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for Students*

Student in Bucovina



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**STUDENT IN BUCOVINA
ABSTRACTS**

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SECTION A
PH.D. STUDENTS' RESEARCHES

EFFECTS OF SPENT GRAIN ADDITION ON THE QUALITY OF SPELT PASTA

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Abstract: Pasta is one of the most common, most consumed, but also the most versatile foods in the world. Pasta is produced from durum wheat, but lately it is also produced from other flours, mixtures of flours with or without the addition of by-products, resulting in quality products that maintain a good consistency after cooking. Spent grain is the primary by-product from the beer and whisky industry, rich in fiber and protein content. Although durum wheat flour is conventionally used to produce pasta emphasis was placed on the use of spelt flour in the formulation of the pasta recipe with the replacement with spent grain obtained from distilleries for its content of fiber and protein. In order to optimize the spelt pasta matrix, the spent grain content was varied to 5%, 10%, 15%, and 20%. Spelt pasta fortified with spent grain is included in products with a high fiber and protein content and with antioxidant activity and high polyphenol content. The color of the pasta obtained was acceptable, and the cooking losses were within the limit of 12%, which fits them into good quality products. These results show that spent grain can be used successfully in the recipe for fortified pasta, producing high-quality products. Spent grain flours can be used in food formulations because of their potential to improve the nutritional quality of the product and may have a lower glycemic index compared to pasta based on flour from durum wheat. The valorisation of spent grain can improve the sustainability of the brewing process and the whisky production process.

Key words: pro-health food, pasta, spent grain, valorisation

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COMPARATIVE STUDY ON QUALITY PROPERTIES OF GLUTEN-FREE BEER FROM MALTED AND UNMALTED SORGHUM

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Abstract: Beer is currently one of the most fascinating drinks whose consumption increases year after year and it ranks 3rd, after water and tea. The consumers' interest for this drink has increased due to the unprecedented assortment diversification, the rebirth of craft beer, the increase demand for functional beer, for gluten-free beer and other type of beers. Beer is most commonly obtained from barley malt and wheat malt, but currently other cereals and pseudo-cereals are also used. The paper presents the use of sorghum and sorghum malt in the production of beer on a laboratory scale. In the current conditions, in which climate changes are increasingly felt in our country, the production of beer from sorghum represents a viable alternative, but at the same time a novelty on the profile market in Romania. Barley and barley malt was used as control in all experimental variants of obtaining beer in laboratory conditions. For the finished product beer, the following physicochemical analyzes were performed according to standard procedures: real extract (% m/m), apparent extract (% m/m), alcohol content (% v/v, % m/m), density (g/cm³), pH, colour, CO₂ content (g/L), O₂ content (mg/L). Determinations were performed in triplicate, and mean values were used in this study. The obtained results show that raw materials investigated can be used successfully in the production of beer in malted form, but also unmalted, for the last option it is recommended to use enzymatic preparations to facilitate the mashing and filtration of beer wort.

Key words: *celiac disease, consumer demand, functional beer*

INFLUENCE OF FLOUR PROPERTIES ON QUALITY OF FROZEN BREAD DOUGH

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Abstract: Worldwide there is an increased interest among consumers for frozen dough products. Frozen dough technology is effectively extending the shelf life of bread, which is widely used and gradually replaces the traditional bread production. The quality of bread produced from frozen dough depends directly on the characteristics of the yeast and flour. Flour is the most important ingredient in bread making because it modulates specific characteristics of bread products. It consists of protein, starch and carbohydrates, lipids, fiber, ash and a small amount of vitamins, minerals and enzymes. Because of freezing, storing and thawing, wheat flour for frozen dough products should have high protein content and an increased strength. Yeast leavened frozen bread dough needs high quality wheat flour with high protein content (12-14%) comparing with common wheat flour which has between 7-16% protein content in order to ensure enough dough strength and gas retention during proofing after thawing cycle. The superior performance by using strong flours appears to be due to their ability to maintain higher oven spring during baking even after losing some of their intrinsic strength on freezing and frozen storage. The amylolytic activity of the flour for frozen products is very important. The minimum Falling Number value allowed for frozen dough flour is 280 sec. Below this value, amylases from flour have a significant activity at low temperatures, which leads to sticky dough and poorly developed products with an intensely colour shell.

Key words: *frozen dough, flour quality, protein content, dough strength, amylolytic activity*

NEW APPROACHES TO MONITORING AND CONTROL OF *LISTERIA MONOCYTOGENES* IN DAIRY INDUSTRY

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Abstract: Food safety is generally one of the main priorities in the EU. *Listeria monocytogenes* is one of the most significant foodborne pathogens in the world. Contamination with *Listeria monocytogenes* cannot be completely excluded, despite the strictest hygiene measures, especially in the case of fresh ready-to-eat products, which do not require further cooking and which are therefore particularly popular among consumers. In the dairy industry, many problems associated with *Listeria monocytogenes* contamination are related to minimally processed or postpasteurization contamination from plant environments. It is a Gram-positive, non-spore-forming, rod-shaped which thrives between -0.4°C to 50°C, facultative anaerobe bacterium, and with very high resistance in the external environment, it persists for 1-2 years in a dry state in the soil, about 3 years at room temperature in the laboratory; it is widespread in the environment, and control of *Listeria* in food production facilities requires constant focus by risk managers. Raw milk can be endogenously contaminated by *Listeria monocytogenes*, either as a result of pathological conditions (mastitis), or physiologically, in the case of the existence of healthy carriers. It is important for dairy producers and food safety professionals to understand these risks and develop evidence-based mitigations. This paper deals with the occurrence of *Listeria monocytogenes* in milk and dairy products, including regulatory aspects, and recent advances in technologies for the inactivation of this pathogen in dairy products.

Key words: *cleaning and sanitation process, detection methods, good hygiene practices, listeriosis, monitoring programs*

STUDY ON OBTAINING SOME ASSORTMENTS OF HYPOGLUCIDIC AND HYPOCALORIC ICE CREAM

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Abstract: Ice cream is a frozen product, made of milk, sugar, stabilizers, colorants, flavours and is considered one of the most popular desserts in the world. Standard ice cream is composed of 50% air, 30% ice, 15% non-fat dry matter and 5% fat, food additives (stabilizers, flavours, colourings). The main steps in the ice cream manufacturing process are: mixing liquids and dry ingredients, homogenization, pasteurization, ageing, flavouring, freezing, hardening, packaging. The sugars in ice cream have the following roles: increase the amount of dry matter in the mix, they are responsible for reducing the cryoscopic point, increase the viscosity of the liquid phase and limit the growth of ice crystals which is formed during the incorporation of air. As possible substitutes for sugar, it is proposed to use natural sweeteners: steviol, coconut sugar, agar syrup and maple syrup. In the selection of the fat source, the following factors are taken into account: the rate at which the fat crystallizes the structure of the fat, the melting point of the fat, but also the triglyceride content. Fat replacement alternatives can be: maltodextrin, soy protein, inulin and apple fiber. Obtaining hypoglucidic and hypocaloric desserts are the new trends in the food industry because this category of products are some of the most loved by consumers, and the beneficial effects on health and the quality of the product ensure continuity in their preferences.

Key words: calorific value, functional properties, healthy product, sweeteners

ICE CREAM ASSORTMENTS WITH PARTICULAR NUTRITIONAL USE

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Abstract: Foods for special nutritional use are products with particular characteristics, obtained by technologies and under special conditions. The main components of conventional ice cream are: sugars, fat, non-fatty dairy solids and additives, specifically stabilizers. Currently, the ice cream industry is exploring new ways to redesign existing products by adding healthy ingredients, free of additives, obtained through gentle processing, and having a clean label. Though conventional ice cream is made by using dairy milk, over the last years, dairy-free milk such as soy, almond, coconut, sesame, oat milk, etc. has become more common. These milk substitutes provide plant proteins and lipids in ice cream, by incorporating the nutritional values and health-promoting effects of plant compounds into ice cream. The use of milk substitutes also leads to the production of novel lactose-free products, which could be attractive and practical for consumers. Fat reduction affects the quality of dairy products, including light ice cream, such as deficiency in the flavour profile, poor texture, and lower quality. As health-conscious consumers demand for light and non-fat ice cream is increasing, the quality of light ice cream products should not be compromised. Thus, the quality and type of vegetable milk and bioactive compounds employed in making ice cream have the main role in the final product properties. Currently, the most important fat replacers used in ice cream include inulin, maltodextrin, polydextrose, milk protein, soy protein, dietary fiber, and starch. Searching for new ingredients and creating new functional dairy-free, sugar-free, low-fat ice cream varieties is important as consumers demand new flavors, healthier options and lactose-free and low-fat ice cream products.

Key words: *bioactive compounds, healthy ingredients, lactose-free, low-fat product, new assortments*

EVALUATION OF β -CAROTENE CONTENT FROM DIFFERENT DRIED CARROT POMACES

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Abstract: The pomace produced during the manufacture of carrot juice represent one of the most valuable sources of carotenoids. These compounds, remaining in high amounts in pomace, present health-promoting properties and also may be of importance in prevention and therapy. The content of carotenoids depends on the variety, and varies in studies by different authors, depending on the methodology used.

The present study was aimed to evaluate the β -carotene content from carrot pomace from four carrot varieties, Baltimore, Niagara, Belgrado and Sirkana in order to promote the use of this valuable resource in the food industry. A spectrophotometric method was used to determine the spectrum absorbance of the extract obtained from carrot's pomace variety samples. To quantify the β -carotene content, the calibration curve was plotted at seven successive concentrations. The β -carotene quantitation was performed by setting the β -carotene specific wavelength absorbance at 451 nm and by evaluating the spectral absorption of samples. The β -carotene content in samples was reported by calculations against the reference standard and by overlaying the spectra absorption. The results obtained showed that β -carotene content varied between 5.36 and 9.02 mg/100 g dry matter, depending of carrot variety. There was no significant difference between Niagara and Belgrado, whereas between them and Sirkana, Baltimore was found statistically significant differences ($p < 0.01$). The study revealed that these dried carrot pomaces are valuable source of β -carotene and could be used as a promising vehicle for remarkable enhancing the proportion of health-promoting substances in food.

Key words: *carotene, carrot pomace, health benefits, valorization.*

FUNCTIONAL PROPERTIES OF GRAPE POMACE PECTIN

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Abstract: Pectin is a complex acidic macromolecular polysaccharide found in primary cell walls and the middle lamella. Pectin is highly valued as a functional food ingredient, and finds wide pharmaceutical applications. Being present in fruits and vegetables, pectin contributes to the textural quality of products made from them. Nowadays, pectin is increasingly used as a mono-emulsifier for the production of emulsified oils, as well as emulsion-based foods including low-fat/cholesterol mayonnaise, reduced-fat dairy products and emulsified meat products. Generally, these food(s) (ingredients) are in the form of O/W or W/O. Pectin is also applied in the generation of interfacial polymeric complexes, particularly for the production of emulsified oils. In this context, during the processing of fruit and vegetable emulsions, solubilized pectin may play a role in emulsification and emulsion stabilization and, thus, may affect product rheology. In order to establish the functional properties, pectin was extracted from grape pomace by using different extraction techniques. Therefore, the aim of this study is evaluation of emulsifying potential in terms of emulsion activity and stability of grape pomace pectin (*Vitis vinifera* var. Rară Neagră) compared to the commercial pectin.

