) oil cake, by the extraction biologically active compounds that may be used to diversify food products.

Key words: *Cannabis sativa L., biologically active compounds, industrial hemp, food waste, functional foods oil cake.*

Acknowledgment: The research was funded by State Project 20.80009.5107.10, nr. PS-62 "Personalized nutrition and intelligent technologies for my well-being", running at Technical University of Moldova.

INTRACELLULAR SYNTHESIS OF SELENIUM NANOPARTICLES USING YEASTS AND PROSPECTS OF THEIR APPLICATION IN FOOD INDUSTRY

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Abstract: The deficit of selenium in human body leads to the decrease of synthesis of selenoproteins, the lack of which negatively affects the glutathione peroxidase activity, which results in increased risk of thyroid gland diseases, diabetes, obesity and reproductive dysfunction. Consuming food products enriched with bioavailable selenium in form of nanoparticles might be the solution to problem. For the biosynthesis of selenium nanoparticles (SeNPs) we used *Saccharomyces cerevisiae* M437 cultivated on liquid Reader medium. Sodium selenite was added to culture liquid in 0.5-3 mM concentrations at the beginning of cultivation. Observations were carried out for 7 days. All investigated selenite concentrations, except for 0,5 mM, were toxic to the cells. However, even in non-viable cells we observed selenite biotransformation to SeNPs, since cells color turned from milky to red. At the same time SeNPs were not released into the culture medium and were bonded to the yeasts surface. We investigated the process of sodium selenite biotransformation and found out, that at its lower concentrations biotransformation rate was lower. Thus, while using selenite at 0.5 mM concentration the percentage of unreacted selenite ion was two times higher than while at 3 mM. In the future, yeasts containing selenium nanoparticles in bioavailable form can be used as food additive to recover selenium deficiency in human body and prevent diseases connected to selenium deficit in regions with low selenium content in food products.

Key words: *Saccharomyces cerevisiae, selenium nanoparticles, food products, biotechnology, yeast.*

RESEARCH ON THE WHEY'S VALORISATION FOR BEVERAGE PRODUCTION

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Abstract:
Whey waste load is predicted to be 100–175 times more than that of a comparable volume of home wastewater, making whey a significant environmental pollutant. Roughly half of the whey produced is thought to be used for animal feed or human consumption, with the remaining half being released into the environment as waste water, contributing to further pollution. Therefore, its valorisation through the creation of health-promoting products is a significant step for the environment and the food industry, in line with the rules set forth by the EU Green Deal program. The specialized literature mentions a variety of beverages made from whey. Whey can be used to make low-alcohol (maximum 1% alcohol) beverages that simulate wine or beer. They have to be transparent and ideally sparkling. Low-alcohol beverages can be made by fermenting with yeasts or seeding the whey with a kefir culture. Whey is added to some of the beer wort to create beverages that resemble beer, which is then fermented using brewer's yeast. Wine-like beverages can be made by fermenting whey with different kinds of yeasts, producing liqueur-style drinks, a drink with an alcohol concentration of 10–14%, etc. The examination of the specialized literature on whey, a by-product of the cheese industry, and the opportunities for valorisation that have been used thus far on a national and international scale is presented in this paper.

Key words: *by-products, environmental pollutant, human consumption, health-promoting products*

RESEARCH ON THE USE OF DIFFERENT TYPES OF YEAST IN FROZEN BAKERY PRODUCTS

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Abstract:
Dough freezing and methods for producing superior-quality bakery products from frozen dough are among the most researched technology. Many factors affect the technology used to create frozen doughs, including the quality of the flour, the amount and type of yeast in the dough, the addition of ingredients and additives, the conditions under which the dough ferments and kneaves, and the freezing, storage, and thawing times. A larger dose of yeast is recommended to compensate up for the loss of yeast viability during freezing, frozen storage, and thawing, as yeast performance is one of the main issues with frozen doughs. When used in frozen doughs, the yeast needs to have a high activity of maltase, be resistant to freezing, and be able to maintain trehalose at freezing temperatures above 5%, which is crucial for protecting the cell's protoplasm. The yeast dose must be raised in comparison to normal consumption; typically, the standard amount of yeast in the recipe is doubled. This is because the yeast in frozen dough diminishes its fermentation activity, making it necessary for the dough to ferment in an acceptable amount of time after thawing. For extended durations of storage, the amount of yeast should be increased to 4 or even 5%. Dough with 3% yeast should be stored for no more than two weeks. The dough's ability to retain gas is negatively impacted by an overabundance of yeast (10%). The examination of specialized literature on the use of several strains of baker's yeast in frozen baked products is presented in this article.

Key words: *fermentation activity, frozen dough, trehalose, yeast viability*

STUDY ON OBTAINING LACTOSE-FREE ICE CREAM - A REVIEW

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Abstract:
Due to its flavour and refreshing sensation, ice cream is a famous frozen dairy delicacy that is enjoyed by people of all ages and is consumed in large quantities throughout the world. Highly nutritious ingredients like proteins, some vitamins, minerals, and phytochemicals can be found in ice cream, a multiphasic frozen system. Even though cow milk is used to make traditional ice cream, non-dairy milk has become more popular over time. Because of its nutritional and health benefits, a variety of non-dairy milks, including soy milk, coconut milk, and watermelon seed milk, have been used in place of cow milk while making functional ice cream. The need for more sustainable food systems, ethical concerns about cattle ranching, increasing lactose intolerance, and milk allergies have all raised consumer demand for milk substitutes. Currently, milk allergy is one of the most frequent food allergies in children, with rates ranging from 0.5% to 3% at the age of one year in developed nations. Approximately 70% of people globally suffer from lactose intolerance. For people who are lactose intolerant, non-dairy milk ice cream could be a great substitute that also helps others. There have been reports on the creation and quality assessment of soft ice cream made from non-dairy milk. Consumers want new flavours, healthier options, and lactose-free ice cream products that have "mouthwatering appeal," therefore it's critical to find new ingredients and create new assortments of dairy-free functional ice cream. The use of ice cream made from non-dairy milk is the subject of this paper's literature review.

Key words: *functional ice cream, lactose intolerance, new assortments, new ingredients*

NUTRITIONAL ASSESSMENT OF WHOLE FLOURS OBTAINED FROM DIFFERENT WHEAT SPECIES

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Abstract:
The growing interest in healthy foods, both among consumers and scientists, has shifted the focus to the nutritional evaluation of whole wheat flours. The aim of the present study was to profile the total polyphenol content, antioxidant activity, respectively crude fiber and protein content for 24 modern (*Triticum aestivum*) and ancient (*Triticum monococcum*, *Triticum spelta*) wheat varieties, grown in the same place and in the same growing season. A high variability was observed between the wholemeal flour samples investigated, so that the total phenolic content of the wheat samples varied between 268.57 and 644.05 mg GAE/kg wheat flour. The high content of polyphenols was characteristic for all the spelta wheat samples. The antioxidant capacity in free phenolic extracts from wheat was evaluated by the DPPH method and was between 31.02% and 61.03%. Moreover, significant differences were observed between species, in terms of protein and crude fiber content. The values for the protein content varied between 8.53-17.99%, the highest being recorded for the samples belonging to the species *Triticum spelta*, and for the fiber content, the range of variability was 1.63-2.84%, the highest value belonging to the *Triticum aestivum* species.
This study confirms that ancient wheat can represent a valuable source of biodiversity, especially due to the high content of phenolic compounds as a potential antioxidant and the protein content. Therefore, the intake of whole grains is still the best strategy, to obtain a large amount of nutrients and bioactive compounds from wheat grains as well.

Key words*: ancient varieties, antioxidants, crude fiber, modern varieties, phenolics, wheat*

THE IMPACT OF THE GERMINATION PROCESS ON THE PHYSICO-CHEMICAL CHARACTERISTICS OF BUCKWHEAT GRAINS (*Fagopyrum esculentum*)

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Abstract:
The purpose of this study is to highlight the changes that occur in the buckwheat grains during the germination process. A significant advantage of germination process, as numerous studies in the field have emphasized, is the fact that it decreases the amount of anti-nutritional factors in the germinated grains and at the same time it has the role of increasing the availability of some nutritional compounds.
The good functioning of the human body is given by the quality of food products. For people with celiac disease it is very important to choose gluten-free foods and buckwheat could be a good choice because it does not contain gluten. Also, due to the content of polyphenols and their abundance of nutrients, they present a multitude of health benefits.
To analyze the impact of the germination process on buckwheat grains, was used a growth plant chamber, at a temperature of 20°C, in dark conditions and a constant humidity of 80%, according to the standard method SR 1634:1999. The germination process was followed during 6 days. After these 6 days, in which the buckwheat samples were germinated, the grains were lyophilized so that they could then be ground and turned into flour. A lyophilizer from the BK-FD12 series was used for freeze-drying the buckwheat.
In order to highlight the changes that appeared in the buckwheat grains as a result of the germination process, specific laboratory determinations were carried out. To show the variation of lipids, proteins and carbohydrates was used the Fourier-transform infrared spectroscopy (FT-IR). The obtained data were correlated with the determinations made with the help of spectroscopic techniques, namely near-infrared spectroscopy (NIR). Also, in order to highlight the intensification of enzyme activity in buckwheat grains due to the germination process, Falling Number tests were performed.
Due to the positive impact that the germination process had on buckwheat, this study is of scientific interest, being a good starting point for the use of germinated buckwheat as an additive in some food products.

Key words: *buckwheat, germination process, enzymatic changes, nutritional changes*

CHARACTERIZATION OF BERRY SORBET MATRICES WITH INULIN AND *STEVIA REBAUDIANA* AND EFFECTS OF ADDITION ON SENSORY PROPERTIES

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Abstract:
Sorbet is a fat-free product made with fruit or fruit juice, sometimes with additions of liquor and flavors, being a healthy alternative to ice cream and is widely consumed, especially in the summer months. In the present paper, we have studied the influence of inulin and *Stevia rebaudiana* used as a sugar substituent, in new berry sorbet matrices. A control sample and six variables were developed, and were characterized based on their viscosity, texture, CIELAB color and sensorial analysis. Evaluating the color parameter Luminosity (L*) of the sorbet samples, it was found that there is no significant difference in color due to the more intense purple-reddish color of the berries. The texture of berry sorbets with gelling agents (pectin) and natural sweeteners is influenced by several factors, including the amounts of inulin-pectin or *Stevia rebaudiana* -pectin added. This study aims to produce different varieties of sorbet with natural sweeteners, very tasty as an alternative to carbonated drinks with harmful effects on health.

Key words: *berry sorbet, inulin, sensory properties, texture.*

Section 2
Applied Engineering Sciences

EFFECT OF TECHNOLOGICAL PROPERTIES OF PEA SEEDS AND PROCESSING MODES ON DEHULLING EFFICIENCY

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Abstract:
The process of dehulling grain peas is the most important technological operation of groats of pea seeds. It is determined that the increase of processing time, the pea seeds, the speed of the working organs and filling coefficient of the working chamber of the dehuller increase the efficiency of dehulling peas by linear dependence. Increase in the size of pea seeds contributes to increase of efficiency of dehulling mainly due to increase of the yield of small.
The increase in the scale of seeds leads to a decrease in the dehulling index. Along with the increasing efficiency of dehulling, increases and yield of trinkets at the expense of the kernel. With the increase in the moisture of pea seeds, the yield of a fine grits increases compared to the dehulling of dry pea. Yield of the kernel is directly proportional to the reduction of the yield of undehulling seeds. The yield of a fine grits also has linear dependencies when you change the following parameters. In the process of dehulling reduces the ash content of the kernel, but also decreases the ash content and husk and dust middlings, which is the result of transition of low-ash content particles of kernel into the dust middlings. For effective dehulling of pea seeds, it is necessary to carry out dehulling for 10...15 s, filling coefficient of the machine must be not less 0,48. Pea seeds with an absolute mass of 257 g, dehull better than pea seeds with an absolute mass of 213 g.

