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for Students**

**“STUDENT IN BUCOVINA”**

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**STUDENT IN BUCOVINA**  
**ABSTRACTS**

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

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**Motto**

*“Life isn't about finding yourself.  
Life is about creating yourself.”*

***George Bernard Shaw***



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## ***PSEUDOCEREALS AS FUNCTIONAL INGREDIENTS IN BREADMAKING***

PhD Student: COȚOVAU Ionica

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

MIRONEASA

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*Ștefan cel Mare University of Suceava, Romania*

### **Abstract:**

The use of pseudocereals to development of food products has increased and is attracting much attention from researchers, especially in the production of bakery products. Bread made from refined wheat flour does not adequately meet the requirements for many macro- or micro- nutrients. Wheat protein lacks the balance of essential amino acids lysine, threonine and valine. The blending of wheat flour with pseudocereals flour to produce various products represents a one way to improve its nutritional value. The positive impact of the use of pseudocereals-wheat composite flour can be seen in the final product related to functional properties and health benefits of pseudocereals along with the doses mixing with wheat flour. The nutritional potential of pseudocereals is based on level and heigh quality of protein and depende on varieties. In regard to their healthy aspects, these grains do not contain gluten - like proteins, being suitable for people with wheat intolerance. Pseudocereals such as buckwheat, amaranth and quinoa have been suggested as functional ingredient to obtain a protein-enriched baked product with improved amino acids balance. In addition, the pseudocereals are important source of carbohydrates, vitamins and minerals. Furthermore, some studies showed an increase in mineral bioavailability and a lowering of glycemic response in healthy consumers when pseudo cereals, like chickpea flour are added to the diet. Pseudocereals have been found to be alternative sources of raw materials in the enrichment of cereal products or for designing of new products with healthful properties which can improve the nutritional status of the population.

**Keywords:** *baked products, functional ingredients, pseudocereals*

***CATIONIC CLAY TYPE SMECTITE -  
CHARACTERIZATION AND SYNTHESIS, USED FOR  
SEWAGE TREATMENT***

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MIRILĂ,

Coordinating Professor: Prof. PhD. Denisa- Ileana NISTOR

*Faculty of Engineering,*

*Vasile Alecsandri" University of Bacau, Country Romania*

**Abstract:**

Clay is a fine-grained sedimentary rock ( $<2 \mu\text{m}$ ), consisting of a mixture of silicates and quartz fragments. Cationic clays are made up of tetrahedral and octahedral units maintained by interlayer cations. These may be trioctahedral and dioctahedral depending on the predominant cations of  $\text{Al}^{3+}$  and  $\text{Mg}^{2+}$  respectively in the octahedral unit. Montmorillonite is a smectite clay extracted from bentonite, which is distinguished by two tetrahedron sheets arranged in the hexagonal rings. These two sheets are connected through another octahedral sheet of tetrahedra with common tips. It presents major substitutions in the octahedral sheet and less in the tetrahedral, the  $\text{Al}^{3+}$  ion in the octahedral sheet can be replaced by  $\text{Mg}^{2+}$  and  $\text{Fe}^{3+}$  and the  $\text{Si}^{4+}$ ,  $\text{Al}^{3+}$  ion in the tetrahedral sheet, this substitution being responsible for the negative loading of the lamellae. In nature, the negative charge is counterbalanced by the inclusion of  $\text{Na}^+$  ions and  $\text{Ca}^{2+}$  between the clay lamellae. In this study we proposed to synthesize a smectite clay, montmorillonite, through the pillaring process. This process consists of two stages: intercalation of clay with different cations and calcination thereof.

**Keywords:** *cationic clay, environment pollution, Montmorillonite, smectite, pillaring, wastewater;*



## ***IMPROVEMENT THE PROCESS OF THE ULTRAFINE GRINDING OF MEDICINAL AND COSMETIC MEANS***

PhD student Kateryna HRININH,

Student Anatolii YATSIUK

Coordinating Professor: As.Prof. Oleksii GUBENIA

*National University of Food Technology, Ukraine*

### **Abstract:**

Considering of the advantages and disadvantages of machines for the ultrafine grinding of components of drugs and cosmetics (jet mills, colloidal mills, roller mills and bead mills), it is recommended to use bead mills because they provide high productivity, the degree of uniformity of particle size and shape of the size of the suspension.

It has been established that with increasing time of grinding the power, temperature, density and particle size decreases. This is due to the fact that when the size of the material particles increases, their strength increases, so more power is consumed and, accordingly, more energy is expended to overcome the forces of mutual grip. Reducing the size leads to the dissipation of energy in the form of heat and goes to the movement of particles inside the body, without causing its destruction. Also, the smaller the particle size, the larger the area of the newly formed surface, and consequently increasing the slurry density and the amount of energy to be applied, and increasing the energy dissipation in the form of heat.

Recommended rational parameters for grinding cosmetic suspension based on castor oil: camera volume 0,05 m<sup>3</sup>; size of beads - 10 mm; type of discs - monolithic with symmetrical openings; speed of working bodies - 450 rpm; grinding time - 50 min.

**Key words:** *beads, cosmetics, drugs, grinding, mill, pharmacy.*

## **RESEARCH ON OBTAINING $\beta$ -GLUCAN FROM YEAST FOR ENHANCING THE BIOACTIVE POTENTIAL IN FOOD PRODUCTS**

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

### **Abstract:**

This paper is focused on obtaining the most convenient source of  $\beta$ -glucan from yeast available on the market which can be used in the formulation of functional food.

$\beta$ -Glucans are biopolymers ubiquitous in the cell walls of microorganisms, mushrooms and plants. It is a non starch polysaccharide composed of linear  $\beta$ -(1-3) glycosidic bonds highly branched with  $\beta$ -(1-4) or  $\beta$ -(1-6) linkages depending on the origin. According to the literature, it is demonstrated that  $\beta$ -glucans derived from different sources as well as molecular mass and conformational structure can lead to a particular response from body like: immune-stimulation, lowering cholesterol, antitumoral effect, anti-inflammatory and hypoglycemic activity. Clinical studies reveal that  $\beta$ -(1-3)-(D)-glucan with  $\beta$ -(1-6)-glucan linkage exhibits the most powerful biological effects.

In order to determine the highest concentration of  $\beta$ -glucan, different types of active yeast of the *Saccharomyces* species available were used. Of these, two types of baker's yeast were chosen from a native producer and an imported yeast, a brewer yeast species, and a wine yeast strain.

The experimental results showed that brewery yeast presents the highest level of  $\beta$ -glucan content up to 15.91% followed by bakery yeast and wine yeast.

**Key words:** *biological effect, cell wall, conformational structure, functional food,  $\beta$ -glucan, yeast.*

***PARTICLE SIZE, ADDITION LEVEL AND VARIETY  
INFLUENCE OF GRAPE SEED FLOUR ON THE***

## **VISCOELASTIC PROPERTIES OF WHEAT FLOUR DOUGH AND GLUTEN**

PhD Student: Mădălina IUGA

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

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

### **Abstract:**

Grape by-products use can improve food nutritional value due to their antioxidant fiber content. The non-gluten components from grape seeds are interacting with gluten proteins to form different aggregates that will influence the rheological behavior of dough and thus, the bread quality.

The aim of this study was to evaluate the effects of the particle size, addition level and variety of grape seeds flour (GSF) on the viscoelastic properties of white wheat flour dough and gluten.

The physico-chemical characteristics of flours were determined according to the standard methods. The complex viscosity was recorded with a Haake Mars 40 dynamic rheometer in the linear viscoelastic region by using a frequency sweep test and a temperature sweep test. The ANOVA univariate statistical test was used to see if there are significant differences between the mean values and the *post hoc* analysis by the least significant difference (LSD) comparison test was used to see where the significant differences were.

The results revealed that GSF influenced the viscoelastic behavior of dough and gluten depending on the variety, addition level and particle size. The changes are related to the chemical constituents of grape seeds which are rich in fibers, lipids, proteins and antioxidants. The results obtained can be used to predict dough behavior during bread making so that it has the best sensory and textural properties.

**Keywords:** *dough, grape seeds, gluten, statistical analysis, viscoelastic properties, wheat flour.*

### **Acknowledgements**

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**NEW TRENDS IN FOOD PACKAGING INDUSTRY:**

## ***BIO-BASED EDIBLE MATERIALS INCORPORATED WITH INULIN***

Student: Roxana PUȘCĂȘELU,  
Coordinating Professor: Prof. Ph.D. Sonia AMARIEI  
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Stefan cel Mare University of Suceava, Romania*

### **Abstract:**

Lately, inulin has become increasingly used by food industry manufacturers due to the benefits, but also to a widespread spread. It is a natural fiber that has always been part of the human diet; can replace carbohydrates or fats and have health benefits to consumers.

Because of the advantages in use, inulin has also been used as an ingredient in the development of edible packaging materials along with hydrocolloids such as agar, sodium alginate or starch. Due to the increased solubility or even complete solubilization, but also to the mechanical strength (in case of sample with high amount of inulin, the breaking strength could not be determined because it proved to be stronger than the set parameters, and the elongation presented extremely high values: if initially it was over the possibility of evaluation, after one month reached a value of over 380%), it could be successfully used into the packaging industry.

Biofilms obtained and tested over a three-month period can be used to package products that require solubilization/rehydration before use (instant beverages, dried fruits and vegetables, sauces, etc.). Keeping quality during the testing period indicates the safety of packaging products in this type of material. The addition of inulin improved the appearance, mechanical properties (elongation) and facilitated solubilization. Depending on the necessity and use, industry can control the amount of added inulin so that the desirable product results.