Key words: *comparison, emulsion, functional food, grape pomace, pectin, Rară Neagră*

VALORIZATION OF THE POTENTIAL OF SORGHUM TO DESIGN NEW FOOD PRODUCTS

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Abstract: Sorghum represents an important crop for future human use taking into account the increasing world population and decreasing water supplies. Sorghum grains and sorghum flour represent an important source of macronutrients, micronutrients and nutraceuticals with health-promoting properties. Moreover, due to the various benefits, the consumption of sorghum as human food has raised worldwide. As gluten-free grain, sorghum provides a good basis for gluten-free products, reducing the risk of diet-induced diseases such as diabetes and obesity. Their high nutritional value is linked to the presence of large amount of fibers, proteins, fat, carbohydrate, phenolics, vitamins, and minerals. Previous studies showed that technological processing can substantially affect the physical tissue structure, contents, and functionality of sorghum grains. The processing methods can enhance the nutritional value of sorghum grains, improving sorghum flour-based food product quality. The functional properties of sorghum flour, which vary depending on the particle size, play an essential role to choose the product types that can be manufactured. Moreover, it is needed to take into account the diverse and high levels of bioactive compounds which can be exploited to enhance food quality, sorghum grains representing a promising natural additive that can be used for developing and/or improving functional foods.

Key words: *functional food, functional properties, nutritional composition, processing technologies, sorghum grains, sorghum flour, particle size.*

ACKNOWLEDGMENTS: This work was performed within the framework of the “DECIDE– Development through entrepreneurial education and innovative doctoral and postdoctoral research, project code POCU/380/13/125031, supported by project cofinanced from the European Fund through the 2014-2021 Operational Program Human Capital”.

DEVELOPMENT OF FUNCTIONAL PASTA ENRICHED WITH HEMP PROTEIN ISOLATE

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Abstract: The commercial segment of high-protein pasta, driven by particular nutritional needs but also by recent food trends, has been growing fast in the last few years. The enrichment of wheat-based staple foods, such as pasta, with plant-based sources of protein such as hemp protein isolate received growing research interest nowadays. While it is associated with many challenges regarding technological and sensory quality of the products, it also promises a substantial improvement of the nutritional and functional value of pasta.

This paper aims to study the influence of hemp protein isolate partial addition, in proportions of 5, 10, 15 and 20%, to a new assortment of high protein pasta.

The effect of enrichment the pasta using hemp protein isolate was studied regarding the rheological, physico - chemical, technological and sensory properties of pasta samples.

Therefore, partial replacement of wheat flour with hemp protein isolate leads to a new innovative product that claims a functional benefit and presents an improved nutritional value, as well as certain benefits for a human diet.

Key words: *addition, diet, innovative, functional, hemp, pasta, protein.*

IRON OXIDE NANOPARTICLES CARRIED BY PROBIOTICS IN IRON ABSORPTION

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Abstract: Recently, newly generated iron oxide nanoparticles (IONPs) carried by probiotics have been recommended as innovative iron supplements due to their low reactivity and high bioavailability compared to conventional anemia treatments. Therefore, to strengthen and stimulate more study on this topic, we will assess the scientific literature and lay out the accumulated content on the subject so that future studies can be developed and significantly improve the field. We conducted a systematic literature assessment of the effects of IONPs interacting with probiotic cells on iron absorption, bioavailability, microbiota balance, and associated side effects. Due to the probiotic's capacity to connect with the intestinal walls, IONPs-bacteria incorporate into the enterocyte, where nanoparticles are given, providing an adequate iron content. Since IONPs carried by probiotics may play a key role in iron deficiency therapy, research and development in this area need to increase. As a result, iron oxide nanoparticle-based diagnostics, medicines, and devices are expected to become common in clinical practice within the next two decades.

Keywords: *absorption, cytotoxicity, iron oxide nanoparticles, metabolism, probiotics*

HYBRID HYDROCOLLOID FILMS WITH PECTIN AND SOLID LIPID NANOPARTICLES

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Abstract: The development of innovative and sustainable food packaging materials is an emergency for assuring the necessities of modern society. Increased interest in developing edible films using polysaccharides (e.g. pectin) and lipids is attributed to their biodegradability, biocompatibility, low price, non-toxicity, and high abundance in nature.

The aim of this manuscript was to determine the influence of rosemary oil-loaded solid lipid nanoparticles (SLN) on the pectin matrix. Physical, mechanical, thermal, and morphological properties were analyzed to characterize the developed hybrid hydrocolloid films.

Pectin-SLN films were performed using the casting method. SLN was produced by ultrasound-assisted hot emulsification. Tween 20 and pectin were used as emulsifiers and tristearin as solid lipids.

SLN improved the water barrier by 90%. Tensile strength decreased by 74%, while no significant effects on elongation at break were observed ($p>0.05$). SEM showed good compatibility between pectin and nanoparticles. Storage modulus and loss modulus decreased when SLN was added. All films were water-soluble. Opacity increased with the addition of SLN. Rosemary oil-loaded SLN had an encapsulation efficiency of ~93%.

In conclusion, developed hybrid hydrocolloid films are suitable for food packaging applications. As future perspectives, the bioactivity of films should be analyzed, such as antimicrobial and antioxidant activity.

Key words: *citrus pectin, DMA, edible film, tristearin, Tween 20, SEM, water barrier*

OPTIMIZATION OF THE METHOD OF FORMING NANO-EMULSIONS AND THEIR CHARACTERIZATION

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Abstract: Citrus essential oils are complex mixtures of volatile compounds with manifold possibilities to be used as active antioxidant and antimicrobial ingredients in food, cosmetics or pharmaceutical products. These uses are limited by their susceptibility to external factors such as: light, temperature, pH, oxygen, humidity. In order to enhance the physical-chemical stability of citrus essential oils, they were encapsulated into nano-emulsions. In this study, nano-emulsions were prepared through the ultrasonication method, using citrus oils as lipidic phase and Tween 80 and ethanol as surfactant, and co-surfactant respectively. Five types of citrus oil nano-emulsions were prepared by mixing 8% (v/v) of oil phase (bergamot, tangerine, orange, pomelo and lemon essential oils) with 1% (v/v) of Tween 80, 1% (v/v) of ethanol and 90% of deionized water using a magnetic stirrer and sonication at 72 amplitudes for 15 minutes. The PDI, turbidity, morphology, volatile profile and bioactive properties were investigated and their stability was monitored under different environmental conditions (storage at room temperature, at 37°C, refrigeration, freezing). Each emulsion exhibited different degrees of gravitational separation, the one stored at 37°C being the most unstable, showing coalescence. Gas chromatography-mass spectrometry (GC-MS) coupled with headspace solid phase micro-extraction (HS-SPME) was used to characterize the volatile fingerprint of nano-emulsions. Based on the results obtained from the chromatographic analysis, the main compound present in all studies was D-limonene with a concentration varying between 103.804 ± 8.112 mg/kg and 172.962 ± 25.012 mg/kg. In addition, other aroma compounds specific to citrus essential oils were identified, from the class of aldehydes, terpenes and terpenoids, but in lower concentrations.

Keywords: *chromatography, citrus essential oils, nano-emulsions, nanotechnology, optimization method, Physico-chemical characterization*

ECOLOGICAL PRODUCING SILVER NANOPARTICLES

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Abstract: In recent times there are several ways to obtain silver nanoparticles (AgNPs). Among which there is a biological method using microorganisms or plants which is more environmentally friendly compared to other methods.

Previous studies have shown the possibility of using the YPD medium for the cultivation of *Saccharomyces cerevisiae* M437 in order to obtain AgNPs. Currently the Reader medium which is cheaper was used. Thus when using a cell-free aqueous yeast extract with parameters of 24 hours of cultivation of *S. cerevisiae* M437 and 24 hours of AgNPs biosynthesis silver nanoparticles were obtained. Before the start of AgNPs biosynthesis a silver nitrate salt (AgNO_3) at a concentration of 1 mM was added to the cell-free aqueous yeast extract. Since according to the results of previous studies the specified concentration is optimal for obtaining AgNPs. The fact of the synthesis of silver nanoparticles was fixed visually due to the beginning of the change in the color of the samples from transparent to brown. And also with the help of spectral analysis in the UV-visible region where a pronounced absorption peak was observed at about 425 nm. What speaks about the peak of the surface plasmon resonance just for AgNPs.

Given that AgNPs are widely used in various fields namely in the food, medical, cosmetic, chemical and pharmaceutical industries their production using an ecological method is relevant and promising today.

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

***DETERMINATION OF STRUCTURAL AND MECHANICAL
PROPERTIES OF WHEAT BREAD BY THE PENETRATION
METHOD***

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Abstract: The process of vacuum cooling is one of the promising solutions for reducing the cooling time of bread. A few minutes are enough to cool the bread. But the peculiarities of the process of vacuum cooling of various types of bread have not been sufficiently studied, as a result of which it has not been implemented in flow production. The vacuum cooling method requires additional research related to the destruction of bread samples due to the pressure gradient. Determination of the interdependencies between the parameters of the vacuuming process and the structural and mechanical properties of bread is of great importance for achieving the required quality of finished products. For this purpose, a set of experimental studies was carried out for the bread variety "Kiev Sliced Loaf". Determination of structural and mechanical properties was carried out using the AP-4/1 model penetrometer, which consists of: a base, a lifting screw, a table, a measuring head, a rod, an indicator and controls. Taking into account the fact that in the experiment it is not possible to achieve a uniform stress state of the sample, it is impossible to determine a clear difference between the classical parameters of the limits of elasticity, plasticity and flow, therefore we assume that the generalized limit parameter is at the level of the deformation value of 0.08 and the stress at the level of 0.00045 mPa. The results will be clarified.

Key words: Vacuum cooling, structural-mechanical properties, penetration, elastic limit, yield limit, proportionality limit.

QUANTIFICATION OF FUNCTIONAL MODULES OF DISPENSING AND PACKING MACHINES FOR PACKING BULK PRODUCTS INTO CONTAINERS

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Abstract: Making optimal decisions on the selection or development of functional modules for dispensing and packaging of bulk products depends on many factors. The main factors include productivity, dispensing accuracy, manufacturability and maintenance, flexibility to readjustment, degree of automation, cost indicators, etc. Along with this, it is practically impossible to create a highly efficient functional module without taking into account the nature of the interaction between the particles of bulk products and the particles and working bodies of the module.

To solve this problem, a criterion evaluation of interaction particle-particle and particle-working element was carried out. The following dispensing devices were analyzed: cup-type, chamber, pendulum, tubular, screw, as well as feeders: vibrating, belt and screw. On the basis of a generalized criterion for various types of loose products, according to the given productivity and dose size, the optimal construction performance of the functional modules of dispensing and packaging is determined. The research was conducted using simulation and physical modeling.

A computer subroutine has been developed for automated evaluation of the perfection of functional modules. This quantification approach makes it possible to identify ways to increase productivity, reduce energy consumption, ensure product integrity etc.

