

**INTERNATIONAL
CONFERENCE FOR STUDENTS
“STUDENT IN BUCOVINA”
December, 18th, 2020**

**STUDENT IN BUCOVINA
ABSTRACTS**

Organized by:
*Faculty of Food Engineering,
Stefan cel Mare University of Suceava, Romania*

ISSN 2068 – 7648

SCIENTIFIC COMITEE

AMARIEI Sonia, Faculty of Food Engineering, Stefan cel Mare University of Suceava, Romania

BAHRIM Gabriela, Dunarea de Jos University, Galati, Romania

BERINDE Zorita, North University Centre of Baia Mare, Romania, Technical University of Cluj Napoca, Romania

BLAZHENKO Sergii, National University of Food Technologie, Kyiv, Ukraine

CODINĂ Georgiana, Faculty of Food Engineering, Stefan cel Mare University of Suceava, Romania

DABIJA Adriana, Faculty of Food Engineering, Stefan cel Mare University of Suceava, Romania

FIHURSKA, Liudmyla, Department of Feed and Biofuel Technologies, Odessa National Academy of Food Technologies, Ukraine

GHINEA Cristina, Faculty of Food Engineering, Stefan cel Mare University of Suceava, Romania

GUBENIA Oleksii, National University of Food Technologie, Kyiv, Ukraine

GUTT Georg, Faculty of Food Engineering, Stefan cel Mare University of Suceava, Romania

KLUZ Maciej, University of Rzeszow, Poland

MARIAN Monica, North Univeristy Centre of Baia Mare, Tehnical University of Cluj-Napoca, Romania

MIRONEASA Sivia, Faculty of Food Engineering, Stefan cel Mare University of Suceava, Romania

NISTOR Denisa, Vasile Alecsandri University of Bacau, Romania

OROIAN Mircea Adrian, Faculty of Food Engineering, Stefan cel Mare University of Suceava, Romania

SAND Camelia, Lucian Blaga University, Sibiu, Romania

POROCH SERIȚAN Maria Faculty of Food Engineering, Stefan cel Mare University of Suceava, Romania

PRISACARU Ancuța Elena, Faculty of Food Engineering, Stefan cel Mare University of Suceava, Romania

RESITCA Vladislav, Technical University of Moldova, Rep. of Moldova

RIVIS Adrian, Banat's University of Agricultural Sciences and Veterinary Medicine "King Michael I of Romania" from Timisoara, Romania

RUSU Razvan Radu, Ion Ionescu de la Brad University of Agricultural Sciences and Veterinary Medicine of Iasi, Romania

SALAMON Rozalia Veronika, Sapiientia University, Miercurea Ciuc, Romania

SIPOS Peter, University of Debrecen, Hungary

SZEP Alexandu, Sapiientia University, Miercurea Ciuc, Romania

TIMAR Adrian, Faculty of Environmental Protection, University of Oradea, Romania

TOFANA Maria, Faculty of Food Science and Technology, University of Agricultural Sciences and Veterinary Medicine, Cluj Napoca, Romania

VARGAS Maria, Polytechnical University of Valencia, Spain

ORGANISING COMMITTEE

Faculty of Food Engineering,

Ștefan cel Mare University of Suceava, Romania

President: OROIAN Mircea, Faculty of Food Engineering, Ștefan cel Mare University of Suceava

Members:

AMARIEI Sonia, Faculty of Food Engineering, Ștefan cel Mare University of Suceava

HRETCANU Cristina-Elena, Faculty of Food Engineering, Ștefan cel Mare University of Suceava

LEAHU Ana, Faculty of Food Engineering, Ștefan cel Mare University of Suceava

ROPCIUC Sorina, Faculty of Food Engineering, Ștefan cel Mare University of Suceava

ROSU Alice-Iuliana, Faculty of Food Engineering, Ștefan cel Mare University of Suceava

STROE Silviu-Gabriel, Faculty of Food Engineering, Ștefan cel Mare University of Suceava

Conference program

International conference for students

STUDENT IN BUCOVINA

18thDecember 2020

10.00 – 10.15:

Opening ceremony

meet.google.com/sxh-jgon-kqv

**10.15 – 18.00 Papers presentation on sections (online, on
google meet)**

PH.D. STUDENTS' RESEARCHES

meet.google.com/uxg-sppc-npw

MASTER STUDENTS' RESEARCHES

meet.google.com/ytk-zcxw-sxq

UNDERGRADUATE STUDENTS' RESEARCHES

meet.google.com/cdn-obdg-tsq

18.00 -19.00 Awarding ceremony

meet.google.com/sxh-jgon-kqv

HEALTH BENEFITS OF A NATURAL SWEETENER – STEVIA

Students: Naomi-Delia ALEXA, Bianca-Silvia BOZ

Coordinating Professor:

Associate prof. Ph.D bioeng. Maria POROCH – SERIȚAN

*Faculty of Food Engineering, Stefan cel Mare University, Suceava,
Romania*

Abstract:

Stevia rebaudiana (Bertoni) is the sweetest plant belonging to the *Asteraceae* family. Stevia leaves taste sweet due to the diterpene glycosides stevioside, rebaudioside A-F, dulcoside and steviolbioside. These are non-toxic and extremely strong sweeteners, being 300 times sweeter than sucrose. The chemical composition of stevia changes depending on their degree of processing. The results of the study by Snehla and Madhukar (2012) show that the extract of dried stevia leaves contains 10% amino acids, 18% protein, 33% carbohydrates and 39% reducing sugars, while in the extract of fresh leaves the levels are 25%, 19%, 31% and 25%, respectively. The fat content of the dry matter of stevia leaves amounts to 1.9-4.34 g per 100 g of dry matter.

Stevia leaves can be used for many purposes in a product either alone or in a mixture of other sweeteners; from sugar and artificial substitute for sweetener, flavor enhancer, to an incredibly beneficial ingredient in pharmaceuticals. Its many health benefits and the many therapeutic applications of stevia can be attributed to the impressive antioxidant effect, being consumed as an herbal tea. Other applications of stevia leaves are as a sweetener, in products such as: chewing gum, toothpaste and mouthwash.

A large survey conducted by us, on 170 people showed that over 70% do not consume stevia, because they are not informed of its benefits. Therefore, consumer choices could be influenced by disseminating accurate information on the beneficial effects of bioactive ingredients in stevia powder. Through this study based on the answers of young people surveyed and by presenting the reasons why people should include stevia in their diets, we intend to educate the Romanian consumer about the advantages and versatility of using this plant as a sweetener.

Key words: *chemical composition, health benefits, natural sweetener, Stevia rebaudiana.*

PHYSICAL AND PHYSIOLOGICAL MODIFICATIONS OF DIFFERENT LEGUMES TYPES DURING THE GERMINATION PROCESS

PhD Students: Denisa ATUDOREI, Camelia GOLEA,
Coordinating Professor: Prof. Ph.D.Eng. Georgiana CODINĂ
Faculty of Food Engineering, Stefan cel Mare University, Suceava, Romania

Abstract:

The aim of this study was to highlight the physical and physiological modifications of different legumes types such as sweet lupine, chickpeas, beans, red lentil, soybeans during the germination process. The legumes germination process was made according to the standard method SR 1634:1999 in a growth plant chamber Binder KBW/KBWF 240. The germination process was made on light to a germination temperature of 20°C and a constant humidity of 80%.

The recommended germination period was of 8 days for chickpeas, 9 days for beans and soybeans and 10 days for red lentils and sweet lupine. In order to highlight the physical and physiological modifications of the legumes types a Motic SMZ-140 stereomicroscope with a 20x objective was used. Everyday was captured images that highlighted the changes that occurred to the grains coating, inside the grains structure and the way in which the root and leaves 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.

Key words: legumes, germination process, physical changes.

Acknowledgments: This work was supported by a grant of the Romanian Ministry of Education and Research, CNCS - UEFISCDI, project number PN-III-P1-1.1-TE-2019-0892, within PNCDI III

STUDIES REGARDING THE PHYSICAL CHANGES OF DIFFERENT PSEUDOCEREALS TYPES DURING THE GERMINATION PROCESS

PhD Student: Denisa ATUDOREI,
Coordinating Professor: Prof. Ph.D.Eng. Georgiana CODINĂ
*Faculty of Food Engineering,
Stefan cel Mare University of Suceava, Romania*

Abstract:

Pseudocereals are nutritionally valuable grains fact that led nowadays to an increase of their use in the food industry. Through the germination process all the nutritional quality of the grains increases such as minerals bioavailability, the content of the bioactive compounds, the compounds digestibility, etc. Also, through the germination process the antinutrients compounds from its decreases. Thus, it may be concluded that pseudocereals germs and not only, should occupy a special place in the human nutrition.

The aim of this study was to establish the optimum germination period when pseudocereals of different type (quinoa, amaranth, chia, buckwheat) may be recommended to be used in different foodstuffs. For this purpose, were analyzed the physical germination process of the different pseudocereals types during the 8-10 days' period. This study wants to be a first step in establishing the optimal germination period in order that pseudocereals in a germinated form to be as valuable as possible.

Key words: *pseudocereals, germination, physical changes*

Acknowledgment: This work was done from „DECIDE-Development through entrepreneurial education and innovative doctoral and postdoctoral research”, project code POCU / 380/6/13/125031, project co-financed from the European Social Fund through the Human Capital Operational Program 2014 - 2020”.

OBTAINING BITTER CHOCOLATE COOKIES USING GRAPESEED OIL AS A REPLACEMENT FOR BUTTER

Students: Olivia ATUDOREI,

Ionel-Dănuț CHIHAIA, Andreea-Diana JUNCANARIU

Coordinating Professor: Lecturer Ph.D. Cristina DAMIAN

Faculty of Food Engineering,

Stefan cel Mare University of Suceava, Romania

Abstract: Cookies are produced by confectioners appreciated by consumers for their special taste and special tenderness. They are preferable due to the fact that they do not lose their nutritional and sensory value, even if they have been kept for a longer time. They also come in different assortments, depending on the manufacturing recipe (ingredients used, appearance, shape and size). All these features are desirable by consumers, but the product becomes all the more appreciated, as it can be considered to be one with special properties on health. Thus, the use of bitter chocolate and grapeseed oil in the cookie making recipe is desirable. It is well known that bitter chocolate brings multiple health benefits. Scientists have shown in various studies that bitter chocolate contains a significant amount of antioxidants. Comparing with different fruits that stand out in this field (blueberries, pomegranates, currants), it was shown that bitter chocolate, with a content of at least 60% cocoa, contains the largest amount of flavonoids. These chemicals have a positive effect on the prevention and treatment of cardiovascular disease because they help regulate blood pressure. At the same time, it is worth mentioning that bitter chocolate, consumed periodically, reduces oxidative stress and helps maintain optimal glycemic levels. Bitter chocolate also contains substances with a euphoric effect, which helps to remove depressive states. With regard to grapeseed oil, it should be noted that it can be used successfully to replace fats (in this case, butter) in biscuit/cookie recipes. This oil is distinguished by its special smell, sweet and pleasant taste. To obtain this product, it is desirable to use this ingredient because it has beneficial effects on health, but also due to the fact that it supports researchers trying to find alternatives to protect the environment because it can be obtained from grape seeds resulting from the manufacturing technology of wine. In the category of benefits several examples offered by grapeseed oils can be listed. First of all, it contains a significant amount of resveratrol. This is a polyphenolic compound with a positive action in various diseases: cancer, diabetes, fungal infections, etc. This oil contains a significant amount of minerals such as copper, selenium, zinc and vitamins: vitamin E and vitamin F. It has an important role in maintaining ocular acuity due to the fact that it has a positive action on the ocular blood vessels. Considering the positive aspects presented above, both related to the finished product and to the raw materials and ingredients used in the manufacturing recipe, it can be concluded that the food cookies with bitter chocolate and grapeseed oil is desirable in the diet consumers and would probably hold a special place among their preferences.

Key words: *cookies, bitter chocolate, grapeseed oil, health benefits*

INFLUENCE OF CELL DISRUPTION ON β -GLUCAN EXTRACTION FROM SPENT BREWER'S YEAST

Student: Ionuț AVRĂMIA,
Coordinating Professor: Prof. Ph.D. Sonia AMARIEI
Faculty of Food Engineering
Stefan cel Mare University of Suceava, Romania

Abstract:

β -Glucan is a well known immunostimulator and exhibit a multidirectional role in gut, from as a dietary fiber or symbiotic effect to the cardioprotector role *via* gut microbiota. Spent brewer's yeast contains an appreciable amount of these bioactive compounds and isolation processes have a decisive influence on the water holding capacity, emulsion stabilization, oil binding or as a thickening agent. Yeast β -glucan mainly consists in a mixture of β -(1-3)/ β -(1-6)-glucan chains (85/15%) that are interconnected in small proportion with mannoproteins. Cell lysis has a certain importance in the structural form of the finished product and is among others the first step of the extraction process. If it is desired to use β -glucans for encapsulation purposes then the spherical shape of the yeast must be maintained to obtain hollow inside particles by using mild extraction processes and implicitly a gentle cell lysis. On the other hand, if the lytic process is too hard it involves the rupture of the cell wall, the β -glucans obtained are fragmented allowing a better contact with foods. Among the mechanical strategies of cell lysis, bead mill is the most effective approach in cell breakage that can be adapted to the β -glucan extraction. Best cell disruption degree is achieved by using small yeast concentrations and three homogenization cycles of 10 minutes each.

Key words: cell lysis, glass beads, insoluble β -glucan, spent brewer's yeast, *Saccharomyces cerevisie*.

Acknowledgement: This work was supported by “DECIDE -Development through entrepreneurial education and innovative doctoral and postdoctoral research project POCU/380/6/13/125031, project co-financed from the European Social Fund through the 2014 -2020 Operational Program Human Capital”.

DEVELOPMENT OF FUNCTIONAL BREAD ENRICHED WITH ACEROLA POWDER

Student: Marina AXENTII,

Coordinating Professor: Prof. Ph.D.Eng. Georgiana CODINĂ

Faculty of Food Engineering,

Stefan cel Mare University of Suceava, Romania

Abstract:

Acerola, also known as Barbados cherry, is one of the richest natural sources of Vitamin C (ascorbic acid) which may be successfully added to some bakery products, such as white bread, which has a low nutritional value, but still is frequently consumed worldwide.