**Keywords:** *biofilms, biopolymers, ecosystem, fiber, instant beverages, solubility*

## **CHEMICALLY MODIFIED CATIONIC CLAYS AND THEIR USES IN FOOD DYES REMOVAL – BY ADVANCED OXIDATION PROCESSES**

PhD. Student : Mirilă Diana Carmen<sup>1</sup>,  
Coordinating Professors: Denisa Ileana Nistor<sup>1</sup>, Abdelkrim  
Azzouz<sup>2</sup>, Mohamed Amine Didi<sup>3</sup>

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Alecsandri” University, Romania;*

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<sup>3</sup> *University of Abou Bekr Belkaid-Tlemcen, Algeria*

### **Abstract:**

Advanced oxidation processes are a set of chemical treatment methods and procedures used to remove pollutants present in wastewater by oxidation through the reaction who involve hydroxyl radicals formation. The advantages and drawbacks of these processes are highlighted, while some of challenges (decrease of operational cost, adoption of strategies for processes integration) are ongoing. These processes are sensitive to variations in temperature, pH, ozone concentration, pollutant concentration, the amount of catalyst used and the duration of the oxidation of pollutants is high. In order to remove these shortcomings, in this paper we propose the preparation of heterogeneous cationic catalysts, based on chemically modified composites materials of the smectite type, and testing them for the total elimination of chromophore groups of dyes from the food industry.

**Keywords:** *clays, dyes, ion exchange, oxidation, pillaring, wastewaters*

## ***GRAPE PEELS – WHEAT COMPOSITE FLOUR GLUTEN CHARACTERISTICS EVALUATION***

Student: Mădălina IUGA

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

MIRONEASA

*Faculty of Food Engineering,*

*Ștefan cel Mare University of Suceava, Romania*

### **Abstract:**

Grape by-products can be used to improve food nutritional value due to their antioxidant fiber content. Gluten is a protein network formed during the mixing of wheat flour with water and it affects bread loaf volume. The non-gluten components from grape peels are interacting with gluten proteins to form different aggregates that will influence the rheological behavior of dough and thus, the bread quality.

The aim of this study was to establish the relationships between the Glutograph and Farinograph parameters and composite flour analytical characteristics in order to estimate the effect of grape peels addition on the gluten quality. For this purpose, grape peels with different particle sizes (large, medium and small) were added at five levels (0, 3, 5, 7 and 9%) to wheat white flour. A Brabender Glutograph-E and a Brabender Farinograph were used to determine the rheological properties of dough samples. The analytical characteristics of the composite flour were determined according to the standard methods.

The results revealed that the rheological behaviour of dough gluten and the analytical characteristics of the composite flours are affected by grape peels addition, depending on the particle size and addition level. Some correlations between the Glutograph, Farinograph parameters, and the characteristics of composite flour were obtained. These results can be used to estimate dough behavior during the technological processes of bread making.

**Keywords:** *dough, grape peels, gluten, Glutograph, Farinograph, wheat flour.*

### **Acknowledgements**

This work was supported by a grant of the Romanian National Authority for Scientific Research and Innovation, CNCS/CCCDI – UEFISCDI, project number PN-III-P2-2.1-BG-2016-0136, within PNCDI III.

## ***IDENTIFICATION OF THE LACTIC ACID BACTERIA ISOLATED FROM THE KOUMISS, KYRGYSTAN***

Student/s: Ruslan Adil Akai Tegin, PhD

Coordinating Professor: Assoc. Prof. Dr. Anarseit Deydiev

*Faculty of Engineering, Food Engineering Department*

*Kyrgyz-Turkish Manas University, Kyrgyzstan*

### **Abstract:**

Koumiss is the historically oldest national drink. Mankind knew about the beneficial effects on health from time immemorial. The scientists are interested in composition of Koumiss from mare's milk that contains not only valuable nutrients, but also probiotic cultures, which safely affect human health. Koumiss is widely consumed in Kyrgyzstan, Kazakhstan, Mongolia and some regions of Russian and China. For this study, samples of Koumiss were collected from the pastures of Naryn and Chuy (Kashka-Suu) and microbiological analyzes were made in the laboratory.

A total number of 22 samples were obtained from the pastures of the Naryn region, and also samples from the newly smoked cask from Kashka-Suu. From the smoked cask samples were taken after 2, 4, 7, 10, 12 and 15 hours, the subsequent tests were taken once a day for 5 days. The Lactic Acid Bacteria cultured at 30 °C in MRS agar. The identification of the selected strains was carried out with the PCR, Vitec 2 Compact, and MALDI-TOF-MS.

As a result of identification the Lactic Acid Bacteria such as *Lactobacillus helveticus*, *Lactobacillus kefir*, *Leuconostos mesenteroides*, *Lactobacillus paraplantarum*, *Leuconostos mesenteroides ssp.cremoris* were determined. In addition, the antibiotoxic effect of koumiss against pathogenic bacteria *E. coli* and *L.monostogenes* was also determined.

**Keywords:** identification, koumiss, lactic acid bacteria, *Lactobacillus ssp.*, *Leuconostos ssp.*,

## ***COMPARATIVE STUDY BETWEEN BARELY GRASS POWDER AND ALFALFA POWDER, AND THE POSSIBILITY OF USING THEM AS FOOD INGREDIENTS***

Student/s: Victoria BEGLIȚA, Mădălina IUGA  
Coordinating Professor: Prof. Ph. Silvia MIRONEASA  
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"Stefan cel Mare" University of Suceava, Romania*

### **Abstract:**

Contemporary society has a dynamic rhythm of life. The active life also requires a good nutritional support. Unfortunately, the contemporary man fails to ensure a diet that includes all the necessary nutrients. Nutritional supplements can alleviate this problem. Supplements come in a variety of forms: tablets, capsules, powders, as drinks and energy bars.

Green barley powder and alfalfa powder are supplements that have significant functional and nutritive characteristics. The green barley powder is a complex source of very valuable nutrients that are necessary for the human body as a daily intake: proteins, vegetable fibers, vitamins (A, B, C, E, P) minerals (K, Fe, Zn, Cu), chlorophyll. Alfalfa powder contains a large amount of enzymes, anti-inflammatory substances, betacarotene, vitamins B6, C (more than citrus), E, D, K and U, as well as minerals (calcium, phosphorus, iron, potassium, magnesium). These powders have a preventive and therapeutic role for many diseases.

The aim of this study is to present the possibility of using barely grass powder and alfalfa powder as food ingredients. The introduction of these powders into food requires the analysis of certain parameters such as: water retention capacity (WRC), water swelling capacity (WSC), oil adsorption capacity (OAC), water absorption index (WAI), cation exchange capacity (CEC). These parameters have a significant impact on the finished product. The results highlight the possibility of using these supplements as ingredients.

**Keywords:** *barley grass powder, alfalfa powder, food, supplements, ingredients, functional characteristics.*



## **OPTIMIZATION OF INULIN, CALCIUM AND MAGNESIUM COMBINATION FOR IMPROVING BREAD FROM WHITE WHEAT FLOUR**

Denisa ATUDOREI, Ana CIMPOI, Andreea VOINEA  
Coordinating Professor: Ph.D. Georgiana Gabriela CODINĂ  
*Faculty of Food Engineering, Ștefan cel Mare  
University, România*

### **Abstract:**

In the world, bread is the most consumed food by peoples. Bread was enriched with inulin, a prebiotic and minerals such as calcium and magnesium in order to obtain a functional food of a good quality from the technological point of view. The formulation was used in order to improve bread from the nutritional point of view and were chosen due to the fact that magnesium and calcium absorption by the human body increased by the addition of inulin, a soluble fiber. Levels of ingredients in bread such as inulin, calcium lactate and magnesium gluconate were optimized using response surface methodology (RSM) for its physico-chemical (loaf volume, porosity, elasticity), sensory (appearance, colour, taste, smell, texture, flavor, overall acceptability), colour (L, a, b) and textural attributes (springiness, cohesiveness, resilience, firmness, gumminess, chewiness). Studies indicated that the composition of inulin, calcium lactate and magnesium gluconate was found to have significant effect on the dependent variables. The optimum formulation obtained in order to achieve a bread of a good quality contained 3.57 g/100 g inulin, 2.00 g/kg calcium and 1.37 g/kg magnesium.

**Keywords:** *bread quality, calcium lactate, magnesium gluconate, inulin, refined wheat flour*

**Acknowledgement:** This work was supported by a grant of the Romanian National Authority for Scientific Research and Innovation, CNCS/CCCDI-UEFISCDI, project number PN-III-P2-2.1-BG-2016-0079, within PNCDI III

## ***ASPECTS CONCERNING OBTAINING AN INNOVATIVE FUNCTIONAL YOGURT***

Students: Iulia-Andreea CIORNEI, Dumitrița FLAIȘ  
Coordinating: Assoc. Prof. Ph.D. Eng. Adriana DABIJA  
*Faculty of Food Engineering*  
*Stefan cel Mare University of Suceava , Country ROMANIA*

### **Abstract:**

Yogurt is one of the popular fermented milk products known for thousands of years and has a dietary product with many desirable effects. This paper proposed a set yogurt with 8% fat content, yogurt that is innovative in many ways, including: composition, texture, and packaging. In terms of composition, the innovation consists in the combination of two ingredients: buckwheat and oat fiber with yogurt, mix that is not found on the world market for dairy products. Buckwheat and oats are important sources of energy due to the high starch content, high-quality proteins, dietary fibers, and lipids which rich in unsaturated fatty acids. The antioxidant substances from buckwheat have a preventive role in the development of cancer, cardiovascular diseases, neurodegenerative diseases. Nowadays, global interest in oat has begun to grow more and more due to its bioactive and functional components:  $\beta$ -glucans, antioxidants, sterols, proteins and polyunsaturated acids. Adding buckwheat flour and oat fibers to the simple yogurt formula changes the physicochemical, textural and sensory properties of finished product. This new product can be obtained at the industrial level without changing the technological procedure.