Key words: functional module, dispensing, packing, bulk products

RESEARCH FEATURES OF LOW-FAT ICE CREAM MIXTURES STRUCTURING WITH β -GLUCAN AND PECTIN-CONTAINING VEGETABLE RAW MATERIALS

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Abstract: A study of the viscosity-speed characteristics of ice cream mixes was conducted using a rotary viscometer with a "cylinder-cylinder" measuring system. Shear stress τ (Pa) was measured at a temperature of 20°C for twelve values of the shear rate gradient in the range from 3 to 1312 s⁻¹ in forward and reverse motion. The research was conducted in 8 samples of ice cream mixes: control №1-2 with the composition of classic hydrocolloids and Cremodan® SI 320, respectively; sample №1-3 with β -glucan in amounts of 0.5, 0.75 and 1.0%, respectively; sample №4-6 with β -glucan (0.5, 0.75 and 1.0%, respectively) in combination with vegetable puree (15%). Analysis of the characteristics of two control and two experimental samples showed that mixes with β -glucan had a slower process of structure destruction. In addition, this process continued until the values of the effective viscosity became almost twice as high - up to 40.1 mPa·s for sample №2 and up to 47.4 mPa·s for sample №5, compared to the control samples №1 and 2 – 25.1 mPa·s and 26 mPa·s, respectively. Mixes of milk and milk-vegetable ice cream can be attributed to systems with a pronounced coagulation structure with the detection of thixotropic properties. The last property is most pronounced for systems containing β -glucan. With this in mind, further research into the technical regimes of the freezing process, especially the duration of freezing and overrun of ice cream mixes with β -glucan, is needed. These processes will be considered in further studies.

Key words: *ice cream, hydrocolloids, mixes, thixotropic properties, vegetable puree, viscosity-speed characteristics.*

INFLUENCE OF KINEMATIC PARAMETERS OF COMPRESSING ON THE QUALITY OF TABLETS

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Coordinating Professor: PhD, assoc. prof. Oleksii Gubenia

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Abstract: Tablet compressing is one of the most efficient processes in the production of medicinal products. Tablet dosage forms are easy to use and easy to dose. Today, the main machine for production is a tablet press. Modern high-speed presses are capable of producing up to 30,000 tablets per minute. In the modern world, there are many requirements for the characteristics of tablets, both in terms of quality characteristics and design. There are a large number of forms and combinations that the tablets must correspond to. Such requirements create a significant number of problems and tasks that must be solved by manufacturers of equipment and tools. To date, many issues and phenomena that affect the quality of finished products remain unresolved. Most of the challenges in tableting are related to machine speed and the quality of tablet mass distribution in the die, as the product is scaled up from a relatively slow press in the R&D department to high-performance production machines. Such problems are: capping, lamination, picking, stress cracking, chipping. The following indicators remain unknown: Dependence of changes in kinematic parameters of pressing on the amount of damage to finished products. Dependence of changes in kinematic parameters of pressing on the nature of defects. Dependence of changes in the kinematic parameters of pressing on the wear of the press tool and the stresses that arise in it. The results of the study are: Derivation of dependencies. Improvements in the material and design of the pre-tool to minimize wear and impact on the physical properties of the tablet. Creation of a software complex for computer simulation of the process in different modes.

Key words: compression, kinematic, machine, quality, tableting, tablets

FORMATION OF WHEAT DOUGH STRUCTURE DURING KINDING

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Student/s: Viktoriia ISKAKOVA, Yegor FUZIK
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Abstract: It was conducted experimental studies of the change in the rheological properties of the dough during kneading, namely, the change in the effective viscosity of the dough. Kneading was carried out on an experimental batch kneading machine, energy consumption during kneading was measured. The experimental setup allows you to intensify the dough kneading process by changing the rotation frequency of the working body (1.5; 2.2; 2.8; 4.4 s⁻¹) and the duration of kneading. Research of rheological characteristics was carried out on a rotary viscometer.

The yeast wheat dough can exhibit elastic or plastic-viscous properties depending on the size of the stresses, the time of their action and the rate of deformation. As a result of mathematical processing of experimental data, curves of the bread baking yeast dough mixed were obtained. The obtained dependences characterize the behavior of the yeast dough as a pseudoplastic fluid and are of a power-law nature. The effective viscosity of the dough depends significantly on the shear rate

Research was conducted to determine the regularities of changes in the structural and mechanical properties of the dough during its kneading with the aim of its intensification and the directed influence of the design of the working organs for the development of modern designs of dough kneading machines.

Key words: dough, deformation, kneading, rheology, viscometer, pseudoplastic fluid.

SECTION B

MASTER STUDENTS' RESEARCHES

MICRONUTRIENT COMPOSITION OF ALFALFA EXTRACT

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Abstract: Alfalfa extract is a promising ingredient in various industries. It contains flavonoids, proteins, amino acids, chlorophyll, coumarins, polysaccharides. It exhibits mild antiseptic and antioxidant effects, has an anti-inflammatory effect and a high iron content, strengthens capillary walls. Therefore, it is widely used in the pharmaceutical, cosmetic and food industries. It is used in cosmetics as a thickener, dye and neutralizer, and in the food industry it is used as a dye, a functional additive and a basis for dietary supplements. The issue of the presence of heavy metals in the extract is relevant, which is one of the safety criteria for its further use in the product. All trace elements found in the extract are important for the body's vital activity and are contained in relatively small amounts. The material for the research is alfalfa alcohol extract obtained from dried plant material. To determine the micronutrient composition of alfalfa extract, we used the method of mass spectrometry (MS) with inductively coupled plasma (ICP / MS).

The alfalfa extract contains a microelement composition for 24 elements, their total content is 4.917 mg/l. Insignificant content have elements such as Be, Co, Cd, In at <0.1; Cs, Bi <0.07; Tl - <0.05; U - <0.037 µg/L. The concentration of toxic elements is within the permitted limits and does not pose a threat to the target product. According to safety indicators, this extract can be recommended for use in the formulations of dietary supplements or cosmetic products.

Key words: *alfalfa extract, toxic elements, mass spectrometry, M.SATIVA, dietary supplement.*

VALORISATION OF ACACIA FLOWER POWDER IN THE MANUFACTURING OF GLUTEN-FREE GINGERBREAD

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Simona MAN, Lecturer PhD. Simona CHIȘ, Lecturer PhD. Anca FĂRCAȘ

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Abstract: The goal of this study is to highlight acacia flowers powder in the manufacture of a gluten-free gingerbread variety, with enhanced sensorial and functional characteristics. The high content in nutrients and bioactive compounds of gingerbread is mainly due to the acacia flower powder, which has a rich chemical composition in protein, flavonoids, phenolic acids, minerals and unsaturated fatty acids. The rice flour and almond flour was blended with corn starch resulting composite flour with following ratios 55:15:30 from which the control sample was obtained (0% acacia flower powder). Comparatively, three experimental variants were analysed in which the corn starch was substituted in proportions of 3%, 6% and 9% with acacia flower powder, the rest of the ingredients being in the same concentrations in each experimental variant. After manufacturing the four experimental variants of the gingerbread, the obtained samples were subjected to sensorial and physico-chemical analysis, aiming to highlight the influence of acacia flower powder addition on the quality of gluten-free gingerbread. Sensorial analysis emphasized that the product with 6% addition of acacia flower powder reached the highest overall acceptability score, registering an improved content of total phenols and antioxidant activity.

Key words: *acacia flowers, antioxidant activity, gingerbread, gluten-free, powder.*

DETERMINING THE SAFETY OF TOBACCO EXTRACT BY EXAMINING ITS TRACE ELEMENT COMPOSITION

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Olena PODOBII

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Abstract: Tobacco extract is widely used in various industries, because it contains many activities components. There comes the question about its safety. Therefore, determination of the microelement composition of this extract is an important topic as for today.

The object of the study was the ethyl alcohol (EC) extract from tobacco plant material. Microelement composition of tobacco extract was investigated by mass spectrometry (MS) with inductively coupled plasma (ICP/MS) on Agilent 7500 CE ICP/ (USA) instrument.

In the extract of tobacco determined the trace element composition for 24 elements, their total content is 3.128 mg/dm³. According to the data of the study, it can be concluded that the tobacco extract has a high content of Zn (0,925 mg/dm³) and Cr (0,356 mg/dm³). Zinc and chromium – the most important and indispensable for the vital functions of human body of trace elements. Zinc is a powerful antioxidant that prevents the formation of free radicals. However, in the extract there is an increased content of Al and there are also such toxic substances as Pb, Rb, As, but their content is within normal limits (≤ 10 ppm).

Therefore, the studied tobacco extract can be considered safe and we can use this tobacco extract in preparing cosmetic products.

Key words: *ICP/MS method, mass spectrometry, microelements, safety, tobacco extract.*

HYDRODYNAMIC TREATMENT OF HYDROPONIC SOLUTIONS

Students: Artem MAKAREVYCH¹, Anna MYRONCHUK²

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Abstract: Growing vegetable products in the conditions of open soils has a number of difficulties associated with complex agricultural technology, the impossibility of growing in hard climatic environment, the impossibility of growing in winter and in the off-season. Thus, greenhouse complexes are gaining a lot of development. Growing plants on hydroponics is the most common technology, which involves the rejection (or partial rejection) of the soil as the main environment. Hydroponic technology involves the use of a nutrient solution as the main source of nutrient supply to plants. One of the capable methods of obtaining hydroponics solutions is hydrodynamic treatment. The effect of hydrodynamic treatment leads to a change in the physical and chemical properties of nutrient media: an increase in pH, electrical conductivity, an increase in the number of free ions and active radicals. This study was carried out at the pilot unit; the main part of the unit was a rotary pulsed apparatus in which realized hydrodynamic treatment. It was established, that the pH of the water for hydroponic solution has raised on 15-16,5%. Method of the hydrodynamic treatment may be suitable for obtaining hydroponics solutions.

Key words: *agriculture, impulse, hydrodynamic, hydroponic, solution, treatment, plants, processing*

PRODUCTION TECHNOLOGY OF CLASSIC DRY HONEY WINE (MEAD)

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Abstract: The aim of my work was to design a classic dry honey wine production line with an alcohol content of 12% v/v. The raw material used was mixed flower honey with a carbohydrate content of 78.78%.

According to the production block diagram made on the basis of a traditional recipe, I determined the total material, heat and component balance with the help of which it was possible to follow the transformations during the process from raw material to the final product, namely the mead.

In parallel with the technical calculations, I also carried out an experiment, in a 20 L volume batch fermentation vessel. I measured the variation of the density of the wort by a self made digital densimeter sensor with wifi connection. The data collection was made in 17 days period, and was used in the modelling of the fermentation process. Furthermore I created the design for the product for marketing purpose.

The determination of food safety parameters was obtained with Combase program. Finally I estimated the price of the product based on the technology line investment, the price of raw materials and energetic cost used for its production.