Key words: *peas, dehulling, kernel, ash content, moisture, husk, dust middlings, fine grits*

RHEOLOGICAL CHARACTERISTICS OF BETA-GLUCANS OBTAINED FROM WINE LEES OF WINES FROM LOCAL GRAPES VARIETIES

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Abstract:
Beta-glucan is a biologically active substance with a wide range of physiological effects: it is used to lower blood cholesterol, to stimulate the health of the digestive system and immune system. A large amount of beta-glucan is found in yeast. The aim of the study was to characterize some rheological parameters of beta-glucan isolated by two methods from the wine lees obtained after the manufacture of three red wines: Feteasca Neagra, Rara Neagra and Craft wine.

The results of the analysis of the viscosity of the liquid phase of the suspensions obtained after centrifugation did not give impressive results, the viscosity of all analyzed suspensions ranged from 0.9044 (Craft wine) to 0.9108 (Rara Neagra) at 60 degrees and from 0.9072 (Craft wine) to 0.9318 (Rara Neagra) at 80 degrees, these indicators practically do not differ from the viscosity of water. The results of the analysis of the surface tension of the liquid phase of the suspensions obtained after centrifugation showed the difference between suspensions with the addition of beta-glucans obtained by the first and second methods. The surface tension of suspensions with the addition of beta-glucans isolated by the first method ranges from 70.14 (Feteasca Neagra) to 72.64 (Craft wine), while the results of the surface tension of suspensions with the addition of beta-glucans isolated by the second method range from 40.45 (Feteasca Neagra) to 54.33 (Craft wine).

Key words: *ß-glucans, extraction, suspension, surface tension, viscosity, wine, yeast.*

APPLE PUREE, AN IMPORTANT NUTRITIONAL ALTERNATIVE IN REDUCING THE SUGAR CONTENT OF PASTRY PRODUCTS

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Abstract:
In recent years, the consumption of pastry and bakery products has grown considerably, and consumers are increasingly tempted to choose products from an organoleptic point of view. At the same time, consumers are also interested in having a healthy diet, respectively products with special sensory properties, but with a low sucrose content. Substituting the sucrose in these products with apple puree represents an alternative in obtaining cakes with a lower sugar content and, in addition, in obtaining products with high nutritional value, the bioactive compounds from apples having special properties on health. The purpose of this work was to analyze both the physico-chemical properties, the total content of polyphenols and the antioxidant activity of the apple puree samples, as well as their variation during the storage period. The physico-chemical properties analyzed were: humidity, titratable acidity, ash content, pH, water activity, total soluble solids content and color. Regarding the content of the bioactive compounds, the total content of polyphenols and the antioxidant capacity were determined by the Folin-Ciocalteu method, respectively the DPPH method. The results showed that apple puree is an important source of polyphenols, and these are the main factors influencing the antioxidant activity.

Key words: *antioxidant capacity, apple puree, pastry and bakery products, physico-chemical properties, total polyphenol content*

MODELING OF HYDRODYNAMIC CAVITATION FOR THE PURPOSE OF EXTRACTING DISSOLVED GASES FROM AN ALCOHOL-CONTAINING MEDIUM

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Abstract:
Cavitation phenomena, which are usually undesirable in industry, can be used to extract vapors and dissolved gases from liquids, such as for the beer dealcoholization. Computational experiments make it possible to determine the necessary process parameters. The SolidWorks 2020 Flow Simulation software module was used for computer analysis of the cavitation process performed to extract alcohol vapors from beer. A model water-alcohol mixture was used for the experiment. The flow rate at the inlet to the cavitator is 10 m/s based on the calculation of the diameter of the cavitator body, and the liquid moves by gravity at the outlet. We set the pressure at the gas extraction nozzle to 50300 Pa. The "vortex" and "cavitation" parameters are enabled in the program.
The cavitation process will occur if the pressure in the flow drops below the threshold value at which evaporation begins. Computational experiments demonstrated the formation of a cavity behind the cavitation element. A reduced pressure was established in it, which leads to a partial release of ethanol vapor from the liquid into the cavity. When the gas-filled cavity is closed, a field of gas-filled cavitation microbubbles is formed, which, falling into the zone of reduced pressure, continue to be filled with alcohol vapors.
Thus, computer modeling in SolidWorks 2020 Flow Simulation of the cavitation process organized for the extraction of alcohol vapors from beer demonstrated the fundamental feasibility of implementing such a technology.

Key words: *beer dealcoholization, cavitation, cavity, flow rate, modeling, pressure.*

SCIENTIFIC EXPLANATION OF THE RECIPE COMPOSITION OF MILK-VEGETABLE PASTAS

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Abstract:
Recently, there has been an increased trend in the production and consumption of fermented milk products. In Ukraine, fermented milk pastas are gaining much more popularity.
At the department of Milk and Dairy Products Technology of the National University of Food Technologies, recipes of new types of sour-milk milk-vegetable pastes have been developed. The low-fat fermented milk cheese, obtained by a separate method, and low-fat yogurt were used as milk base, multifunctional vegetable raw materials (beetroot and prunes) were used as a filler, which perform a coloring function due to the presence of natural pigments, and a structuring function due to the presence of dietary fibers (fiber, pectin substances).
On the basis of the sensory evaluation of quality, a ratio of dairy and vegetable raw materials in the composition of sour-milk pastes was selected. Also, the selection of structure stabilizers was carried out. Potato starch, modified potato starch LYCKEBY Volume C E1420, modified potato starch Microlys 52 E1442, modified potato starch CheesMaker BL 140 were used as structure stabilizers.
The complex interaction of pectin-containing plant raw materials and modified starches (LYCKEBY Volume C E1420 and Microlys 52 E1442) in the composition of sour-milk pastes allows obtaining a product with a delicate plastic consistency and prevent the separation of moisture during storage. The developed new types of milk-vegetable pastes will allow expanding the range of sour-milk snacks and improve the nutrition structure of the country's population.

Key words: *beets, yogurt, sour milk paste, starch, sour milk cheese, prunes.*

INFLUENCE OF DEMINERALIZED WHEY CONCENTRATES ON ICE CREAM SUGAR CONTENT

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Abstract:
The production of low-calorie ice cream is increasing every year, which is one of the modern trends of changing consumer preferences in the direction of healthy eating. Sucrose in the composition of ice cream performs not only the role of a sweetener, but also is a source of solids, and ensures the proper formation of its structure and affects its quality indicators during storage. The use of liquid hydrolyzed whey concentrates in the composition of ice cream can help reduce the sugar content in it due to the increased degree of sweetness of monosaccharides.
The recipe of whey ice cream (solids content - 25%, including sugar - 17%, starch - 2.84%, fat - 0.5%) was chosen as a control sample. To optimize the replacement of sugar in ice cream with whey, liquid demineralized whey concentrate and liquid hydrolyzed demineralized whey concentrate were used.
A sensory assessment of ice cream samples based on demineralized whey concentrates with a sugar content from 9 to 17% was carried out according to 6 descriptors of the perception of sucrose sweetness according to authors developed gradation. The degree of replacement of sugar in ice cream with whey concentrate was optimized using MathCad 15. It was showed that the reduction of sugar in ice cream with non-hydrolyzed whey concentrate reached 29% in terms of its total content, and with hydrolyzed concentrate by 42%.

Key words: *whey concentrate, optimization, sweetness index, ice cream, sucrose, protein supply.*

PROTEIN OLEOGELS: PRODUCTION AND EFFECT ON RHEOLOGICAL AND REOFERMENTOGRAPHIC PROPERTIES IN BUN DOUGH

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Abstract:
In this article we will focus on the potential of proteins to create edible oleogels. Pea protein (PP) was used to form the oleogel. Due to their nutritional value and high degree of consumer acceptance, proteins are of particular interest for the preparation of edible oleogels as an alternative to solid fats. Using proteins as a structuring for oil is challenging because proteins do not readily form a protein network in oil or other hydrophobic media. The method of obtaining was based on the preparation of an oil-in-water emulsion with proteins as an emulsifier. Xanthan gum was added to strengthen the oil-water binding interface. A sufficiently stable interface is crucial for the next step, where water is removed by drying. The oils used in this research were: sunflower oil (SO), grape seed oil (GO) and olive oil (OL). The protein oleogels were introduced into the fermented dough for the manufacture of buns in a percentage of 3%. Rheological properties were determined by measuring viscoelastic parameters. The frequency sweep test showed that the storage modulus and the loss modulus of the doughs with the addition of protein oleogels in percentage of 3% increased significantly compared to the control. The obtained results demonstrate the fact that protein oleogels can be used in low percentages to avoid obtaining tough doughs. From a rheofermentographic point of view, protein oleogels improve the fermentation capacity of the dough. The results suggest that using oleogels instead of margarine in buns could be an interesting strategy to prepare healthier baked goods.

Key words: *oleogelation, protein, protein oleogelation, oil structuring, rheology, fermentation.*

INFLUENCE OF WATER HARDNESS ON THE PROCESS OF FERMENTATION BY MEDUSOMYCES GISEVII CONSORTIUM

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Abstract:
According to Zion Market Research, the global kombucha market in 2016was valued at approximately 1.062 billion US dollars and is expected to reach approximately 2.5 billion in 2022 with an annual increase of about 25.0%
It is believed that kombucha has the healing and preventive properties:improves the activity of the gastrointestinal tract, inhibits putrefactive microflora,strengthens intestinal peristalsis, normalizes stomach acidity.
The basis for the production of kombucha is water. The technology of fermented drinks, as a rule, does not involve additional water treatment. However, the chemical composition of the source water has a significant impact on the technological process and indicators of the finished product. Based on the results of studies of the dynamics of wort fermentation, it was established that high water hardness negatively affects the fermentation process by Medusomyces gisevii culture and worsens the organoleptic qualities of the finished drink. It was established that the most intensive fermentation process occurred from the fourth to the eighth day, which can be explained by the logarithmic phase of growth of yeast cells as a component of the Medusomyces gisevii consortium.
It was found, that the high water hardness had a negative effect on the fermentation caused by the Medusomyces gisevii yeast culture and made the organoleptic qualities of the finished drink worse. There was defined the correlation between water indicators, wort fermentation dynamics and organoleptic evaluation of finished drinks.

Key words: *non-alcoholic fermented drinks; kombucha; Medusomyces gisevii*; *wate*.

Section 3.
Food Products Quality and Safety

PHYSICOCHEMICAL, ANTIOXIDANT, ANTIMICROBIAL AND SENSORY PROFILE OF SELECTED COCONUT OILS

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Abstract:

For many hundred years, coconut oil has been one of the most frequently used vegetable oils. But coconut oil might also be viewed as a cooking oil who's chemical and dietary components have received the least attention.

The aim of this study was to determine peroxide value, acid number, oxidation stability (Rancimat method), antioxidant activity (DPPH method), antimicrobial activity (with disc diffusion method), sensory properties (with 9-hedonic scale), and fatty acid profile (FAME) of five kind of coconut oils (CO) purchased from local market (CO1 – cooking fat, fully hydrogenated, CO2 – refined, non-hydrogenated, CO3 – bio, virgin, CO4 – bio, raw, virgin, CO5 – bio extra virgin). All kind of oils were made in Sri Lanka.