**Keywords:** *bioactive components, buckwheat, functional food, oat fibers, rheological properties, syneresis*

## ***THE EVALUATION OF QUALITY OF SELF-PRODUCED POLISH MEAD***

Students: Adrian Frydrych, Wiktoria Litwa

Coordinating Professor: Assoc. prof. Małgorzata Dżugan PhD,

Assoc. prof. Agata Znamirska PhD,

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### **Abstract:**

Mead is a traditional alcoholic drink of honey which were produced and consumed by the ancient Greeks before they began to produce wine. The aim of study was to produce and quality examination of the mead made from honeys coming from the Podkarpackie region. Four samples of honeys were used: "pale" (mix of rapeseed, acacia, linden, goldenrod and multiflora honey), and "dark" (mix of honeydew, buckwheat, heather and multiflora honey). Before fermentation honey were liquefied in an ultrasonic bath at 40 °C. The fermentation medium was prepared from honey diluted using natural spring-water in the ratio 1:1 ("dwójniak") and 1:2 ("trójniak"). The pH was corrected to 3.8 with citric acid and mixture was inoculated with *Bayanus* yeast. After 1 month of fermentation obtained alcoholic beverages were decanted and analyzed regarding to alcohol (distillation followed by pycnometric measurement), reducing sugars (colorimetric method using a DNS reagent), pH, and titrimetric acidity). For the antioxidant activity evaluation two methods were used (DPPH and FRAP).

Among studied meads, "dwójniak" was characterized by a lower alcohol content (7-8%) than "trójniak" (11-15%) and contained more sugar (26-31 and 12-14%, respectively). Meads made from dark honeys had higher antioxidant activity than meads made from pale honeys. The meads, preserve a beneficial properties of honey, and they can be consider as a valuable alcoholic beverage.

**Keywords:** *alcohol content, antioxidant activity, mead production, reducing sugars,*

## ***EFFECT OF KNIFE SPEED AND PRODUCT STRUCTURE ON CUTTING FORCE***

Students: Mariia ALIPATOVA<sup>1</sup>, Maksym SPOLOVYCH<sup>1</sup>  
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*2 - National Research Institute of Industrial Safety and Labor  
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### **Abstract:**

It is known from the production practice and own scientific research, as well as from the analysis of scientific literature, that the cutting forces are influenced by the speed of the knife in the product and the product structure, namely, location of the layers of the product in the multilayer material relatively to the movement of the knife. Research has been conducted to determine these dependencies for different food products. The process of cutting of bread, frozen and raw meat, sugar beet, cheese, as well as some model multi-layer packaging materials – foam with polymer films was studied.

For the visco-elastic products (crumbled bread, cheese, raw meat) if speed of the knife is increases, the cutting force increases, and then, at knife speeds of more than 3–6 m/s – cutting force decreases. Note that with the decrease in strength, the quality of the sliced product also becomes better – product doesn't destroy and doesn't deform.

This is explained by the fact that at high cutting speeds the destruction of visco-elastic products occurs with less plastic deformation, and consequently, less effort is exerted on deformation. If the product has a solid, thin layer, then the cutting effort will be smaller if the thin layer is cut at the beginning. If the thin layer is cut at the end of the process, it creates resistance to the deformation of the bulk of the product during the movement of the knife. There are additional friction forces that increase the overall resistance of the knife movement.

**Keywords:** *cutting, food, force, quality, speed, structure.*

## ***CALCULATION OF ENERGY EXPENDITURE OF THE DOUGH KNEADING PROCESS***

Students: Andrii ANISIMOV, Mykhailo ILCHUK

Coordinating Professors: As. Prof. Ph.D. Yuliya

TELYCHKUN, Vitaliy RACHOK

*National University of Food Technologies, Kyiv, Ukraine*

### **Abstract:**

Determination of energy expenditure is necessary for calculation the dough machine and energy analysis of specific stages of the process, improving the mechanism and justification of the parameters of specific kneading stages, depending on the subsequent operations of the technological process. The amount of energy consumed for mixing can be determined experimentally and calculated according to the proposed method of prof. O. Lisovenko. The energy balance for a dough machine with a rotary movement of a kneading blade is determined by one cycle of the kneading blade.

However, the comparison of experimental data with the results of calculations of a particular dough machine shows that they are significantly different. The calculation does not fully take into account the energy expenditure on the viscous friction of the mass of the dough during mixing and the change in the structural and mechanical properties of the dough mass, the transition during mixing from the particular powder and liquid masses to the complex structure, which is characterized by non-Newtonian properties.

Recent theoretical and experimental studies of the process kneading of wheat dough proves the necessity of making changes to the technique of calculation energy consumption for the process of mixing, the exclusion of the formal approach to this process and the consideration of energy expenditure for the structural transformations, which are significant in terms of energy expenditure and quality of the dough semi-finished product.

**Keywords:** *dough, energy, expenditure, kneading, machine, quality.*

## ***RESEARCH OF VACUUM COOLING OF BREAD***

Students: Valentyn CHERVONYI, Mykhailo BENZEL  
Coordinating Professors: prof. Volodymyr TELYCHKUN,  
as. prof. Mykola DESYK  
*National University of Food Technologies, Kyiv, Ukraine*

### **Abstract:**

Cooling of hot bread after baking before cutting and packaging is relevant for the baking industry. The traditional way of cooling and storing bread on trolleys (containers) involves the use of manual labor. Equipment which is used in bakeries to cool bread is massive, and the process is long.

The application of the vacuum bread cooling method is expanding, and this method makes it possible to reduce the cooling time, reduce the cost of equipment and production space. To study the processes of cooling the bread under vacuum, we have created an experimental installation, which includes: vacuum chamber, vacuum pump, condenser, control and control devices.

The obtained temperature curves of bread-dough and its following cooling in vacuum and storage conditions indicate a significant reduction in the cooling process of bread in vacuum conditions compared with traditional ones. It was found, that from 98 °C to 30 °C 5,5–6% of moisture evaporates from the weight of the billet during vacuum cooling, while cooling in a storage facility, the amount of evaporated moisture is 2.5–5%. Slight moisture losses in vacuum cooled billets can be compensate with shorting of baking time, and such benefits as reducing the process length, reducing energy consumption costs for cooling products, and improving their qualitative indicators, which testifies about prospects of vacuum cooled bread.

**Keywords:** *baking, bread, cooling, dough, temperature, vacuum.*

## ***AGROPRODUCTIVE BEHAVIOR OF AN EARLY CABBAGE VARIETY IN DIFFERENT MULCHING AND FERTILIZATION CONDITIONS***

Students: Cristina PRECUPEANU, Teodora HORVAT,  
Ioan-Sebastian ȘFABU, Georgiana RĂDEANU, Ioan ȚIFUI,  
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### **Abstract:**

The paper aims to evaluate the yield capacity of the early cabbage variety (Delight Ball) in conditions of mulching and application of environmental friendly products in order to satisfy the market demand for healthy agri-food products.

The experience was conducted in the Vegetable Growing experimental field within the U.A.S.V.M. Iasi, during 2018, the experience being a bifactorial type. The culture was established by seedling, in two-rows strip, the distance between the strips being 80 cm and between the rows of 60 cm. The distance between plants was 25 cm resulting in a density of about 570 thousand plants per hectare. The results, under the specified conditions, show the usefulness of mulching and fertilization of early cabbage culture, the highest yields being obtained by using 30 microns wrap mulch and Orgevit organic fertilization.

**Keywords:** cabbage, Delight Ball, early production, fertilization, mulching.

## ***ACEROLA AS A FUNCTIONAL ADDITIVE FOR MILK ICE CREAM***

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*Faculty of Biology and Agriculture*

*University of Rzeszów, Country Poland*

Acerola belongs to the fruit with the highest content of natural vitamin C, which increases the body's resistance and is necessary for its proper functioning. The addition of acerola to ice cream is a good supplement to supplementation combined with refreshing and pleasant taste, i.e. ice cream characteristics. The aim of the study was to determine the possibility of using acerola in the production of milk low-lactose with mango- maracauya flavor.

Two groups of ice cream were made: the first one with the addition of acerola and the second one without acerola. 450 g of cream, 120 g of saccharose, 40 g of inulin, 490 g of milk 2%, 1 ml of NOLA Fit lactase, 3 g of Acerola, and mango-maracauya essence were used in their production. The whole was mixed to dissolve saccharose. Ice cream was placed in the fridge for 24 hours. Then the ice mixture was poured into the cooler (Unold), frozen for 40 minutes. The finished ice mass was packed into containers and coded as B. Before freezing, the chemical composition of the ice mixture were evaluated in the Bentley B-150 Chemical and Food Ingredient Analysis (% fat, protein, sugars), pH, total acidity ( $^{\circ}\text{SH}$ ) and lactic acid (g / l) After 28 days of freezing, the pH, total acidity ( $^{\circ}\text{SH}$ ) and lactic acid (g / l) were again evaluated, and the downiness of the ice cream was measured (%). Sensory evaluation was also carried out. The consumers rated samples on a 9-point scale, with markings at both ends, where "1" meant the least perceptible, least characteristic feature, while "9" defined the most intense, most characteristic feature [PN-ISO 11035: 1999]. Preference was also assessed by the scheduling method, where "1" was the most preferred ice cream and "3" was the least preferred ice cream.

Ice cream with the addition of acerola was characterized by lower pH and lower total acidity as compared to controls. The introduction



of acerola into the ice cream resulted in their greater plumpness by approx. 3.5%. Consumers preferred ice cream enriched with acerola because of their better smoothness. Analysis of texture components showed that ice cream with acerola was harder by 17.8 N than control ice cream. The addition of acerola stabilized the color, and increased the feeling of sweet taste and additives.

**Key words:** *acerola, ice cream, lactic acid, low-lactose, total acidity, vitamin C*

## ***CONSUMER PERCEPTION ON SOFT FRUIT DRINKS***

Student: Mădălin George FĂRCUȚ

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Anamaria MORNA

*Faculty of Environmental Protection, 26, Gen. Magheru,  
Oradea, University of Oradea, Romania*

### **Abstract:**

It is becoming increasingly difficult to ignore the existence of soft drink in today's markets. The production of soft drinks from fruit has become increasingly big in the last period, gradually replacing similar products containing synthesis substances, due to the very important role that fruits has in rational nutrition, high nutritional value and thanks bioactive principles contained therein.