Key words: *beverages, fermentation, wireless sensor, packaging design.*

BIOCHIMICAL AND PHYSICAL CHARACTERIZATION OF COMMON BEAN (*PHASEOLUS VULGARIS* L.) LANDRACES BY NORTH – NORTH-WESTERN EXTREMITY OF ROMANIA

Students: Dumitrița – Sabina DOBRINCU¹, Alexandra-Lăcrămioara MATEI¹, Tudorița CHICAROȘ¹, Paula - Maria GRECULEAC²
Coordinating Professor: Associate prof. Ph.D. bioeng. Maria POROCH – SERIȚAN¹, Lecturer Ph.D. Mihaela JARCĂU¹,

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Abstract: The aim of our study was to characterize beans (*Phaseolus vulgaris*), one of the most important legumes at the international level, by examining their physical and biochemical properties, to highlight the importance of preserving local bean varieties in Romania, beans which are kept in the collection of the Mihai Cristea Suceava Plant Genetic Resources Bank. Local cultures of *Phaseolus vulgaris*, have been best preserved, especially in the Maramureș area, followed by Suceava area. Based on all 28 samples from the common bean germplasm collection, the mean values for seed size characteristics were seed length (L) 14.64 ± 2.24 mm and seed width (W) 8.93 ± 1.51 mm. The average weight of the 1000-seed characteristic was 521.34 g, with the minimum and maximum values ranging from 136.96 to 1045 g for all 28 samples. The highest coefficient of variation was calculated for 1000-seeds weight (39.9%) and the lowest for L/W (13.2%). The protein content determined for 16 samples from the common bean germplasm collection was 23.79 ± 2.49 g. The amount of protein varies between 18.84 per 100 g dry matter (sample F23) and 26.69 per 100 g dry matter (sample F27). The free amino acid content varies between 0.56% and 1.29% of the dry matter, and the boiling time between 35 and 80 minutes. Boiling time is dictated by the variety of beans, but a very interesting thing, observed from the analyses carried out, is that the boiling time varies inversely with the percentage of protein. So, in sample F27 we have a boiling time of 35 minutes and a protein content of 26.69% of the dry matter. The sample with the highest protein content has the lowest boiling time. At the same time, sample F19 has a boiling time of 80 minutes and a protein content of 19.44%.

Key words: *the cooking time, free amino acids, local populations, quantitative seed descriptors*

THE IMPACT OF DIFFERENT PRODUCTION PRACTICES ON VOLATILE AND PHENOLIC PROFILES OF MEAD

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Abstract: The national production of honey peaked at over 25000 tonnes in 2019, ranking fourth in Europe and first regarding rosehip production with approximately 3,051 tons in 2007.

Rosehip fruits (*Rosa canina* L.) are underutilized by the food industry. Due to their significant biological value (high content of vitamin C, carotenoids, tocopherols, bioflavonoid phenols, organic acids, and amino acids), rosehips are the raw material of interest to the beverage industry.

In this regard, we proposed to analyse the performance of different yeasts on the volatile and phenolic compounds, as well as thermal and non-thermal treatments on chromatic proprieties, antioxidant activity and total polyphenol contents of the mead. The experimental alternatives included testing of different yeast species—*Saccharomyces cerevisiae* and non-*Saccharomyces cerevisiae* and applying different physical treatments (thermal and non-thermal) to accelerate the extraction of colour compounds and polyphenols from the rosehip into the honey wort. The determination of volatile compounds, phenolic compounds, organic acids, and glucides were realized chromatographically, chromaticity characteristics spectrophotometrically, antioxidant activity by measuring the ability of antioxidants to react with DPPH radicals, and total polyphenol contents using the Folin-Ciocalteu method.

Keywords: Mead, non-*Saccharomyces cerevisiae*, phenolic compounds, rosehips, *Saccharomyces cerevisiae*, volatile compounds.

THE USE OF TENEBRIO MOLITOR MEALWORMS IN THE PRODUCTION OF FUNCTIONAL BISCUITS

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Abstract: The aim of the work was to study the influence of flour obtained from *Tenebrio molitor* yellow worms on the physical-chemical and sensory characteristics of biscuits. The physical-chemical and sensory properties of the biscuits were influenced by the characteristics of the yellow worm flour. Organoleptic examination showed a very good appreciation of biscuits with flour from yellow worms with the ratio of 3.5% and a rather higher purchase trend. Biscuits made of yellow mealworm flour contain mineral elements with a structural role and indispensable for carrying out the metabolic functions of the body (Zn, Fe, K, Na). The content of saturated and unsaturated fatty acids is balanced in the two types of biscuits, the unsaturated ones having an important role in contributing to a good function of the cells and maintaining the health of the heart. As for polyphenols (antioxidants), their content is higher both in the yellow mealworm powder and in the biscuits associated with it. Biscuits with a ratio of 3.5% yellow worm flour are functional foods, characterized by much higher protein, lipid and mineral intake compared to biscuits prepared from 100% white wheat flour. The absence of lactose from their structure, also recommends them in the diet of people with lactose intolerance.

Key words: *biscuits, mealworms, mineral elements, fatty acids, polyphenols, Tenebrio molitor*

INFLUENCE OF BUFFALO MILK ON BUTTER QUALITY

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Abstract: The dairy industry seeks to maintain its competitiveness by investing in new products and processes. Dairy products play an important role in the livestock sector and in the global healthy diet. Buffalo milk has special nutritional values, high levels of fat, protein and minerals, being important either as a raw product or as a raw material for transformation. The energy value of milk is closely related to the concentration of certain compounds in the dry matter, especially the amount of fat. Buffalo milk can be considered a good source of essential aminoacids, and the content of lysine was found to be the highest, followed by valine and isoleucine.

Butter obtained from buffalo milk, due to its higher level of saturated fatty acids, is much harder than that obtained from cow's milk. Furthermore, the high variability of the triglyceride and fatty acid composition of buffalo milk makes it possible to separate milk fat into different fractions based on its melting characteristics. Due to the more solid fat and a slower rate of fat hydrolysis, buffalo milk produces butter with a significantly higher yield and better stability. The advantages of buffalo milk compared to cow's milk are not only in terms of physicochemical, compositional and sensory attributes, but also in its nutritional and health aspects.

Key words: *buffalo milk, nutritional aspects, healthy diet*

NOVEL APPROACHES TO ENHANCE THE CONTENT OF YOGURT PROTEINS

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Abstract: Consumption of fermented dairy products as functional and nutritional foods has reached new dimensions in recent years due to beneficial health effects. Yogurt is the most famous fermented milk product, with yogurt consumption having grown over the years and is still rising in many countries. Many researchers have achievements in the field of fortification of protein-based yogurt, with milk proteins or vegetable proteins. The additions of these proteins lead to the improvement of the quality of yogurt and an increase in its nutritional value. The use of milk protein could be difficult and expensive. An alternative for improving the yogurt nutritional value is the fortification of yogurt with plant proteins. The firming effect of different proteins addition in the formulation of yogurts could lead to a distinctive structure of the casein, with beneficial influences on the textural characteristics of finished product. The increase in the protein content improves the degree of satiety, especially beneficial for those who consume fermented dairy products for health reasons, certain diets etc. The addition of vegetable proteins in the yogurt formulation can modify their rheological, physicochemical and sensory properties. It is possible to produce yogurts containing vegetable proteins without changing the technological procedure and with a good quality for the consumers.

Key words: *functional food, formulation, fortification, vegetable proteins, satiety, sensory properties*

PHYSICAL, PHYSIOLOGICAL AND MINERALS MODIFICATIONS OF BUCKWHEAT GRAINS DURING THE GERMINATION PROCESS

Student: Olivia ATUDOREI

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Abstract: This study focuses on highlighting the physical, physiological and minerals modifications of buckwheat grains during the germination process. Germination is of scientific interest due to the fact that it has the role of increasing the availability of some nutritional compounds and decreasing the amount of anti-nutritional factors in the grains subjected to this process, as numerous studies in the field have already highlighted. Buckwheat grains are a promising food ingredient for the manufacture of different foods due to their abundance of nutrients with health advantages and, also, due to their polyphenol content. Moreover, buckwheat does not contain gluten, which is an advantage for consumers suffering from celiac disease. To carry out this study, the buckwheat grains germination process was made according to the standard method SR 1634:1999, in a growth plant chamber. The germination process was carried out exclusively in dark conditions, at a temperature of 20°C and a constant humidity of 80%. The germination process was stopped at two days, four days and at six days, respectively. In order to highlight the physical and physiological modifications of the buckwheat grains a Motic SMZ-140 stereomicroscope, with a 20x objective, was used. Every day, were captured images that highlighted the changes that occurred to the coating of the grain and also inside the structure of the grain and the way in which the radicle and the plumule were developed during the germination process. Also, by using a caliper, the increase of the size of these parts was highlighted, depending on the germination time. Moreover, in order to highlight the variation of the amount of mineral substances during the germination process, a Shimadzu EDX-900HS was used. The present study is of interest from the perspective of highlighting the positive effect of germination on buckwheat grains, having as a starting point the possibility of using buckwheat germs as an addition in the recipe for the manufacture of various food products.

Key words: *buckwheat, germination process, mineral changes, physical changes*

RESEARCH ON METHODS OF STRUCTURING OILS INTO EDIBLE OLEOGELS

Otilia FORTUNA și Loredana HUȚUȚUI

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Abstract: Current research shows that high intakes of trans and saturated fatty acids cause various adverse health effects and increase the risk of cardiovascular disease. Furthermore, as there is a growing concern to ban or reduce trans and saturated fatty acids, a lot of research is being done to find alternatives to solid fats.

Applications in the food industry of oleogels are new in terms of how to reduce solid fats. Bakery products are usually formulated with solid fats, such as margarines, which contain high levels of saturated and trans fatty acids and have negative effects on human health. Since the intake of trans fatty acids is limited to 2 g/100 g by the European Commission, researchers and food manufacturers have developed alternative ways of obtaining lipids with "zero" trans fatty acids, but with ideal rheological characteristics.

Oil gelation is a relatively new strategy compared to the "zero trans fat" alternative, which consists of transforming liquid oil into viscoelastic "gel-like" material without changing its chemical structure. For this purpose, two major groups of compounds are used including low molecular weight oleogelators (LMOG) capable of forming and inducing crystallisation of the oil phase and high molecular weight oleogelators (HMOG) capable of forming a 3D network that can capture a large amount of oil in a gel-like structure.

Key words: *health, margarine, oil, oleogelators, saturated fatty acids, wax.*

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STUDY OF THE QUALITY OF BUTTER WITH FLAVORING COMPONENTS

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Coordinating Professor: Lecturer Ph.D Sorina ROPCIUC, Lecturer Ph.D

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Abstract: The paper describes ingredients that can improve the quality of flavored butter during storage by using ingredients containing natural antioxidants. The composition of the flavoring component may include: tomato flakes; salt; olives, basil, onion, oregano, garlic, sugar, sage, etc. The consumption of dairy products is at a high level today, being considered a reliable source for the assimilation of vitamins and minerals. A large and diverse variety of butter continues to appear in the food industry. There is a search for ways to benefit from this product, trying to improve its quality and implicitly its organoleptic properties. Functional foods open a new opportunity for health support. The use of herbs and butter extracts has been found to increase oxidative stability through high polyphenol content.