Despite its widespread popularity, white bread is often characterized as unhealthy, harmful and even fattening product because of its low nutritional content. On the other hand, in spite of the high antioxidant capacity of acerola fruit and its "functional food" appeal, the acerola is underutilized in large parts of the globe.

However, nowadays functional bakery products such as acerola bread, has an increasing popularity as consumers realize that the treatment of some minor ailments or augmentation of their diets may be solved by choosing healthy alternatives for conventional products.

In order to obtain a new bakery product that claims a functional benefit, the white bread obtained from refined wheat flour was enriched with 3%, 5%, and 7% of acerola powder. The effect of enrichment of white bread using acerola fruit powder was studied regarding the physical, sensorial and textural properties of bread samples.

According to the results, addition of acerola powder enhanced gluten structure of bread samples, increased the nutritional value and lead to good technological and sensory properties. The optimum level of acerola fruit powder for all parameters tested was found to be 5%.

Key words: *acerola powder, antioxidant capacity, bakery products, bread, nutritional value, functional.*

REODYNAMIC METHODS IN MECHANICAL SYSTEMS MODELING

Student: Mariia ALIPATOVA, Mariia LAPKO
Coordinating Professor: Assoc. prof. Ph.D. Oleksii GUBENIA
National University of Food Technologies
Kyiv, Ukraine

Abstract:

Existing methods of calculating transportation, packing, forming and other operations do not always taking into account the complex rheological properties of products and the features of the working organs of the technological equipment, and their influence on the kinematic and energy characteristics of the process

In rheology, mathematical models are constructed by different combinations of simple rheological bodies possessing one property: ideal elasticity, ideal viscosity, dry friction. In rheodynamics, the characteristics of several single-type simple rheological bodies can be assumed to be the same. This approach greatly simplifies mathematical calculations.

The basis for the analysis and construction of rheological models are mechanical models in the form of a spring, an object of friction connected in a certain sequence. In this case, the spring stiffness characteristic is assumed to be constant up to a certain amount of its compression, the damper's viscosity characteristic does not depend on the speed, and the dry friction of the friction body remains constant under any driving regimes.

The obtained mathematical dependencies allow to determine the displacement, speed and acceleration of the product at the contact with the elements of equipment, and energy indices – the work and the power for different laws of mutual movement.

Key words: *rheodynamic, friction, viscosity, mathematical model*

THE IMPACT OF DRY HEAT TREATMENT AND MILLING OF SORGHUM GRAINS ON PHYSICO-CHEMICAL AND FUNCTIONAL PROPERTIES OF FLOUR

Student: Ana BATARIUC

Coordinating Professor: Prof. Ph.D. Eng. Silvia MIRONEASA

*Faculty of Food Engineering,
Ștefan cel Mare University of Suceava, Romania*

Abstract:

Heat treatment is a promising approach to preserve and modify properties of raw materials. Dry heat treatment (DHT) plays an essential role in the green processing of grains, being efficient and safe and influencing their nutritional profile. In addition, particle size reduction by milling the grains has attracted rising attention due to the different functionality remarked in the fractions. The aim of this study was to investigate the impact of dry heat treatment of sorghum grains and milling process (MP) on the physicochemical and functional properties of different particle sizes of sorghum flour. The sorghum seeds, from two varieties, white and red, were roasted at 121°C and 140°C, for 15 min and ground to flour. The milled product was then sieved to separate three different particle size fractions. The moisture, lipid, protein and carbohydrates values were quantified in all selected fractions. The results showed that DHT and MP induced an increase or a decrease of the physicochemical composition of sorghum flour, or induced no significant change between some particle sizes. The data obtained revealed that DHT influenced also the functional properties of the sorghum flour, depending on the particle size. Based on these results, DHT followed by MP can be applied to produce sorghum flour with different nutritional composition and functionalities which can be used in the formulation of various food products.

Key words: *flour, milling fractions, dry heat treatment, particle size, sorghum grains, statistical analysis.*

ORGANIC POULTRY FARMING

Student: Yelizaveta BEDLINSKA,
Coordinating Professor: Prof. Ph.D Makarynska Alla
*Department of Grain Technology and Grain Business,
Odessa National Academy of Food Technologies, Ukraine*

Abstract:

Organic agriculture is primarily concerned with providing humane conditions for raising animals, close to their natural way of life. Keeping poultry in cages limits the manifestation of their natural behavior, including self-searching for food, spreading their wings, digging in the ground and so on. According to the standards of organic rearing of poultry, it is forbidden to keep in small cages or in a limited fenced area and to use antibiotics. The area of the poultry house or mobile chicken coops should be large enough for the chickens to move freely all day and meet their natural needs. The paper provides for the production of organic feed for laying hens and broilers with a higher content of protein and calcium. Enrichment of compound feeds is carried out at the expense of natural vitamins and minerals, probiotics, prebiotics, phytobiotics. Calculated formulas and nutritional value of organic feed. Researches on an estimation of qualitative indicators of compound feeds on organoleptic, physical and microbiological indicators of quality are carried out. The use of feeding programs that ensure maximum productivity of poultry and safe livestock products is proposed.

Key words: *poultry, organic feed, technology, quality, safety.*

OPTIMIZATION OF CONCENTRATION AND PROCESSING TEMPERATURE IN TOMATO POMACE SUSPENSIONS

Student: Victoria BEGLIȚA

Coordinating Professor: Prof. PhD. Eng. Silvia MIRONEASA

Faculty of Food Engineering,

Stefan cel Mare University of Suceava, Romania

Abstract:

Tomato powder (Tp) suspensions can be an innovative ingredient for the development of new products. The aim of this study was to investigate the influence of two independent variables: the concentration of tomato powder and the processing temperatures, on the physicochemical, rheological and color parameters of Tp suspensions. For this purpose, response surface methodology (RSM) with general factorial design by applying the desirability (D) function were used (Design Expert trial version). The Tp concentration was varied at 3 levels (15%, 20% and 25%), the temperature at 2 levels (60°C and 95°C). The 9 experiments resulted allowed the evaluation of the singular and combined effect of the factors on the responses - soluble solid content (SS), acidity (A), rheological parameters (elastic modulus (G'), viscous modulus (G''), complex viscosity (η^*)), color parameters - brightness (L^*) and color intensity (C^*). The data of G' , η^* , SS, A and C^* were fitted to the quadratic model, while G'' and L^* were fitted to the linear model, with coefficient of determination (R^2) values between 0.64 and 0.99. Two solutions were selected from optimizations in order to establish the processing conditions for a juice type product and for a pasta type respectively by imposing some restrictions. A concentration of 20.71% Tp and a temperature of 66.19 °C ($D = 0.63$) were obtained for juice type product, while for paste 25.00% Tp and 86.23°C ($D = 0.67$) is recommended. In conclusion, the results can be guides for choosing the best concentrations and processing temperatures according to the desired type of product, underlining the possibility to valorize tomato pomace.

Key words: *acidity, color parameters, dynamic rheology, response surface methodology, soluble solid content, tomato pomace.*

THE USING OF GOAT MILK IN A FRESH CHEESE IMPROVED WITH THYME ESSENTIAL OIL AND ALOE VERA

Student: Raul-Andrei BERBECARU ANTAL,
Coordinating Professor: Mirela JIMBOREAN, Delia MICHIU
Faculty of Food Science and Technology
*University of Agricultural Sciences and Veterinary Medicine Cluj-
Napoca, România*

Abstract:

The present study aims to obtain an innovative and high-quality fresh cheese with a high intake of bioactive compounds. For manufacturing the finished product four stages have been taking place:

1. The manufacturing process of fresh cheese from goat milk;
2. Thyme essential oil extraction;
3. Microencapsulation of Aloe Vera gel;
4. Processing of spreadable cheese with Aloe Vera microcapsules and thyme essential oil.

The purpose of this research was to obtain a new assortment of spreadable cheese by adding essential oil in fresh cheese during the grinding phase, to ensure a stable quality during storage, followed by the incorporation of the Aloe Vera gel by microencapsulation technique to give a more taste to the product.

The product was examined by organoleptic and physico-chemical analysis: fat, protein, dry matter content as well as sodium chloride and acidity.

This study concludes that by adding thyme essential oil and Aloe Vera microcapsules the appearance and taste of spreadable cheese from goat milk has been improved, being more appreciated by consumers.

Keywords: *fresh cheese, essential oil, microcapsules, Aloe Vera, goat milk, microencapsulation technique*

WASTEWATER TREATMENT TECHNOLOGY OF LOW-POWER ENTERPRISES

Olena BORUK,

Coordinating Professor: Prof. Ph.Fedoryak M. M.

*Institute of biology, chemistry and biological resources,
Chernivtsi National University, Ukraine*

Abstract:

The environmental pollution with oil and petrochemical products is one of the most dangerous effects of the human induced activity. Petrochemical products affect human and animal bodies, water plants, physical, chemical and biological condition of the water objects. For the present, a lot of wastewater treatment have been developed to clear them from oil and petrochemicals. But the treatment process should be easy and cheap for small companies. Thus, mobile wastewater treatment modules are reasonable to be made for a small amount of wastewaters. Our research is devoted to finding the most efficient sorbents and the conditions of their use for removing petrochemicals from the wastewaters.

The use of coal slacks allows to bind up to 80% of petrochemicals of the wastewaters by means of absorption. We found that the sorbent mixture is the most efficient. The petrochemicals removal degree gets larger due to the more efficient petrochemicals binding both in wastewater volume and from the water phase surface. We recommend to pass the wastewaters containing petrochemicals through “cartridge” filter filled with the mixture of sorbents with mosaic and hydrophobic surface to clean them.

Key words: *surface waters, oil, petrochemicals, pollution*

BREWER'S SPENT GRAIN: POSSIBILITIES OF VALORIZATION IN FOOD PRODUCTS

PhD Student: Ancuța CHETRARIU

Coordinating Professor: Prof.Ph.D. eng. Adriana DABIJA

Faculty of Food Engineering

Ștefan cel Mare University of Suceava, Romania

Abstract:

Brewer's spent grain (BSG) is the solid residue left after filtration of the beer wort, being the insoluble part of the wort and is composed mainly of cellulose, hemicellulose and lignin, lipids, and a small fraction of proteins. BSG is a valuable source of individual components due to its high nutritional value and low cost that is worth exploiting more to reduce food waste but also to improve human health and the environment. In the food industry, BSG has been used mainly in the bakery industry to obtain bread, biscuits, pretzels, or crackers. Formulas with a maximum of 30% BSG addition were used in this regard, but 15-20% are considered optimal to obtain products acceptable from the consumer's point of view, with good physicochemical and sensory properties. Due to biologically active compounds with physiological roles in the body, foods fortified with BSG are considered functional foods, foods that offer health benefits, used as an adjunct in a balanced diet. BSG can be added to frankfurters sausages to obtain low-fat products or fish burgers prepared with various bioactive powders of BSG. The addition of BSG to fruit juices and smoothies has a beneficial effect on increasing phenolic content and antioxidant activity. BSG was successfully used to obtain a fermented beverage rich in phenolic compounds, the beverage that has a shelf life regarding the bioactive components of 15 days.

Key words: *brewer's spent grain; bioeconomy; food waste, valuable compounds*

RESEARCH ON OBTAINING LAGER BEER WITH SORGHUM FLOUR

PhD Student: Marius Eduard CIOCAN

Coordinating Professor: Prof. PhD. eng. Adriana DABIJA

Faculty of Food Engineering

Ștefan cel Mare University of Suceava, Romania

Abstract:

Sorghum is the fifth most important cereal crop in the world after rice, wheat, corn and barley and serves as the main food grain for over 750 million people living in the semi-arid tropical regions of Africa, Asia and Latin America. Food products made from sorghum grain include breads, cakes, cookies, noodles, flat breads, tortilla chips, snacks, beverages, and baby food. The versatility of sorghum makes it a very promising crop for exploitation in Europe. The substitution of barley malt with adjuncts in brewing has the potential to reduce the cost of raw materials and to create a unique beer flavour/aroma. On the other hand, in addition, the substitution of 30-50 % barley malt with different sorghum types significantly reduced the gluten content of beers. The objective of this paper was to study the effect of the addition of sorghum flour as a substitute for malt in the proportion of 10-50% in the recipe for making a variety of lager beer. It was found that brewing with unmalted sorghum resulted in considerably lower total soluble and free amino nitrogen content, as well as a higher wort pH value. The optimal percentage of sorghum flour added was set to be 30%, the finished product having a lighter colour and a good stability of the foam compared to the control sample. The use of sorghum as brewing adjunct can be innovative, is a great potential, but also challenging. Further research is needed to overcome problems such as starch gelatinization, optimization of mashing and fermentation conditions, wort filtration and stabilization finished product.

Key words: *brewing adjuncts, fermentation, mashing, sorghum flour*

INFLUENCE OF CORN, RICE AND INVERTED SUGAR SYRUPS ON PHYSICO-CHEMICAL PROPERTIES OF SUNFLOWER HONEY

Student: Paula CIURSA ,
Coordinating Professor: Prof. Ph. Mircea OROIAN
Faculty of Food Engineering,
Stefan cel Mare University of Suceava, Romania

Abstract:

The purpose of this paper was to highlight the differences between pure and adulterated honey with corn, rice and inverted sugar syrups. Thus, sunflower honey was adulterated by adding syrup in percentages of 5%, 10%, 20% and 50%. The physico-chemical parameters studied were: electrical conductivity, moisture content, color, hydroxymethylfurfural content, pH, free acidity and sugar content (glucose, fructose, sucrose, melesitose, turanose, maltose, raffinose, trehalose). The electrical conductivity increased in case of honey adulterated with rice syrup from 373 $\mu\text{S}/\text{cm}$ in pure honey to 515.34 $\mu\text{S}/\text{cm}$ in honey adulterated with 50% syrup and decrease to 194.79 $\mu\text{S}/\text{cm}$ and 232.91 $\mu\text{S}/\text{cm}$ for honey adulterated with 50% corn and inverted sugar. The moisture content did not exceed the maximum allowed level (20%) established by Codex Alimentarius. The free acidity showed an increase in honey adulterated with rice syrup from 17.6 meq/kg in pure honey to 19.80 meq/kg in honey adulterated with 50% syrup and a significant decrease for honey adulterated with 50% corn syrup (10.95 meq/kg) and 50% inverted sugar (12.45 meq/kg). The hydroxymethylfurfural content were below the maximum limit (40 mg/kg) for adulterated honey samples with corn and rice syrups, while in case of honey adulterated with 50% inverted sugar increased 10.79 times.