The peroxide value ranged from 0.6 (CO5) to 1.2 (CO2) mmol O_2/kg. All measured values was with according to Slovak legislation, in which it is established that peroxide value for edible oils must be max. 15 mmol O_2/kg. The value of acid number was in ranged from 0.13 (CO5) to 0.48 (CO4)

mg KOH/g. These values were in accordance with the Slovak legislation as they did not exceed the values 0.6 mg KOH/g. The oxidation stability was very long ~70 hours, which was not surprising, because coconut oils are rich for saturated fatty acids. The amount of saturated fatty acid in analyzed oils was in line ~94%. The dominant fatty acid in coconut oils was lauric acid (~48%), following by myristic acid (~19%), palmitic acid (~9%), caprylic acid (~7%) and stearic acid (from 2.86 % in CO2 to 10.82 in CO1). In samples of CO2 was detected the highest value of linoleic acid – 1.63%, while the lowest in sample CO1. Antioxidant activity was the strongest in sample CO5 – 0.46 mg TEAC/g (Trolox equivalent antioxidant capacity). Samples CO2 and CO5 had the strongest inhibition activity to *Candida tropicalis* CCM 8223 (3.66 mm) and *Bacillus subtilis* CCM 2010 (1.33 mm). In samples of CO3 and CO4 was detected the best values for inhibit *Yersinia enterocolitica* CCM 5671 (1.83 mm). By sensory analysis the best score obtained samples CO2 and CO4, the evaluator's positive evaluated smell, taste, aftertaste and overall acceptability.
Coconut oil is a tropical oil that is consumed in many Asian region countries. Though it was criticized for its adverse health effects in the early days due to the presence of saturated fatty acid, by many studies claim the positive health effects of oil consumption.

Key words: *peroxide value, acid number, DPPH method, fatty acids, oxidation stability*

Acknowledgment: This study was supported by the project APVV-21-0168.

MICROBIOLOGICAL PROPERTIES OF VARIOUS TYPES OF HOMEMADE KOMBUCHA BEVERAGES USING ALTERNATIVE KINDS OF SUGARS

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Abstract:
Kombucha is a beverage made by fermenting sweetened tea with a symbiotic culture of yeast and bacteria. Literature data indicate that the kombucha beverage shows many health promoting properties such as detoxification, chemo-preventive, antioxidant, antimicrobial, antifungal, and general strengthening. The aim of this work was to determinate of microbiological composition of SCOBY and new kinds of homemade kombucha beverages with alternative sugars like cane and coconut. Also antimicrobiological activity of the kombucha beverages was determined. Analysis of the composition of the tea mushroom (SCOBY) microflora using the MALDI TOFMS Biotyper mass spectrometer showed 8 species of bacteria and 7 species of yeasts. In vitro studies confirm the bactericidal and bacteriostatic properties of fermented kombucha beverages, with white and green tea beverages showing the highest antibacterial activity. The bacteria *Staphylococcus aureus* and yeast *Candida albicans* were the most sensitive to the effects of kombucha tea beverages.

Key words: *kombucha, MALDI-TOFMS, antimicrobial properties, SCOBY*

IDENTIFICATION OF MICROORGANISMS IN MODEL MEAT STUFFINGS USING MALDI TOF MS BIOTYPER

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Abstract:

The aim of this work was to identify of pathogenic microorganisms in a model pork meat stuffing using MALDI-TOF MS. The scope of the work included microbiological analysis of model pork stuffings using classical (selection media) and molecular (MALDI TOF MS) microbiological methods. Testing using a MALDI TOF MS Biotyper mass spectrometer revealed the presence of a broad spectrum of bacteria in model pork meat stuffings stored for 12 days under refrigeration. Bacteria isolated from the samples were *Hafnia alvei, Kocuria salsicia, Micrococcus luteus, Enterobacter cloacae, Enterobacter hormaechei, Pseudomonas lundensis, Pseudomonas fragi, Pseudomonas fulva, Pseudomonas synxantha, Pseudomonas fluorescens, Serratia fonticola, Serratia liquefaciens, Serratia proteamaculans, Serratia grimesii, and Klebsiella oxytoca.* Identification of bacteria using the MALDI TOF MS Biotyper method identified the presence of 15 bacterial species in the material studied, mainly of the genus *Pseudomonas*. These are widely distributed in nature. The second most abundant group were bacteria of the genus *Serratia*. The remaining bacteria belong mainly to the *Enterobacteriacea* family, which can occur in food as pathogens. The MALDI TOF MS Biotyper technique allows rapid identification of pathogenic microorganisms, which is important in identifying and preventing the spread of food contamination.

Key words: *MALDI-TOF MS Biotyper, meat, microbiological quality*

ANTIOXIDANT ACTIVITY OF HOME-MADE ENERGY DRINKS BASED ON NATURAL INGREDIENTS

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Abstract:
The aim of this work was to produce a home-made energy drinks based on green coffee or matcha extracts and to evaluate their antioxidant properties. The scope of research was to determined: 1. antioxidant activity (DPPH and FRAP tests) 2. total phenolics content 3. (TPC) caffeine, chlorogenic acid and Luteolin 7-Glukoside determined by thin layer chromatography (TLC) 4. organoleptic assessment by 20 persons group using the 5-cm scale method. The antioxidant activity and the total content of polyphenols in the extracts of the tested green coffee and matcha samples differed between particular samples regardless of the applied extraction method. The results obtained for the antioxidant activity and phenolic compounds content tested for the home-made energy drinks were significantly higher as compared to the literature data obtained for popular, commercial energy drinks with the addition of synthetic substances. TLC analysis showed that caffeine was present in all energy drinks. In the organoleptic assessment, the best energy drinks turned out to be a drinks with the addition of lemon juice and mint. To sum up, it is possible to self-prepare energy drinks containing caffeine of natural origin based on matcha tea or green coffee water infusions while the addition of honey, herbs or fruit juices shapes their organoleptic qualities acceptable to consumers.

Key words: *home-made energy drinks, antioxidant activity, TLC*

INSIGHTS INTO THE STARCH STRUCTURE, PHYSICOCHEMICAL PROPERTIES AND IN VITRO DIGESTIBILITY OF WHOLE BLACK RICE FLOUR, WHOLE BROWN RICE FLOUR, THEIR MIXTURES AND CORRESPONDED BREADS

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Abstract:
Recent studies have reported the health benefits of pigmented rice cultivars due to the presence of bioactive compounds in the bran layer of caryopsis. This study evaluated the proximate composition, colour, sensorial study, texture analysis, image analysis, total flavonoids, and proanthocyanidins contents, as well as the total phenolics of two types of rice varieties (*Oryza sativa* and *Oryza sativa L.)* and their corresponded breads. The quality and digestibility behaviors of bread with BRF and WBRF were evaluated through instrumental and *in vitro* digestion studies.
Whole brown rice flour (WBRF), black rice flour (BRF), flour mixture in ratios of 25% (25-BRF), 50% (50-BRF) and 75% (75-BRF) and their corresponded breads (WBRB, BRB, 25-BRB, 50-BRB, 75-BRB) were subjected to physico-chemical characterisation and *in-vitro* digestibility. The proximate analysis showed higher concentrations of proteins (with 20.49%), lipids (47.38%), crude fiber (50.29%), polyphenols (58.08%), proantocyanidins (95.27%) and flavonoids (85.01%), which proportionally increased the functional properties of the obtained rice bread samples. The color parameters such as Lightness (L*), redness (a*) and yellowness (b*) were modified with the addition of BRF. As a result, L* and b* decreased with the increase of BRF in the crust of bread whereas, L* and b* were reduced and a* increased in the crumb. Furthermore, the addition of BRF

increased the elasticity of bread structure, giving springiness, chewiness, resilience and cohesiveness, whereas adhesivehess and hardness lowered.
A tighter folding of proteins and a more compact structure was suggested by the modified patterns in amide I band of proteins, the peaks assigned to starch bands were displayed by the FTIR spectra of BRF, as compared to WBRF. As for the digestion study, BRB was atributed a reduction of rapidly digestible starch (RDS) with 17.94% and increase in slowly digestive starch (SDS) with 16.00%, than in WBRB, resulting in a significant reduction of estimated glycemic index (eGI) with 5.83%.
The results indicated that bread fortifiation with BRF may provide new oportunities to produce functional bread by slowing down the digestion rate, however, the production of BRB on large scale is limited by the consumers preference, the sensorial study indicating the consumer overall acceptability for the 50-BRB.

Key words: *black rice, FTIR, functional bread, in-vitro digestibility, polyphenols, whole brown rice*

INFLUENCE OF THE PROCESSING TECHNOLOGY ON DORNA SWISS CHEESE QUALITY

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Abstract:
The production of high-quality Swiss cheese depends on the milk quality, the professional training and experience of the processor and the staff involved, as well as some specific spaces, equipment, and installations. The aim of this study was to evaluate the influence of the processing technology on Swiss cheese's chemical, physical, and sensory properties. For this purpose, the amino acids content, fatty acids content, polyphenols, color, texture, and sensory profile of the two Dorna Swiss cheeses (ITC-made in a copper tank, with standardized microflora and matured for 90 days, ICA-made in stainless steel tank, with spontaneous microflora, matured for 70 days) were investigated. The results showed that Dorna Swiss cheese is rich in aspartic acid, glutamic acid, proline, and valine. ITC presented a higher content of polyunsaturated fatty acids and it was richer in polyphenols and copper than ICA. The sensory profiles of the two local samples were similar and differed from the characteristics of the commercial sample. ITC has higher cutting force and stickiness and lower firmness and adhesiveness, while the luminosity and the yellow nuances were less pronounced compared to ICA. These results are important for both consumers aware of a healthy diet and producers interested in process optimizations.

Keywords: *amino acid profile, Emmental cheese, fatty acids, minerals, physical properties, sensory characteristics.*

INFLUENCE OF WALNUT OIL ADULTERATION WITH SUNFLOWER OIL ON COLOR PARAMETERS

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Abstract:
The determination of colour in oil is an important measurement to predict the quality and acceptability of edible oil. Walnut oil is an omega rich oil with immense nutritional values mainly ascribed to its high content of polyunsaturated fatty acids (PUFAs) such as linoleic and linolenic acids, and monounsaturated fatty acids (MUFAs) like oleic and petroselinic acid. The characteristic colour of walnut oil depends on the concentration and ratio of different pigments. These are classified into chlorophyll pigments, responsible for greenish hues, and carotenoids, responsible for yellow hues. Five walnut oils were obtained from different sources by cold pressing method, then adulterated with sunflower oil (5%, 10%, 20%, 30%, 40%, 50%). The obtained oils were subjected to colorimetric analysis in CIELAB uniform space. Adulteration of walnut oil resulted in less vivid colours (lower values for chroma, C*ab) with increasing concentration of commercial oil for three samples. However, all adulterated oils became darker (lower values for brightness, L*). The a* and b* values showed different trends depending on the sunflower oil used. These results indicate that colour analyses could potentially be useful both for discriminating cold-pressed oils and for rapid determination of adulteration with cheaper oils.