Key words: *butter, functional, health, plants, polyphenols, sensory*

3D PRINTED SILVER DOPED PLA-BASED BOXES DESIGNED FOR THE STORAGE OF COW CHEESE

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PETER

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Abstract: Polylactic acid (PLA) is a biopolymer obtained from renewable resources, such as corn, wheat, or potatoes corn. It can replace polymers of petroleum origin, thus reducing the gas emissions and, implicitly, the pollution. Due to its compatibility with different compounds, PLA can be modified either by surface deposition or by incorporation. Among the modified agents are silver ions that exert antimicrobial activity. The purpose of this study was to prepare a rigid biodegradable packaging of PLA by 3D printing to modify it with nano-Ag and to test its preservative action while keeping fresh cow cheese in refrigerated conditions. The results showed that the rigid packaging PLA-nano-Ag preserved the organoleptic characteristics of the cow cheese until day 12 of storage, compared to the unmodified PLA, in which the cheese showed slight changes from day 6 of storage followed by sharp deterioration. Also, the lowest variation in the cheese moisture and acidity was recorded in the case of cheese kept in the rigid packaging PLA-nano-Ag, due to the antimicrobial effect of nano-silver. According to the Romanian Standard (SR 1981 / January 2008), the cow cheese can be stored in safety conditions for a maximum of 10 days in the unchanged PLA package and up to 20days in the PLA-nano-Ag package.

Key words: *biopolymer, biodegradable, cheese, packaging, PLA, silver*

PHYSICO-CHEMICAL PROPERTIES OF FUNCTIONAL GELLED CONFECTIONERY PRODUCT

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Abstract: Rowanberries (*Sorbus aucuparia*) have high nutritional values and health benefits. These are due to the high concentration of phytonutrients such as vitamins, carotenoids and phenolic acids, as well as minerals, such as iron, potassium, calcium and magnesium. The aim of this study is to propose innovative gelled confectionery product with high content of bioactive components of rowanberries. In this study, biochemical profile of fruits and gelled confectionery product of *S. Aucuparia* genotype was analyzed. Primary metabolites (sugars and organic acids) and flavonoids were analyzed by using HPLC-RI method.

Following the physico-chemical analysis performed on the fruits, high content of flavonoids, namely catechin and vanilla acid, and carbohydrates can be observed. Citric acid increases and tartaric acid remains constant in the jelly samples with *Sorbus aucuparia*. From carbohydrates content, fructose and glucose predominate in the final product.

The interest in *Sorbus spp.* as a promising source of valuable bioactive compounds has increased during last decade. This study shows a new functional fruit gelled confectionery product, fortified with *Sorbus aucuparia* juice that contain bioactive compounds.

Key words: *Rowanberries (Sorbus aucuparia), physico-chemical analysis*

IMPROVE OF THE NUTRITION VALUE OF FUNCTIONAL BREAD BY ADDING PLUMS AND WALNUTS

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Abstract: The bakery segment is part of a market centered on the demand for conventional food, where the innovative element gradually takes over the ground. The quality of the products, but also the increase of the assortment diversity with new tastes and flavors, are key factors that can boost a healthy lifestyle. The purpose of this study is to develop a functional product with multiple benefits for the consumer. The flour mix achieved led to the production of dough that matures in a relatively short fermentation time and to quality products, especially better core characteristics and superior taste. By choosing the process parameters, colloidal, biochemical and microbiological processes can be directed so as to obtain, in addition to the best possible rheological properties, the multiplication of yeast and the formation of sufficient amounts of acids and substances of taste and flavor.

Key words: *quality, food products, safety*

CHANGE IN GRANULOMETRICAL COMPOSITION OF SUSPENSIONS OF MEDICINAL AND COSMETIC PRODUCTS DURING PROCESSING IN A BEAD MILL

Master Students: Kostiantyn OMELIANENKO, Pavlo YAREMCHUK
Coordinating Professors: Oleksii GUBENIA, Kateryna HRININH
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Abstract: It is studied the change in the particle size composition of medical and cosmetic suspensions during processing in a bead mill. Suspensions according to two recipes were ground on an experimental unit — a laboratory bead mill of periodic action. Suspensions based on castor refined oil Ph. Eur. and iron oxide pigment "Red 120" were chosen as model samples. The change in particle size composition and the degree of grinding were researched by light microscopy using a digital monocular camera.

A curve of the degree of grinding during grinding shows that the compositions of the suspensions within the studied range are actively grinded. The resulting particle size distribution diagrams illustrate the dynamics of the formation of a monodisperse system.

The curve of the degree of grinding and the size distribution diagrams demonstrates that suspensions with a higher content of the solid phase are crushed more intensively and have a more pronounced monodispersity. It can be concluded that for the production of medicinal and cosmetic products it is advisable to use formulations of suspensions which have a higher concentration of the solid phase in their composition.

The obtained results of studies on changes in the granulometric composition of suspensions allow monitoring and adjusting the necessary parameters of the ultrafine grinding process to achieve the required product quality

Key words: *granulometric, particle, grinding, beads, mill, suspension.*

SECTION C

UNDERGRADUATE STUDENTS'
RESEARCHES

FOOD SAFETY – TRUTH AND CHALLENGES

Students: Maria-Magdalena GONTARIU, Luminița ACASANDREI,
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Abstract: To preserve life and promote health, it is critical to have access to appropriate quantities of safe food. Food safety refers to the proper food handling procedures applied during food preparation, processing, storage, and distribution of the products. Nowadays food safety is being challenged by the different dimensions of food supply chains, the need of food waste reduction and efficient use of natural resources. Food safety and health are the responsibility of everyone, from the agricultural chain to the consumer who comes into touch with food, in order to limit the amount of food poisonings. Foodborne diseases cause a massive economic and social burden on societies and their health systems. Recent data released by the World Health Organization have estimated that at least 600 million people all over the world become inflicted with foodborne illnesses after consuming unsanitary food. Of these people, at least 420.000 people die every year. Basic and everyday foods can easily become contaminated. Some examples of foods involved in common illnesses include high-risk ingredients and any perishable food such as eggs, poultry, fresh fruits, deli seafood salads, raw meat or deli meats, undercooked seafood, ground meat, raw sprouts, and raw milk products. Therefore, ensuring food safety of the food supply chain is a continuous challenge and needs our attention.

Key words: *foodborne diseases, health, quality, safety, unsanitary food, waste reduction*

PURPLE YOGURT- ENRICHED YOGURT WITH ANTHOCYANINS OBTAINED FROM PURPLE CORN COB

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Abstract: Anthocyanins are among the most important and widespread plant-derived pigments, with a great importance for food science and technology, as the attractive color of food is an important parameter of quality that affects customer preferences. Thinking of unexploited functional potential of purple corn cob in the food industry and following the general trend of increasing demand for sustainable products on the world market, this study aimed at using purple corn cob as a new source of natural pigments and bioactive compounds, in order to develop an innovative product.

Therefore, the present study aimed to extract anthocyanins from purple corn cob using an industrially friendly solvent, ethanol and water (60/40v/v). These recovered anthocyanins were characterized in terms of quality and quantity using chromatographic techniques (LC-MS) and spectrophotometric techniques to determine the antioxidant activity. For the practical realization of the yogurt, it was used high quality milk UHT 3.5% and cultures of *Lactobacillus delbrueckii ssp. Bulgaricus* and *Streptococcus thermophilus*.

Two yogurt variants containing different concentrations of anthocyanins were made and following biochemical analyzes in both variants, anthocyanins showed high stability during storage.

The product is based on the concept of innovation and on the power of dressing some classic products such as yogurt in an improved form from a nutritional and aesthetic point of view. Purple yogurt was created as a healthy snack with beneficial effects on the body.

Keywords: anthocyanins, antioxidants, black corn, natural, pigments, sustainability

FRUIT AND VEGETABLE WASTES – A SURVEY OF CONSUMERS BEHAVIORS AND PERCEPTIONS

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Abstract: The most wasted foods are fruits and vegetables, compared with other food categories. In every year, large amounts of fruit and vegetable wastes are generated at international level (over 1748 millions of tons). In the EU alone, an estimated 89 million tons of food waste is generated per year, of which 50% is fruit and vegetable waste. It is considered that 50% of fruit and vegetable wastes are generated after retail. Consumers behaviors and perceptions greatly influences the amount of waste generated. In this paper, the behaviors and perceptions of young Romanian consumers regarding fruit and vegetable waste were investigated. A structured questionnaire was developed and distributed online. Results showed that about 50% of the total of 92 people who answered the questionnaire eat fruits and vegetables every day. Most of them consume between 100 and 200 g of fruit per day and between 200 and 300 g of vegetables per day. 82.6% declared that they are eating apples most often, while 94.6% affirms that they are eating potatoes most often. 26.3% believe that fruits most often end up in the trash, while 39% believe that vegetable waste is generated most often. 85.9% declare that the food ends up being thrown away because it is no longer good for consumption.

Key words: *young consumers, food waste, fruits, vegetables, waste management*

STUDY OF SOLAR RADIATION IN URBAN PARKS

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Abstract: Green areas such as urban parks ensure the microclimate stabilization. The energy from solar radiation is redistributed and temperature differences appear in different parts of cities. In this study, solar irradiation was investigated in four urban parks in Suceava. The photovoltaic Geographical Information System (PVGIS) web application was used to obtain monthly solar irradiation (kWh/m^2) and daily average irradiance (W/m^2) estimates. Also, Extech SP505 digital device was used to measure radiation (W/m^2) in all four urban parks in October 2022. Measurements were performed in each selected park near trees, statues, playgrounds, small buildings, artesian fountains. The results showed that the global mean daily irradiance in October 2020 did not differ significantly, and possibly due to the short distance between the parks (min. 210 m and max. 1300 m). Instead, the daily direct irradiation varies and the highest values were registered between 10:00 and 12:00. Results obtained with Extech SP505 digital device showed that the highest average daily value (169.35 W/m^2) was registered between 10:00 and 12:00 in the park with fewer trees and direct exposure to the sun.

Key words: *daily direct irradiation, energy, green parks, PVGIS, solar radiation, urban environment*

MEASUREMENT OF NOISE LEVELS IN URBAN PARKS

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Abstract: In many urban areas, noise pollution is a significant environmental issue. Urban parks were created to provide a place for recreation, an open space that has vegetation (flowers, grass, trees) but also benches, artesian fountains, statues, playgrounds included. The aim of this study was to determine the noise level in four different parks from Suceava, Romania. The noise levels were recorded with SAUTER SU 130 Sound Level Meter ranging from 30 to 130 dB, with a resolution of 0.1 dB. Recommended noise levels for residential areas measured outdoors are: ≤ 49 dB(A) (clearly acceptable); between 49 and 62 dB(A) (normally acceptable); between 62 and 76 dB(A) (normally unacceptable) and > 76 dB(A) (clearly unacceptable). The results showed that unacceptable noise levels were recorded outside the parks with noise levels between 65.8 and 74.9 dB(A), while inside the parks the noise levels were between 51.6 and 60.5 dB(A) (normally acceptable), for three investigated parks. In only one park, clearly unacceptable values were obtained inside it (80.5 dB(A)), the possible cause being the small area of the park, which is surrounded by busy streets.