Key words: *adulteration, allowed limit, honey, physico-chemical properties, significant changes, syrups.*

ACKNOWLEDGEMENTS

This work was performed within the framework of the “DECIDE - Development through entrepreneurial education and innovative doctoral and postdoctoral research, project code POCU/380/6/13/125031, supported by project co-financed from the European Social Fund through the 2014 – 2020 Operational Program Human Capital”.

THE INFLUENCE OF PHYSICAL-CHEMICAL INDICATORS OF WATER QUALITY ON THE GROWTH PERFORMANCE OF COMMON CARP (*CYPRINUS CARPIO L.*) IN DIFFERENT AQUACULTURE SYSTEMS

Students: Anca Nicoleta CORDELI (SĂVESCU), Mihaela MOCANU
Assoc: Săndița PLĂCINTĂ

Coordinating Professor: Lucian OPREA, Isabelle METAXA
“Dunărea de Jos” University of Galați, Domnească Street no. 47, Galați,
Romania

Abstract:

This study analyses the influence of physical-chemical parameters of technological water on the common carp culture performance in ponds in recirculating aquaculture systems. The Physical-chemical parameters of water analyzed during the experiments include air temperature, water temperature, pH, and dissolved oxygen (DO). They were measured weekly, and their averages were calculated on a monthly basis for the entire experimental period. Water temperature inflicts prominent effects on fish life by directly or indirectly influencing the aquaculture environment. Each organism has a specific survival range of environmental temperature range for its efficient existence, and beyond these limits, conditions become lethal. pH is the measure of hydrogen ion concentration. Each organism has its maximum and minimum toleration range of pH. It can be regarded as an index of environmental conditions. The water used in fish culture is chemically not pure and contains different substances as a result of fish metabolism, which makes it acidic, neutral, and alkaline in terms of pH during the fish rearing process. The majority of technological water from fish pond culture has an alkaline pH due to the presence of sufficient quantities of carbonates and bicarbonates. It increases during the day largely due to photosynthetic activity, whereas it decreases at night due to respiratory activity. These parameters are interlinked and estimate the water quality by influencing the biological productivity of the aquaculture systems water.

Keywords: *aquaculture systems, Common carp (Cyprinus carpio L.), physical – chemical parameters*

DYNAMIC RHEOLOGY OF QUINOA (*CHENOPodium QUINOA WILD*) FLOUR DOUGH IN RELATION TO DIFFERENT MILLING FRACTIONS

Student: Ionica COȚOVANU
Coordinating Professor: Prof. PhD. Silvia MIRONEASA
Faculty of Food Engineering,
Stefan cel Mare University of Suceava, Romania

Abstract:

The use of quinoa flour (QF) in wheat flour (WF) bread with the intent of improving the nutrient profile represents a suitable approach due to its unique chemical composition and the health benefits. The aim of this study was to evaluate the effect of QF particle size (PS) on the chemical composition and functionality of quinoa flour fractions. Also, the optimal combination of PS and the amount of QF to the WF on the dynamic rheological properties of composite flour dough to develop new healthy bakery products was established. The results obtained showed that the moisture, protein, fat and carbohydrates followed an irregular trend depending on PS. The variation in water absorption capacity and water retention capacity could be connected to the different composition of PS. The increase in swelling capacity with PS decrease can be explained by the small size of quinoa starch granule. The impact of dose and PS of QF added in WF on the storage (G') and loss (G'') moduli, loss tangent ($\tan \delta$) and maximum gelatinization temperature (T_{max}) was evaluated using response surface methodology (RSM). The multiple responses optimization indicated that the composite flour dough has a good quality at the optimum QF addition level of 17.00 % for medium ($180 \mu\text{m} < M < 300 \mu\text{m}$) PS, this formulation being adequate for the development of new bread products.

Key words: Chemical composition, Dynamic rheology, Functional properties, Milling fractions, Quinoa flour, Optimization.

Acknowledgments: This paper was financially supported within the project entitled „DECIDE - Development through entrepreneurial education and innovative doctoral and postdoctoral research, project code POCU / 380/6/13/125031, project co-financed from the European Social Fund through the 2014 – 2020 Operational Program Human Capital.

STUDY OF THE PHENOLIC COMPOUNDS CONTENT AND ANTIOXIDANT ACTIVITY OF WILD AND CULTIVATED BILBERRIES FROM ROMANIA

Students: Bianca-Mihaela DROB, Alexandru-Marian FÎRCAL

Coordinating Professor: Ph.D. Eng. Florina DRANCA

Faculty of Food Engineering,

University Stefan cel Mare, Suceava, Romania

Abstract:

Bilberry (*Vaccinium myrtillus* L.), also known as European blueberry, is one of the most important wild berries consumed as food and used for medicinal purposes. The health-beneficial properties of bilberries are linked to the variety of phenolic compounds found in their composition; the predominant group of phenolic compounds are anthocyanins (delphinidins, cyanidins, petunidins etc.), which are responsible for the purple-blue color hues of these berries. Other phenolic compounds determined in bilberries are flavonols (quercetin and catechin), tannins and phenolic acids. The phenolics composition is greatly variable depending on climate and geographic conditions and cultivation practices. As in Romania the commercially-available bilberries can be both wild-grown and cultivated, the aim of this study was to investigate the differences in the phenolic compounds composition of bilberries as determined by spontaneous and cultivated flora. For this purpose, the samples used in this study were wild bilberries picked from two different locations in Suceava County, and cultivated bilberries from two different Romanian producers. The bilberry samples were analyzed and compared in terms of color (fruit and alcoholic extract), total anthocyanins, flavonoids and polyphenols content, and DPPH scavenging activity assay.

Keywords: *bilberries, anthocyanins, phenolic compounds, antioxidant activity*

RESEARCH ON THE USE OF BANANA PEEL IN PASTRIES

Student: Ioana Isabela DUMITRAȘCU,
Coordinating Professor: Prof. Ph. D Adriana PĂUCEAN,
Assoc.prof. Ph.D Simona Maria MAN,
Assist. Ph.D Maria Simona CHIȘ
*Faculty of Food Science and Technology,
University of Agricultural Sciences and Veterinary Medicine
Cluj-Napoca, România*

Abstract:

Banana peel accounts for about 35% of the total weight, so about 36 million tons of banana peel are discarded. Banana peel contains several bioactive compounds, such as phenols, carotenoids, biogenic amines, phytosterols, many of these compounds have antioxidant activity and are effective in protecting the body against various oxidative stress. The aim of this study was to capitalize the powdered banana peel in the manufacture of muffin and waffle products by aiming to obtain a product with improved nutritional qualities. The muffins and waffles were manufactured with three different concentrations of 20%, 30% and 40% banana peel powder, respectively 10%, 20% and 30%. The product obtained were analyzed from sensorial point of view (appearance, color, texture, odor, taste, general appreciation) and also, the physic-chemical characteristics were determined. Adding banana peel powder to the muffin and waffle, the sensory characteristics and the nutritional value of the finished product were improved. As a result of this research, it has been found that the use of 30% of banana peel powder in the production of muffins and 20% of banana peel powder in the production of waffles, brings a high content of antioxidant substances doesn't change the parametres of the technological process and significantly improved the qualitative characteristics of the finished product.

Key words: *powder, muffins, waffles, phenols, antioxidant capacity, banana peel.*

FERMENTATION OF DIFFERENT CARBOHYDRATES USING WATER KEFIR GRAINS

Student/s: Adrian FRYDRYCH, Ewelina SIDOR,
Coordinating Professor: dr hab. inż. Małgorzata Dżugan prof. UR
*Department of Food Chemistry and Toxicology,
Institute of Food Technology and Nutrition,
University of Rzeszow, Poland*

Abstract:

Water kefir, also known as sugar kefir or fruit kefir is a probiotic, fizzy drink produced by fermentation of dried sugary fruits (raisins) or plain refined sugar using water kefir grains — a type of grain-like symbiotic culture of bacteria and yeast. The aim of this study was to determine the properties of water kefir obtained with different kinds of sugar (sucrose, rape and honeydew honey, inulin, fructose and glucose). The samples were fermented for $20\pm 2^{\circ}\text{C}$ in dark for 1-4 days. The fermented solutions were evaluated in terms of pH, Brix index, the antioxidant activity (DPPH and FRAP methods) and total phenolic content (TPC). The sugars were also detected by TLC method. The best results for the parameters tested was obtained for solution of refined sugar and both honey variety. The fastest fermentation, measured as significant decrease in Brix index and pH value after 24h culture, was observed for sucrose. In the case of honey the course of processing should be prolonged to 4 days. However, the beverage obtained from honey was characterized by significantly higher antioxidant activity tested by both DPPH and FRAP methods as well as higher total phenolic content. Studies have shown that valuable probiotic non-dairy beverage can be developed with honey and kefir grains.

Key words: *water kefir grains, sucrose, honey, probiotic beverage, antioxidant activity, Brix index*

STUDY ON THE BENEFITS OF CONSUMING RICE SLICES - COMPLEX OF CEREALS AND SEEDS

Student: Otilia FORTUNA

Coordinating Professor:

Associate prof. Ph. D bioeng. Maria POROCH – SERIȚAN

Faculty of Food Engineering,

Stefan cel Mare University of Suceava, Romania

Abstract:

Rice is one of the cereals beneficial to human health due to its content of carbohydrates, proteins, dietary fiber, minerals, etc. It is recommended for people who want a gluten-free diet and those who follow a diet. Rice slices - a complex of cereals and seeds, found on supermarket shelves usually in the form of a mixture of cereals and seeds in which the main component is rice, are known as a dietary product, tasty, healthy and convenient. The popularity of these slices is also maintained by their price, which is affordable. Due to these properties, rice slices are more often purchased by people aged 18 - 45, who have a very active life and are concerned about a comfortable and healthy lifestyle. The advantages of consuming rice slices - a complex of cereals and seeds, are due to the number of low calories, which are about 400 kcal / 100 grams of product. In addition, the content of dietary fiber, protein, carbohydrates and vitamins, according to the product label, are in an adequate amount for a balanced diet. These rounds are a quick snack that gives satiety due to the fact that they can be eaten with dairy products, meat, sausages and vegetables. However, rice slices also have some disadvantages. Most doubts about the acquisition of a "healthy" product are induced by the way these rounds are obtained, which reduces the amount of limiting amino acids and some vitamins in the rice grain. Thus, the nutritional value of the cereal complex decreases, and high temperatures favor the formation of a carcinogenic substance - acrylamide. In addition, the high intake of dietary fiber in their composition, through the effect of ion exchangers, can impoverish the body in the necessary macro- and microelements, favoring the occurrence of mineral deficiencies. From the comparative study of the advantages and disadvantages of consuming rice slices - cereal and seed complex we came to the conclusion that the slices are products that can be consumed in the short term and should not replace other products that bring a significant intake of nutrients .

Key word: *advantages and disadvantages, complex of cereals and seeds, dietary fibers, rice slices.*

FORTIFICATION WITH VITAMIN D3 OF THE NEW YOGURT WITH QUINCE AND MAPLE SYRUP IN THE CURRENT CONTEXT OF THE PANDEMIC GENERATED BY COVID-19 – SENSORY, RHEOLOGICAL AND TEXTURAL CHARACTERISTIC

Student: Ioana-Beatrice GHERASIM

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

Faculty of Food Engineering,

Stefan cel Mare University of Suceava, Romania

Abstract:

The aim of this paper was to determine the sensory, rheological and textural characteristics of a new assortment of yogurt with quince and maple syrup fortified with vitamin D3.

Vitamin D deficiency and insufficiency are recognized as a global problem with serious consequences, especially in the current context of the covid-19 pandemic, but a fortified yogurt with a vitamin D3 offered for adult consumption could be a lifesaver because fortification is one of the most important processes for improving the quality and quantity of nutrients in food. In terms of ingredients, a single quince contains 15% of the daily dose of vitamin C, which is essential for a healthy and functional immune system.

The yogurts were obtained using cow's milk with a fat content of 3.5% in which calcium salts were added in doses of 500-1300mg, vitamin D3 in doses of 600-2000 IU, quince puree in a proportion of 2 -10% and maple syrup in 10%. The viscosity and elastic and viscous modulus of the yogurt samples were analyzed at intervals of 1, 3 and 7 days. The yogurt was analyzed texturally in order to appreciate the firmness and elasticity with the increase of the addition of quince puree. The sensory characteristics were appreciated by the scoring scale of experienced tasters.

Key words: *sensory characteristics, quince, fortification, yogurt, maple syrup, vitamin D3.*

**ASPECTS RELATED OF THE WHEAT VARIETIES
CONSERVATION FROM THE VEGETAL GENETIC
RESOURCES BANK OF SUCEAVA**

PhD Student: Camelia GOLEA,

Coordinating Professor: Prof. Ph.D.Eng. Georgiana CODINĂ

Faculty of Food Engineering

Ștefan cel Mare University of Suceava, Romania

Abstract:

The „Mihai Cristea” Vegetal Genetic Resources Bank of Suceava (BRGV) is the only institution recongnized to the national level, in terms of plant heritage conservation. Nowadays, there are approximately 18000 of samples in the bank’s collection from which 2637 belong to the *Triticum* genus which includes the fallowing species: 2546 of *Triticum aestivum*, 53 of *Triticum monococcum* and 32 of *Triticum turgidum*. These samples were collected from 20 countries, most of them from Romania, Hungary, Bulgaria and the United States.

The aim of this study was to present the quality of these wheat grain species determined within BRGV Suceava. During time, these varieties have been analyzed through different parameters such as protein content, lysine content, viability tests, etc. Also has been made different morphological plants research on the land. The data obtained, which has as a central element the *Triticum* genus aims to carry out molecular biology studies, in order to determine the genetic diversity and the phylogenetic relationships. Also, the genetic analyzes correlated with the biochemical ones provides valuable informations on the studied varieties and to the samples identification with a very good quality for bread making industry.

Key words: conservation, genetic diversity, *Triticum* varieties.