Soft drink products have been well accepted by consumers and gradually overtaking hot drinks as the biggest beverage sector in the world. In the midst of the rapidly growing soft drink demand, the industry on the whole is encountering new opportunities and challenges.

Changing consumer demands and preferences require new ways of maintaining current customers and attracting new ones. Amid ever-increasing competition, beverage companies must intensely court customers, offer high quality products, efficiently distribute them, ensure safety and keep prices low all while staying nimble enough to exploit new markets by launching new products.

This study focuses the consumer perception and their taste in the food habits as well as their preference in fruit-based soft drinks. Understanding the behaviour of human being is more complex and it is very much difficult to learn the consumer behaviour.

The objectives of the study were to understand consumer perception toward soft drinks, to understand purchase behavior of consumer, to understand relationship between demography of population and purchase behavior and to understand what people prefer most towards soft drinks.

In this study 71.7% respondents are males and 24.7% are females.

Respondents are home based as follows: 74.4% in urban areas, and 25.6% in rural areas. 90% respondents consume soft drinks and 10% does not consume soft drinks. 21 % respondents use soft drinks daily, 39% use use weekly 22% are use monthly and 18% use occasionally. 65% respondents are under 15-25, 21% are 26-35 and 14% are above 35. The consumers, in large part, consider that soft drinks from fruits bring health benefits.

The data has clearly indicated that soft drinks products are more popular mainly because of its taste, brand name, availability and packaging, thus the companies should focus on good packaging so that it can capture the major part of the market. Thus, the ideal product should be: colorful, pulp, sweet taste, specific odor of the fruit from which it was made, opaque, served cold, packed in glass packaging, preserved by pasteurization, polychromatic label a safety feature.

**Keywords:** *soft drinks, fruit, respondents, market study.*

## ***INCREASE THE OPERATING EFFICIENCY OF THE EQUIPMENT FOR THE LIQUID NUTRIENT MEDIUM STERILIZATION***

Students: Yelyzaveta FOMENKO, Andriy KUCOLAPSKIY  
Coordinating Professor: As. Prof. Ph.D. Olena CHEPELIUK  
*National University of Food Technologies, Kyiv, Ukraine*

### **Abstract:**

The irrelevant microflora in liquid nutrient media suppresses the growth of the culture of microorganisms, as well as changes the composition and properties of the nutrient medium, so it needs to be sterilized. Existing machine-and-apparatus schemes are quite energy-consuming and difficult to maintain, so increasing their efficiency is an urgent task. The feature of the proposed scheme of continuous sterilization of a liquid nutrient medium based on molasses with a productivity of 25 m<sup>3</sup>/h is the use of two contact heads, one of which is heated by the secondary vapor, and a tubular heat exchanger to cool sterile nutrient medium.

Thermal and hydrodynamic processes that occur during processing, are simulated in the Flow Vision software system. The results of the computational experiment conducted in the Flow Vision software system indicate that the product speed through pipelines is on average 1.1 m/s and is sufficient to provide the desired productivity at moderate costs of transportation.

For the considered scheme, the rational values of heat carriers temperatures required to achieve the desired product temperatures during its sterilization and cooling were determined. So, the heating steam temperature should be 132 °C, the temperature of the cooling water should be 15 °C.

**Keywords:** *heat, molasses, nutrient medium, speed, sterilization, temperature.*

***THE STUDY OF DIFFERENT FERTILIZATION TYPES  
INFLUENCE ON BELL PEPPER (CAPSICUM ANNUM  
L.) CULTIVARS, IN POLYTUNNELS CONDITIONS***

Students: Georgiana RĂDEANU, Ioan-Sebastian ȘFABU,  
Cristina PRECUPEANU, Ioan ȚIFUI,  
Ștefana-Lavinia BELDIMAN

Coordinating Professors: PhD. Prof. Neculai MUNTEANU,  
PhD. Assist. Gabriel-Ciprian TELIBAN

*Faculty of Horticulture,  
“Ion Ionescu de la Brad” University of Agricultural Sciences  
and Veterinary Medicine of Iasi, Romania*

**Abstract:**

The paper aims to assess the influence of different types of fertilizations regimes on the yield of a certain bell pepper assortment, in polytunnel conditions, in Iași county. The researches were carried out in the didactic and experimental field of Vegetable Growing discipline within the Didactic Station of UASVM Iași, during 2018. The culture was established using 55 days old seedling, achieving a plant density of 33300 / ha. The experiment was organized in a device of subdivided plots, with the repetition plot area of 300 cm<sup>2</sup> (10 plants). The following cultivars were used: Barbara, Brillante and Hildi. Fertilization of said cultivars were done by using organic fertilizers – Orgevit along with Microseed MB – microorganisms. Also, an unfertilized control variant was present. The results show that the greatest yields, up to 40496 kg / ha, were obtained by using the Brillante cultivar with Microseed MB.

**Keywords:** *bell pepper, cultivar, organic fertilization, yield.*

***THE STUDY ON BEHAVIOR OF GARDEN RUNNER  
BEAN VARIETIES (PHASEOLUS COCCINEUS L.) IN  
POLYTUNNELS***

Students: Ioan-Sebastian ȘFABU, Georgiana RĂDEANU,  
Ștefana-Lavinia BELDIMAN, Cristina PRECUPEANU,  
Ioan ȚIFUI

Coordinating Professors: PhD. Prof. Neculai MUNTEANU,  
PhD. Assist. Gabriel-Ciprian TELIBAN  
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“Ion Ionescu de la Brad” University of Agricultural Sciences  
and Veterinary Medicine of Iasi, Romania*

**Abstract:**

The paper aims to assess the yield capacity of three runner bean cultivars in polytunnels conditions, in the Vegetable Growing didactic and experimental field, within the UASVM, during 2018. The culture was established by 15 days old seedlings, two plants at the nest, using three cultivars from Great Britain (Lady Di, Desiree and Polestar), with a set up scheme of 120 x 60 cm.

The results revealed the main morphological characters and their evolution during the growing season and the yield potential, which ranged from 17011 kg / ha (Desiree) to 25361 kg / ha (Polestar).

**Keywords:** *Pods, polytunnels, runner bean, seedling, yield potential.*

## ***ECOLOGICAL FARM CERTIFICATION – THE SAFETY OF PRODUCTS OFFERED TO CONSUMERS***

Students: Ioan ȚIFUI, Ioan-Sebastian ȘFABU,  
Georgiana RĂDEANU, Cristina PRECUPEANU,  
Ștefana-Lavinia BELDIMAN

Coordinating Professor: Prof. univ. Dr. Vasile STOLERU,  
Asist. univ. Dr. Gabriel TELIBAN

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and Veterinary Medicine of Iasi, Romania*

### **Abstract:**

The focus of the paper is on the demonstration mode of the stages that an agricultural holding have to go through for the ecological certification.

In this regard, it was performed a case study where, step by step, we followed the completed stages of S.C.D.L Bio-Bac Bacau from inregistration as ecological agriculture operator pending the certificate of conformity. These stages are applicable for every farm who want to obtain and sell healthy agri-food products below the "organic" logo.

Bio-Bac Bacau fulfilled every fundamental criteria, creating a good example for other farmers, Vegetable Resort and Development Station Bacău being able to provide a wide variety of seed, healthy vegetables product or processed on the market.

**Keywords:** *certification, vegetables production, inspection, food safety.*

## ***SYNTHESIS AND CHARACTERIZATION OF ANIONIC CLAY NANOMATERIALS - USED FOR WASTEWATER REMEDIATION***

Student/s: Mădălina-Ştefania PÎRVAN

Coordinating Professor: Prof. PhD Eng. Denisa Ileana NISTOR<sup>1</sup>, Prof. PhD Laurance PIRAULT-ROY<sup>2</sup>, Prof. PhD Rachid Brahmi<sup>2</sup>, Prof. PhD Mohamed Amine DIDI<sup>3</sup>

<sup>1</sup> *Faculty of Engineering, „Vasile Alecsandri” University of Bacau, Country Romania*

<sup>2</sup> *Institute of Chemistry of Materials and Materials in Poitiers) (UMR 7285), Poitiers University, Country France*

<sup>3</sup> *Abou Bakr Belkaid University of Tlemcen, Department of Chemistry, Country Algeria*

### **Abstract:**

In this work we studied retention of pollutants like polycyclic aromatic hydrocarbons, from liquid effluents, on simple anionic clays of the type Layered Double Hydroxydes (LDHs) and functionalized. This pollutants, which can result from various industries such as the plastics industry (PVC), adhesives, dyes, insecticides and others. Polycyclic pollutants are very toxic and not real degradable and can affect human health as well as the balance of ecosystems and the environment. To remedy this pollution and to allow retention of this, we have studied different adsorbent materials such as anionic clays. We therefore prepared samples of Mg-Al anionic clays in a 3: 1 ratio called. We then determined the best operating conditions in order to maximize the amount of retained pollutants. Using LDH material, adsorption isotherms were determined as a function of agitation rate and temperature. Also, we have studied the key parameters that can influence the retention of pollutants on these materials. In conclusion, if we add the LDH material, we can functionalize the anionic clay to achieve a more efficient material concern the retention of pollutants. For the retention of pollutanta we used different quantities of adsorbent material in accordance with the other working conditions: dynamic regime, temperature; optimum pH and duration. The materials used in this study were synthesized in the laboratories of the "Vasile Alecsandri" University of Bacau, Romania, the Institute of Chemistry of



Materials and Materials in Poitiers (IC2MP) of Poitiers, France and University of Tlemcen, Algeria. The LDH Mg: Al material was obtained by co-precipitation at a constant pH . For this purpose, we prepared a solution containing the  $MgCl_2$  salts at 0.3 mol / L and  $AlCl_3$  at 0.1 mol / L, therefore in a molar ratio of 3/1, which we put in contact with a solution of NaOH. The resulting material was dried and then calcined. The synthesized materials have been studied using a set of techniques to highlight their most important characteristics. We first used the XRD analysis which is a microstructure analysis that gives us information about the structural properties of the materials and FTIR spectra for the inclusion compound. The synthesized materials will be used for wastewater, stopping the degradation of the environment.