Keywords: *walnut oil, sunflower oil, adulteration, color, cold-pressed oil*

IMPORTANCE OF IDENTIFICATION AND CONTROL LISTERIA MONOCYTOGENES IN FOOD SAFETY - CASE STUDY- OCCURRENCE OF LISTERIA MONOCYTOGENES IN THE PRODUCT READY TO EAT

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Abstract:
Ensuring food quality and safety, together with both international and state regulations, requires the implementation of practices that provide the possibility of identifying contamination with pathogenic bacteria at any stage of production. These practices include not only compliance with health standards during work, but also monitoring their efficiency by collecting microbiological samples from different areas of technological flow. At the same time, it is very important to assess the risk in terms of carrying out the microbiological sample collection plan. In this way, products with high perishability, but also hard-to-reach production areas can be mounted more rigorously. At the same time, given that ready-to-eat products are no longer heat treated after procurement, controlling their microbiological load is a priority. Listeria-like bacterial contamination of these types of products is a real danger to the health of consumers.
The study is based on research and investigation of a case of identification of L. monocytogenes in a ready-to-eat product intended for human consumption. For the purpose of investigating the potential source of contamination, samples were taken both from direct contact surfaces with the product and indirectly. Microbiological samples were collected according to the method of microbiological monitoring of factory surfaces and machines implemented by the technical department of the factory. The importance of developing microbiological monitoring and control systems in the production flow was highlighted.

The importance of developing microbiological monitoring and control systems in the production flow was highlighted. Based on these, in the case of detection of pathogenic bacteria of the genus Listeria in one of the products, the cause of the contamination can be determined. Moreover, in the case described in this paper, it has been shown that a thorough investigation, but also a rigorous sanitation of the machine that caused the contamination, can contribute to the elimination of the pathogen. This result can be maintained through frequent monitoring and thorough audit of industrial processes in order to control the development of the pathogen and maintain the standard of quality and safety of the food.

Key words: *contamination measures, hygiene, monitoring, risk,*

FORMULATION OF THE COMPOSITION FROM SCALDED DOUGH WITH NATURAL SWEETENER

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Abstract:
One of the most significant challenges faced by producers of pastry products today is the reduction of sugar in manufacturing recipes. The research aims to incorporate a natural sweetener into the composition of a product based on parboiled dough with filling and identify the optimal processing factors and conditions for the dough and filling. Physico-chemical methods were applied to assess the quality of the flour (moisture content, acidity, ash, wet and dry gluten quantity, hydration capacity, extensibility, deformation, and expansion gluten), as well as cream viscosity and the texture of the semifinished used in the production of éclair with natural sweetener. The viscosity of the cream boiled was observed to remain stable within a temperature range of 5 to 15°C at speeds of 110-180 RPM, while the viscosity of cream with added stevia increased with the rising speed of the DV-III Ultra rotary rheometer. Textural properties of the scalded dough, filling, and finished product were evaluated using the STABLE MICRO Systems TA texture analyzer. The addition of stevia to the éclair recipe resulted in improved cohesiveness, gumminess, and chewiness due to the increased hardness of the baked product. Results indicated instability of the cream with stevia addition and stability of the sample with stevia and gelatin, confirmed through sensory analysis. Additionally, has been observed a nonsignificant influence on the organoleptic characteristics of the éclair with filling, identifying a less sweet taste with a slightly bitter aftertaste inherent to this sweetener. As a result, we conclude that texture plays a crucial role in the perception of sweetness, with firmer products being considered less sweet.

Key words: *éclair, pastry, rheology, stevia, sweetener, texture*

STEVIA REBAUDIANA USE AS A NATURAL SWEETENER IN ICE CREAM PRODUCTION. REVIEW

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Abstract:
Ice cream is a frozen product made of milk, sugar, stabilizers, dyes and flavors and is considered one of the most popular desserts in the world. Standard ice cream is on average 50% air, 30% ice, 15% nonfat dry matter and 5% fat, other ingredients, and food additives, especially stabilizers. The search for sugar substitutes from natural sources has led to the discovery of several substances that have an intensely sweet or taste-altering taste. About 150 plants have been found to taste sweet because they contain high amounts of sugars and/or polyols or other sweet constituents. The use of an alternative sweetener should be able to improve the quality of ice cream while providing additional health benefits to consumers, one of which is stevia. *Stevia rebaudiana* or "sweet plant from Paraguay" is a shrub, originally from America, belongs to the *Asteraceae* family, being a low caloric sweetener but with a high sweetening power. Stevia powder (*Stevia rebaudiana*) contains 5-10% stevioside and has a sweetening power 10-15 times higher than sucrose. Replacing sugar with stevia powder as a sweetener in icecream could reduce the caloric value of the product because the number of calories in sucrose is 3.94 kcal/gram while the number of calories in stevia leaf powder is 2.7 kcal/gram. Stevia was used instead of sucrose in ice cream, there were substantial changes in the compositional qualities, the value of solids was reduced, protein content increased and also increased the role of antioxidant activity. Stevia remains stable over a wide range of temperatures, making it suitable for use in ice cream production. It can withstand heat treatment, freezing and storage without losing its sweetening properties.

Key words: *Stevia rebaudiana, sweeteners, energy value, health benefits*

FORMULATION AND STABILITY OF BIODEGRADABLE FILMS MADE FROM CELLULOSE AND THYME OIL

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Abstract:
Most of the films used for food preservation have a synthetic source. However, recently biodegradable films/edible films have attracted attention for environmental reasons. The materials used to make the film are typically waste products from food processing, making the process more sustainable. These films are biodegradable and edible, so they can be used in both the food industry and agriculture. The materials used are mainly proteins, carbohydrates, and fats. The essential oils are widely studied as ingredients in edible/biodegradable emulsified films and coatings. Therefore, the aim of this study was to produce films from carboxymethyl cellulose (CMC), pectin, thyme oil, and glycerol in order to determine some physicochemical parameters (e.g., water vapor and oxygen permeability) of obtained films. Films were prepared by mixing pectin and CMC solutions with glycerol and thyme oil in different concentrations (1, 2 and 3%). Films formulated with 2% of thyme oil had lower oxygen permeability (0,0261 cc/day) in comparison with other samples. In conclusion, these membranes are suitable for application in food industry as an edible formulation of film.

Key words: *biodegradable film, cellulose, glycerol, pectin, physicochemical parameters, thyme oil*

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EVALUATION OF THE BIOACTIVE COMPOUNDS AND THE ANTIOXIDANT CAPACITY OF GRAPE POMACE (BĂBEASCĂ NEAGRĂ VARIETY)

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Abstract:

Grape pomace is an agro-industrial residue that occurs all over the world and is primarily used as animal feed or fertilizer. Several studies have shown that grape pomace is a rich source of bioactive compounds such as phenolic compounds, fatty acids, polysaccharides, and others. During winemaking, only a small portion of the phytochemicals are transferred from the grapes to the wine, but a large amount remains in the pomace, a by-product consisting of pressed grape residue (seeds, skins, stems, etc.) remains. The aim of this study was to determine the content of bioactive compounds in terms of total phenolic content (TPC), total flavonoids content (TFC), and antioxidant activity as DPPH assay scavenging activity of grape pomace (Băbească Neagră variety) with different granularities (<125 μm, ≥125 – <200 μm, and ≥200 – <300 μm). The highest values of TPC (146.52 mg GAE/g) and DPPH (67.1% inhibition) were obtained for grape pomace extract with granularity of <125 μm, while the highest value of TFC (21.4 mg QE/g) for grape pomace extract with granularity of ≥125 – <200 μm.

Key words: *antioxidant activity, Băbească Neagră, bioactive compounds, extraction, grape pomace, phenolic compounds*

Acknowledgments: This work was funded by Ministry of Research, Innovation and Digitalization within Program 1 – Development of National Research and Development System, Subprogram 1.2 – Institutional Performance – RDI Excellence Funding Projects, under contract no. 10PFE/2021.

THE PARTICULARITIES OF PALM OIL CONSUMPTION IN THE REPUBLIC OF MOLDOVA

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Abstract:
Due to its high palmitic acid (44%) content, palm oil represents important raw materials in the production of solid fats with low or absent trans isomers (margarine, spreads, shortenings). According to the FAO statistical data, the average global consumption of palm oil per capita in a year has increased 1.25 times in the last 10 years and averages 2,4 kg/capita/year. The main consumers of palm oil are African and Asian countries, while the Republic of Moldova is just discovering the world of palm oil (approx. 1 kg/capita/year), but this trend is growing.
Thus, due to palm oil's availability, stability, and relative safety, it is now widely used in the production of bakery, confectionery, dairy and sausage products, etc. The wide range of these goods on the local market has contributed in recent years to an increase in the total number of calories in citizens' diets, mainly from fats (up to 105 g/capita/day).
To establish local dietary habits regarding the consumption of foods high in saturated fatty acids, especially palm oil, a sociological survey was conducted in April-May 2023. Respondents were found to snack 2-3 times a day using a variety of ready-to-cook foods, 45% of which potentially contained palm oil. Moreover, the survey participants themselves often find it difficult to say which products may contain palm oil, they are mainly interested in the taste and total calorie content. At the same time, the attitude towards palm oil itself is quite negative, 40% of respondents claim that the corresponding product is harmful and should not be consumed.
Palm oil can indeed be pernicious to health, but only if consumed in large quantities due to its high content of saturated fatty acids, or if the manufacturer uses its hydrogenated form with trans isomers.

According to the Government Decree No. 279/2017, such information must be presented on the product label and comply with the manufacturer's internal technological instructions. However, due to the negativity of society towards palm oil, manufacturers often camouflage this product with terms such as 'vegetable fat', 'mixtures of vegetable fats', and 'special-purpose oils.' Raising awareness about products' characteristics and palm oil's properties can enhance the quality of life for local citizens.

Keywords: *food habits, health, sociological survey, saturated fatty acids, solid fats, trans isomers*

Acknowledgment: *The research was funded by State Project 20.80009.5107.09 "Improving of food quality and safety through biotechnology and food engineering", running at the Technical University of Moldova.*

STABILITY OF EMULSIONS WITH PUMPKIN BY-PRODUCTS AND CHIA MUCILAGE

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Abstract:
Emulsions are one example of metastables colloids, with multiple applications.
The food industry is one of the major users of emulsion technology, as many food products exist in an emulsified form, including many dressings, sauces, spreads, creams, and beverages. Recently, there has been an interest in improving the healthiness, sustainability, and safety of foods in an attempt to address some of the negative effects associated with the modern food supply, such as rising chronic diseases, environmental damage, and food safety concerns.
Chia mucilage is formed by the hydration of chia seeds and presents characteristics that potentiate its application as substitute of fat in several foods. Adding pumpkin powder to mayonnaises as an emulsion ingredient may improve their anti-oxidative and functional properties.
The aim of the present study was to examine the effect of pumpkin byproducts and chia mucilage on the qualitative aspects of mayonnaise.

Key words: *by-products, pectin, antioxidants, biochar*

SAFETY IN CONSUMPTION OF SOME PLANTS WITH THERAPEUTIC POTENTIAL FROM SPONTANEOUS MOUNTAIN FLORA: VACCINIUM OXYCOCCOS AND CENTAUREA JACEA

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Abstract:
Recent research on the chemical composition highlights the therapeutic potential of some plants from the spontaneous mountain flora, among which are also the peatland small cranberry (*Vaccinium oxycoccos)* and the brown knapweed (*Centaurea jacea*). These plants have a significant content of active principles in the category of phenolic compounds and other antioxidants, omega fatty acids and some volatile compounds, with a proven role in preventing, combating and curing various ailments of the modern world.
A challenge of using these plants as sources of active principles is the possible toxicity due to some contaminants, at a time when agriculture uses a wide variety of pesticides, the number of cars is constantly increasing and, in general, environmental pollution is quite high, even in rural areas.
The present study aimed to determine the content of the most important contaminants: polycyclic aromatic hydrocarbons (PAH), dioxins and furans and organochlorine pesticides, nitrits and nitrats, from the mentioned plants.
The results show an extremely low content of polycyclic aromatic compounds, while both dioxins and furans, organochlorine pesticides and are below the detection limit, which shows that these plants can be used safely for all categories of consumers, including infants or special medical preparations.