STUDY OF YOUNG CONSUMERS KNOWLEDGE, ATTITUDES AND PRACTICES TOWARDS FOOD WASTE GENERATION

Students: Andreea GOREA, Cătălina LUPĂȘTEAN ,
Diana CRECIUNESCU

Coordinating: Lecturer PhD Cristina GHINEA
*Faculty of Food Engineering,
Stefan cel Mare University of Suceava, Romania*

Abstract:

Food is a precious commodity and important resources are needed to obtain it. Globally, about a third of food produced for human consumption is wasted or lost, which generates significant economic and environmental costs. Food waste is produced along the entire value chain: during the production and distribution process, in shops, restaurants, public catering units and households, and because of this it is very difficult to quantify it. In Romania, given that over 4.5 million Romanians have difficulties in procuring daily food, 2.55 million tons of food are thrown away every year. In this context, the aim of this study was to investigate the young consumers' knowledge, attitudes and practices towards food waste generation and management. Data was collected through an online questionnaire. 129 young people aged 19-25 years responded to the survey, from which 85 were females and 44 males. Results show that 72.4% from the interviewed young people considers that there is a problem with household waste in the locality of residence, while 17.2% don't know. The food consumed by the families of those interviewed is purchased from: supermarket (41.4%), neighborhood stores (24.1%), own household (20.7%) and the agri-food market (13.8%). 61.2% of those who answered the questionnaire consider that less than a quarter of the total food purchased remains unused. Cooked food most often ends up in the trash, according to 48.3% of the interviewed people. In the young consumers' view, consumers, local authorities, governments and traders are the main actors who should act to reduce food waste.

Key words: *consumer, environment, food, impact, solid waste, survey*

USE OF PHARMACOPOEIAL METHODS OF QUALITATIVE ANALYSIS TO DETERMINE THE CONTENT OF HORMONAL DRUGS IN MEAT

Student: Dmitry GRABOVSKY,
Coordinating Professor: PhD., Assoc. Professor, Marianna BARUS
*Department of Medical and Pharmaceutical Chemistry, Bukovinian
State Medical University, Chernivtsi, Ukraine*

Abstract:

Hormones - biologically active, chemically diverse substances produced by the endocrine glands in small quantities. Given the topic of our study, we give a classification adopted in pharmaceutical chemistry.

Natural hormones undergo chemical transformations in living organisms and cannot be detected in their usual form. It should be noted that in the studied samples the initial concentration is much lower than the concentration of these substances in animals. For each of the qualitative reactions, there is such a thing as a "threshold of sensitivity", which directly depends on the concentration of the substance being determined.

Qualitative analysis of steroid hormones in the studied samples was performed taking into account the chemical classification by standard methods. The structural basis of steroid hormones is the skeleton of the hydrocarbon cyclopentanephenanthrene.

To study the presence of hormonal drugs in meat at random, 12 samples of different types of meat were selected in the markets. We performed 72 qualitative identification reactions on the content of hormonal drugs in the studied samples, 13 of which showed a positive effect, ie 18% of specific reactions had a sufficient threshold of sensitivity to detect hormonal drugs in the studied meat samples. Tests for synthetic hormones showed that only in three samples (rabbit; veal; chicken) all qualitative reactions were negative, ie it can be assumed that 25% of the studied meat did not contain synthetic hormones. Qualitative reactions gave a positive analytical effect in 9 samples, which indicates the presence of hormonal drugs in 75% of the studied meat.

The obtained data are of a pilot nature and require further research.

Key words: *analytical effect, functional groups, hormonal drugs, meat, qualitative analysis, sensitivity threshold.*

PARTICULARS OF CONSUMPTION OF SALTY FOOD IN THE REPUBLIC OF MOLDOVA

Student: Livia GRAUR,

Coordinating Professor: PhD., Assoc. Prof. Aurica CHIRSAKOVA

Faculty of Food Technology

Technical University of Moldova, Republic of Moldova

Abstract:

The objective of the study was to assess the particularities of the consumption of salt-rich food products in the Republic of Moldova. A questionnaire on this issue was applied to achieve this goal. The main objectives of the study were to identify foods that lead to high sodium intake in the adult population and to analyze practices, attitudes, behavior and knowledge about salt consumption. It has been found that citizens consume excessive amounts of salt. Actions are part of the National Strategy for the Prevention and Control of Noncommunicable Diseases. About 90% of respondents are aware that excessive salt intake is associated with the incidence of adverse health conditions, more than 54% indicated that they are trying to reduce their current salt intake and only 26% of respondents stated that I know there is a maximum recommended value of salt or sodium intake. High salt intake is mainly caused by the consumption of highly processed foods such as bread, meat, cheese, bread or vegetables.

Conclusions. In order to reduce salt consumption, further effort is needed by informing and educating society to increase consumer awareness of the effect of salt on health, products with a high salt content and the limit for salt consumption.

Keywords: *questionnaire, salt content, processed products, Republic of Moldova.*

FORCED OXIDATION OF SUNFLOWER OIL

Student: Crina GUȚU ,
Coordinating Professor: Prof. Ph. Iurie SUBOTIN.
Faculty of Food Technology,
Technical University of Moldova, Republic of Moldova

Abstract:

This article investigates the processes that take place during the forced thermo-oxidation of sunflower oil. The results obtained in the study showed a major impact of thermo-oxidation on the physico-chemical indicators of the studied oil. The acidity index of fresh sunflower oil increased 13.7 times, with a value of 2.46 mg KOH/g of fat for the thermo-oxidized oil compared to the initial value of 0.180 mg KOH/g of fat. The thermo-oxidation of sunflower oil caused a significant decrease of the saponification index, which indicates a significant degree of polymerization and leads to viscosity increase of the studied sunflower oil. The accumulation of hydroperoxides and triacylglycerides that have hydroxyl functions have facilitated the course of polymerization reactions, which are to increase the viscosity of thermo-oxidized studied sunflower oil.

Key words: acidity index, oxidation, peroxide index, saponification index, sunflower oil, thermal oxidation.

ANALYSIS OF MECHANISMS FOR MECHANICAL ENERGY REGENERATION IN DRIVES OF TECHNOLOGICAL MACHINES

PhD student: Volodymyr HERA

Coordinating Professor: Prof. Anatolii SOKOLENKO

National University of Food Technology, Ukraine

Abstract:

One of the ways to limit energy costs is to use the drives of machines with double energy flows. Regulation of technological machines of cyclic action requires special measures to limit the non-uniformity of their course in order to achieve a given kinematic accuracy.

One of the important measures to limit the non-uniformity of the technological machines is the use of drives with doubled energy flows with synchronization in them of the stages of acceleration and slow motion of the working elements. This synchronization, in addition to limiting the unevenness of the course, leads to the possibility of regeneration of kinetic energy in the interaction of two energy streams.

Geneva wheel are used to ensure the cyclic movement of the output links. They are characterized by better kinematic parameters than ratchet and gear mechanisms, and reliable compliance with the travel time and stop.

For technological machines in which the work process or operation is performed in the stop phase, it is used links with a limited number of slots. This allows to limit the loss of time for the auxiliary stroke, which corresponds to the rotation of the output link. However, this criterion is not unique and in some cases it may not be decisive for the choice of the number of slots.

An in-depth analysis of the kinematics and dynamics of Geneva wheel has shown their ability to maintain the calculated kinematic parameters of the working elements of technological machines and their use in double technological machines for the implementation of mechanical energy regeneration.

Key words: *cycle, energy, kinematics, mechanism, non-uniformity, regeneration.*

USE OF NATURAL SWEETNERS IN THE DEVELOPMENT OF HYPOCALORIC PRODUCTS

Student: Anna Vanesa HRENYUK
Coordinating Professor: Prof. PhD Socaci SONIA,
Assist. PhD FĂRCAȘ Anca, Lecturer POP Oana
*Faculty of Food Science and Technology,
University of Agricultural Sciences and Veterinary Medicine
Cluj-Napoca, Romania*

Abstract:

Overweight and obesity are global health problems that affect more and more people every year, often being associated with an increased risk of chronic diseases such as cardiovascular disease, type 2 diabetes or metabolic syndrome. One of the incriminating factors for the occurrence of these diseases is excessive sugar consumption.

Therefore, both the food industry and the specialized forums are looking for feasible solutions in an effort to reduce sugar consumption. For example, the Dietary Guidelines for Americans 2015-2020 recommended limiting sugar to 10% of total energy. Another alternative is to use natural sweeteners, which in addition to the role of sugar substitutes, have other functional properties (sources of fiber, prebiotics, increase the melting resistance of the product, lower caloric value).

The aim of this work was to develop a product similar to chocolate, but with a low caloric value, ideal for diets, which can also be used by people with diabetes, because it doesn't increase level of glucose in blood. Inulin and isomalt were used as sweeteners for the development of the product, the products obtained being sweet, but with a low caloric content.

Following the sensory analysis performed, the product was highly appreciated by consumers, who expressed their interest in buying healthier products with a lower caloric value.

Keywords: Isomalt, inulin, hypocaloric, natural, fiber.

BACTERICIDE PACKAGING MATERIALS CONSISTING THE NANOSIZED DISPERSE TITANIUM(IV) OXIDE

Student: Joanna ILIUC,

Coordinating Professor: Prof. Igor Kobasa

*Department of Chemical Analysis, Food Safety and Testing,
Yu. Fedkovych National University of Chernivtsy, Ukraine*

Abstract:

Infectious diseases are one of the toughest problems for the healthcare field of all countries. In this context, new technological solutions directed onto better antibacterial protection seem very interesting and promising. For instance, the bactericide packaging materials can be very effective in the protection of food against pathogenic microbes at all production, transportation and storage stages.

It has been found that different phase composition, structure and production technologies used for the synthesis of titanium(IV) oxide (titania) result in different antibacterial activity against *Staphylococcus aureus* and *Escherichia coli* of the packaging materials containing this compound. The nanosized TiO₂ can be synthesized by the hydrolysis of a mixture of titanium tetrachloride with air and hydrogen at 700-1100 °C. This material is a non-stoichiometric mixture of the anatase and rutile modifications exhibiting rather high antibacterial activity about the abovementioned germs. Therefore, it can be used as an admixture to the packaging materials ensuring their bactericide properties and extending the shelf-life of the food packed in such materials.

Key words: *antibacterial activity, packaging materials, pathogenic microbes, titanium(IV) oxide.*

THE EVOLUTION OF THE FERMENTATION PROCESS OF SOME LOCAL VEGETABLES

Student: Nicoleta IPIROTI,

Faculty of Food Technology, "Tehnologii Alimentaries" French Filière

Coordinating Professor: PhD., Assoc. Professor, Aurica CHIRSAKOVA

Faculty of Food Technology

Technical University of Moldova, Republic of Moldova

Abstract:

The consumption of fermented foods in the world is known through the following products: gundru sinki, mula gundru and narzi, sauerkraut, tempeh, natto, miso, kimchi, kombucha, kefir and others. In the Republic of Moldova, the consumption of fermented vegetables, especially in the cold period of the year, includes a varied assortment, such as: sauerkraut, sauerkraut with apples; pickled apples; eggplant stuffed with cabbage and carrot; sweet peppers stuffed with cabbage and carrots and others. The beneficial effect of these products is well known, but even more so in conditions of pandemic, flu, respiratory infections, etc.

Conclusions: the optimal fermentation period of eggplant stuffed with cabbage and carrot is 7 -8 days at a temperature of +15...+ 20 C and 15-18 days at a temperature of +5 ..+ 7C. During the fermentation for 30 days of the eggplants stuffed with cabbage and carrot, there was an evolution of the pH from 6.5 to 3.3; the content of vitamin C increased 2.5 times compared to the initial amount.

Keywords: *fermented vegetables, eggplant stuffed with cabbage and carrots, pH, titratable acidity, vitamin C*

STUDIES REGARDING THE USE OF SUB PRODUCTS FROM THE SUNFLOWER OIL INDUSTRY IN THE BREAD MAKING INDUSTRY

PhD Student: Ana Maria ISTRATE,

Coordinating Professor: Prof. PhD. Eng. Georgiana CODINĂ

Faculty of Food Engineering

Ștefan cel Mare University of Suceava, Romania

Abstract:

Within the vegetal oilseed production, results some subproducts which may be used for different purposes. Such of subproduct is the sunflower meal resulted from the oilseed extraction from the sunflower seeds. The aim of this paper was to investigate the effect of sunflower meal (SF) addition in a flour form (provided by Marbacher Ölmühle GmbH Company) on dough rheological properties. The sunflower seeds flour was incorporated in a refined wheat flour of a very good quality for bread making and a low α amylase activity to a level of 0-20% addition. The wheat-sunflower seeds flour blends obtained were analyzed for the mixing, extension and pasting rheological properties. For this purpose was used as rheological devices Glutograph, Farinograph, Extensograph, Amylograph and Falling Number. According to the data obtained the dough stability, water absorption, peak viscosity increases with the increase level of SF addition in wheat flour whereas the dough extensibility and falling number value decreases.

Key words: *sunflower flour, wheat flour, mixing, extension, pasting.*

Acknowledgment: This work was done from „DECIDE-Development through entrepreneurial education and innovative doctoral and postdoctoral research”, project code POCU / 380/6/13/125031, project co-financed from the European Social Fund through the Human Capital Operational Program 2014 - 2020”.

USE OF GRAPE PEELS FOR WHEAT PASTA ENRICHMENT

Student: Mădălina IUGA
Coordinating Professor: Prof. PhD. Eng. Silvia MIRONEASA
Faculty of Food Engineering,
Ștefan cel Mare University of Suceava, Romania

Abstract:

Grape peels (GP) are one of the by-products resulted from vinification and represent a valuable source of fiber and antioxidants. The aim of this study was to optimize the addition level of GP in wheat pasta.

The effects of GP factor on the composite flour, dough and final product were evaluated by ANOVA test and the optimization was performed by using the Derringer function from Design Expert 12 software (State Ease, Trial version). The responses considered were: flour peak viscosity η_{max} (Pa·s), dough complex modulus G^* (Pa), dough cohesiveness Co , fracturability F (g), cooking loss CL (%), pasta luminosity (L^*) and Chroma (C^*), pasta chewiness Ch , pasta total polyphenols content TPC ($\mu\text{g/g}$), total dietary fiber TDF (%). For this purpose, the following targets were established: CL and Ch were minimized, L^* and η_{max} were kept in range, while G^* , Co , F , C^* , TDF and TPC were set to be maximum. The obtained data for Co were fitted to the quadratic model, those resulted for CL , C^* , Ch , F , TPC , η_{max} and G^* were fitted to the quartic model, while for L^* and TDF the data were fitted to the fifth model. The mathematical models were suitable to predict the effects of GP on the selected responses, the R^2 values ranging from 0.76 to 0.99. CL , Co , F , G^* , η_{max} , TDF and TPC increased with the addition level increase, while L^* , C^* and Ch decreased. The optimal amount of GP in wheat pasta was found to be 4.58 %, at a desirability value of 0.54. The predicted values of the composite flour, dough and final product characteristics were the following: $\eta_{max} = 0.83$ Pa·s, $G^* = 112784.11$ Pa, $Co = 0.41$, $F = 5403.00$ g, $CL = 6.76$ %, $L^* = 56.22$, $C^* = 19.11$, $Ch = 3594.69$ J, $TPC = 140.75$ $\mu\text{g/g}$, $TDF = 1.41$ %. In conclusion, the optimal amount of GP found can be used to increase the nutritional value of pasta without significant negative effects on the technological properties.