**Keywords:** *clay, layered double hydroxydes, wastewater, pollutant retention*

## ***CHEMOMETRIC APPROACH OF UV-VIS ANALYSES FOR THE DISCRIMINATION OF COFFEE VARIETIES***

Student: Melinda-Anna MAGIARI

Coordinating Professors: Assoc. prof. Sonia SOCACI, Assist.  
prof. Anca FĂRCAȘ, Assoc. prof. Loredana LEOPOLD

*Faculty of Food Science and Technology*

*University of Agricultural Sciences and Veterinary Medicine  
of Cluj-Napoca, Romania*

### **Abstract:**

Coffee is one of the most consumed drinks worldwide, being obtained from the seeds of the beans of the coffee plant. The coffee plant has over 90 species, but only two are cultivated widely and have economical importance: *Coffea arabica* (Arabica coffee) and *Coffea canephora* (Robusta coffee). Qualitatively coffee Arabica is considered superior to Robusta, this being the main reason for the economically motivated adulteration of coffee Arabica with Robusta. The purpose of this research study was to use UV-Vis spectroscopy coupled with multivariate analysis of data in order to develop a simple protocol for the authentication of coffee varieties. Twenty two samples of coffee were taken into study, including Arabica coffee 100%, Robusta coffee 100%, combination between Arabica and Robusta, decaf coffee and instant coffee. Using spectrophotometric methods their content in caffeine, antioxidant capacity as well as the characteristic UV-Vis spectra between 190 – 700 nm were determined by means of Shimadzu Pharmaspec1700 spectrophotometer. The results gave valuable information, underlying the usefulness of UV-Vis spectroscopy in the development of a simple method for the discrimination of coffee varieties.

**Keywords:** *Arabica, caffeine, coffee, Robusta, UV-Vis spectroscopy.*

## ***DEVELOPMENT AND ASSESSMENT OF MUFFINS WITH ALMOND FLOUR***

Students: Maria COJOCARU, Maria-Valentina LADARIU

Coordinating Professor: Ph.D. Eng. Cristina GHINEA

*Faculty of Food Engineering,*

*”Stefan cel Mare” University of Suceava, Romania*

### **Abstract:**

The aim of this work is to investigate the development of new product namely almond flour muffins. Almonds are widely used in the preparation of confectionery products such as marzipan, macarons and cakes due to good nutritional value and high content of proteins, minerals and unsaturated fatty acids. The product considered in this study contain: almond flour, coconut oil with a lower fat content of 10% compared to other vegetable fats, cranberry with a strong antioxidant character, nuts which helps to improve memory and eggs rich in vitamins, minerals and proteins. In order to determine the acceptability of this product a sensory analysis was performed and a questionnaire was applied. 75% of the interviewed persons consider that the taste of the almond flour muffins is very good, 20% affirms that the products have a good taste, while 5% mentioned that the taste is satisfactory. The texture of the muffins is very good according to 50% of the respondents and only 5% considers that the texture is not satisfactory. The exterior and interior aspects are very good according to 45% questioned persons and 30% respectively. As a result of the questionnaires analysis, the product price has to be maximum 4.5 - 5 RON so that it can be purchased. After market research, the approximate price for a muffin is between 3.5 RON and 12 RON per unit, given that their recipes contain white flour, much cheaper than almond flour.

**Keywords:** *almond flour, coconut oil, market analysis, muffins, nutritional value, sensory analysis*

## ***THE ENVIRONMENTAL IMPACT OF BOVINE GROWTH***

Students: Ovidiu PROCOPEȚ, Loredana PETRUNEAC,  
Ovidiu APETREI, Florentina ACHILĂRIȚEI  
Coordinating Professor: Assoc. Prof. Ph. D. Eng. Ana LEAHU  
Ph. D. Cristina DAMIAN  
*Faculty of Food Engineering,  
University "Ștefan cel Mare" of Suceava, Romania*

### **Abstract:**

The farm animal sector is the single largest anthropogenic user of land, contributing to many environmental problems, including global warming and climate change.

Bovine husbandry needs great space, water, energy and it has some environmental negative effects such as deforestation, greenhouse effect, soil erosion, water acidification and pollution, eutrophication and the disappearance of certain plant varieties.

Farm animal production also results in releases of up to 28 million metric tons of CO<sub>2</sub>/year from cultivated soils.

Desertification, or the degradation of land in the arid, semiarid, and dry subhumid areas, is also exacerbated and facilitated by the animal agriculture sector. By reducing the productivity and the amount of vegetative cover, desertification allows CO<sub>2</sub> to escape into the atmosphere. Desertification of pastures due to animal farming is responsible for up to 100 million metric tons of CO<sub>2</sub> emissions annually. Ammonia emitted from animal feeding operations is an environmental and human health hazard, contributing to eutrophication of surface waters and nitrate contamination of ground waters, soil acidity, and fine particulate matter formation.

**Keywords:** *climate change, desertification, eutrophication, greenhouse effect, soil erosion*

## ***RESEARCH ON THE INFLUENCE OF THE ADDITION OF CAROB POWDER IN YOGHURT***

Students: Ramona ILUCĂ, Simona ACHELĂRIȚEI  
Coordinating Professor: Lecturer PhD. Eng. Sorina ROPCIUC,  
Lecturer PhD. Eng. Laura Carmen APOSTOL  
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### **Abstract:**

The purpose of this study was to add the yoghurt carob powder to improve the sensory, physicochemical and rheological quality of yogurt. The powder was added at 0.2-1% and the characteristics obtained in the yogurt were compared with a witness sample (0% carob powder).

From a sensory point of view, carobs powder significantly alters the color, syneresis effect and rheological characteristics analyzed. The acidity of yogurt increases by the addition of carobs powder.

In order to determine the rheological characteristics, the dynamic rheometer HAAKE MARS was used. The viscosity and viscoelastic modulus was determined in yogurt samples with added reddish powder and the control sample.

With the results we have concluded that the optimal dose of powder that should be incorporated to get quality yogurt is 1%.

**Keywords:** *Ceratonia siliqua, sensory characteristics, rheological properties.*

## ***STUDY ON THE DEVELOPMENT OF PARAMETERS BY THE DEGREE OF CALCULATION OF THE CROWN OF COLD MILK***

Student: CIORNEI Iulia-Andreea, FLAIȘ Dumitrita

Coordinating Professor: Amelia BUCULEI

Faculty of Food Engineering, "Stefan cel Mare" University, Romania

### **Abstract**

Cheeses in brine are characterized by a specific technology of milk processing and maturing-preservation in brine. The retention system in brine provides a long shelf life (up to 1 year), which is an important feature both qualitatively and economically for these cheeses.

Regardless of where you get it, the quality of finished products is influenced by two important factors:

- physico-chemical and microbiological characteristics of raw milk;
- the technology of manufacturing the product in question.

The research was carried out on the assortment of fresh cow cheese obtained from the commercial network, the main parameters (humidity, fat content, sodium chloride content, acidity) were determined and matured in 3 different concentrations of salt, tracking the evolution of parameters at different intervals.

There is a decrease in moisture from 62.3% to 58.5% during the 25 days maturation at 14oC. The intensity of dehydration during maturation depends on the water content of the cheese, the size of the pieces of cheese, the air parameters (relative humidity, temperature) and the duration of maturation, the surface treatment of the cheese

The reduced development of flavor and texture in low-fat cheeses is a considerable technological problem, limiting the marketing / selling of these products. As in all foods with a high fat content, milk fat can undergo degradation via lipolysis (enzymatic) or oxidative (chemical).

It has been noticed that during maturation, the fat content of the buttermilk cheese varies very little, the fat relative to the dry substance being approximately linearly stable under the conditions of the butirometric determination and falling within the parameters provided by the manufacturing standards. The acidity dynamics of the cheese maturing, according to the chart, shows a minimum value

in the first 6 days, after which it increases differently - depending on the concentration of brine - until the 25th day, which corresponds to the intense activity of lactic acid bacteria, then takes place stabilization thereof when lactose is almost completely fermented.

A more pronounced increase is evidenced by the maturation of cheese at brine concentrations at lower values, motivated by the action of inhibiting the action of lactic bacteria. A particular influence on the pH is the water content of the cheese paste.

**Keywords:** *cheese, fermentation, maturation, lactic bacteria*

## ***CHEMICAL AND MICROBIOLOGICAL QUALITY OF HOMEMADE FRUITS VINEGARS***

Students: Przemysław Horeczy, Joanna Kuzdrolińska  
Coordinating Professor: Maciej Kluz PhD., Assoc. Prof.  
Małgorzata Dżugan  
*Faculty of Biology and Agriculture  
University of Rzeszow, Poland*

### **Abstract:**

Fruit vinegar is a popular product in many home kitchens. Production of fruits vinegars is not complicated, only a greater amount of time for fermentation is required. Vinegar made of fruit is known primarily for its taste values used in the kitchen, it also has many pro-health properties, favorably affecting the functioning of our body. The aim of our work was determination of chemical and microbiological properties of homemade vinegars. Seven kinds of vinegars were produced, each with a different kinds of fruits, during 3 weeks fermentation. The acidity was tested using the pH-meter and the titration method. Sugar content was determination by refractometric method. Total antioxidant activity was determined by FRAP method. The total phenolic content was determined quantitatively using the Folin Ciocalteu reagent, with Gallic acid as the standard. The results showed that sample No. 6, made of plums, shows the highest acidity in comparison with the rest 3.30 pH - 2.42%. Acetic acid, it also contains the most sugar from other vinegars. The sample No. 5 made from pears was the least acidic test - 3.60 pH 1.53% acetic acid. The best antioxidant activity was determined in sample No. 1 - vinegar from ecological apples (509.62  $\mu\text{mol Trolox}/100\text{ml}$ ) also the total phenolic content was the highest (111.08 mg Gallic acid/100 ml) in this kind of vinegar. Homemade vinegars are good and healthy products, especially when they are made of organic fruits.