Key words: *green parks, noise levels, Sound Level Meter, urban environment*

DESIGNING NEW BIGELS FOOD SYSTEMS FOR REPLACING SATURATED AND TRANS FATS IN SOME CONFECTIONERY PRODUCTS

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Abstract: The aim of this study was to develop and characterize some bigels, in order to use them as a fat replacing systems in confectionery products. Design-Expert statistic software was used to project the experiment using a combination of 3 factors: emulsification time [min], the rotations used for emulsification [rpm] and the emulsifier type (Polysorbate 20/ Tween 80/ Lecithin). The obtaining process of the bigels includes the distinct obtaining process of the hydrogel and oleogel (both phases being structured) and subsequently mixing them at a high shear rate. The hydrogel is obtained by adding xanthan gum to distilled water and holding them on a magnetic stirrer plate at 300 rpm (without heating). The oleogel was prepared by the direct method using refined sunflower oil and carnauba wax (10%), at 85 °C to ensure melting and complete dissolution. The oleogel is then added to the hydrogel and the mix is homogenized with Ultra-Turrax according to the design (23 samples). The samples were stored for 24 hours at 4 °C and then subjected to physical analysis (texture profile, emulsion stability, rheological measurements). In terms of texture analysis, P8 registered the highest hardness value- 16.28 N, followed by P23- 10.47 N and P17- 7.72N, all samples being obtained with lecithin. The losses of liquid phases for all samples were below 0.56%. The replacing of conventional fats with the new bigels food systems, could be a viable alternative in the confectionery technology in order to obtain spreadable creams.

Key words: *Bigel, experimental design, stability, rheology, texture, hydrogel, oleogel.*

STUDY ON THE VALORISATION OF THE MOOR BERRIES (VACCINIUM OXYCOCCUS) IN "CĂLIMANI CAKE" PRODUCT

Students: Petronela (CIUBOTARU) FLOREA, Gabriel MITRIC, Lavinia TARNIȚĂ, Daria URSACHI

Coordinating Professor: Associate prof. Ph. D. bioeng. Maria POROCH – SERIȚAN, Lecturer Ph.D. Mihaela JARCĂU,

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Abstract: The moor berries (*Vaccinium oxycoccus*) are soft, spherical, bright-red fruits with a sour taste in autumn and a sweet, aromatic taste in spring.

The main aim of our study is to exploit these fruits, which are a valuable source of antioxidants and other chemicals with direct biochemical activity on the human body. The main biologically active substances [Jurikova *et al.*, 2019] in the composition of these fruits are: polyphenolic compounds anthocyanins (12.4- 207.3 mg/100g fw), proanthocyanins (1.5- 5.3 mg/ 100g fw), flavonols, especially quercetin (0.52-15.4 mg/100g fw).

The "Călimani Cake" is a sweet product which combines harmoniously the nutritional value of cow's cheese with the sensory qualities of the jelly made of the fruits from Călimani region, Suceava county. „Călimani Cake” ensures both health through nutritional elements and responds in harmony with our concerns to promote cultural identity through traditional customs and gastronomic tastes of the Bucovina area.

Key words: *cake, dairy product, jelly, Vaccinium oxycoccus*

THE MONOSODIUM GLUTAMATE CONTRIBUTION ON SENSORIAL PROPERTIES OF FOODS

Students: Vicol-Beniamin LAZĂR and Diana PREPELIȚĂ,
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Abstract: Monosodium glutamate (MSG, $C_5H_8NO_4Na$) is the sodium salt of glutamic acid, the most abundant non-essential amino acid found in food. MSG naturally occurs in vegetables (mushrooms, tomatoes), cheeses (Parmesan and Cheddar), seafood and meats. MSG is mostly produced by bacterial fermentation (genus *Corynebacterium*), but it has also been achieved by hydrolysis of vegetable protein and synthesis via chemical means. MSG promotes palatability and is used as a flavor enhancer with an umami taste used also as a food preservative. This article analysis studies regarding the effects of MSG on foods sensorial properties. Among foods studied, chicken soup has been significantly boosted in sensory properties such as meaty flavor, chicken flavor and umami taste when MSG was added to the dish in combination with sodium chloride, compared to salt, without MSG. Also, all of MSG alternatives enhanced the flavors and tastes of chicken soup. Another product studied were 'Poories' (traditional wheat based indian bread). The results revealed that the MSG added products were given a higher score for umami flavor in comparison to the products that didn't have any added MSG. The terms most frequently mentioned in the studies related to monosodium glutamate (MSG) added products were related to salt, seasoning, tasty and meal. The effects of MSG on food taste depend on the concentration used and the type of food studied.

Key words: *MSG, saltiness perception, sensory properties, umami*

DEVELOPMENT OF A NOVEL ALCOHOLIC WHEY BEVERAGE

Students: Florentina Nicoleta TEMNEANU
Diana-Raluca CRECIUNESCU

Coordinating Professors: Prof. PhD. eng. Adriana DABIJA
Sen. lect. PhD. eng. Anca-Mihaela GĂTLAN
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Abstract: Whey is a by-product resulting from the coagulation of milk from cheese manufacture. Strict regulations related to environmental pollution lead to increased interest in the recovery of nutrients from whey. The economic impact consists in the effective use of useful substances from the resulting whey in the manufacture of cheeses, obtaining new products along with increasing the profit of milk processing units. The paper proposes a method for obtaining a fermented drink from deproteinized whey with the addition of raspberry syrup in variable proportions, endogenously impregnated with CO₂, in laboratory conditions. The obtained product belongs to effervescent alcoholic beverages category. Its composition includes only natural ingredients: whey, raspberry syrup, sugar and yeast, without the addition of food additives. The uniqueness of the product consists in the use of whey, a by-product resulting from the cheese industry, when obtaining an effervescent alcoholic beverage. With an original recipe, the new assortment of alcoholic beverage presents special sensory characteristics, unique freshness, flavour given by the raspberry syrup from the manufacturing recipe and perlage, conferred by the carbon dioxide of endogenous origin resulting from the alcoholic fermentation.

Key words: alcoholic fermentation, by-product, sweet whey, sustainability, valorisation

ARONIA PRALINES: A NEW SOURCE OF ANTIOXIDANTS FOR DIABETICS?

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Abstract: *Aronia melanocarpa* is a shrub of the *Rosaceae* family, native to North America, but which has been naturalized in Europe in recent decades. Consumption of chokeberry has many benefits for human health, as it comes with a significant intake of antioxidants, due to the large amount of anthocyanin compounds in its composition. On the other hand, chocolate is one of the products consumed since antiquity intuitively for the medical properties it can induce, but as science has evolved, it has been shown that it is also a much richer source. in antioxidant compounds than many other common foods. Therefore, through this work, we propose an innovative product that brings together 2 sources rich in antioxidants: dark chocolate without sugar, respectively chokeberry powder rich in **anthocyanins**. Chokeberries were processed in a controlled environment (temperature, light) in order to obtain a colorful powder, which was subjected to anthocyanins extracts and purification. The obtained extracts were characterized by LC-MS. Further, anthocyanins were incorporated in a novel two types of chocolate praline containing 5 and 10% chokeberry powder. The product proposed in the introductory part has been successfully obtained, following the specific standards for the production of chocolates. From an organoleptic point of view, it has pleasant properties, the astringency specific to chokeberry does not significantly influence the taste of chocolate. Also, following the analysis, it was found that both types of praline have improved nutritional properties than the sample. Therefore, the conclusion drawn from the analysis is that the prom combination of the two products, chokeberry and chocolate, we get a product very rich in antioxidants. In addition, due to the well-known **antidiabetic** properties of chokeberry, as well as the lack of sugar in chocolate, the product can be recommended for consumption by diabetics.

Key words: *anthocyanin, antidiabetic, antioxidant, chocolate, chokeberry, health.*

EVALUATION OF THE FUNCTIONAL PROPERTIES OF A NEW FERMENTED BEVERAGE BASED ON NETTLE POWDER (URTICA DIOICA) WITH KEFIR GRAINS

Students: Oana Maria GRIGOR, Diana GHEORGHE

Coordinating Professor: Prof. univ. dr. Anuța M. ROTAR, Conf. dr.

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Abstract: The fruit and vegetable fermented beverages were among the first processed food products consumed worldwide by humans since ancient times. Over the last few years, these products are in focus globally because of their nutritional and functional utility for health improving benefits.

The present study highlights the functional potential of a novel kefir grains-fermented beverage in terms of chemical and biological profiles with great effect on health improvement. A great variety of experimental prototypes were comparatively analysed (B1- 2,5% of nettle powder fermented beverage; B2- 5% of nettle powder fermented beverage; B3- 7,5% of nettle powder fermented beverage). Following the realisation of the three prototypes of fermented beverages, they have undergone spectrophotometric, physicochemical and microbiological analyses. The final product has been monitored for 30 days at refrigeration temperature of 2-4 degrees Celsius.

The acceptability concerning the consumption of this new kefir grains- fermented beverage was realised on a sample of 50 people.

The results of the analysis prove that the beverage presents high microbiological characteristics up to day 20 of storage and then it identifies a rise of the monitored microorganisms. This beverage presents high level of bioactive compounds and it maintains its functionality during the 20 days of storage.

The use of a fermented beverage based on nettle powder with kefir grains offers a promising alternative for those consumers interested in including vegetarian fermented drinks in their diet. For economic reasons, in order to extend the beverage validity term, a pasteurization is highly recommended.

Key words: *bioactive compounds, fermented beverage, functionality, health benefits, kefir grains, nettle.*

OPPORTUNITIES TO DEVELOP AND MANUFACTURE DIFFERENT TYPES OF FOODS: ICE CREAMS

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Abstract: Nutritional and physico chemical attributes are important deciding factor when consumers purchase dairy products. In recent years, the development of healthier foods, richer in nutraceutical or functional compounds, has been in great demand. Ice cream is considered a food for enjoyment, rather than a basic food.

Therefore, fortification of ice cream with nutrients or other bioactive substances should be supported.

By incorporating probiotic bacteria into ice cream, a nutritionally rich food is obtained, which contains dairy raw material, vitamins and minerals, is usually consumed by everyone, being well accepted by the public.

Beetroot (*Beta vulgaris* L.) is rich in betalains and phenolic compounds. Betalains are water-soluble pigments that have been authorized by the European Union as E-162 for use in food as colorants. Therefore, incorporating beetroot by-products into food products such as ice cream may be affordable.

Application of *Spirulina platensis* into food product can be used for producing functional food and improve its nutritional value. The results showed that addition of 1 % and 1.2 % *S. platensis* was considered as the best concentration for ice cream.