Key words: *color, grape peels, pasta, polyphenols, rheology, texture, wheat flour*

INFLUENCE OF COOLING OF BAKERY PRODUCTS IN THE CONDITIONS OF RAREFACTION ON QUALITY OF FINISHED PRODUCTS

Students: Oleksandr KOZAK, Ivanna NAZARENKO

Coordinating Professor: Assoc. prof. Mykola DESYK

Prof. Volodymyr TELYCHKUN

National University of Food Technologies, Ukraine

Abstract:

Cooling of freshly baked bread is an urgent task facing the bakery industry and scientists and is caused by the need to package finished products. Vacuum cooling is the fastest way to cool. The cooling process takes a few minutes. The technology of vacuum cooling of bread assumes that during vacuuming there is an isobaric process - water passes from a liquid state to gaseous due to decrease in temperature of a product. Thanks to instant cooling, the products can be used for the following technological processes - packaging, cutting, storage, transportation. To study the technological aspects of the process of vacuum cooling was used experimental setup, which consists of: housing, vacuum chamber, vacuum pump, condenser, devices for regulating and controlling the rate of vacuum. Organoleptic methods were used to assess the quality of the products after evacuation and the structural and mechanical properties of the crumb were determined. Great importance for achieving the quality of finished products is the vacuum mode, which is significantly influenced by the technological process of cooking, especially the stage of aging and baking. A rational mode of changing the vacuum speed to avoid crumb rupture has been determined. As a result of vacuum cooling, the volume of finished products increases to 15%. The structural and mechanical properties of bread crumb after cooling with a penetrometer have been studied and the nature of changes in elastic, plastic and general deformation during hardening has been established. Vacuum cooling of bread products - solving problems of cooling time, reducing energy consumption and production space required for cooling finished products, the possibility of automation for the preservation, and in some respects, and improve the quality of finished products.

Key words: *structural and mechanical properties, bread crumbs, vacuum cooling, deformation, hardening.*

UNIVERSAL COMPLEX PREMIX FOR POULTRY

Student: Ganna KRAVCHENKO,
Coordinating Professor: Ass. Prof., PhD. Sc. Nina VORONA
*Faculty of Feed and Biofuel Technologies,
University Odessa National Academy of Food Technologies, Ukraine*

Abstract:

It is impossible to avoid the influence of physiological stressors in critical periods of development and productivity of poultry in industrial conditions. Stress is a deviation from the optimal conditions of keeping, feeding and watering. During stress, the body of poultry produces excess free radicals, which can damage all types of biological molecules and promote oxidative processes. All this leads to a decrease in productivity and quality of the final product. Feed should be enriched with amino acids, vitamins, enzymes, salts of trace elements, antioxidants and other preparations of biologically active substances to maximize the mobilization of the body's defenses against stress. Based on the experience and needs of industrial poultry farmers, we have developed a universal complex premix, which at the optimal level of biologically active substances meets the needs of poultry and provide productive action. During the development of the universal complex premix we were guided by the recommendations on the general optimal requirements for the content of biologically active substances for poultry. Universal complex premix is intended for use in the diet of poultry as a universal premix with a basic set of vitamins, amino acids and trace elements. The advantages of using a universal complex premix are the absence of restrictions on the use of poultry for a specific purpose or age group, ease of use, the ability to produce on its basis address premixes to order.

Key words: *biologically active substances, enrichment, poultry, premix, productivity, stress.*

CARROT-BY PRODUCTS: A VALUABLE SOURCE TO DEVELOP NEW PRODUCTS BASED WHEAT FLOUR

Student: Marian – Ilie LUCA,

Coordinating Professor: Prof. PhD. Silvia MIRONEASA

Faculty of Food Engineering

Stefan cel Mare University of Suceava, Romania

Abstract:

The food industry is in a continuous development, a fact demonstrated by the appearance on the market of new products, enriched with ingredients that bring benefits on the health of consumers. The addition of various by-products can provide both a viable economic solution through their use and substantial help in health through their nutritional and functional value. Available in large quantities and characterized by a high level of dietary fiber, by-products of fruits and vegetables have a low price. From the processing of carrot juice results a carrot pomace, a by-products with a large amount of carotene, an important source of dietary fibers, vitamins and minerals. The addition of carrot pomace into food formulas could lead to a valuable strategy to increase the dietary ingestion of β -carotene and fiber. By adding it in food formulas, carrot pomace changes the physic-chemical properties and nutritive value of the finite products. Foods enriched with carrot by-products may have therapeutic effects: reduces blood pressure, reduces cholesterol levels, helps reduce heart disease, helps relieve diabetes and has a major role in stimulating immunity, stimulates the visual acuity. Several cereal products such as a bread, cake and biscuits have been successfully enriched in fibers and carotene by adding carrot pomace. On the Romanian market there are no products containing carrot pomace as a replace for conventional wheat flour. The incorporation in adequate concentrations, results in an important intake of nutrients. Furthermore, it is possible to develop new food products and to reduce the environmental pollution.

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

PROPOSED INNOVATIVE FOODS IN SYNDEMIC COVID-19: FUNCTIONAL SNACK FROM DRIED FRUITS WITH PROBIOTICS AND BLACKCURRANT SEED OIL

Student: Carla MARCU,
Coordinating Professor: Prof. dr. Ramona SUHAROSCHI,
Prof dr. Dan Cristian VODNAR, Prof dr. Sonia SOCACI,
Asist. Dr. Anca FĂRCAȘ, Lecturer dr. Oana Lelia POP
Faculty of Food Science and Technology
University of Agricultural Science and Veterinary Medicine
Cluj-Napoca, Romania

Abstract:

Nowadays, the ready-to-eat meals market is pretty extended and there are plenty of possibilities for the consumers to choose from. Thus, a turnover is required due to the fact that consumers are more and more interested in foods that bring quality nutrients and valuable biomolecules, not just fast and easy alternative ones. Moreover, due to the pandemic (COVID-19) evolved as a syndemic and due to the consumer's focus on health and their awareness about the fact that what we eat can make us healthier boosting immune system, this market starts to be reinvented.

In this context we propose a functional snack from dried fruits with encapsulated probiotics and linseed oil. The probiotic viability on long term (over three months) is ensured by the fact that these valuable cells (*Lactobacillus casei* and *Lactobacillus rhamnosus*) are incorporated in microcapsules together with blackcurrant seed oil, rich in polyunsaturated fatty acids, and antioxidants as vitamin A, D, E, and minerals such as iodine, selenium and chromium

The product was dried at 40 °C till over 95% dry substance. The nutritional value of the snack was analyzed; probiotics viability was determined over 3 months using the micro dilution method, and the polyphenols content was determined using spectrophotometric method. A simulated gastrointestinal passage test was also conducted, and the presence of oil was analyzed using GS-MS.

Key words: *healthy snacks, probiotic, polyunsaturated fatty acids, dried fruits*

STUDY ON OBTAINING AN ALCOHOLIC BEVERAGE FROM WHEY

PhD Student: Valentin MAZĂRE

Coordinating Professor: Prof. PhD. eng. Adriana DABIJA

Faculty of Food Engineering

Ștefan cel Mare University of Suceava, Romania

Abstract:

Worldwide there is a crisis of physical and energy resources, while the food crisis is at the forefront. In this context, valuing useful substances within by-products resulted from food industry is a necessary measure to solve part of these food shortages. Valorisation of whey, a by-product from cheese production, is a major problem in the dairy industry requiring simple and economical solutions. Whey has been used by many researchers as a raw material for alcoholic fermentation because it contains a large amount of lactose and is available in large amounts. The literature shows a wide variation of soft drinks obtained from deproteinised whey, and also alcoholic beverages: low alcoholic beverages with max 1% alcohol, very similar to beer and wine which are obtained internationally. Wine-like beverages may be obtained by fermenting whey under the action of different types of yeast thus creating a drink with alcohol content between 10-14% alcohols, liquor-type drinks. The aim of this research is to develop a technology for obtaining alcoholic beverages from whey, a technology validated in the laboratory, as a viable method for whey valorisation, with immediate applications at industrial level. The technological process of production will be similar to that for obtaining bottled sparkling wines. For a beverage to be accepted by the modern consumers, it has to satisfy at least some of the main determinants of success—desirable sensory quality, thirst-quenching effectiveness, favourable price and positive „health image”.

Key words: *alcoholic beverages, by-products, lactose, sparkling wines, valorisation, whey*

TECHNOLOGY OF OBTAINING WINE VINEGAR FROM GRAPE CONCENTRATE

Student: Oxana MARCU ,
Coordinating Professor: PhD student Alina BOIȘTEAN
Faculty of Food Technology
Technical University of Moldova, Republic of Moldova

Abstract:

Nowadays, the world produces a wide range of vinegars such as: cider vinegar, wine vinegar, beer vinegar, malt vinegar, fruit vinegar, rice vinegar, etc. The rate of transformation of ethyl alcohol into acetic acid depends on several factors, such as: the nature of the microorganisms and the substrate, the degree of aeration, the influence of temperature, etc.

Within this study, was analyzed the technology of obtaining wine vinegar from grape concentrate. Optimal conditions were established for the alcoholic and acetic fermentation of the grape concentrate. Concentrated grape juice for the first stage of alcoholic fermentation was diluted to a sugar concentration of 25%, the temperature during the alcoholic fermentation was 25 ± 1 °C, isolated from UV rays and with minimal access to air. For the second step of acetic acid fermentation (AAF) was taken wine obtained from the first stage of fermentation with alcohol concentration below 13% and organic white wine vinegar with quality parameters: TTA (total titratable acidity) = 6%, residual alcohol - 0.93%, pH = 3.33, $\rho = 1.070$ kg / m³. The temperature during acetic acid fermentation (AAF) was 28 ± 1 °C with access to air but isolated from UV rays. In order to study the influence of nutrient salts on the acetic acid fermentation (AAF) process, samples with and without nutrient salts were researched. It was found that in both samples with and without nutrient salts during 27 days there is a slight difference of TTA (total titratable acidity) of 1.26% more in the sample with nutrient salts than in the sample without nutrient salts. In this study, were established the technology and parameters for obtaining vinegar from grape concentrate and it was shown that the use of nutrient salts can reduce the time of obtaining it.

Key words: *acetic acid fermentation, wine vinegar, grape concentrate, acetic acid, ethyl alcohol.*

VALORISATION OF EINKORN FLOUR IN A BAKERY SOFT BUN PRODUCT

Student: Ana-Maria MIHALY

Coordinating Professor: Prof. PhD Adriana PĂUCEAN,

Assoc. Prof. PhD Simona Maria MAN,

Asisst. PhD Maria Simona CHIȘ

University of Agricultural Sciences and Veterinary Medicine,

Cluj-Napoca, Romania

Abstract

The aim of this study is to obtain a bakery soft bun product, by valorisation of the einkorn flour and the use of special strains of yeast in order to make sourdough.

Einkorn flour was used to obtain the product and also the sourdough. Einkorn flour is a good source of proteins, dietary fibers, mineral substances and antioxidants among which lutein is found in higher concentrations compared to other wheat flours. According to a large body of literature, the activity of these compounds is correlated with the prevention on cardiovascular diseases, cancer and ocular degeneration.

The special strains of yeast used to obtain the sourdough, enhance mainly the product aroma compounds. Einkorn flour contains the precursors of the aromas, which can be highlighted through the action of enzymes that are produced by specially selected yeasts.

In order to fulfill this study the following objectives have been proposed: optimization of technological process, recipe optimization, raw material and final product characterization through physico-chemical analyses and also quality evaluation through sensory analysis.

This study also aimed to optimize wheat flour and einkorn flour ratio, with the purpose of obtaining a product with good sensory characteristics. There were made three experimental samples, one with 100% einkorn flour, the other one with 50% einkorn flour and 50% wheat flour, and a control sample with 100% wheat flour. After sensory and physico-chemical analysis of the samples the product with 50% einkorn flour and 50% wheat flour was found to be the optimal one.

Key words: einkorn flour, special yeast strains, sourdough, lutein, enzymes;

SCIENTIFIC EXPLANATION OF COMPOSITION OF ACIDOPHILIC-WHEY ICE CREAM, ENRICHED WITH PROTEIN

Student: Artur MYKHALEVYCH,
Coordinating Professor: Prof. Ph. Galina POLISCHUK
*Scientific-Research Institute of Food Technologies,
National University of Food Technologies, Ukraine*

Abstract:

The work is devoted to solving the actual problem of the dairy industry - complex processing of food raw materials; rational use of production resources by reducing the technological process duration.

The aim of the research is to substantiate the composition of a new type of acidophilic-whey ice cream of high nutritional value due to enrichment with a complex of proteins, probiotic sourdough and pectin-containing vegetable paste.

In order to identify the rational content of protein concentrates in acidophilic-whey ice cream, was investigated the possibility of enriching the product with sodium caseinate (SC), concentrate of whey proteins obtained by ultrafiltration (CWP-UF) and soy protein isolate (SP).

Therefore, if necessary to enrich acidophilic-whey ice cream with protein in an amount of not less than 2.75%, it is advisable to use the following protein composition: 0.75% SC (the most effective moisture-binding stabilizing high-value protein); 1.0-1.5% CWP-UF (protein with foaming ability); 1.0-1.5% SP (cheap protein with moderate technological activity). The highest overrun of the ice cream was with content of vegetable paste at the level of 10% , which is explained by the rational ratio between the foaming and stabilizing properties of the protein complex and pectin substances.

Key words: *acidophilic-whey ice cream, probiotics, prebiotics, protein, pectin-containing purees, dairy products*

COMPARATIVE ANALYSIS OF HONEY FROM THE REPUBLIC OF MOLDOVA, ROMANIA AND TUNISIA

Students: Sergiu MORARI, Larisa MALAI

Coordinating Professor: Ph.D., Assoc. Prof. Aurica CHIRSANOVA,

Ph.D., Assoc. Professor, Tatiana CAPCANARI

Faculty of Food Technology

Technical University of Moldova, Republic of Moldova

Abstract.