**Keywords:** *homemade vinegars, fruits, fermentation, FRAP, TPC*



## ***STUDY ON THE PROPRIETIES OF FOREST MUSHROOMS IN THE AREA OF BUCOVINA***

Students: Alexandru-Marian FÎRCAL, Andreea-Ioana  
POPESCU, Alexandra MATEI

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

### **Abstract**

This paper is a study of the current national and international research, the physical and chemical properties of forest mushrooms, their protein and mineral content, the benefits of their consumption on the human body and especially about boletus in the forest of Bucovina.

Hundreds of people are roaming Bucovina's forests, which became a true „goldmine” for the massive production of mushrooms. Mushrooms are considered to be, at least in our country, the nourishment of the gods, having a consistency of ninety percent water, fat-free. They do not contain any sugar or salt and they serve as a valuable source of vitamins.

Mushrooms have an increased nutritive value like vegetal protein (vitamin A, B1, B9, B12, D, E, K, etc), minerals (calcium, phosphorus, magnesium, etc.), trace elements (copper, iron, iodine, zinc). However, they contain a small number of carbohydrates, fats, and they proved to be a scarce source of calories.

Mushrooms have a number of interesting properties, they help people by maintaining a low blood pressure, preventing strokes and ensuring that the metabolism is functioning properly. The calcium in mushrooms strengthens the bones and the iron in mushrooms prevents anaemia. Simultaneously, mushrooms strengthen the immunity system and prevent infections. People should be well-versed when picking mushrooms. Although it seems like a simple task, there are some mushrooms which are poisonous, thus, inedible. Mushrooms can be preserved in various ways: by drying them, freezing them, by putting them in oil or by putting them in vinegar. The most nutritious and valuable mushrooms are the boletus, or

„hribi” as Romanians call them, delicious mushrooms with a high nutritious value. Boletus is used in different dishes becoming a highly sought mushroom and used in various dishes in restaurants as well, due to its delicious taste.

The Romanian boletus grows naturally and it is highly appreciated on the worldwide market, being appreciated due to its special qualities, holding the second place worldwide in comparison with the winter's truffles, which occupy the first position.

**Keywords:** forest mushrooms, preservation of forest mushrooms, boletus, minerals, physical properties, chemical properties and vitamins.

## ***THE EFFECT OF PHYSICO-CHEMICAL ELICITORS ON THE PHENOLIC CONTENTS OF SELECTED MICROGREENS***

*Students:* Bianca Şuiian, Sabina Ujeniuc and Maria Zugun

*Coordinating Professor:* Assist. prof. dr. biologist Andrei  
Lobiuc and Conf. dr. ing. Ana Leahu

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Stefan cel Mare University of Suceava, Country Romania*

### **Abstract:**

Microgreens (plantlets) are a valuable source of health-supporting compounds and can be stimulated in order to produce high amounts of such substances. The current study investigates the effect of cold shock and phenylalanine aminoacid on the total flavonoid and phenolic contents and antioxidant capacity of arugula, alfalfa and red cabbage microgreens.

Microgreens were cultivated in plastic containers in soil, for 7 days. Flavonoid content was increased with close to 50% in cabbage microgreens by aminoacid treatment. Total phenolic content was higher with 28 and, respectively, 75% in arugula microgreens in cold shock and aminoacid treatments. Antioxidant capacity was slightly increased by aminoacid treatment in arugula and alfalfa plantlets.

Physico-chemical stimulation of phenolic synthesis in microgreens should be further investigated in order to achieve added value products.

**Keywords:** alfalfa, arugula, health-supporting, phenylalanine, red cabbage, stimulation.

## ***STUDY ON THE VALUATION OF MEDLAR FRUITS (*Mespilus germanica*) IN GELIFIED PRODUCTS***

Student: Iasmina BLIDAR

Coordinating Professor: Prof. Emil RACOLȚA, Lecturer Vlad

MUREȘAN, Lecturer Cristina COMAN

*Faculty of Food Science and Technology*

*University of Agricultural Sciences and Veterinary Medicine*

*Cluj-Napoca, Romania*

### **Abstract:**

In the present paper, we have attempted to obtain a gelified food product using the medlar (*Mespilus germanica*) fruit, which is generally a not very well known fruit and is also underutilized in the food industry sector, despite it being rich in bioactive principles. *Mespilus germanica*, member of *Rosaceae* family, can be found in Romania. A special feature of this fruit is that the harvesting takes place only after the first frost. The medlar fruit can be consumed as such or embedded in various foods and desserts. The purpose of this study was to utilize the active principles in the medlar fruit by incorporating them into a jelly-like product. Pectic substances in the fruit help protecting the colon by acting as a natural prebiotic, while the phenols and flavonoids give powerful antioxidant properties, and iron helps fight anemia. Two types of finished products were obtained: a simple jelly and a jelly glazed in white chocolate. On this samples three determinations with major importance on its consumption and storage were made. So, we have determined the content of mineral substances by the calcination method and also the dry matter content in drying oven. Because one of the most important characteristics for an innovative food product is the texture, we analyzed the textural profile. We have thus succeeded to obtain a gelified product, jelly type, capitalizing *Mespilus Germanica* fruits, which romanian specific, based on the high pectin content, that meets the challenges of food science, acting as an intermediary for the beneficial effects of the medlar on the human body.

**Keywords:** *Medlar, Mespilus Germanica, jelly, pectin, prebiotic, texture.*

## **POPCAKES RAW WITH AGAVE SYRUP**

Students: Bianca Mihaela Drob

Cătălina Apopii

Coordinating Professor: Ph. D. Cristina Damian

*Faculty of Food Engineering,*

*University "Ștefan cel Mare" of Suceava, Country Romania*

### **Abstract:**

The ingredients for the production of these sweets were: 120 g seedless persimmon, 80 g of sunflower seeds hydrated for 4 hours, 120 g nuts hydrated for 4 hours, 20 g (2 tablespoons) alkalized cocoa, 20 g melted cocoa butter. The chocolate glaze was formulated from 50 ml of coconut oil, 120 ml of melted cocoa butter, a little salt, 3 tablespoons of agave syrup, and 10 g of alkalized cocoa. The original ingredients were mixed with the kitchen robot until a homogeneous composition was obtained, from which small spheres were formed which were placed on sticks and then put in the freezer for 30 minutes. Meanwhile the ingredients for the glaze were mixed until a homogeneous composition was obtained, and then put in the refrigerator for 15 minutes. The popcakes were removed from the freezer and inserted into raw chocolate. Then the pistachios were sprinkled on top and the samples were placed in the refrigerator.

The sensory analysis of the samples was carried out by a group of students at the Faculty of Food Engineering of "Ștefan cel Mare" University of Suceava. The analyzed samples obtained a high score, being unanimously appreciated by the tasters.

**Keywords:** *persimmon, agave syrup, sensory analysis*

***ANTIPROLIFERATIVE ACTIVITY OF ANTHOCYANINS  
PURE EXTRACTS FROM MULBERRIES AND  
RASPBERRIES ON HeLa AND A2780 HUMAN CANCER  
CELL LINES***

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**Abstract:**

Plant polyphenols have received substantial attention due to their biological activities. Berries including mulberries, raspberries, blackberries, bilberries are rich sources of polyphenolic compounds that may provide health benefits. Dietary anthocyanin compounds have provide multiple biological effects *in vitro*, including antioxidant, anti-inflammatory, and anti-atherosclerotic characteristics. The first objective of this work is to obtain a rich extract in anthocyanins from two sources: raspberries (*Rubus sp.*) and mulberries (*Morus sp.*) and to characterize these extracts regarding their anthocyanin content. The second objective is to evaluate the antiproliferative potential of the obtained extracts *in vitro* using two cell line models: A2780 human ovarian carcinoma and HeLa human cervical cancer. Upon chromatographic analysis, three anthocyanins were identified in purified extracts of mulberries, with cyanidin-3-O-glucoside being more abundant. On the other hand, purified extracts of raspberries contained 2 anthocyanins, both identified as cyanidin-derivates. The *in vitro* test showed that both extracts decreased the proliferation on both HeLa and A2780 human cancer cell lines in a dose dependent manner, demonstrating that these two different berries are rich sources of anthocyanins and are able to exert antiproliferative properties toward cervical and ovarian cancer.

**Keywords:** *anthocyanins, cervical cancer, mulberries, ovarian cancer, raspberries*

## ***THE INFLUENCE OF THERMAL PROCESSING TECHNOLOGIES ON APPLE JAM ENRICHED WITH FIBERS***

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### **Abstract:**

Natural apple jam is a good way to preserve the fruits. A conventional apple jam contains higher quantities of soluble fibers, so an alternative which offers an enhanced balance of soluble and insoluble fibres ratio was formulated by adding an amount of grape skins.

The aim of this study was to investigate the sensory profile of the new type of apple jam enriched with grapes skins and processed in two ways (conventionally and with microwaves) and their influence on the rheological, textural and physicochemical properties of the final product. The rheological behaviour of jam knowledge is important to establish the quality standards for the new type of apple jam. The viscosity ( $\eta$ ) variation with frequency was determined by the oscillatory method, using a dynamic rheometer Haake Mars 40. The values obtained were fitted to the power law model which described very well the variation tendency ( $R^2 > 0,99$ ). The texture parameters (adhesiveness, firmness, chewiness, springiness and gumminess) of jam were investigated with a Perten TVT texturometer. The soluble solid content was determined with the Abbe portable refractometer. By using the pH meter, the pH was determined. The colour parameters were determined with a Chroma Meter. The sensory evaluation allowed to estimate the organoleptic characteristics of the product.