Key words: *Centaurea jacea, dioxins and furans, nitrats, nitrits, organochlorine pesticides , PAH, Vaccinium oxycoccos*

USE OF DRIED BASIL IN THE TECHNOLOGY OF HAMBURGERS BUNS

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Abstract:
The expediency of using spicy and aromatic raw materials in the technology of hamburger buns, namely dried basil, is substantiated.
A variety of bakery-based restaurant products are popular: burgers, hot dogs, paninis, etc. The use of an improved bread base makes it possible to expand the range of the mentioned products, which, in the conditions of significant competition between enterprises of the restaurant business, plays a significant role in attracting more customers.
Adding basil to the bun recipe has a positive effect on sensory quality indicators. Changes in the course of the technological process under the influence of basil do not significantly affect the quality of finished products. Buns with basil have less porosity due to a decrease in the gas-holding capacity of the dough. However, the dimensional stability of the new products, which was evaluated by the H/D indicator, improves, which is convenient in the further preparation of hamburgers at the stage of transverse cutting of the bread semi-finished product.

Indicator	Bread without additives	Bread with dried basil
Moisture, %	43,0±0,5	43,0±0,5
Acidity, deg.	2,7±0,2	2,6±0,2
Porosity, %	79,6±2,0	76,9±2,0
Form stability, H/D	0,41	0,45

Key words: bread, basil, hamburgers buns, restaurant, moisture, acidity, porosity.

DEVELOPMENT AND CHARACTERIZATION OF GLUTEN-FREE PASTA WITH PECTIN FROM SUGAR BEET FLAKES

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Abstract:
In the last few decades, gluten-free pasta is consumed not only by the growing number of people diagnosed with celiac disease, but also by others who wish to exclude gluten-based products from their diet for health reasons. Common ingredients used for the preparation of gluten-free pasta are flour and/or starch from corn, rice, potato, pseudocereals, alongside the addition of proteins, gums, and emulsifiers that may partially act as gluten substitutes. Hydrocolloids such as carboxymethyl-cellulose, pectin and agar are also added in the composition of gluten-free pasta as mean to improve the texture and taste of the product. This study aims to contribute to the current state of knowledge regarding the use of pectin in gluten-free pasta because it is the first report on the use of pectin from sugar beet flakes for this application. For this purpose, the optimization of the composition of gluten-free pasta was made using three types of flour – rice flour, millet flour and quinoa flour, and different concentrations of pectin (1, 2 and 3% w/w). The gluten-free pasta samples were characterized by means of rheological and thermal analysis (differential scanning calorimetry).
Acknowledgement. This work was supported by a grant of the Ministry of Research, Innovation and Digitization, CNCS - UEFISCDI, project number PN-III-P1-1.1-PD-2021-0290, within PNCDI III.

Key words: *gluten-free pasta, pectin, sugar beet flakes, rheology, differential scanning calorimetry*

ASSESSMENT OF THE FIBER CONTENT OF GRAPE POMACE-MAIZE FLOUR MIXTURES USED TO PRODUCE HIGH-FIBER SNACKS

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Abstract:
The fiber content of maize-grape pomace mixtures was investigated to underline the possibility of using them in high-fiber snacks. For this purpose, different grape pomace (whole and seedless pomace dehydrated in a convection oven or lyophilized) was added to maize flour in 10, 20, 30, and 40% doses. The fiber content was determined by the enzymatic method. The results obtained revealed that the enhancement of maize flour with grape pomace resulted in raised fiber content as the addition level was higher. The seedless grape pomace contains lowed dietary fibers compared to the whole grape pomace, thus the mixtures containing whole grape pomace were richer in fibers compared to the seedless-containing samples. The total dietary fiber content was different among the dehydration methods. These results underscore the potential of these mixtures to enrich the fiber content of maize-extruded snacks which have limited nutritional value. This research could contribute to the selection of the grape pomace-maize mixture suitable to produce extruded snacks rich in fibers and at the same time with acceptable sensory characteristics. Future studies will concentrate on the effects of these mixtures on the expansion ratio and consumer acceptability of the enriched snacks.

Key words: *addition level, dehydration, dietary fiber, extruded snack, grape pomace, maize flour.*

Acknowledgement: This work was supported by a grant of the Ministry of Research, Innovation and Digitization, CNCS - UEFISCDI, project number PN-III-P4-PCE-2021-0718, within PNCDI III.

STUDY ON THE INCIDENCE, MONITORING AND CONTROL OF LISTERIA MONOCYTOGENES SPECIES IN MILK AND DAIRY PRODUCTS - A REVIEW

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Abstract:
Foodborne pathogen cross-contamination can happen at any point in the food preparation process. The amazing adaptability of *Listeria monocytogenes* in a variety of temperature and pH ranges, as well as its capacity to survive at elevated salinity concentrations, present noteworthy and continuous challenges for the food sector and significantly impact the final risk to consumers. Despite the microorganism's widespread prevalence in the environment and its comparatively high frequency of isolation in food, the incidence of listeriosis in the general population is minimal. The prevalence of systemic listeriosis is significantly higher in vulnerable groups, such as the elderly, pregnant women, and people with weakened immune systems. *Listeria monocytogenes* is the most significant species of the *Listeria* genus for food safety because it can grow and thrive in wet habitats including rivers, lakes, ditches, and canals. It can also adapt to a continuously changing environment. Recent developments in detection techniques have led to the identification of more outbreaks with fewer cases each epidemic. An efficient environmental monitoring program is necessary to track and validate the performance of control measures. A strong, scientifically grounded environmental monitoring program encompasses multiple elements, such as defining sampling zones, figuring out when and how often to sample, setting up protocols for sampling and detection, and carrying out corrective measures. The examination of the specialized literature on the occurrence, surveillance, and management of the *Listeria monocytogenes* species in milk and dairy products is suggested in this research.

Key words: *control methods, environmental monitoring programs, food safety, listeriosis, occurrence*

TRENDS IN OBTAINING BAKERY PRODUCTS, FROZEN PASTRIES

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Abstract:
Breakfast pastry is a dominant segment in European industry. People choose quick snacks for the morning meal, which favored the demand for these types of products. Also, the development of tourism, catering and fast food sectors provides the premises for a promising growth in the region in the future period. The trend of recent years in the domestic market of frozen bakery and pastry has been the conversion from traditional pastry dough products to ready-to-bake frozen products, maintaining the global trend of comfort consumption and on-the-go products. Always fresh and ready to eat and frozen bakery products have responded to the growing demand for on-the-go products or at any time within the reach of the consumer through the many benefits they confer. Among them is the extension of the shelf life is an important factor because a baked product of several hours no longer has the same interest from the consumer.
The research focused on the analysis of the quality indicators for a new product, the cake subject to the freezing operation to establish the shelf life and the monitoring of the parameters for establishing the optimal freezing regime. We analyzed from the sensorial point of view (texture, exterior and section aspect, product form, color, properties of the core), physico-chemical (acidity, humidity, insoluble ash, reported fat), porosity, elasticity, respectively from a microbiological point of view, 4 samples: P1-fresh cake, P2-cozonac subjected to thermal shock, P3-frozen cake analyzed after 3 months of freezing, P4-frozen cake analyzed after 6 months of freezing.
In order to keep under control the physico-chemical phenomena that occur from the moment of freezing of the cake, the rheological and textural characteristics must be analyzed, the phenomena that occur from the moment of freezing and the parameters on which it is possible

to maintain, and especially to improve, the quality of the finished products. The low-temperature freezing of the cake allows the rational organization of the manufacture and the feeding of the baking and/or selling points in the major shopping centers. It was noted that during the process of rapid freezing, the temperature inside the product drops to +5°C - 18°C, over 4 hours. The biggest advantage of rapid freezing is maintaining freshness over a long shelf life (6 and 12 months respectively). The benefits of freezing as a form of food preservation are confirmed, first of all, underline the fact that they retain their taste and nutritional qualities, while also having a positive impact on the environment.

Key words: food waste, freshness, technological innovation, preservation, quality, validity

NEW CHALLENGES IN TRADITIONAL BAKERY – BREAD WITH SOURDOUGH AND SHEEP CHEESE

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Abstract:
Adapting food to the physiological needs of the human body, to the wishes and preferences of the consumer for quality products can be achieved through various technical innovations (new raw and auxiliary materials, as well as, new processing technologies, new conditioning and packaging methods) and commercial innovations. The particularity of each type of bread result, first of all, from the choice of ingredients. In addition to raw and auxiliary materials, passion or recipes, an essential element is the approach of a proper attitude towards the consumption of traditional products. Various traditional styles, in terms of the consumption of bakery products has developed due to climate change and eating habits. Consumer preferences are changing as distinct previous styles are now available in other regions, and traditional style consumption seems to be growing at the expense of industrial products. The bakery product segment is part of a market centred on demand for conventional food, where the innovative element is gradually taking over the ground. Traditional products currently occupy an important segment of the total market of bakery products, but the orientation of young people, people with higher education, with increased incomes, from the urban environment, from the, towards new assortments it will be able to influence the trends for the future.
The purpose of this study is to capitalize on and improve a traditional recipe to obtain a functional product with better rheological properties, to extend the shelf life, to improve organoleptic and nutritional bread and at the same time to meet recent consumer demand for natural technologies. The research focused on the use of the addition in

different percentages (15%, 25% and 35% respectively) of sheep's milk in bread production. By assessing the investigated characteristics the highest increase in specific volume was observed in the sample with the addition of 15% sheep's telemea. In the case of the sample with 25% added sheep telemea, the rheological qualities are influenced, decreasing the tenacity (P) by 29.07%, but also the extensibility (L) by 10.34%, as well%, but without irrevocably influencing the bakery capacity of the dough. It is noted that in the case of the sample with 35% addition of sheep's milkweed, the rheological qualities of the dough obtained are worsened, decreasing first of all the tenacity (P), which indicates that the bread obtained could have a volume well below normal.

Key words: *consumers, functional product, new trends, quality, safety, traditional*

EXPLORING THE POTENTIAL OF CANOLA PROTEIN IN THE FOOD INDUSTRY: MARKET TRENDS, NUTRITIONAL BENEFITS, AND TECHNOLOGICAL ADVANCEMENTS

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Abstract:
Rapeseed protein, also known as Canola protein, scientifically derived from rapeseed plant Brassica napus, stands as a highly promising plant-based protein source worldwide, albeit currently unavailable in the Romanian market. Globally, canola protein is already successfully implemented as a co-ingredient in various food products, emerging as a sustainable and economically viable protein option. Essential drivers for the substantial growth of the canola protein market include the escalating demand for supplementary products, especially among the younger and middle-aged population, a surge in lactose intolerance and gluten sensitivity, a rise in the adoption of vegan or vegetarian diets, and an increasing demand for sustainable and environmentally friendly protein sources. Notably, canola protein is considered a complete protein within the plant-based protein segment, due to its comprehensive amino acid profile essential for human health. Recognized for its sustainability, economic feasibility, high bioavailability, and digestibility, canola protein has found applications across various sectors. Its versatile applications include enhancing bakery products, acting as an emulsifier and binder in meat products, and serving as a substitute for traditional protein sources in vegetarian and meat analogues. Additionally, animal feeds benefit from its high protein content and balanced amino acid profile. Moreover, the rapeseed protein market is witnessing notable advancements, particularly in extraction techniques and new product development. These innovations result in the introduction of modern innovative canola protein products with enhanced functional properties, further propelling market growth. In conclusion, the untapped potential of canola protein in the Romanian market presents a compelling

opportunity for the local food manufacturers and researchers. With its status as a complete and sustainable plant-based protein source, canola protein is well-positioned to meet the growing demands of consumers seeking supplementary, eco-friendly, and nutritionally balanced food products. As the market continues to evolve with innovative product developments and heightened consumer awareness, the canola protein market is poised for robust growth, offering a promising avenue for industry stakeholders and food innovators alike.