The European Union is the world's second largest producer of honey after China, with an average production of 230,000 tonnes per year, a total of 17.5 million hives owned by 650,000 beekeepers. The Republic of Moldova has a rich tradition in terms of honey production, with an average of 4,000 tons per year, but which is mostly exported to the European Union. Romania is one of the main honey producers in the EU, occupying in 2018 the first place in the ranking of member countries, with a production of 30,900 tons. In Tunisia, the number of beekeepers is growing, currently reaching 12,000, with a number of hives of 163,000, honey production averaging 1,750 tons per year).

Conclusions: Following the analysis of the 15 honey samples, of 5 from each country (Republic of Moldova, Romania and Tunisia) it was found that the physical and chemical index in most of the tested samples falls within the permissible intervals, but some types of honey such as honey of rapeseed, buckwheat, black grass are of particular interest and require further research

Key words: *honey, pH, titratable acidity, reducing sugar, easily hydrolyzable sugar, phenolic compounds, Hydroxymethylfurfural content*

INTELLIGENT FOOD PACKAGING AND THE SUPPORT OF ZERO FOOD WASTE TREND

Student: Silvia Amalia NEMES,
Coordinating Professor: Prof. Dan Cristian VODNAR
Faculty of Food Science and Technology
University of Agricultural Sciences and Veterinary Medicine
Cluj-Napoca, Romania

Abstract:

Introduction: The efforts made in the world of science, along with the trend of “zero waste”, are constantly growing. Efforts are made to find environmentally friendly solutions to combat food waste and to capitalize on raw materials at high capacity. As an effect, of this trend, soon, more compounds will be integrated into food coatings.

Scope and approach: Several bioactive compounds from the agro-industrial by-products, had been identified and described, compounds that can be recovered and can be incorporated into smart food packaging constituents, such as sensors, indicators, radio frequency identification. Furthermore, the present study concretely defines the concepts of smart, active, and intelligent packaging, and presents some of the commercially available models found in the marketplace.

Conclusions: The next generation of food packaging developments and food packaging materials should be environmentally friendly, and more importantly, they should be reusable, easy to use, and communicative with the consumers, to avoid the specific problems related to food waste, food quality managing, or foodborne diseases. Most importantly, this paper highlights the viewpoint of incorporating the by-products derived compounds to intelligent packaging, supporting all the characteristics mentioned above.

Keywords: *by-products; indicators; smart packaging; sensors; intelligent packaging; zero-waste; food quality*

FLAXSEED CAKE, GRAPE SEED OIL, CAROB POWDER AND THEIR BENEFICIAL EFFECTS

Students: Maria Nicoleta MUȘINĂ, Ionuț PREDĂ,
Andrei Nicolae TOMA,

Coordinating Professor: Lect. Ph.D. fiz. Mihaela JARCĂU,
*Faculty of Food Engineering,
Stefan cel Mare University of Suceava, Romania*

Abstract:

In this paperwork we will present a cake made with natural ingredients, and beneficial effects on the human body.

For this cake we used ingredients such as flax flour, grape seed oil, carob powder, brown sugar, berries, lemon, organic baking powder without gluten and without phosphate, with corn starch, baking soda and tartrate of potassium.

This cake can also be considered useful for people who are on a diet and want to lose weight, because it is known that grape seed oil inhibits enzymes which help absorb and accumulate body fat. Also, carob powder helps decrease appetite, gives the feeling of satiety for longer and helps maintain a normal weight.

Flax seeds are being considered to be a "superfood" due to their excellent source of fiber, protein, amino acids, Omega-3 fatty acids, vitamins and minerals such as vitamin B1, copper, magnesium and phosphorus, but also other compounds essential for proper functioning of the body.

Constant consumption of flax seeds plays an important role in regulating blood cholesterol levels. It also can reduce blood pressure, regulate blood sugar levels.

We used berries both for their slightly sour aroma and for the beneficial effects on the body. Berries contain a number of antioxidants such as: anthocyanins, quercetin and vitamin C, fiber and folic acid.

Another ingredient used in this cake is brown sugar, which has the ability to stimulate energy levels, prevent colds, treat urinary tract infections and improve digestion. Brown sugar is produced in the same way as white cane sugar, but it has a molasses intake, which makes it healthier.

Key words: *Berries, Brown sugar, cake, carob powder, flax seeds, grape seed oil.*

INFLUENCE OF BUCKWHEAT MALT ON BEER PROPERTIES

Student: Anastasiia PARKHOMENKO,
Coordinating Professor: Associate prof. Ph. D. Roman MUKOID
*Faculty of Biotechnology of Fermentation and Winemaking
Products, National University of Food Technologies, Ukraine*

Abstract:

The prospects of using buckwheat malt for the production of low-gluten beer are shown.

Gluten is absent in such cereals as buckwheat and rice, and in other cereals the amount of gluten is: corn 80 ppm, barley 151 ppm, wheat 162 ppm. Therefore, for the preparation of low-gluten beer buckwheat malt and barley malt are recommended.

The sample with the replacement of 5% barley malt on buckwheat malt has the highest content of reducing substances, namely 91.0 g per 100 g of extract and amine nitrogen 167.1 mg per 100 g of extract, the content of ethyl alcohol in the finished beer 3.5% by weight at mass fraction of the actual extract of 4.83% by mass.

As the amount of buckwheat malt increases, the amount of reducing substances and amine nitrogen decreases due to the insufficient amount of hydrolytic enzymes in barley malt, under the action of which the above substances are formed. Thus, in the sample with the replacement of 5% barley malt by buckwheat malt, the content of reducing substances was 92 g per 100 g of extract, and the content of amine nitrogen was 168 mg per 100 g of extract. Whereas in the sample with a substitution of 15% barley malt, these figures are 82 g per 100 g of extract and 91 g per 100 g of extract, respectively.

The best crop for the production of low-gluten beer is buckwheat malt in a ratio of 95:5.

Key words: *barley, beer, buckwheat, gluten, malt, wort.*

COENZYME Q₁₀: HEALTH BENEFITS AND BIOAVAILABILITY

Student: Andersina-Simina PODAR,
Coordinating Professor: Prof. Ph. D. Habil Sonia-Ancuța SOCACI
*Faculty of Food Science and Technology,
University of Agricultural Sciences and Veterinary Medicine
Cluj-Napoca, Romania,*

Abstract:

Coenzyme Q₁₀, is a lipophilic metabolite present in nearly all human tissues, being involved in the electron transport chain in the plasma membranes of prokaryotes and in the inner mitochondrial membranes of eukaryotes. This coenzyme participates in aerobic cellular respiration, which generates energy in the form of ATP (95% of the energy of the human body is generated in this way). Therefore, the organs with the highest energy requirements (heart, liver and kidneys) have the highest concentration of CoQ₁₀. After the age of 30-35, the organism loses the ability to synthesise CoQ₁₀ from food and levels of coenzymes deplete in the skin resulting in a reduced production rate of collagen and elastin formation.

This review focused on the health benefits of CoQ₁₀ dietary supplementation and its bioavailability for human body.

In order to achieve the set goal, a screening of the scientific literature from the last 20 years dealing with this theme, was conducted. The literature screening was performed using: National Centre for Biotechnology Information (PubMed), Science Direct, Web of Science, Nature and Elsevier databases.

Stress, infections, poor eating habits and ageing are only a few disorders which affect the organism's ability to provide adequate amounts of CoQ₁₀. More than 200 clinical trials have investigated its use as a drug or dietary supplement and reported beneficial effects for human health.

Conclusion: Researches suggest that using CoQ₁₀ supplements alone or in combination with other nutritional supplements may help to maintain the health of elderly people or treat some of the health conditions and diseases.

Key words: *Coenzyme Q₁₀, dietary supplementation, health benefits*

THE USE OF COMPOSITE FLOURS AND CHIA SEEDS IN THE MANUFACTURE OF AN ASSORTMENT OF BISCUITS FOR SPECIAL NUTRITION

Student: Maria Florina ROȘCA,
Coordinating Professors: Prof. Ph.D Adriana PĂUCEAN,
Assoc.prof. Ph.D Simona Maria MAN,
Assist. Ph.D Maria Simona CHIȘ
*Faculty of Food Science and Technology,
University of Agricultural Sciences and Veterinary Medicine
Cluj-Napoca, Romania*

Abstract:

The purpose of this study is to manufacture an assortment of biscuits for special nutrition. To obtain the biscuits, chia seeds were used together with a composite mixture of rice flour, chickpea flour and buckwheat flour. Rich in Omega 3 fatty acids, proteins, antioxidants, minerals, B-complex vitamins, chia seeds improve the nutritional value and texture of gluten-free products and can also be used as an egg substitute. Stevia, sesame seeds and coconut butter, raw materials with many health benefits were also used. For this purpose, several experimental prototypes were analyzed (P_M- test witness without the addition of chia seeds, P₁-with 8% chia seeds, P₂-with 12% chia seeds and P₃- with 16% chia seeds). After obtaining the four prototype biscuits, they were subjected to sensory and physico-chemical analysis to highlight the influence of various proportions of chia seeds on the quality of biscuits. The obtained results showed that the sample with 12% chia seeds obtained the highest degree of acceptability by consumers, and due to the beneficial properties of raw materials, the assortment of biscuits can be included in the category of foods for special dietary use.

Key words: *biscuits, special nutrition, composite flours, chia seeds, gluten-free, Omega 3, antioxidants.*

STUDIES REGARDING THE QUALITY OF BISCUITS WITH INULIN ADDITION

Student: Maria OBREJA

Coordinating Professor:

Lecturer Ph.D. Eng. Mihaela JARCĂU

Faculty of Food Engineering

Stefan cel Mare University of Suceava, Romania

Abstract:

The aim of this paper was to investigate the effects of partial substitution of sugar with inulin, a soluble fiber in order to improve the quality of biscuits from the nutritional and technological point of view. The paper presents a comparative study between 2 biscuits samples namely a control sample (no inulin addition) and one with 5% level of inulin addition in the manufacturing recipe.

The use of inulin in biscuits recipe, will lead to a functional food, a fiber-enriched product with prebiotic and bifidogenic effects which may favor the calcium absorption of the human body. From the technological point of view, it seems that inulin is an excellent partial substitute for sugar in biscuits which presented a good behavior during obtaining these being more fragile and less rigid than the control sample. From the humidity point of view, it seems that the biscuits with inulin presents similar values with the control sample. From the sensory point of view, the biscuits with inulin were well appreciated being less crunchy, less sweet but more appreciated than the reference sample.

Therefore, it may be concluded that inulin it a partially excellent sugar substitute in biscuits recipe which lead to a healthier and well appreciated product by the consumers.

Key words: *inulin, biscuits quality, functional characteristics*

PHYSICO-CHEMICAL PROPERTIES OF ACACIA HONEY

Student/s: Daniela-Oana PAULIUC,
Coordinating Professor: Prof. PhD. Mircea-Adrian OROIAN
Faculty of Food Engineering,
Ștefan cel Mare University of Suceava, Romania

Abstract:

The aim of this paper was to evaluate the physicochemical characteristics of acacia honey collected from Romania. 30 acacia honey samples were selected to determine their physicochemical parameters (moisture content, pH, free acidity, electrical conductivity, color and HMF content) along with the analysis of pollen content. The melissopalynological analysis showed that all honey samples has a percentage of pollen grains *Robinia pseudoacacia* well above the minimum of 45%, which is necessary to classify the samples as monofloral honey. The electrical conductivity for acacia honey samples was low (220 $\mu\text{S}/\text{cm}$) and the moisture content was within the 20% limit imposed by the Codex Alimentarius, respectively 18%. Honey is acidic and the pH of acacia honey was 4.01 and the free acidity was 2.3 meq/kg. The limit set for HMF content was not exceeded by any sample of acacia honey evaluated in this study (3.9 mg HMF/kg). Acacia honey had high values of L* (40.4) and this indicates the clearness of honey samples.

Key words: authentication, botanical origin, classification, honey, physico-chemical properties, pollen

ACKNOWLEDGEMENTS

This work was performed within the framework of the “DECIDE - Development through entrepreneurial education and innovative doctoral and postdoctoral research, project code POCU/380/6/13/125031, supported by project co-financed from the European Social Fund through the 2014 – 2020 Operational Program Human Capital”.

EVALUATION OF MICROBIOLOGICAL AND PHYSICOCHEMICAL PROPERTIES OF KOMBUCHA

Student: Milosz PASTUSZCZAK,
Coordinating Professor: Ph. Maciej KLUZ
*College of Natural Sciences,
Institute of Food Technology and Human Nutrition
University of Rzeszow, Poland*

Abstract:

Kombucha is a drink made by fermenting sweetened tea with a symbiotic culture of bacteria and yeast. Consumption of kombucha is associated with some health effects, such as: lowering cholesterol and blood pressure, reducing the spread of cancer, improving liver function, immune system, and gastrointestinal function. The beneficial effect of kombucha is attributed to the presence of bioactive compounds such as polyphenols, organic acids, minerals and vitamins, which act synergistically. The main microorganisms in kombucha are bacteria belonging to the genus *Acetobacter*, *Gluconobacter*, and yeast of the genus *Saccharomyces*. In kombucha you can find compounds such as acetic acid, glucuronic acid, gluconic acid, citric acid and lactic acid, as well as minerals, B vitamins and vitamin C, as well as amino acids and other metabolic products of yeast and bacteria that can contribute to the improvement of functioning body and health. This work focuses on the analysis of polyphenolic compounds formed in the fermentation process using ultra-efficient liquid chromatography, as well as checking by agar assay the antimicrobial properties of kombucha and studying pH changes during fermentation.

Key words: *antimicrobial properties, fermentation, kombucha, polyphenols, tea, ultra-efficient liquid chromatography,*

ANALYSIS OF THE MICROBIOLOGICAL QUALITY OF PORK MEAT WITH THE USE OF MOLECULAR METHODS

Student: Karol PIETRZYK,
Coordinating Professor: PhD. Maciej KLUZ
Faculty of Technology of Food and Human Nutrition
University of Rzeszow, Poland

Abstract:

The aim of this study was to analyze the microbiological analysis of pork meat treated with essential oils in order to extend its shelf life using classical and molecular analytical methods.