The results obtained revealed that the processing technology and the grape skins addition as a fibre source influence the quality parameters of the final product. Significant differences between the control samples and the enriched samples, depending on the processing technology were obtained. In conclusion, this innovative product is rich in fibres and grape skins can be used as an additional source of fibers.

**Keywords** *apple jam, fibers, grape skins, processing technology, rheology, texture.*

## QUALITY CHARACTERISTICS OF BREAD ENRICHED WITH PEA FIBERS

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### **Abstract:**

In order to enrich bread in especially the white one with dietary fibers it may be used different source of fibers. The most common sources used in bread making are the wheat bran, gums, modified celluloses,  $\beta$  glucans. In the last years it has been used more and more fibers obtained from corn, rye, rice, sorghum, soybean, e.g. Today, the bread producers are begin to used some unconventional source of fibers, such as vegetables, legumes, citrus, flax or tomato seeds. Such an unconventional source of fiber is the pea fiber, an insoluble one which presents the advantage to conduct to bread products with similar properties to the white bread without fibers addition. Also, due to the fact that pea is an insoluble fiber it increases the hydration capacity of the mixture, which is economically advantageous for the bread producers. In order to evaluate the effect of pea fiber on bread quality we used it in the levels of 2%, 4% and 6% addition. The bread was evaluated from the physical characteristics (porosity and elasticity), textural properties (springiness, cohesiveness, resilience, firmness, gumminess, chewiness) colour and bread microstructure by using a stereomicroscope device were determined. The best sample from the quality point of view was those with 4% pea fiber addition in wheat flour.

**Keywords:** *bread quality, pea fiber, refined wheat flour*



## ***EFFECT OF THE ADDITION OF CITRUS FIBERS ON BREAD QUALITY***

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### **Abstract:**

Today, white bread is the most consumed type of bread. Therefore, in order to enrich bread obtained from refined wheat flour with dietary fibre it may be added in bread recipe different types of fibers such as citrus fibers. This type of fibers presents a better quality than other fibers due to the presence of bioactive compounds such as polyphenols, flavonoids and carotene. These fibers are effective in bread making due to the fact that are not compromising the sensorial properties of the finished products. In our study the citrus fibers were added in the levels of 2%, 4% and 6% in wheat flour in order to obtain bread. The physico-chemical (porosity and elasticity), textural properties (springiness, cohesiveness, resilience, firmness, gumminess, chewiness) colour and bread microstructure by using a stereomicroscope device were determined. The best sample from the quality point of view was those with 4% citrus fiber addition in wheat flour for which was obtained the best values for porosity, elasticity and the most uniform pores to the stereo microscope device. From the textural point of view the bread cohesiveness and springiness decreased with the increase level of citrus fiber addition.

**Keywords:** *bread quality, citrus fiber, white wheat flour*

***THE PLASTIC BAGS AND THE ENVIROMENT - A  
CRITICAL EVALUATION OF THE PRESENT AND THE  
FUTURE***

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**Abstract:**

The purpose of this paper is to study the impact of thin and very thin plastic carrier bags on the environment and how the population of Romania perceives the pollution they represent in the light of the new regulations at European level. At national level, the Law no. 249/2015 establishes the management of packaging and packaging waste and beginning with the 1<sup>st</sup> January 2019 the use of thin and very thin handle-plastic carrier bags is forbidden on the national market. Plastic carrier bags are widely used in the retail sector because they are lightweight, durable and relatively cheap. However, a number of problems arise from their use. In this paper we study the environmental impact caused by plastic bags on the environment, as well as the modern tendencies of replacing them by some biodegradable materials. The paper also presents the conclusions drawn from a survey of 101 respondents regarding the replacement of the current plastic bags.

**Keywords:** *plastic bags, waste packaging, environmental impact, pollution, consumer safety, biodegradable.*

***CULINARY TRADITION AND FINE TASTE OF SIBIU,  
THE "EUROPEAN REGION OF GASTRONOMY",  
IN 2019***

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**Abstract:**

The region of Sibiu is located in Southern Transylvania, a unique cultural and natural scenery. The Region includes the city of Sibiu and its surroundings, standing out through its exceptional heritage and traditions carried on by a multi-ethnic and multi-cultural community. Awarded Region of Gastronomy for Europe, Sibiu has since focused on its vivid cultural life, also developing its touristic profile.

Alongside its other valuable assets, traditions had an important role in shaping Sibiu as a viable touristic destination, food culture being one of the main attractions of the Region.

The cuisine of southern Transylvania is a mosaic that reflects the multicultural gastronomic and cultural influences of the populations and various trends in society.

One of the best dishes is the Lamb Stew, a 200 years old Shepard recipe, made from lamb's intestines. This old dish has been brought to life by a local chef, respecting the concept „no waste” and reinventing the fine taste of Transylvania, in order to educate for better health and sustainability, to nurture creativity, improve tourism standards and stimulate gastronomic innovation.

**Keywords:** *food culture, lamb stew, traditional recipe, region of gastronomy.*

## ***CHOCOLATE - FROM PLEASURE TO SCIENCE***

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### **Abstract:**

*Chocolate* is the food product obtained by mixing sugar with cocoa powder, sometimes with various milk and flavor.

According to specialty studies, chocolate consumption due to the content of active ingredients in cocoa powder - *flavonoids*, positively influences both psychic processes by helping to fight depression and anxiety, as well as health through the anti-inflammatory role.

Considering that there are milk chocolate, black chocolate and white chocolate in the trade, we have conducted a study aimed at knowing the *consumer* choices in the Suceava area for a certain chocolate assortment. Milk chocolate assortment is obtained by mixing whole milk, sprayed or condensed with cocoa powder, to which are added cocoa butter, vanilla, milk fat and lecithin.

The difference between chocolate and milk chocolate, respectively, is given by the cocoa powder content of the composition, which in the case of black chocolate varies between 30% and 80%. The white chocolate assortment is made only from cocoa butter, which is a vegetable fat, milk, sugar and vanilla and does not contain cocoa powder.

The result of a study of 200 people shows that chocolate with milk is more appreciated by respondents than black chocolate and white chocolate.

In conclusion, more sustained information on the beneficial effects of active ingredients in cocoa powder could influence consumers' choices for black chocolate, which not only provides *health* benefits but also makes it better and more active - in the short term, but also on long term.

**Keywords:** *chocolate, flavonoids, consumers, pleasure, health*

## **CHARACTERISTICS OF LACTIC FERMENTED PLANT-BASED BEVERAGES**

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MATEI

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### **Abstract:**

*Fermented* beverages have been produced by humans since ancient times and, while a preservation of the product is achieved, the product is also enhanced, sensorially but also by increasing the content of health-supporting compounds. The purpose of this research was to investigate several parameters (type of raw material, extraction temperature, starter culture) for the production of a *fermented*, plant-based beverage with *probiotic* potential, starting from *wheat*, *wheat bran*, *buckwheat* or *cashews*.

Obtained *beverages* had a pH between 4.03 and 4.5, a content of titratable acidity between 0.12 and 0.36 g lactic acid/100 ml and were sensorially acceptable. The optimum period for fermentation was 4 h, at 20°C temperature with starter culture II.

**Keywords:** *fermented, beverages, probiotic, wheat, wheat bran, buckwheat, cashews.*

## ***COMPARATIVE STUDY ON CHEMICAL COMPOSITION, NUTRITIONAL VALUE AND MEDICAL BENEFITS OF ALMONDS AND PASTRY FLOUR-REVIEW***

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### **Abstract:**

Flours are the basic raw materials used in the bakery and pastry industry. The objective of this study was the comparison between pastry flour (the most used flour in Romania) and the almonds flour (new entry into the market of Romania). Regarding the chemical composition, almond flour has a lower carbohydrate content (50%) and a higher protein content (32,5%) than pastry flour. The lipid content is about 8,5g/100g flour in the case of almonds flour and 1,75g/100g flour in pastry flour. The mineral content is represented by Na, K, Mg, Ca, Zn but their proportion differ and in this aspect the almond flour is ranked first. The nutritional value of the flour is given by their carbohydrate, lipid and protein content. Nutritional value for 100 g almond flour is 406,5 kcal and for 100 g pastry flour is 339,75 kcal. Even if the nutritional value is higher for almonds flour is more beneficial because the high calorie intake is given by protein content. In the case of pastry flour the high calorie intake is given by carbohydrate content. In terms of medical benefits both types of flours are used to combat anemia because they contain vitamins and minerals such as Fe and Cu. The almond flour has many uses. Almonds are useful in treating gastro-enteritis, kidney pains, diabetes, facial neuralgia and gastric ulcers. This review focuses on the certain minerals such as calcium and magnesium. Almond flour is a good source of vitamin E, dietary fibers, B vitamins and essential minerals.

**Keywords:** *almond flour, chemical composition, medical benefits, nutritional value, pastry flour*

**RESEARCH ON THE POSSIBILITIES OF COLORING  
YOGURT WITH NATURAL EXTRACT OF PRUNUS  
SEROTINA**

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Coordinating Professor: *Senior Lecturer Timar Adrian, Phys.*

*Eng. Alin C. Teusdea,*

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**Abstract:**

Research studies in recent years have focused on finding resources rich in phytonutrients with antioxidant activity. Black cherries are appreciated not only for their taste but also for the high content of vitamins and minerals they contain, among the fruits with the highest level of antioxidants. Whether we eat them fresh, like syrup or jam, these are real drugs for the human body.