Key words: *advancements, canola protein, environment, global market, rapeseed protein, sustainability*.

INVESTIGATION OF THE PHYSICOCHEMICAL, TEXTURAL AND ANTIOXIDANT PROPERTIES OF CREAM CHEESE WITH ALGINATE-ENCAPSULATED PLANT EXTRACTS

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Abstract:
This study investigated the antioxidant activity of extracts from three aromatic plants - *Ocimum basilicum* L., *Satureja hortensis* L. and *Rosmarinus officinalis* L., encapsulated in alginate. The encapsulation efficiency was controlled by FTIR and SEM analysis. The alginate-encapsulated plant extracts were used for the preparation of cream cheese. The addition of 0.6–0.9% alginate-encapsulated plant extracts was found to increase the pH value compared to the control sample, which confirms the preservation potential of the encapsulated plant extracts due to the inhibition of microorganisms. After 28 days of storage, the hardness and adhesiveness of the cream cheese showed an essential increase, and the cohesiveness and gumminess of the samples gradually decreased. The improvement in texture parameters is probably due to the better water-holding capacity of the alginate-encapsulated plant extracts in the fortified cream cheese. The microcapsules based on sodium alginate ensured the stability of the polyphenolic compounds of the plant extract and led to their controlled release from the cream cheese during storage. Mutual information analysis was applied to establish the correlation between the concentration of plant extracts encapsulated in alginate and the sensory, physicochemical, textural and antioxidant properties of cream cheese.

Key words: *basil, cream cheese, encapsulation, extraction, quality, rosemary, summer savory.*

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WINERY BY-PRODUCTS AS INGREDIENTS IN EXTRUDATES

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Abstract:
The main residues from the wine-making activity are represented by: organic waste (grape pomace, containing seeds, pulp and skins, grape stems and grape leaves), waste water, emission of greenhouse gases (CO_2, volatile organic compounds) and inorganic wastes. Wine and grape by-products are natural matrices rich in phenol, with more than 200 compounds identified. Phenolic compounds are responsible for some important organoleptic properties of both grapes and wine, playing an important role in wine quality, including color, favor, bitterness and astringency. A considerable amount of the by-products of winemaking is represented by grape pomace. Grape pomace is the winery waste originated during the production of must (grape juice) by pressing whole grapes. Grape pomace is an abundant by-product of the wine industry, which consists of the remaining skin, seeds and stems and represents about 25% of the total weight of grapes used in winemaking. Grape skins are the major component of grape pomace. They have received more and more interest, being rich in phenolic compounds, which are not completely extracted during the vinification process. Grape seeds represent between 2 and 5% of the weight of grapes and constitute approximately 38–52% of the solid waste generated by wine industries. They consist of certain substances, such as dietary fibers, oils, proteins, phenolic compounds, minerals, vitamins, sugars, organic acids. Phenolic compounds are a valuable constituent in grape seeds, representing 5-8% of the seeds. During extrusion cooking, raw materials undergo chemical and structural transformations, such as gelatinization of starch, denaturation of proteins, formation of complexes between amylose and lipids, and degradation reactions of vitamins, pigments. The addition of grape pomace to the extruded product has the potential to

increase dietary fiber content, reduce vitamin loss, reduce oil oxidation, and reduce starch digestibility. This paper presents a mini-review on the influence of winemaking by-products in extruded products studied by researchers.

Key words: *extrusion, grape pomace, grape seeds, grape skins, polyphenols, wine by-products*.

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VALORISATION OF CARROT POMACE AS A SOURCE OF DIETARY FIBER IN REFINED WHEAT FLOUR PASTA

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Abstract:
Carrot processing by-products are known to be a source of beneficial compounds such as dietary fibers. Dietary fiber is the main focus are for human nutrition, and increased fiber intake is a dietary recommendation for reducing the risk of the number of chronic diseases. The present study was aimed to assess the total dietary fiber content from carrot pomace from four carrot varieties cultivated in Romania, Baltimore, Niagara, Belgrado and Sirkana. In this sense, the enzymatic method was applied. The results revealed that carrot pomace from the studied varieties presents high contents of total dietary fibers which varied between 20.09% and 33.34%, depending on carrot variety, showing their potential for fiber enrichment of nutritionally poor products, such as pasta obtained from refined wheat flour. By partially replacing refined wheat flour with 3 to 12% carrot pomace, a rise in fiber content was obtained which will enhance the nutritional value of wheat pasta. Further research would be necessary to find the optimal dose which could replace refined wheat flour without affecting the techno-functional properties of the pasta, including sensory characteristics.

Key words: *carrot pomace, carrot varieties, dietary fiber, substitution level, wheat pasta, valorisation.*

Section 4.
Equipment for Food Industry

MECHANICAL CELL DISRUPTION OF MICROORGANISMS

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Abstract:
The cell disruption on an industrial scale is employed during the extraction of beta-glucan from the shells of brewing yeast, the production of biofuel from microalgae, and the production of insulin from Escherichia coli bacterial cultures.
Cell disruption, unlike the grinding of solid materials, has a unique nature where the key aspect is not complete grinding but rather damaging the cell wall.
Methods such as ultrasonic, osmotic shock, chemical, and others have been proven limited in their use on large industrial scales. Possible reasons for this limitation include high energy consumption, process efficiency instability, or difficulties in scaling and integrating these methods into production conditions.
Among various mechanical cell disruption methods, pressure application through a gap and mechanical grinding in bead mills are the most widespread. For effective yeast cell disruption, bead mills are recommended, while methods utilizing pressure are preferred for algae. These methods are chosen for their efficiency in breaking down specific cell types and their suitability for industrial conditions.
On an industrial scale, cell disruption utilizes mechanical methods, particularly in bead mills and under pressure in gaps, aimed at disrupting the integrity of the cell wall. While chemical agents may serve as supplements to intensify the process, the ultrasonic method remains confined to the laboratory, as its application on an industrial scale is complicated by high energy costs and rapid equipment wear.

Key words: *bead, cell, disruption, grinding, pressure, mill.*

SYNTHESIS OF MODULAR MECHATRONIC SYSTEMS FOR PROCESSING OF SMALL PIECE FOOD PRODUCTS

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Abstract:
The analysis of technical solutions for vibroinertial hopper-feeder and hopper-tray systems has revealed the most common control system based on an electropneumatic drive, which provides a wide range of changes in the dynamics of typical technological processes. To improve the design solutions for the drives of the loading vibroinertial functional modules of blister machines, the design of bellows pneumatic cylinders of variable pressure is proposed. The material of the study is bellows pneumatic cylinders in the experimental design of a vibroinertial feeder tray. The aim of the study is to develop energy-efficient, multifunctional mechatronic modules in the structure of the synthesis of the module of a vibroinertial feeder tray for small-piece products. The research methods used in the development of mathematical models are methods of gas dynamics, mathematical analysis, mathematical physics and modern numerical methods.
Objectives of the experimental study: verification of the assumptions made in the development of the mathematical model in relation to real conditions; verification of the adequacy of the mathematical model to the actual process of movement and separation of small-piece products in the system of the vibroinertial tray of the forklift.
On the basis of the carried out research, a control model for the vibroinertial tray device based on an electropneumatic drive has been proposed, which provides a wide range of changes in the dynamics of the characteristic technological processes of moving and separating the flow of piece products.

Key words*: feeder hopper, electropneumatic drive, dynamics, blister, packaging.*

THE IMPACT OF CRUST PERMEABILITY ON VACUUM COOLING OF BREAD

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Abstract:
Cooling of bread is carried out to ensure the necessary structural and mechanical characteristics of the bread, upon achieving which the processes of cutting and packaging become possible. The vacuum cooling method is the fastest and most effective way to cool freshly baked bread, but additional research is needed to implement this method in continuous production, to determine the operational parameters of vacuuming at which there is no deformation and destruction of the bread.
We conducted research to determine the gas permeability of the crust and crumb of the loaf on developed experimental setups of vacuum cooling and gas permeability. It was determined that the quality of the finished products depends on the mode of vacuum cooling, which is influenced by the permeability of the bread crust. In the course of processing the obtained data, the total surface area of the loaf was calculated, the specific permeability of the crust in different areas of the loaf surface: for the bottom crust - Pn = 0.42 ($m^3/(m^2 \cdot s)$); for the central part of the upper crust Pc = 0.32 ($m^3/(m^2 \cdot s)$); for the side surface of the loaf - Pb = 0.37 ($m^3/(m^2 \cdot s)$). It was determined that the maximum rate of pressure reduction in the vacuum chamber to ensure the required quality of the loaf is 4.5 kPa/s. The area of the crust of the loaf was calculated, which is 0.091 m^2.

Key words *bread, pressure, vacuum cooling, throughput, mode parameters, crust.*

SYNTHESIS OF PNEUMATIC NOZZLE DEVICES FOR PACKAGING MACHINES

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Abstract:
Application of simulation modelling software and computational resources in solving complex technical problems, - creates an opportunity for integration of advanced technologies into new technical solutions.
The task of the research is to analyses the possibility of using pneumatic nozzle elements based on ejectors for packaging processes of food production. Simulation models of consumer packaging blowing processes with application of gas-dynamic theory methods are considered. Different designs of ejectors with application of different atomization media are the material of research. Based on CFD-methods (Computational Fluid Dynamics) pneumatic nozzle systems of packaging machines are developed and investigated.
We have investigated the problems of ejection flow formation on the packaging material: 1. Determination of the main geometrical parameters of the ejector. 2. Clarification of the relative length of the mixing chamber, justification of the nozzle removal from the processing object. 3. Investigation of the degree of diffuser expansion, in order to optimize the spray jet. 4. Law of conservation of energy with the determination. The flow rate dependence for gas with mixture surface treatment. The equation of connection of ejector parameters in cross-sections is compiled. Based on the analysis of the work of pneumatic nozzle devices in the composition of packaging equipment considered: simulation methods of modelling in the Simulink software package. Mathematical models of hydrodynamic character in L-shaped ejector for functional modules of packing machines of food products are developed.

Key words: *simulation modelling, ejector, packing, gas-dynamic theory, atomization medium.*

INTRODUCTION OF INDUSTRIAL CONTROL VALVES AT THE DEFECOSATURATION STATION

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Abstract:
The use of automatic industrial control valves makes it possible to maintain the technological process of the defecosaturation station in a preset mode. With the help of a tracking actuator, the valves support the automatic control loop. The ratio diffusion juice - lime milk with correction on milk density; ratio diffusion juice - return of juice of I (II) saturation or suspension of juice of I (II) saturation; temperature of juices; pH of pre-defecated, defecated, first and second saturation juice; process of blowing from sand of pre-defecator, defecator, saturates; pressure and flow rate of saturation gas. The liquid level control device, based on the received mismatch of the control action and the signal from the liquid level sensor, forms the action coming to the input of the pneumatic actuator control device. In the work the technology of regulating valve selection based on static characteristic analysis of the regulating object is offered, where it is shown that for valve size selection by equations of flow and throughput characteristics, the valve operation is considered separately from the regulating system operation. Experimentally investigated the behavior of the object with a regulating organ to determine the valve size. However, there are many cases when direct access to the actuator is difficult or the process requires manual control of the actuator. We have developed electropneumatic tracking actuators with remote control system to solve such problems. It can control one or several actuators in the form of a cylinder with a sensor. This solution offers the highest degree of protection for the control elements and allows the air preparation system, manual override module and indication means to be located in the cabinet as required.