The examined material was pork (pork neck, pork loin, shoulder). The following methods were used in the research: determination of the total number of microorganisms, identification of pathogenic microflora with the use of selective media, identification of microorganisms using the PCR method.

On the basis of the conducted PCR tests, the following *E. coli* bacteria were identified in: pork loin, neck and shoulder from the 3rd day of storage, *P. areuginosa* in: pork shoulder. However, the presence of *Salmonella* bacteria was not confirmed, despite the fact that its growth was observed when grown on selective media.

The PCR method is a fast and reliable method of identifying microorganisms at the molecular level. Identification by means of the PCR method showed the presence of bacteria: *E.coli* and *P. areuginosa*. Rosemary oil has better antimicrobial properties than basil oil.

Key words: *analysis, essential oils, identification of microorganisms, molecular metod, PCR, pork meat*

THE INFLUENCE OF BIOLOGICALLY ACTIVE SUBSTANCES FROM WALNUTS PELLICULA ON THE QUALITY OF KERNELS

Student: Anastasia PODREZ

Coordinating Professor: PhD Raisa DRUȚĂ, PhD Alexei BAERLE

*Faculty of Food Technology,
Technical University of Moldova, Chisinau, Moldova*

Abstract:

Walnuts are exposed to the risk of oxidative damage, during storage and transportation, this causes an external change. Walnuts become brown and bitter. Phenolic compounds that are contained in high amounts in the pellicle make these undesirable transformations.

The aim of this research was to extract the polyphenols and naphthoquinones from the pellicle of kernels, and to estimate the influence of extraction on the quality of walnuts.

Practical significance: Extraction of coloring and phenolic substances can improve the organoleptic characteristics of walnut kernels as raw materials. This will improve the quality and nutritional value of food products that are produced directly from the walnut kernel.

In this research were analyzed five types of walnuts, which were from different period of storage: Schroth 2017, Schroth 2018, Schroth 2019, whole nuts 2018 and whole nuts 2018 from which were extracted juglone. All the nuts were placed in a special solution (prepared from ethanol, Na₂CO₃ and polygalacturonase,) in which the extraction process started from the first minutes. After that it was recorded Spectra of strongly diluted extracts on a DR 5000 spectrophotometer in the range of 200...1000nm, using quartz cell with l =10mm. Finally, nuts were dried and sensory analyzed.

Conclusions: Electronic spectra demonstrated that during the storage of nuts, the content of the juglone in the pellicle of kernels increases a lot. Walnuts look lighter, more attractive and significantly enlarge in size after our research. Thus, the removal of juglone can greatly improve the appearance and taste of the nut kernels.

Key words: *juglone, organoleptic characteristics, oxidative damage, pellicle, storage, walnuts kernels.*

PHYSICO-CHEMICAL CHARACTERIZATION AND ANTIOXIDANT ACTIVITY OF AMARANTH SEEDS (AMARANTHUS CAUDATUS L.)

Student Ovidiu PROCOPEȚ,
Coordinating Professor: Prof. Ph. Mircea OROIAN
*Faculty of Food Engineering,
Stefan cel Mare University of Suceava, Romania*

Abstract:

In the last decade, the use of amaranth has expanded not only in the common diet, but also in the diet of people with celiac disease or allergies to certain cereals. The purpose of this paper is to determine the physico-chemical composition content (humidity, total ash content, HCl insoluble ash content, protein content, total crude fiber content, total polyphenol content and antioxidant capacity) of amaranth seeds (*Amaranthus caudatus* L. in order to advanced their characterization and compliance with quality standards. The moisture content did not exceed the maximum permitted level (14%). The content of total ash (2.75%) and HCl insoluble ash (0.14%) were within the Codex Alimentarius parameters. The protein content (10.19%) and the total fiber content (10.23%) represent a high level above the average of other types of pseudocereals. The total flavone content was 3591.94 mg equivalent to quercetin / 100 g amaranth and the total polyphenol content was 109.12 mg equivalent gallic acid / 100 g amaranth.

Key words: amaranth, physico-chemical properties, antioxidant capacity.

ACKNOWLEDGEMENTS

This work was performed within the framework of the “**DECIDE** - Development through entrepreneurial education and innovative doctoral research and postdoctoral project”, Project Code POCU / 380/6/13/125031, project co-financed by the European Social through the Human Capital Operational Program 2014 - 2020”;

MAGNESIUM: THE ROLE IN TREATING VARIOUS DISEASES

Students: Corneliu RUSU, Polina TIMUȘ

Coordinating Professor: Assoc. Prof. Ph. D. Eng. Ana LEAHU

Faculty of Food Engineering,

Stefan cel Mare University of Suceava, Romania

Abstract:

Magnesium is the essential minerals and the second most abundant intracellular divalent cation for optimal metabolic function. Research has shown that the magnesium content of food sources is declining and the occurrence of chronic diseases is reported in people with magnesium deficiency.

Magnesium is an important component of many foods, such as whole grains, nuts and green leafy vegetables. Because it is an essential cofactor for hundreds of enzymes involved in glucose metabolism and a direct antagonist of intracellular calcium, a high-magnesium diet has the potential to prevent diabetes. Consumption of magnesium in foods or supplements can prevent a number of chronic diseases, such as: type 2 diabetes, cardiovascular disease, stroke (stroke) and high blood pressure.

Food sources of magnesium include green leafy vegetables, nuts, legumes, and whole grains.

Key words: *disease prevention, food sources, magnesium cation.*

EVALUATION OF ACRYLAMIDE LEVELS IN DIFFERENT FOODSTUFFS DURING 2017-2019 PERIOD FROM THE ROMANIA MARKET

PhD Student: Cristina SARION,
Coordinating Professor: Prof. Ph.D.Eng. Georgiana CODINĂ
*Faculty of Food Engineering of
Ștefan cel Mare University of Suceava, Romania*

Abstract:

Due to the fact that nowadays, the food safety is one of the most important aspect from the food industry, the establishment of an analysis laboratory within a food factory becomes a mandatory requirement. To the national level, very few samples of foodstuffs were analysis in the last three years. Most of them were analyzed by A.N.S.V.S.A. using HPLC-UV and others were analyzed by the I.B.A. using gas chromatography, coupled with mass spectrometry. The paper aims to present a general situation regarding the evolution of the acrylamide content from different foodstuffs on the Romania market, between 2017-2019 period, as a result of legislative measures imposed by the European Union. The existence to the national level of a small number of accredited laboratories to perform these determinations, explains the small number of samples and recommends the establishment of a laboratory analysis in the food safety field, in the NE Romania region, in order to perform these determinations.

Key words: *laboratory, analysis method, acrylamide, foodstuffs*

Acknowledgment:

This paper was supported by „DECIDE-Development through entrepreneurial education and innovative doctoral and postdoctoral research”, project code POCU / 380/6/13/125031, project co-financed from the European Social Fund through the Human Capital Operational Program 2014 - 2020”.

MODELING OF THE DOUGH KNEADING PROCESS

Student/s: Danilo SOBACHKO,

Coordinating Professor: Assoc.prof., PhD Vitalii RACHOK
*Department Machines and apparatus of food and pharmaceutical
productions,
National University of Food Technology, Ukraine*

Abstract:

Mathematical simulation of the process of kneading wheat yeast dough by cam working elements in the software complex Flow Vision was carried out. The calculation grid was used to model the process. At the stage of setting of the task, the conditions of contact of interaction of the material with the working elements and the mixing chamber are specified, as well as the values of the structural and mechanical characteristics of the dough. During the study, the distance between the cam working elements were placed in the range from 2 to 10 mm (2-4-6-8-10 mm), the inspection speed was used in the range from 20 rpm to 100 rpm (20- 40 60-80-100 rpm). After settings all the necessary parameters in the program complex the stage of calculating and visualizing of the kneading the yeast dough process begins. For pseudoplastic fluids with variable product viscosity (non-Newtonian fluid), the shear stress is gradual. The distribution of the shear stress in the yeast dough in the process of kneading by the cam working elements was investigated and, as a result, the distribution of mechanical load for each position of the cam working elements in the kneading chamber. Studies related to the influence of the distance between the cams and the speed of rotation of the working element on the process of kneading the yeast dough.

Key words: *cam, dough, kneading, modeling, range, structural.*

THE EFFECT OF GRINDING METHOD AND EXTRACTION SOLVENT ON THE RESULTS OF DRONE BROOD ANTIOXIDANT ACTIVITY MEASUREMENTS

Student: Ewelina SIDOR,
Coordinating Prof.: dr hab. inż. Małgorzata Dżugan prof. UR
*Department of Food Chemistry and Toxicology,
Institute of Food Technology and Nutrition,
University of Rzeszow, Poland*

Abstract:

Drone brood (apilarnil) is male honey bee (*Apis mellifera*) larvae homogenate, firstly used in Romania by Nicolae Iliesiu in 1980. It is very nutritious due to the high content of proteins, lipids, fatty acids, carbohydrates, vitamins (A, B, E and D), bioelements, sex hormones (testosterone, progesterone and estradiol) and antioxidants. The aim of the study was to determine the effect of the grinding method and the extraction solvent used on the results of antioxidant activity of the drone brood measurement. The experiment used standard methods of antioxidant (DPPH, FRAP) and the total phenolic compounds (TPC) Analysis. The tested bee product (7, 11, 14- day- old larvae) showed an increase in antioxidant activity dependent on the brood development stage. Using the knife homogenizer and a physiological saline as extractant gave the best results of antioxidant activity for tested samples. Moreover, the sediment (51,09 % DPPH, 38,5 nmol/g FRAP) has a higher activity than the supernatant (27,78 % DPPH, 11,98 nmol/g FRAP), so the homogenate is fully active without separation of solids.

Key words: *antioxidants, apilarnil, drone brood, extraction solvent, homogenate*

CONSUMING OF HIGH-PERFORMANCE (HP) INULIN PRODUCTS FOR HEALTH IMPROVEMENT

Student: Svetlana SOLNTSEVA

Coordinating Professor: Prof. Ph. Victoriia EVLASH

Kharkiv State University of food technology and trade, Ukraine

Abstract:

Poor eating habits include under- or over-eating, not having enough of the healthy foods we need each day, or consuming too many types of food and drinks, which are low in fibre or high in fat, salt and/or sugar. The main problem is that we eat much more fast digesting carbs than necessary, including sucrose. Consuming too much sugar raises the risk of several dangerous health problems, including obesity, type 2 diabetes, increased pressure on the heart and blood vessels. The purpose of this experiment was developing a new functional curd dessert adding dietary supplementation 'Mak-var powder from Jerusalem artichoke' and an artificial sweetener "SPLENDA"

Dietary supplementation 'Mak-var powder from Jerusalem artichoke contains inulin. Inulins (C₆H₁₀O₅)_n are a group of naturally occurring polysaccharides produced by many types of plants, industrially most often extracted from chicory and Jerusalem artichoke. The previous studies proved the fact that the consumption of HP inulin supplementations has several health benefits, such as improving digestive health, helping control diabetes, and aiding weight loss. SPLENDA is a zero calorie artificial sweetener. Its 600 times sweeter than sugar (1 g SPLENDA= 2 tsp).

A new functional sugar-free curd dessert enriched with HP inulin has been developed for adding to a diet for people who suffer from increased blood glucose level and overweight.

Key words: *functional food, inulin, innovation, dietary supplementation, artificial sweetener, curd dessert.*

INFLUENCE OF TIME, TEMPERATURE, pH AND PARTICLE SIZE ON THE YIELD OF GRAPE POMACE PECTIN

Student: Mariana SPINEL,
Coordinating Professor: Prof. Ph. Eng. Mircea OROIAN
Faculty of Food Engineering,
Stefan cel Mare University of Suceava, Romania

Abstract:

Nowadays, there are several unconventional sources of pectin coming from food, vegetable and fruit residues, and plant species, which have a different pectin content and physicochemical properties. The grape pomace is one of the most important by-products obtained in the wine industry and represents about 20-25% of the grape weight which contains skin, seeds and other solid parts by pressing process. This residue represents a complex substrate composed of neutral polysaccharides, pectic substances, insoluble proanthocyanidins, lignin, structural proteins and other phenolic compounds. In this context, the potential of grape pomace obtained from two grape varieties (Fetească Neagră and Rară Neagră) as an unconventional source for the extraction of pectin was evaluated. Pectin was extracted from these varieties of grape pomace by using citric acid with solid-to-liquid ratio of 1:10. The parameters which have varied were pH (1, 2 and 3), time (2, 3 and 4 h), temperature (70, 80 and 90 °C) and particle size (200-300 µm, 125-200 µm and <125 µm). The results showed that time, temperature, pH and particle size had significant effects on the pectin yield. The highest pectin yield (7.4% and 7.1% for Fetească Neagră and Rară Neagră, respectively) were obtained at pH 2, 90 °C for 3 h and particles sizes between 125 and 200 µm.

Key words: *grape pomace, particle size, pectin, pH, unconventional source*

ACKNOWLEDGEMENTS: This work was performed within the framework of the „DECIDE – Development through entrepreneurial education and innovative doctoral and postdoctoral research, project code POCU/380/6/13/125031, supported by project co-financed from the European Social Fund through the 2014-2020 Operational Program Human Capital”.

RESEARCH OF SHRIMP FEED PRODUCTION

Students: Dmytro STEPANENKO, Anna KONAK

Coordinating Professor: Ass. Prof. L. FIHURSKA

Faculty of Grain and Grain business,

Odessa National Academy of Food Technologies, Ukraine

Abstract:

Inland industrial fish farming has become increasingly important in recent years and is one of the sources to meet the needs of people in high-protein foods. Fish meat is a very rich source of proteins (18.4%), which are easily digested, vitamins (groups B, C, E, D), polyunsaturated fatty acids, macro- and microelements. Shrimp farming is an aquaculture business that exists in a marine or freshwater environment, producing shrimp or prawns (crustaceans of the groups Caridea or Dendrobranchiata) for human consumption. The paper presents research on the production of feed for shrimp by extrusion in the laboratory of the Department of Technology of Feed and Biofuel. The aim of the work is to develop a scientific and practical basis for the production of feed for shrimps. To achieve this goal, defining the task: to analyze the physiological features of shrimp and the role of nutrients and biologically active substances in feeding, to analyze raw materials for the manufacture of feed for shrimp, to analyze foreign shrimp feeding programs, analyze the needs of shrimp in nutrients and biologically active substances, develop a shrimp feeding program, to develop recipes for shrimp feed, to substantiate the technology for the production of extruded feed for shrimp, to build a line for the production of extruded feed for shrimp, to develop feed for shrimp by extrusion in the laboratory of the Department of Technology of Feed and Biofuel, to investigate the physical power and chemical composition of the prepared shrimp feed, to investigate the acidity of compound feed during storage.