Thus, from the present study it can be concluded that the presented natural additives offer a great potential for use in the dairy industry to improve the functional properties of ice cream

Key words: *Beetroot, ice creams, probiotic bacteria, Spirulina platensis.*

DEVELOPMENT OF A NOVEL ALCOHOLIC WHEY BEVERAGE

Students: Florentina Nicoleta TEMNEANU

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Coordinating Professors: Prof. PhD. eng. Adriana DABIJA

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Romania*

Abstract: Whey is a by-product resulting from the coagulation of milk from cheese manufacture. Strict regulations related to environmental pollution lead to increased interest in the recovery of nutrients from whey. The economic impact consists in the effective use of useful substances from the resulting whey in the manufacture of cheeses, obtaining new products along with increasing the profit of milk processing units. The paper proposes a method for obtaining a fermented drink from deproteinized whey with the addition of raspberry syrup in variable proportions, endogenously impregnated with CO₂, in laboratory conditions. The obtained product belongs to effervescent alcoholic beverages category. Its composition includes only natural ingredients: whey, raspberry syrup, sugar and yeast, without the addition of food additives. The uniqueness of the product consists in the use of whey, a by-product resulting from the cheese industry, when obtaining an effervescent alcoholic beverage. With an original recipe, the new assortment of alcoholic beverage presents special sensory characteristics, unique freshness, flavour given by the raspberry syrup from the manufacturing recipe and perlage, conferred by the carbon dioxide of endogenous origin resulting from the alcoholic fermentation.

Key words: *alcoholic fermentation, by-product, sweet whey, sustainability, valorisation*

POTENTIAL UTILIZATION OF FOOD WASTE AS A SOURCE OF BIOACTIVE SUBSTANCES

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Abstract: Food waste is a by-product of various industrial activities, which are constantly increasing due to the growth of large industries. The purpose of the study was to show that different types of food waste obtained from the processing of citrus fruits, nuts and even from the use of onions, can be used as a potential source of bioactive compounds, which have significant application and in the treatment of various ailments. Citrus peel is a natural antimicrobial and antioxidant source rich in polyphenolic compounds, mainly flavonoids, including hesperidin, naringin, nobiletin, anthocyanins and coumarins located in the cellular vacuoles of albedo tissue in citrus peel. At the same time, onion (*Allium cepa* L) is endowed with several biological properties, such as antibacterial, antimutagenic and antioxidant activities. Phytomolecules such as phenolic acids, flavonoids, cepenes, thiosulfinates, and anthocyanins are the major biologically active compounds of onion, while organosulfur-containing compounds play a major role in its medicinal value. And with regard to the production of walnuts (*Juglans regia*) generates a quantity of waste which consists mainly of husk and shell. The two by-products have several bioactive compounds, mainly phenolic compounds with antioxidant activity. The utilization of waste streams and industrial residues for the production of bioactive compounds is a good strategy for circular economy approaches. Following this bibliographic study brought to people's attention, we propose to educate the Romanian consumer with a view to reusing food waste due to the benefits it can bring to food products while also trying to reduce food waste to a higher yield.

Key words: *food waste, nuts, antioxidant activity, onion, bioactive.*

NANOTECHNOLOGY AND FOOD QUALITY CONTROL

Students: Alexandra HUMĂ, Andreea SANDU, Sava SAVU
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Abstract:

Nanotechnology refers to the realization, the manipulation, and the use of nanomaterials with constitutive elements with at least one dimension between 1 and 100 nm, although in practice these constitutive units aggregate in submicrometer, micrometer or bigger structures, which can be also incorporated into a matrix thus realizing nanocomposites with enhanced physical, chemical, or biological properties. Indeed, nanomaterials possess properties which usually dramatically differ from those of their bulk counterparts

This is a branch of technology that deals with the control of matter on an atomic molecular, and supramolecular scale. As science has progressed. We have been able to manipulate materials at this microscopic level. Currently nanotechnology is being used in many different industries from medicine to manufacturing of smart packaging.

In the food industry, nanotechnology is most frequently found in food supplements.

The promise of nanotechnologies is that they will allow the redesign of ingredients through the use of nanoparticles that can be more quickly absorbed into the body. This can create an intake of beneficial nutrients for the body, allowing the filtering of less desirable components.

Nanotechnologies are also used in some food packaging and containers. Silver nanoparticles are mainly used due to their antibacterial properties

Key words: nanotechnology, food, quality.

VALORIZATION OF FRUIT AND VEGETABLE BY-PRODUCTS IN EXTRUSION PROCESSING

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Abstract: Fruit and vegetable by-products such as pomace represent the pulpy residue left after the juicing process, which mainly includes skin, pulp, seeds, and edible part of fruit stem. The processing of by-products into value-added food products is beneficial to the human body as most of the by-products obtained are highly nutritious and can be excellent sources of dietary fibre, protein, polyphenols, antioxidants and vitamins. One of the processing methods is extrusion, a widely used thermo-mechanical process due to its versatility, flexibility, high production rate, and low cost. The extruded products characteristics are influenced by the chemical composition, structure and functional properties of the by-products, and also by the extrusion processing conditions. Findings on by-products properties and their impacts on the extrudates and their nutritional profile can offer new ideas for future applications.

Key words: *apple pomace, berry pomace, carrot pomace, extrudates, grape pomace, nutritional properties, tomato pomace.*

MOLASSES: TYPES, NUTRITION AND BENEFITS

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Faculty of Food Engineering,

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Abstract: Red beetroot (RB) and grapes (G) are well known for its high proportion of betalains, with great potential as functional food ingredients due to their health- promoting properties. Beetroot extracts have been reported to have numerous bioactive properties, including antioxidant, anti-inflammatory, antihyperglycemic, anticancer, antihypertensive, lipid lowering effects, etc.

Grape (G) is the raw material for molasses and represents a rich source of potent bioactive compounds which could display a wide range of beneficial effects in human health for their association with reduced risk of several chronic diseases.

The purpose of this work was to obtain and analyze some types of natural sugar extracted from vegetable sources.

The juice obtained from beetroot and grapes was concentrated by boiling to the specific consistency of molasses.

The molasses obtained was analyzed for dry matter, acidity, viscosity, sensory analysis and nutritional value.

The content of dry matter varied between 48 and 60%, acidity had values between 0.83 (malic acid) and 2.28 (tartaric acid), the viscosity varies between the limits of 20.44 Pa (for grapes molasses) and 97.3 Pa (for beetroot molasses).

Key words: *health, juice, nutritional value, raw material, sensory analysis, sugar.*

WALNUT OIL ADULTERATION WITH EDIBLE OILS

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Abstract: Walnuts have a high nutritional value, being rich in proteins and lipids, containing high levels of polyunsaturated fatty acids (PUFA) and monounsaturated fatty acids (MUFA), which mainly include linoleic acid (about 50–59%) and oleic acid (about 12–25%). Walnut oil can lower blood cholesterol levels and prevent cardiovascular disease. These benefits are due to the high levels of MUFA, PUFA and tocopherols, which are believed to reduce the incidence of coronary heart disease by lowering total cholesterol. Walnut oil is expensive; therefore, nut oil is often adulterated with low-cost edible oils such as soybean oil and sunflower oil to reduce costs and increase profits. In this study we evaluated the usefulness of UV-VIS spectroscopy for the detection of walnut oil adulteration with edible oils (sunflower, rape and soy oils), in different percentages. The most prominent differences can be seen in the case of oil adulterated with soybean oil in the spectral range 400 – 500 nm, soybean oil showing a strong absorbance due to the pigments present. Regarding adulteration with sunflower oil and rapeseed oil, the addition of adulterant resulted in a decrease in absorbance intensity, mainly due to a lower concentration of pigments absorbing in the 400 – 500 nm range. In the case of walnut oil and soybean oil, an absorption peak can be observed in the range of 650-700 nm, which does not appear in sunflower oil and rapeseed oil.

Key words: *walnut oil, edible oils, adulteration, UV-VIS spectroscopy*

RECOVERY AND VALORIZATION OF TOMATO AND POTATO WASTE

Students: Klaus Ronald BALLA, Vasile-Georgian CÂRȘMARIU, Alina TOFAN

Coordinating Professor: Lecturer PhD Cristina GHINEA
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Abstract: Large amounts of tomato and potato waste are generated annually due to industrial processing. In this study the potential utilization of tomato and potato waste is investigated. Valorization of these wastes can contribute to sustainable development, value-added products generation and circular economy. Tomato and potato peels are used mainly for animal feed, fertilizer and biogas production, or are landfilled. Tomato peel contains cutin (polymeric building block – mixture of fatty acids), pectin (polysaccharide), hemicellulose, cellulose, and also carotenoids (lycopene, lutein, zeaxanthin, β -Carotene and cis- β -Carotene). It can be used for production of bioplastics, food additives, or for extraction of high-value compounds. Starch, protein, soluble sugars, fat and fibers are the main constituents of dry potato peels. Also, potato peels contain phenols (1.02–2.92 g per 100 g of raw potato peel) and flavonoids (0.51–0.96 g per 100 g of raw potato peel). Valorization of potato peels can be done by extracting phenolic compounds, liquefying potato peels, extracting the aroma from liquefied potato peels, extracting alkaloids. Potato peel is a source of dietary fiber and can be used in pharmaceutical and baking industries, the potato peel can also have a biotechnological application such as the production of biogas and lactic acid. Tomato and potato waste are cheap and abundant raw materials which can be used for obtaining interesting products with high commercial value.

Key words: *dietary fiber, potato peel, recovery, tomato peel, value-added products, waste*

EVALUATING THE INFLUENCE OF OIL TYPE ON THE PROPERTIES OF OLEOGELS DEVELOPPED FROM K-CARAGENAN AND PEA INNER FIBER CRYOGELS

Student: Răzvan ODOCHEANU,

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Abstract: Cryogels are obtained by lyophilization of hydrogels and are characterized by a low specific surface area, highly interconnected microporous networks (which can range from a few micrometers to hundreds of micrometers in diameter) and excellent mechanical properties. Samples were obtained by adding k-carrageenan to a pea fibre solution of different concentrations (1, 3, 5, 7.5, and 10%), in the presence of calcium ions, and then subjected to freeze-drying (at 0,001mbar/72h, at -55 °C, LyoQuest) for obtaining the cryogels. The structural properties of the cryogels were revealed by a compression test using CT3 Brookfield texture analyzer. Further, the incorporation of two types of oil (cold pressed pumpkin seed oil and refined sunflower oil), in the fibrous matrix of the cryogels was conducted by immersing the samples in oil for 2 hours in order to develop oleogels. Oleogels are solid-type systems in which the constant liquid phase is trapped or immobilised in a 3D network. The influence of pea fibres concentration or the oil type on the oil retention was determined. Micrographs of the samples were also aquired through polarised light microscopy. The novel food lipid systems represent good alternatives to partially hydrogenated oils (PHO) and saturated fats in nutritionally improved food products

Key words: *cryogel, freeze drying, k-caragenan, oleogel, Pea inner fiber, texture.*

DESIGNING A NEW VARIETY OF HALVA FROM FAGUS SYLVATICA SEEDS

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Abstract: Halva is a confectionery product based on nougat (a caramel mass obtained from water, sugar and glucose) and various oilseed pastes. Conventional halva has historically been produced from sesame seeds in the Middle East and Northern Africa, but in Europe, the sesame seeds used to make tahini are replaced with sunflower, pumpkin, pistachio or almond seeds, depending on the availability of each region. The aim of the work is the design of a new variety of halva which is more sustainable and economically feasible, from forest seeds of *Fagus sylvatica L.* The evaluation of the textural and stability parameters of the novel halva was compared to a commercially available reference from sunflower seed tahini. For the textural analysis, the TPA test was conducted on CT3 Brookfield analysis, while the stability was assessed as a measure of the oil loss during storage. Color parameters were also assessed. The novel halva shows a real potential for commercialization.