Besides anthocyanins and essential antioxidants, other bioactive compounds have been identified in bitter cherries, such as flavonoids, vitamin C, melatonin, potassium, calcium, magnesium, etc. The objective of this study was to introduce different amounts of natural extract of bitter cherries into yogurt and to analyze the changes made on it. It has been used "Napolact" 3.5% fat yogurt which contains milk protein ingredients, pasteurized cow's milk and selected lactic crops. Determination of the staining effect was achieved by adding concentrations of 1, 2, 3, 4, 5, 7.5, 10, 15% extract and sample scans, and its acidity was determined by titration with sodium hydroxide with phenolphthalein indicator. Sensory analysis indicates that concentrations between 1-5% have more effect on taste, but not on color, but between 5-10% the effect is more visible, the 15% concentration change in yoghurt consistency and the taste is bitter. The acidity level varied between samples, with a slight increase of between 0.88-0.94 g of lactic acid.

**Keywords:** *bitter cherries, extract, yoghurt, acidity*

## ***CHEMICAL COMPOSITION AND BIOLOGICAL ACTIVITIES OF SPENT COFFEE GROUNDS***

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### **Abstract:**

The spent coffee ground (SCG) is the by-product resulted after the brewing of coffee. It is produced in large quantities all over the world its disposal causing environmental issues. Even though considered a waste, the presence of antioxidant dietary fibers, phenolic compounds, lipids, minerals, caffeine and other bioactive molecules in SCG together with its low-cost value sustain the opportunity of re-using the SCG for the development of innovative food and non-food products. The recovery of the bioactive compounds from SCG can be performed using solvent extraction or other modern techniques such as microwave assisted extraction, low-pressure extraction, ultrasound assisted extraction, supercritical fluid extraction (CO<sub>2</sub>). The aim of this study was to assess the content in different bioactive compounds and the biological activities of several SCG resulted using different brewing techniques. In this sense, the total polyphenolics, caffeine, proximate composition as well as the antioxidant activity of SCG methanolic extracts were determined. According to the obtained results the SCG samples still contained appreciable amounts of bioactive compounds that could be recovered and exploited as functional ingredients with manifold applications.

**Keywords:** *bioactive compounds, by-product, food industries applications, spent coffee ground*



## ***NUTRITIONAL COMPOSITION AND MEDICINAL PROPERTIES OF MOMORDICA CHARANTIA: A REVIEW***

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Coordinating Professor: Lecturer PhD. Eng. Ancuța Elena PRISACARU, Lecturer PhD. Eng. Laura Carmen APOSTOL

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### **Abstract:**

*Momordica charantia* L., or bitter melon, belongs to the Cucurbitaceae family (a group comprising about 130 genera and 800 species). It is an herbaceous plant that can grow up to 10 meters tall and that oblong fruits with a distinct waxy exterior. The interior of the fruit contains white pith and seeds. When ripe the fruit becomes yellow and split into segments that curl back and reveal the seeds. The fruits are eaten while still green and unripe. It contains biologically active compounds including alkaloids, tannins, saponins, flavonoids, cardiac glycosides and steroids.

Bitter melon is a good source of carbohydrates, proteins, vitamins, minerals and has the highest nutritive value among cucurbits. The crude protein content is higher than that of tomato and cucumber. The fruit is rich in folic acid and vitamin C.

The medicinal properties of bitter melon include antidiabetic, neuroprotective, anti-obesogenic, antimalarial, antioxidant, anti-inflammatory, antimicrobial and allelopathic.

**Keywords:** *biologically active compounds, health impact, Momordica charantia L., nutritional composition*

## ***STUDY OF CACAO CHIA SEEDS PUDDING***

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### **Abstract:**

In this study a food product was evaluated, namely the chia seeds pudding with cacao obtained by us. Chia seeds have high fiber content, also contain omega 3 fatty acids and are suitable for people intolerant or allergic to gluten and lowers cholesterol levels. Pudding includes besides chia seeds: almond milk, coconut flakes, honey, cacao and vanilla. Almond milk is lactose-free, rich in antioxidants and essential minerals such as potassium and calcium. Coconut has anti-inflammatory and antibacterial properties, honey contain antioxidant compounds, while cacao is very rich in polyphenols. A questionnaire was applied after being performed a sensory analysis of the product. 54% from the total of 50 investigated persons mentioned that they are occasionally eating pudding, while 14% do not consume at all. Over 80% of interviewees prefer pudding with cocoa and only 52% have heard about chia and its benefits. 34% of the persons affirm that the taste of the chia seeds pudding with cacao is excellent, 42% state that the taste is good and only 3% mentioned that they did not like this product.

**Keywords:** *almond milk, antioxidants, chia, fibers, gluten free, sensory analysis*

## ***SPECIFICS OF SOUTH AFRICAN DAIRY INDUSTRY***

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### **Abstract:**

There are many players in the market and the competition amongst manufactures and milk processors is fierce. Milk producers are producer distributors and they process raw milk produced by them, then sell the final products to the retailers or consumers. There is business opportunity for milk distributors however they will be subjected to a fierce competition because already milk producer's even processors are occupying that role in the value chain. There should be a legislation that must protect the small processors against large processors, to afford them an opportunity to grow and become large processors with the intention to increase a number of large processors. With the future prospects of milk consumption increasing to 23% by 2026, this present a business opportunities in a long run and job opportunities in dairy industry. The South African dairy market is free and competitive and there's no statutory intervention as far as marketing of products. On the global scale the dairy industry is one of the most deregulated industries. There is a need for regulating the dairy industry across the globe despite its competitiveness to level the ground for all producers and processors of milk. South Africa dairy industry contributes in domestic economy, national food security and also supplying neighbouring countries with milk products

**Keywords:** *dairy, industry, market, milk, manufacture, South Africa.*

**ANTIOXIDANT, ANTIMICROBIAL AND ANTI-LIPASE  
ACTIVITIES OF  
COMPOSITES DERIVED FROM GREEN TEA, LEMON  
PEELS AND RED WINE LEES**

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**Abstract**

Novel sources of nutraceuticals, composites derived from green tea extract, red wine lees and lemon peels extract were produced. The first composite was produced from green tea extract and red wine lees. The second composite was produced from green tea extract, red wine lees and lemon peels. The composites intensively depressed the growth of gram-positive bacteria *Staphylococcus aureus* and *Rhodococcus sp.* Inhibition zone for the first composite was 16.1 and 24.1 mm respectively and for the second composite – 18.5 and 24.3 mm respectively. In case of gram-negative bacteria *Esherichia coli* and *Pseudomonas aeroginasa* inhibition zone for the first composite was 18.1 and 6.1, for the second composite - 6.1 and 10.2 mm respectively. In case of pathogenic fungi *Rhizoctonia sp.* and *Streptomyces glaucus* 71MD inhibition zone for the first composite was 14.7 and 22.3 for the second composite - 8.5 and 20.3 mm respectively. Both composites exhibited approximately 4 times less than antioxidant potential than L-ascorbic acid and showed high level of lipase inhibition, i.e. 12.3 % and 10.5 % per mg dry matter of the first and second composites respectively. In comparison with Orlistat® it was 30 % less anti-lipase activity.

**Keywords:** *anti-lipase activity, antimicrobial agents, antioxidants, citrus, Nutraceuticals, polyphenols, tea, wine*

## ***FILTERING NATIVE POTATO STARCH BY USING MEMBRANE***

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### **Abstract**

Native (unmodified) starch - a product of natural origin, which is not a food additive. The use of native starches in pure form in the food industry has a significant impact on the organoleptic quality of foodstuffs.

Adding native starch to products with a continuous aqueous phase improves the nutritional value of their compositions, and also reduces the content of sugar (sucrose) and fat in fillings, sweets, jams, etc. Native starch does not cause indigestion, unlike polyols and soluble fibers, which have a laxative effect in food.

A particle size distribution of native starch from 5 microns to 45 microns is optimal for use in food compositions with a continuous aqueous phase. The use of native starches with the above granule size provides a balance between fine and coarse particles of starch. The presence of fine particles increases the viscosity of the food composition, which requires an increase in fat and water. The presence of coarse particles causes a sandy feeling in the mouth when consuming the food composition. Thus, a good compromise is achieved between the viscosity of the food composition and the ratio of calories derived from slowly digestible carbons to total calories.

In this regard, it is proposed to add a stage of filtration of a starch suspension to the process of obtaining native potato starch in order to separate the starch particles into fractions.

After analyzing the advantages and disadvantages of the existing filter barriers, the use of polymer microporous membranes for the separation of starch particles by size is the most appropriate. At the moment there is no scientific evidence about the possibility of using such membranes for the separation of starch particles.

**Keywords:** starch, particle, fraction, filter, membrane, liquid.

## ***SPROUTED SEEDS – INGREDIENTS WITH HIGH HEALTH-SUPPORTING VALUE***

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### **Abstract:**

Due to the development of the food industry, consumers began to appreciate the sprouts because they are not processed and have beneficial effects on the body. They can grow in a short time without requiring special environmental and climate factors.

In the food industry, sprouts are obtained from a large number of species, a significant number of seeds belonging to families such as *Brassicaceae*, *Fabaceae*, *Poaceae*. Each seed variety has different organoleptic properties, depending on the species, resulting in a varied range of culinary preparations.

Research has shown that the sprouts offer a variety of vitamins and nutrients, and the chemical composition is different from that of the seeds from which they are produced, providing energy-producing substances.

**Keywords:** consumer, diversity, glucosinolates, health, phenolics, sprouts,

## ***THE INFLUENCE OF RED BULL ON THE HUMAN BODY***

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### **Abstract:**

Red Bull is an energy drink which is not good for human organism. The aim of this work is to demonstrate that this drink contains substances which damage human health. The ingredients are caffeine, taurine, vitamins (B3, B5, B6, B12) and simple sugar in a buffer solution of carbonated water, baking soda and magnesium carbonate. To produce Red Bull, sugars sucrose and glucose have been replaced

The effects of Red Bull are negative because. energy drinks increase mental and athletic performance. But most of the effects such as increased attention and reaction speed are caused by presence of caffeine. The general population of healthy adults is not at risk for potential adverse effects if they limit their consumption to 400mg per day.

**Keywords:** Caffeine, effects, energy drink, health, red bull, sugars.