Key words: *technological process, mode, valves, automatic regulation, diffusion juice, lime milk.*

GUMMY CANDIES AS AN ALTERNATIVE METHOD FOR DELIVERING ACTIVE PHARMACEUTICAL INGREDIENTS

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Abstract:
Traditional production of chewable candies with active pharmaceutical ingredients typically involves using a modular forming system with press molds in starch trays. However, this method has limitations in producing products with API:

- High temperature can adversely affect the stability of components
- Some manufacturers might use an excess of vitamins and other dietary ingredients to prevent API degradation
- Some API may have solubility issues or react unfavorably with other candy components, complicating precise dosing.
- Microbial contamination
- Product shape: manufacturing complex-shaped gummy products has been challenging due to the use of starch trays.

Innovative developments in this field aim to overcome these difficulties and expand opportunities for producing gummy products with APIs in the future. A notable starchless method involves forming gummy products in silicone molds using a vacuum boiling kettle and dosing system. This method helps avoid the negative impact of high temperatures on component stability and ensures accurate API content in products.
Seattle Gummy's patent for a new therapeutic chewable candy for allergy treatment demonstrates the potential significance of this type of production in the medical field and its ability to become a competitive medicinal product.
Advancements in producing gummy candies with API open up new horizons for the pharmaceutical and nutraceutical industries. They offer an alternative way of delivering active components with more appealing shapes and flavors for consumers.

Key words: *Vitamins, Gummy Candies, Api, Dietary Supplements, Vitamin Delivery, Medicinal Remedy.*

STUDY REGARDING THE EFFECTS OF TEST CONDITIONS ON THE PARAMETERS OF THE TEXTURE PROFILE ANALYSIS

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Abstract:
Texture Profile Analysis (TPA) is a widely used method for quantifying the mechanical properties of food and other materials, especially their texture characteristics, and offers essential insights into food quality. However, the variability in test conditions across different studies may result in irreproducible outcomes. This study emphasizes the impact of various test conditions, including compression level, deformation rate, sample geometry, and size, on textural parameters such as hardness, adhesiveness, fracturability, springiness, cohesiveness, gumminess, and masticability.
It highlights the impact of variations in these conditions on the interpretation of texture characteristics, offering a comprehensive overview of the challenges and considerations when applying TPA to different materials. The findings of this research have practical implications for industries such as food science, materials engineering, and quality control, enabling researchers and practitioners to achieve consistent and accurate texture assessments.

Key words: *adhesiveness, cohesiveness, compression, deformation, fracturability, hardness, springiness, texture profile analysis*

CHANGE OF VISCOSITY OF A SUSPENSION OF COSMETIC PRODUCTS DURING ULTRAFINE GRINDING IN BEAD MILL

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Abstract:
Rheological characteristics effect on emulsification, transportation and also ensure proper consumer properties (spreadability, uniform distribution and fixation on the surface). The suspension was prepared according to the recipe: pigment iron oxide red 120 – 40% and castor oil – 60%. The duration of grinding is 45 minutes (2700 s). During grinding, the bead mill chamber was sampled every 5 minutes (300 s) to measure the shear stress at different values of the shear rate.
The flow curves of castor oil and suspension were constructed and it was established that the nature of the flow does not change depending on the duration of the measurements. The dependence of the effective viscosity on the shear rate when grinding the suspension has a power-law character and confirms the non-Newtonian nature of the product and is defined as a linear plastic body.
The temperature dependence of the effective viscosity of castor oil and suspension was compared. The viscosity of both tested substances varies logarithmically for all investigated temperature values and is equal to 1,011 Pa·s for castor oil, which corresponds to the value in the manufacturer's specification, and 2,127 Pa·s for the suspension based on castor oil. The suspension under study has 2,1 times higher viscosity compared to castor oil, which is due to the high content of solids (40%) and the increase in the newly formed area during the ultrafine grinding process.
The obtained results make it possible to monitor and adjust the necessary parameters of the ultrafine grinding process to achieve the required product quality.

Key words: *bead mill, grinding, rheology, suspension, viscosity.*

Section 5.
Ecology and Environment Protection

POLVAK 15/72 - AN ECOFRIENDLY COAGULANT FOR TAP WATER PRODUCTION

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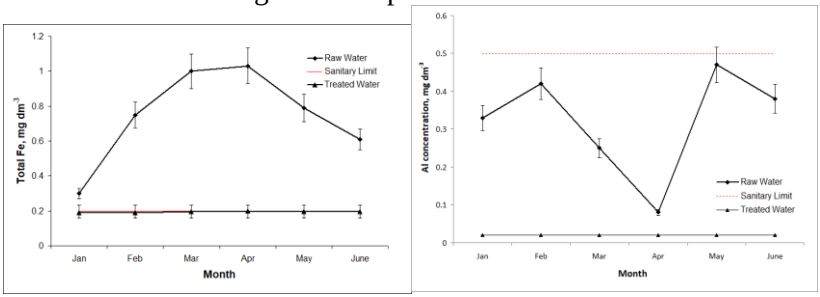
Abstract:
Coagulation of suspended water pollutants is an essential part of tap water production that makes it cleaner and removes unwanted contamination. However, many coagulation agents cause some secondary contamination of water with Fe^{3+}/Fe^{2+} or Al^{+3}. Polvak 15/72 is a new safe coagulant consisting of aluminum hydroxychloride with a pure Al_2O_3 content of at least 15.3 wt %. This coagulant does not contain iron, which is more toxic than aluminum, and removes Fe^{3+}/Fe^{2+} present in the raw water taken for processing. Excessive Al^{3+} coming with the agent is also removed from the processed water because of its capturing on the coagulated flocks (see figures below). Excessive chromaticity and turbidity are also kept within the sanitary limits after treating the water with Polvak15/72, while its efficiency in the removing of trihalomethanes is weaker and the use of extra non-polar adsorbents is recommended to bring the latter parameter within the limits.



Key words: *tap water production, suspensions, coagulation, secondary contamination, aluminum compounds, ferric compounds*

THE EFFECT OF TEMPERATURE ON THE BIOSYNTHESIS OF SILVER NANOPARTICLES USING SACCHAROMYCES CEREVISIAE M437

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Abstract:
Metal nanoparticles are well-known for their unique properties. Among them are silver nanoparticles (AgNPs), which exhibit significant antibacterial activity against various pathogenic microorganisms, making them promising in the fight against antibiotic resistance. Currently, a more advantageous and environmentally friendly method for obtaining nanoparticles is biological. As the size and shape of AgNPs depend on the conditions of their biosynthesis and biological activity, improving the processes of nanoparticle synthesis is a promising direction. For the biosynthesis of AgNPs, a cell-free aqueous extract of *Saccharomyces cerevisiae* M437 yeast was used. Silver nitrate solution was added to the cell-free aqueous extract to a final concentration of 1 mM. The samples were incubated for 21 days at 30, 35, 40, 45, and 50 °C under static conditions. Confirmation of AgNPs synthesis was performed through spectral analysis in the UV-visible range, specifically in the wavelength range of 350 to 600 nm using a spectrophotometer. At the beginning of the study, nanoparticle synthesis was visually observed through a color change samples from transparent to brown. Subsequent measurements of the samples revealed UV-visible spectra showing the appearance of an absorption peak between 400 and 450 nm. Thus, the formation of AgNPs using the cell-free yeast extract at different temperatures was confirmed by spectral analysis. Consequently, all samples underwent the reduction of silver ions (Ag^+) to the formation of AgNPs.

Key words: *yeast, silver nanoparticles, ecological method, biosynthesis, Saccharomyces cerevisiae.*

SYNTHESIS OF SILVER NANOPARTICLES USING MUTANT YEAST AND ITS DEPENDENCE ON THE SILVER NITRATE CONCENTRATION

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Abstract:
Silver nanoparticles (AgNPs) are becoming more and more popular due to their valuable properties, especially their antimicrobial activity. Chemical and physical methods are traditional for the synthesis of AgNPs, however biological method is considered to be the cheapest and most eco-friendly. This technique involves the application of different biological agents, including yeasts. Properties of silver nanoparticles depend greatly on the conditions of their biological synthesis, particularly silver nitrate concentration. The biosynthesis of silver nanoparticles was carried out using cell-free aqueous extract of mutant *Saccharomyces cerevisiae* M437 yeast, obtained using the exposure to the ultraviolet light. Argentum nitrate was added to the cell-free extract to reach the final concentrations of 0.5, 1, 1.5, 2, 2.5, 3 mM $AgNO_3$. Obtained samples were incubated under static conditions at 30 °C. Synthesis of silver nanoparticles was confirmed by the measurement of the absorption spectra of the samples in 200-700 nm wavelength range using UV-Vis spectrophotometer. Formation of AgNPs at the beginning of the experiment was confirmed by the shift in reaction mixture color from transparent to dark brown. During the spectrophotometric analysis, maximum absorbance value of the samples was noted at 420 nm, which is the evidence of silver nanoparticles presence. It demonstrates that the reduction of silver and formation of AgNPs occurred in all samples with different argentum nitrate concentrations. The fastest synthesis occurred in the samples with final concentrations of 0.5 and 1.5 mM $AgNO_3$.

Key words: *mutant yeast, silver nanoparticles, ecological method, biosynthesis, Saccharomyces cerevisiae.*

PREVENTIVE MEASURES FOR MONITORING AND WATER MANAGEMENT IN SUCEAVA MUNICIPALITY

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Abstract:

Resource efficiency is an important aspect in the efforts to support and evolve economic development, while maintaining all natural systems unaffected. However, resource efficiency cannot guarantee the perpetual use of existing water resources. Water resource efficiency policy must be based on an awareness of the amount of resources that can be used, but also the impact of activities on the environment and how it is affected. Any human action that does not respect the environment will have negative effects on the health of the population. Sustainable management is based on the identification, recognition and assurance of basic consumer needs. Developing and increasing the number of consumers benefiting from drinking water will only be possible by using strategies for the recovery and reuse of waste water. This involves the restatement of waste water and its use in irrigation processes, with developing countries accounting for 7% of the land that is irrigated. Options for water sources used for drinking water and irrigation will continue to evolve, with a growing dependence on groundwater and alternative sources, including wastewater. This study aims to monitor the quality of water distributed to consumers from Suceava county. The physico-chemical and microbiological analysis of the drinking water in the city was carried out in several strategic points, covering the entire distribution network. Samples were taken both from the catchment wells area and from the storage/storage tanks for drinking water and were analyzed physical-chemical parameters (pH, turbidity, conductivity, oxidability, oxidation, etc, free residual chlorine, nitrates, nitrites and ammonium, hardness and in the case of the water station was also performed iron analysis) and microbiological (total number of aerobic mesophilic germs and number of coliform bacteria). The analysis points were chosen according to the way of distribution of water in the city, taking into account its route (7 different points). The day of the week, the time interval, the volume of water consumed and the number of accidental damage occurred on the distribution network are the factors that influence the values of the analyzed parameters. During the study, there were no exceedances of the maximum concentration allowed by national legislation, for none of the analyzed parameters.