Key words: *Confectionery product, forest seeds, oilseed pastes, sustainability, stability, textural parameters.*

CONTRIBUTIONS TO THE STUDY OF CARBOHYDRATES INFLUENCE ON HUMAN THINKING AND MEMORY

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Abstract: Food - the fundamental and essential component in the life of all people. Its quality also determines the quality of physiological and chemical processes within the human body. The main objective of our research is to study the influence of the most used substances in food - carbohydrates - on human thought and memory, presented in several papers based on experimental results. Carbohydrates are an extensive class of organic compounds that perform many functions. Carbohydrates or carbohydrates (sugars) are indispensable nutrients that are essential for the normal functioning of the human body. Sugars are our body's main source of energy, which should normally provide over 50% of our daily calorie intake. Depending on their composition and impact on blood glucose, carbohydrates are classified as refined (simple) and complex. The two types of carbohydrates affect blood sugar levels (*glycaemia*) differently and have a different impact on both the feeling of hunger, by triggering fast or slow insulin secretion from the pancreas, and on energy production and storage in the body. The links between nutrition and cognition are widely recognized. In the context of short-term cognitive performance, carbohydrates have been the most frequently investigated dietary component.

Key words: *glycemic index, glycemic load, glycemic response, carbohydrate, cognition, cognitive performance, memory, attention.*

ANALYSIS OF THE DIFFERENCE BETWEEN COW'S MILK ALLERGY AND COW'S MILK INTOLERANCE

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Abstract: Cow's milk (CM) is important in nutrition because it contains proteins - 3.3%, fats - 3.7%, carbohydrates, minerals and vitamins - A, B₁, B₂, B₁₂, D, E, which are valuable for the human body. Both clinical practice and research findings are confused because cow's milk intolerance (CMI) and cow's milk allergy (CMA), which are two distinct words, are sometimes used interchangeably. CMA is a systemic anaphylactic reaction to cow's milk proteins that is immunologically mediated and may affect the gastro-intestinal tract, skin, respiratory tract, or multiple systems. It is most prevalent in babies and has the lowest frequency in adults in the general population. Dietary elimination is linked to a positive prognosis even though it can result in significant morbidity and even death. CMI, on the other hand, should be used to describe nonimmunologic responses to cow's milk, such as issues with certain CM components: metabolism, digestion, or absorption. Lactase deficiency is the most frequent cause of CMI. It exhibits a strong racial preference, with dark-skinned groups showing the highest prevalence and northern Europeans the lowest. Although the primary acquired kind of lactose intolerance is a lifelong condition, it is typically a benign condition with symptoms confined to the gastro-intestinal tract. Reducing the intake of CM or employing lactose-hydrolyzing medicines can also significantly reduce symptoms. In conclusion, the terms allergy and intolerance are sometimes used synonymously. An allergy is a hypersensitive reaction, often known as an immunologically mediated reaction. On the other hand, intolerance is a vague, broad term that refers to weakness.

Key words: *Allergy, Density, Intolerance, Lactose, Milk, Reaction.*

COMPARATIVE STUDY OF THE PROPERTIES OF PLAIN YOGHURT AND FRUIT YOGHURT

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Abstract: The aim of this study is to highlight the physical and functional properties of plain yoghurt as compared to yoghurt with berries. Most substances results either from the standardization process of milk, by removing water by concentration, adding powdered milk to other dehydrated milk products, removing the water by separation of the membranes or by the fermentation process of milk by traditional methods, separation with curd, ultra-filtration. The quality of whole yoghurt and concentrated yoghurt is particularly influenced by composition: acidity, fats, aroma, and physical proprieties: consistency, texture, viscosity. Concentrated yoghurt is characterized by a high content of dried substances, including proteins. Plain yoghurt contains the following ingredients: pasteurized whole milk, yoghurt ferments. And it has the following nutritional values per 100g product: energy value: 60kcal, fats: 3,5g of which saturated acids: 2,3g; carbohydrates: 3,9g of which sugars: 3,9g; proteins: 3,1g; salt: 0,10g; Calcium: 120mg. Yoghurt is rich in vitamins and minerals, and it is considered one of the healthiest food products. It has a lot of benefits, like: it contains lots of nutritive substances; it provides a stronger bone system, it contributes to the good functioning of the digestive system, and it is recommended to be consumed by the people suffering from lactose intolerance. Yoghurt with berries contains the following ingredients: pasteurized milk, sugar, wild berries 2,3% (raspberries, strawberries, blueberries, black carrot, beet, carrot, hibiscus, aroma), milk proteins, modified starch, thickening agent: proteins, yoghurt ferments. And it has the following nutritional values per 100g of product: energy value: 81kcal; fats: 1,9g which of saturated acids: 1,2g; carbohydrates: 13g which of sugars: 12,1g; proteins: 3g; salt: 0,09g. The consumption of yoghurt with berries, brings besides the benefits provided by each component, a series of other benefits which derive directly from their combination.

Key words: *fruits, milk, yogurt, protein, vitamins, water.*

RESEARCH ON PHYSICAL AND FUNCTIONAL PROPERTIES OF WINES

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Abstract: In this paper, we propose to identify some physical properties of wines of several types. At the same time, we can mention the advantages and disadvantages of wine and its influence in human life. Wine is a drink obtained from the fermentation of grape must. Considered the liquor of the gods, wine is a tasty drink enjoyed by many of us. This drink is recognized for its therapeutic effects, being administered in decent quantities. Red wine is recommended for those with low blood pressure, it is also known to have a glass of wine a day, which keeps you in shape, but also helps with heart problems. Apart from the remaining unfermented carbohydrates, the wine extract (what remains after the removal of volatile substances and water) consists of: nitrogenous substances, glycerin, acids (especially tartaric), tannins, mineral salts, higher alcohols and acids, coloring substances, small amounts of vitamins. The amount of the extract is between 1.5 - 2 g% for white wines and 2 - 3 g% for red ones. It is a very good antioxidant and, at the same time, an energizer. Besides beer, which is consumed every day, on any occasion, wine appears more refined. The statement that an old wine is better than other, newer ones is much overused. But there are some wines where the age doesn't matter, because they don't need to be aged to get a good taste, they must be consumed while they are fresh.

Key words: *wine, drink, vitamins, carbohydrates, body, substances.*

RESEARCHES REGARDING METALLIC COMPOUNDS PRESENCE IN DIFFERENT FOODSTUFF

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Abstract: A healthy diet must contain all the nutritional principles. Minerals are some of the most important and metals in particularly. For assessing the contribution of different kind of foodstuff in the diet in this work, the mineral compounds from samples of beetroot juice, black cherry juice, chokeberry, lemon juice, orange juice, pea fiber, three types of pears, pollen and red pepper were determined. The method used was mass spectrometry, which involves the separation of ions using electromagnetic fields on basis of mass / electric charge ratio. The model used in making the measurements was Perkin Elmer Elan DRC II, a quadrupole spectrometer, which means that unlike magnetic sector instruments, the selection is made by varying the electrical and oscillating parameters of an assembly of four conducting bars (quadrupole).

It was observed that all these samples contain a large number of minerals, which are beneficial for a healthy life style. There were essential metals identified in the samples like iron, calcium, magnesium, zinc, sodium, potassium, copper, strontium, nickel, barium and manganese. The heavy metals in all the analyzed samples were below the detection limit. These findings presents that the analyzed samples have various contributions from the metals supplying point of view in consumers. The results allow us to draw conclusions regarding the low level of toxicity from the heavy metals presence point of view. The level of their presence is in range of other researches that prove the value of analyzed foodstuff for consumption.

Key words: *metallic compounds, beetroot juice, black cherry juice, chokeberry, lemon juice, orange juice, pea fiber, three types of pears, pollen and red pepper*

PHYSICOCHEMICAL ANALYSIS AND HEALTH RISK ASSESSMENT OF WELL WATER FROM BOTOȘANI COUNTY

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Abstract: One of the major differences between urban and rural life in Romania is where drinking water comes from. While most cities have a municipal water supply, in the rural areas most households rely on a private well rather than water that is supplied and previously treated. Well water is defined as the untreated groundwater that is stored in underground layers of rock. This type of water almost always requires filtration and other treatments to ensure the quality and safety prior to drinking it or using it to prepare food. Due to the fact that in many rural areas there is a lack of treatment equipment, the safety and quality of water is the responsibility of the house owner. To better understand the current situation regarding the consumption of well water and its quality, this study considered the region of Costești, Botoșani County, from where several samples of well water were collected and analyzed. Therefore, the aim of the study was to evaluate well water quality in this area. Several physicochemical parameters (hardness, nitrate and nitrite content, ammonia) were determined as means to assess water quality and identify any health risks associated with its consumption.

Key words: *well water, quality, physicochemical parameters*

METHODS OF WATER PURIFICATION IN FIELD CONDITIONS

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Abstract: If it is not possible to boil water in the field, other methods can be used, including chemicals and special tablets.

Field filters that are based solely on mechanical removal of microorganisms may be suitable for cysts and bacteria, but cannot reliably remove viruses. They are simple and do not require waiting time. They remove an unpleasant taste and can improve the taste and appearance of water.

Filtration is not an adequate method of destroying viruses, because the infectious dose of enterovirus can be very small. Filters are expensive and can significantly increase the weight and volume of the backpack.

Clarification of turbid water can be achieved by sedimentation, coagulation-flocculation or adsorption. Although filters remove solid particles, they clog quickly if the water contains large particles.

You can use other methods: the easiest way to disinfect water is to use salt. Activated carbon removes the unpleasant smell of water, impurities and harmful substances. Silicon has excellent bactericidal properties, and water with silicon additives improves metabolism and is stored for a long time. The use of potassium permanganate or iodine is effective for water disinfection in small quantities. Iodine in the form of alcohol tincture or iodine tablets is also suitable for water purification. Tablets are also used to kill microbes in field water. In particular, Hydroperit or Furacilin. A bucket of water can be disinfected with four to five hydroperite tablets.

Key words: *Coagulation, Disinfection, Filtration, Microorganism, Purification, Sedimentation, Water.*

VALORISATION OF FOOD WASTE – NATURAL ANTIOXIDANTS FROM WINE BY-PRODUCTS

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Abstract: Various studies have indicated that different kinds of food wastes obtained from fruits, vegetables, cereal and other food processing industries can be used as potential source of bioactive compounds and nutraceuticals.

Natural antioxidants have drawn attention due to their potentially beneficial effects in health. On the other hand, valorization of wine residues is an opportunity to obtain profit in a sustainable way.

There have been found highly useful components such as phytochemicals like phenolic acids, flavonoids, anthocyanins, and lipids, and structural polymers like cellulose and hemicelluloses in winery wastes. In recent decades, owing to this high phyto-chemical content and to the lack of efficient processes for winemaking wastes utilization, large research has been conducted in order to take advantage of the biological properties of compounds provided by winery wastes in different fields of interest.

Moreover, new processes considering industrial ecology concepts, like cradle-to-cradle and circular economy, have revealed the need to recycle, reuse, and recover valuable chemicals from waste and wastewaters as a major research topic.

Key words: *anthocyanins, flavonoids, food wastes, phenolic acids, natural antioxidants*