Key words: *extrusion, fish feed production*

IMPROVING THE PROCESS AND EQUIPMENT FOR TABLETS PRESSING

Student: Maksym SPOLOVYCH, Andrii PROKOP
Coordinating Professor: Assoc. Prof. Ph.D. Olena CHEPELIUK
National University of Food Technologies
Kyiv, Ukraine

Abstract:

Because of differences in the raw materials density and incomplete filling of the tablet presses dies, there are deviations in the mass of the finished solid dosage forms. The task of a dosing accuracy increasing requires a solution.

The rational idea of improving the tablet press dosing mechanism is to adjust the size of the connecting hole between the feed cup and the feeder. It is proposed to change the relative position of the windows of the feeder and the feed cup, which are connected, by rotating the damper located in the ring between the cup and the feeder housing. This mechanism is much easier, faster and more accurately allows you to adjust the flow rate of the tableting mass. The proposed design is simpler and more reliable, as it does not require additional operations to configure. The inclined plane remains in a static position, so the error in braking the flow is smaller than when turning it. Improving the design of the feeder of the rotary tablet press by replacing the lever mechanism on the rotary damper, the position of which regulates the amount of material entering the mixers, simplifies the feed cup design, increases the efficiency of die filling and, accordingly, the dosing accuracy, facilitates the feeding device maintenance and increases its reliability in operation.

Key words: *accuracy, damper, dosage, feeding device, rotary tablet press, tableting mass.*

CERTIFICATION OF ROMANIAN TRADITIONAL FOOD PRODUCTS. A QUALITATIVE STUDY ON CAȘVANA TRADITIONAL CHEESE

Students: Silviu Gabriel TOMESCU, Mihai Adelin ADOMNÎȚEI

Coordinating Professor: Prof. Ph. Sergiu PĂDUREȚ

Faculty of Food Engineering,

Stefan cel Mare University of Suceava, Romania

Abstract:

Traditional food products represent an important element in the development of the rural food industry. These products are produced from local raw materials, don't contain food additives, follow a traditional recipe and a traditional technological process, and are distinguished from other similar products.

This study aims to analyze the main quality properties of the traditional product – Cașvana Cheese. This type of cheese is produced by scalding the curd, obtained from raw milk from the geographical area of Bucovina, a famous area with natural pastures and special hay fields, with a floristic structure consisting of various species of plants that confer to the cow's milk a unique composition.

Regarding the physicochemical properties, the product has a fat content of 45% reported to dry matter, a moisture content of 45%, protein content of 23%, and a maximum sodium chloride of 3%.

The traditionality of Cașvana Cheese is given by the utilization in the production process of traditional techniques and equipment, but also by the application of a traditional recipe, which involves the use of natural brine from Cacica Salt Mine, with a concentration of 20-23%.

Keywords: *Bucovina, Cașvana cheese, certification, food industry, milk, quality, traditional food*

ANALYSIS OF PROCESS AND EQUIPMENT FOR SUPERFINE GRINDING BY DRY METHOD

Student: Oleksandr TROHYMCHUK,

PhD student: Kateryna HRININH

Coordinating Professor: Assoc. Prof. Oleksii GUBENIA
National University of Food Technology, Ukraine

Abstract:

Analyzed the most efficient and productive installations, such as separation mill and jet steam mill to justify the choice of a rational method of grinding. Separation mill. It is a rotor impact-reflective mill into which the dynamic air classifier is integrated. The advantages is: easy maintenance; uniform load on the classifier, the gaps of the classifier rotor are inflated with air, ensuring the elimination of large particles into the product. But it has same disadvantages: uneconomical due to the obligatory presence of powerful compressors for air injection; effective only for materials of relatively high cost. The product is ground to 10 microns (on limestone). Use: for receiving pigments, toners, sugar, cocoa powder, batteries (cathode and anode materials).

Steam jet mill. Uses for grinding superheated high-pressure steam. Advantages: allows you to simultaneously grind and dry wet products without pre-drying at the entrance; productivity twice is more than at traditional jet mills; ability to grind adhesive products. Disadvantages: the mandatory presence of powerful compressors and heaters for steam injection; effective for materials of relatively high cost. The product is ground to less than 0.2 microns (limestone). Use: for photocatalysts, liquid crystal displays, multilayer ceramic capacitors, polishing, glass.

As a result of an analytical review steam jet mill is recommended for superfine grinding of wet components; separation mill - for grinding non-solid components.

Key words: *advantages, disadvantages, grinding, micron, mill, product.*

THE IMPACT OF DILUTE ACID PRETREATMENT ON WHEAT STRAWS

Student: Vasile-Florin URSACHI,
Coordinating Professor: Prof. Ph. Gheorghe GUTT
*Faculty of Food Engineering,
Stefan cel Mare University of Suceava, Romania*

Abstract:

Agricultural biomass is considered one of the most important renewable energy resources and contributes to the development of bioenergy generation. Annually, huge quantities of wheat straws (WS) result from the harvesting of wheat and these residues can be used as potential biomass for production of monomeric sugars. The yield of the enzymatic hydrolysis of cellulose in WS is relatively low due to the complex structure. Therefore, to improve the enzymatic conversion of WS, it was studied the impact of pretreatment with dilute sulphuric acid (H_2SO_4). To investigate the impact of dilute acid pretreatment process on WS, it was used Scanning Electron Microscopy (SEM), Fourier Transform Infrared Spectroscopy (FT-IR) to analyze structural changes of pretreated samples and High Performance Liquid Chromatography (HPLC-DAD) was used to identify and quantify individual phenolic compounds. After different dilute sulphuric acid concentrations used for WS pretreatment, the structural analysis indicated that the most effective it was with 3% (v/v) H_2SO_4 at 100 °C and also lignin was partially removed. The results of the present study indicate that the dilute sulphuric acid pretreatment of WS facilitates the subsequent enzymatic hydrolysis of cellulose and is one of the indispensable process steps for cellulosic bioethanol production.

Key words: *cellulose, FT-IR, glucose, hemicellulose, HPLC, lignin, SEM*

Acknowledgement: *This work was supported by “DECIDE -Development through entrepreneurial education and innovative doctoral and postdoctoral research, project code POCU / 380/6/13/125031, project co-financed from the European Social Fund through the 2014 – 2020 Operational Program Human Capital”*

ACTIVE PACKAGING – PVA BIOFILMS WITH BIOPOLYMERS

Student: Rodica-Anita VARVARA,
Coordinating Professor: Prof. Dr. Ing. Dan Cristian VODNAR
Dr. Ing. Katalin SZABO
*Facultatea Știința și Tehnologie Alimentelor,
Universitatea de Științe Agricole și Medicină Veterinară,
Cluj-Napoca, România*

Abstract:

Food packaging has the purpose to maintain the quality and safety of the food during transport and storage. The plastic packaging fulfill those conditions, but they also contribute significantly to environmental pollution. The aim of this study was to obtain a biodegradable, economical and edible packaging that acts as an antibacterial barrier on the surface of food.

The active biofilms were prepared from polyvinyl alcohol (PVA) with the addition of itaconic acid (AI) and chitosan (Ch), and enriched with extracts from tomato by-products (TBE). The physical and antimicrobial properties of the two biopolymers (Ch, AI), were studied, but also of the tomato extract (TBE) - rich in carotenoids and phenolic compounds. TBE-containing samples showed an improvement in physical properties (diameter, thickness, weight, density) compared to control biofilms (consisting of PVA + Ch, respectively PVA + AI). TBE and Ch give biofilms antibacterial effects, the best inhibition was against *S. aureus* and *P. aeruginosa*, with a minimum inhibitory concentration (MIC) of <0.078 mg DW/mL. Moreover, PVA and AI films have antimicrobial activity against *P. aeruginosa* (2.5 mg DW/mL). The total phenolic content was determined by the Folin-Ciocalteu method, and the PVA-Ch-TBE samples showed the highest values.

These results indicate that PVA-Ch-TBE films can be used to develop active biofilms systems suitable for food packaging.

Key words: by-product, chitosan, carotenoids, food packaging, itaconic acid, poly (vinyl alcohol)

RESEARCH OF THE EFFICIENCY OF PNEUMATIC DRIVE WITH THE FUNCTION OF ENERGY RECOVERY IN EQUIPMENT FOR PACKAGING OF FOODSTUFFS

Student Vladyslav YAKYMCHUK,
Prof. Olexander GAVVA

*Faculty of machines and devices for food and pharmaceutical
production, National University of Food Technology, Ukraine*

Abstract:

The concept of using pneumatic accumulators for energy recovery in pneumatic drives of functional mechatronic modules of a packing installation is substantiated. A mathematical model of astatic processes that occur during the braking of the output link of the pneumatic actuator in the dosing and packaging devices of packaging equipment by back pressure of air in an additional volume (receiver); the general functional dependences of the criteria of working time and energy consumption on the initial parameters of the additional volume in the pneumatic drives of the packing and dosing platform are obtained; Established the rational parameters of additional volume (receiver) in control schemes of the pneumatic actuator of a packing and dosing platform for the minimum power expenses. It is established that at the initial pressure of compressed air in the additional volume of more than 0.4 MPa, its value does not affect the quality of the pneumatic system. Reducing the initial pressure of compressed air leads to a significant impact on the kinematic characteristics of the pneumatic actuator, and the time of the technological operation depends on the amount of additional volume.

Key words: *additional volume, energy recovery, mechatronic module, pneumatic drive, receiver.*

STUDIES REGARDING THE BREAD QUALITY CHARACTERISTICS OBTAINED WITH DIFFERENT LEVELS OF SEA SALT ADDITION

Student: Andreea VOINEA

Coordinating Professors:

Prof. Ph.D.Eng. Georgiana CODINĂ

Lecturer Ph.D.Eng. Silviu STROE

Faculty of Food Engineering

Stefan cel Mare University of Suceava, Romania

Abstract:

The aim of this paper was to investigate the effects of the sea salt (from the Dead Sea) addition on the quality characteristics of the bread obtained. Due to excessive sodium consumption nowadays, the paper wants to investigate the possibility of replacing common salt (sodium chloride) in bread with sea salt from Dead Sea (which presents a low sodium chloride content – maximum 7%). This study analyzes the effect of low-sodium sea salt from the Dead Sea (to a level of 0, 0.3, 0.6, 0.9, 1.2, 1.5%) as a substitute for sodium chloride on the quality characteristics of the bread samples such as texture by using a textural analyzer (Perten TVT 6700, Hägersten, Sweden), loaf volume, porosity, elasticity according to the Romanian standard SR 91:2007 method and color by using a Konica Minolta CR-700 colorimeter. The bread sensory characteristics were analyzed according to a 9 point hedonic test by using 30 semi-trained panelists from the Stefan cel Mare University, Faculty of Food Engineering. As raw material base for bread samples a refined wheat flour of a 650 type of a very good quality for bread making (6 mm deformation index, 30% gluten content) and a low α amylase activity (falling number 322 s) was used. According to the data obtained the bread samples were well appreciated from the sensory point of view even more with the increase level of sea salt addition. Also, the bread samples presented good physical characteristics when high levels of sea salt were incorporated in bread recipe. From the color point of view, the bread samples were lighter when low levels of sea salt were added in bread recipe.

Key words: *sea salt with low sodium content, bread quality characteristics*

PARTICULARS OF CONSUMPTION OF FOODS RICH IN TRANS FAT IN THE REPUBLIC OF MOLDOVA

Student: Marcel ZACUȚELU

Coordinating Professors

Assoc. Prof. PhD. Aurica CHIRSANOVA,

Prof. PhD. Rodica STURZA.

*Faculty of Food Technology, Department of Oenology
and Chemistry, Faculty of Food Technology
Technical University of Moldova, Republic of Moldova*

Abstract:

The main objectives of the study were to identify foods rich in trans fats preferred by the adult population of the Republic of Moldova and to analyze the practices, attitudes and behavior regarding the consumption of foods high in trans fats. It has been found that citizens consume ten times more trans fat than the daily limit recommended by the WHO. This leads to an increase in the number of cases of cardiovascular disease and obesity, which, in the context of the COVID-19 pandemic, considerably increases the risk of severe complications. The traditional specific range of fats used for cooking in households remains dominated by sunflower oil (n 949 / 77.15%), and tallow and lard are still used with a dangerous frequency (n 189 / 15.39%). At the same time, the consumption of foods containing trans fats is dominated by: salty and sweet biscuits, cookies; chips, french fries, burgers, frozen dough - puff pastry or for pizza and others.

Conclusions. Further efforts are needed to provide information to raise awareness among Moldovan consumers about the effect of trans fats on their health and to limit their consumption.

Keywords: *trans fats, questionnaire, nutritional behavior, Republic of Moldova*

RHEOLOGICAL PROPERTIES OF SUSPENSION IN THE PROCESS OF GRINDING IN BEAD MILLS

Student: Oleksandr ZAPOROZHETS,
PhD student: Kateryna HRININH,
Coordinating Professor: Assoc. Prof. Oleksii GUBENIA
National University of Food Technology, Ukraine

Abstract:

The scientific literature is not enough data to change the rheological properties of suspensions based on vegetable fats during their treatment in the bead mill.

Research of ultrafine grinding of suspensions were made in a laboratory bead mill of periodic action. Working elements are small glass balls with a diameter of 2 mm. The suspension was prepared according to the recipe: iron pigment 120 red – 40% and castor oil – 60%. Research of rheological characteristics were performed on a rotary viscometer and use a cylindrical measuring device H.

The obtained results make it possible to construct a flow curve of the suspension under standard conditions (20 °C) and during grinding. Within the research range, the suspension does not change the nature of the flow depending on the time interval of grinding and temperature changes. The flow curve has features and is explained by formation of the structure. The finished product has 6.5 times higher viscosity than pure castor oil, which is due to the high dry matter content (40%) and the increase in the newly formed area. The viscosity of the suspension varies depending on the temperature: cooled to 20 °C, the finished product has a viscosity of 22.5% higher than immediately after the grinding process with a temperature of 34 °C.

Key words: *grinding, mill, product, research, suspension, type, viscosity.*