Key words: a*ssessment, germs, quality, safety, sustainable, waste water*

VALORIZATION OF CITRUS BY-PRODUCTS

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Abstract:
Citrus is one of the largest fruit industries in the world, and vast quantities of citrus by-products (CBP) are produced due to large-scale planting and processing activities. After juice is extracted from the fruit, there remains a residue consisting of peel (flavedo and albedo), pulp (juice sac residue), rag (membranes and cores) and seeds. However, CBP are usually left in the environment, leading to economic loss, environmental pollution, and carbon emissions.
By-products of citrus processing contain multiple nutrients and are rich in bioactive compounds. Recycling of CBP for sustainable materials to be applied in life, pollution treatment, and energy storage is certainly conducive to the realization of net-zero targets. In general, citrus residues have no economic value, even though their composition is rich in soluble sugars, cellulose, hemicellulose, pectin and essential oils that could form the basis of several industrial processes. Strategies for citrus waste utilization include: extraction of essential oil and pectin, production of enzymes, bioethanol, methane, organic acids, single cell protein, natural antioxidants, prebiotics, dietary fibers and use for adsorption of heavy metals.
In the future, citrus by-products biochar will attract increasing interests in the material field due to its desirable physical properties (rigidity, thermal conductivity, and permeability) and its ability to reduce emissions (carbon sequestration and capture).

Key words: *by-products, pectin, antioxidants, biochar*

Section 6.

Multidisciplinary Science

PRODUCTION OF TABLETS AND CAPSULES FROM BOVINE COLOSTRUM TO INCREASE THE PASSIVE IMMUNITY OF HUMANS

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Abstract:
During our research, we have produced tablets or a capsules containing immunoglobulin for human use, to increase passive immunity. During our previous investigation, we analyzed the composition of colostrum and milk, including the content of immunoglobulin-G (IgG). We determined the IgG content of first-milking colostrum and the change in its concentration depending on the time after calving. Based on which knowledge we recommended the use of first-milking colostrum for the production of colostrum powder with a high IgG content.
The colostrum was obtained from a farm with 1,800 Holstein-Friesian cows, which was defatted and then lyophilized in a vacuum of around 5-10 Pa. During our experiments, we produced fatty and fat-free (low-fat) colostrum powder, whose composition was determined. The IgG content of the original, raw colostrum was measured by radial immunodiffusion (RID) as 116.4 g/liter, and from the colostrum powder, restoring the original dry matter content of the colostrum, it was 112.6 g/liter, which means that the amount of immunoglobulins was practically preserved during the processing we used; only a minimal loss should be expected. The dry matter content of both fatty and defatted colostrum powder was between 86-89%, which corresponds to the dry matter content of an air-dried milk powder. The

ash content of the defatted colostrum powder is 6.7-6.8%, its protein content (measured by the Kjeldahl method) is 79-80%, and in addition to these main ingredients, it also contains a minimal amount of milk fat and milk sugar. Fatty colostrum powder contains around 69% protein and around 4.5% ash, and the rest is milk fat and milk sugar.
The protein content of defatted colostrum powder is between 79.5-80.0%, of which 79.3% (80% on average) is immunoglobulin-G determined by the RID method. The conclusion can be drawn from this that 63-64% of the lean colostrum powder is immunoglobulin-G, i.e. one gram of colostrum powder contains 630 mg of immunoglobulin-G. This material is ready for use, and for those who are lactose intolerant, the colostrum can be supplemented with probiotics, possibly prebiotics, and after acidification can be lyophilized, during which a colostrum tablet rich in immune substances and a probiotic rich in immune substances can be produced.
Next, we can add microelements, possibly magnesium (there is a lot of it in colostrum anyway), then in the next step vitamins to the raw material, and we can produce colostrum powder rich in immune substances, enriched with micro- and macro-elements, supplemented with vitamins. If one has imagination, the number of products can practically be more than ten.

Key words: *colostrum, colostrum powder, freeze drying, immunoglobulin-G, passive immunity, radial immunodiffusion.*

ATTEMPTS TO OBTAIN MATERIAL BASED ON POLYVINYL ALCOHOL WITH BARRIER PROPERTIES AGAINST WATER VAPOR

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Abstract:
Biodegradable polymers are materials obtained partially or totally from biomass with low impact on the environment. The aim was to obtain a biodegradable film based on polyvinyl alcohol (PVA) with reduced permeability to water vapor (WPA). The hydrophobic character of the films was achieved by beeswax, vegetable biosurfactant, citric acid as a cross-linking agent and glycerol which gives elasticity to the films, combined with the application of thermal treatment. WPA was determined by gravimetrical method. The results showed that all the obtained films registered a lower WPA in comparison with the untreated or thermally treated PVA film, the barrier against water vapor varies direct proportional with the beeswax mass and the homogeneous dispersion of the beeswax into the PVA matrix is essential for the obtaining of an efficient hydrophobic film. The best material had a 5.15 times lower water vapor permeability than of the neat PVA and 15 times higher than PE, taking in consideration that the barrier property against water vapor of neat PVA was 78 times lower than that of PE. In this regard, beeswax, citric acid and vegetable biosurfactant combined with the thermal treatment can be a viable solution for reducing the hygroscopicity of PVA-based films.

Key words: *biodegradability; polyvinyl alcohol; beeswax; water vapor permeability; hygroscopicity.*

THE EFFECT OF SILVER IONS ON THE OPTICAL PROPERTIES OF COLLOIDAL SOLUTIONS OF NANOPARTICLES CdS

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Abstract:
The creation of core-shell heteronanostructures expands the possibilities of using semiconductor nanocrystals as new effective catalysts, as well as for the production of flat displays, diodes, and sensors. CdS NPs stabilized by L-cysteine are also widely used in analytical chemistry (in particular, as sensors of d-element cations – Zn^{2+}, Ag^{+}, Cu^{2+}, Co^{2+}, Ni^{2+}, Hg^{2+} and s-elements Ca^{2+}, Mg^{2+}), as photocatalysts as active elements of light-emitting diodes.
The aim of the work was to study the influence of the synthesis methods of CdS/L-Cys/Ag heterostructures and the concentration of the alloying impurity on the optical properties of colloidal solutions of the structures. In the work, the synthesis of CdS/Me^{n+}(Ag^{+}) heterostructures was carried out according to two schemes:
-Ion exchange: CdS/L-Cys + xMe → $(Cd_{(1-x)}Me_xS)$/(L-Cys) + xCd^{2+}
-Co-deposition: $(xMe+yCd^{2+})$/L-Cys+$(x+y)S^{2-}$→$(CdS)_y(MeS)_x$/(L-Cys).
Taking into account the values of the solubility products of Argentum sulfides (according to various sources $K_SAg_2S = 8\cdot10^{-51} \div 1\cdot10^{-49}$) and Cadmium CdS ($K_SCdS=1\cdot10^{-26} \div 1\cdot10^{-27}$), it can be expected that when adding CdS ions to NPs Argentum should undergo ionic substitution of cadmium with argentum with the formation of a more stable sulfide, since the solubility product of Ag_2S is much smaller than that of CdS. However, the appearance of both types of spectra does not change, new peaks do not appear, therefore the nucleus of the original particles does not change its composition. It was found that the introduction of Ag+ ions into a solution with nanosized CdS causes an increase in the luminescence quantum yield compared to the original solution of CdS NPs. The improvement of the luminescence output is caused by the

fact that the introduction of impurity ions with a +1 charge contributes to the formation of hybrid structures that participate in energy conversion in the excited state of the system. Absorption spectra are characterized by a shift of the absorption edge to the long-wavelength region. The absorption edge is not clear, which corresponds to the defectiveness of the obtained systems.

On the basis of optical studies of CdS/L-Cys/Me (Me=Ag^+) systems, it is possible to draw a conclusion about the use of the obtained CdS/L-Cys colloidal solutions in analytical chemistry as sensors for Ag^+ ions.

Key words: *heterostructures, CdS nanoparticles, Ag+ ions, optical properties, photoluminescence.*

SALARIZATION AND PERSONAL MOTIVATION IN HOSPITALITY INDUSTRY

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Abstract:
The respondents are part of people who are employed or have been employed in one of the mentioned industries, in the country or abroad with different qualifications and experience levels.
In general, salaries in public catering in Romania can start from the minimum wage in the economy and can increase depending on the qualifications, experience and responsibilities specific to each position. Kitchen staff, waiters, hall managers, restaurant managers and other employees may have different pay levels.
We believe that it is important to understand that every organization is unique, and the pay and motivation strategies should be adapted to its specifics and the needs of its employees. A personalized approach can lead to an engaged, productive and satisfied team.
It can be seen from the study that the Information about the salary in public catering in Romania can vary depending on different factors, such as the experience of the employees, the geographical location, the type of food establishment (restaurant, cafe, university cafeteria, etc.), the level of expertise and the employer's salary policy. Also, legislative changes can influence pay over time.
The research method used is quantitative, the survey with the help of the questionnaire.
The application of the questionnaire was online, via the Google Forms platform and the distribution was done online as well, on different networks & professional groups at a national level.

Key words: *salary, hospitality, motivation, salary policy, minimal wage*

UNHEALTHY EATING AMONG STUDENTS

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Abstract:
The article presents the issue of unhealthy eating among young people. The research is bases on students who prefer fast food over cafeteria food. The research method used is quantitative, the survey with the help of the questionnaire. The research use as population the students at University "Stefan cel Mare" Suceava, and the sample has 150 subjects from different fields and programs of study, undergraduate or postgraduate. The application of the questionnaire was on-line with the use of Google platform. This research topic is important to highlight students' consumption of unhealthy food, through this research we can find out more easily why students choose fast-food instead of university cafeteria food. From this research we also learn how much importance students place on nutritionally healthy food. Based on the questionnaire, we can make improvements both from the point of view of the offer offered by the university cafeteria in terms of food that meets the needs and wants of the students in accordance with their wishes.
The topic of research on fast food VS cafeteria food is important because it addresses issues related to eating habits, health and consumer preferences. The impact of these choices on nutrition, health and eating behavior can be analyzed, thus providing useful information for promoting a healthy lifestyle. Fast food contains a lot of calories. A single menu from a restaurant of this type sometimes provides the necessary calories, in fact, for the whole day or even more. Therefore, those who often eat fast food risk, first of all, to end up facing problems related to weight control. The risk of obesity associated with eating fast food is much more obvious and concerning in other countries, such as the United States, but it is a risk present anywhere. Too many calories easily lead to weight gain, which puts health at risk in many ways.

However, the number of calories is not the only problem with this type of food. Food prepared in fast food style also contains a lot of saturated fat and carbohydrates, but also sugar and salt. Too much salt increases the risk of complications in hypertensive people. People who have circulation problems or heart disease are also affected.

Key words: *fast food, university restaurant, university cafeteria, healthy food, students, unhealthy eating.*

YOUNG PEOPLE BEHAVIOUR ON FOOD WASTE

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Abstract:
The article presents the issue of food waste among young people.
The research is based on the causes of the impact, possible solutions to combat food waste, the causes of its spread and the factors contributing to the spread of food waste worldwide. This is a important topic for all humans and the behaviour of young peoples is very important to be studied.
This topic is very important for all nations, and a very important subject for European Union.
The research method used is quantitative, questionnaire survey. The data obtained from the completion of the questionnaire by the population surveyed has been attached in the presentation in the form of charts for each question asked in the questionnaire. The research uses as the study population, students from "Ștefan Cel Mare" University of Suceava, and the sample students from different fields and programs of undergraduate and postgraduate studies. The application of the questionnaire was done online using the Google platform.

Key words: food waste, food waste impact, behaviour, youth