University of Life Sciences "King Mihai I" from Timişoara
Multidisciplinary Conference on Sustainable Development

BOOK OF ABSTRACT

Section: Food Chemistry, Engineering & Technology

Faculty of Food Engineering

Timişoara, 2023

Academy of Agricultural and Forestry Sciences "Gheorghe Ionescu-Şişeşti" Timisoara Branch

Romanian Association of Food Industry Specialists Timisoara Branch

Romanian Chemistry Society Timisoara Branch

General Conferences Programme

25 May 2023 (Thursday)

11^{00}-12^{00}	**Registration**
12^{00} – 12^{15}	Opening of the Conference
12^{15} – 12^{35}	Plenary Lecture PL_1
12^{35} – 12^{55}	Plenary Lecture PL_2
12^{55} – 13^{15}	Plenary Lecture PL_3
13^{15} – 13^{30}	Plenary Lecture IL_1
13^{30} – 13^{45}	Plenary Lecture IL_2
13^{45} – 14^{00}	Plenary Lecture IL_3
14^{00} – 14^{15}	Plenary Lecture IL_4
14^{15} – 14^{30}	Plenary Lecture IL_5
14^{30} – 14^{45}	Plenary Lecture IL_6
14^{45} – 15^{30}	**Lunch&Coffee break**

Iulius Congress Hall
Ansamblul Iulius Mall, Street. Aristide Demetriade
no. 1, Timișoara, Romania

15^{30} – 15^{45}	Oral Communications OC_1
15^{45} – 16^{00}	Oral Communications OC_2
16^{00} – 16^{15}	Oral Communications OC_3
16^{15} – 16^{30}	Oral Communications OC_4
16^{30} – 16^{45}	Oral Communications OC_5
16^{45} – 17^{00}	Oral Communications OC_6
17^{00} – 17^{15}	Oral Communications OC_7
17^{15} – 17^{30}	Oral Communications OC_8
17^{30} – 17^{45}	Oral Communications OC_9

Iulius Congress Hall
Ansamblul Iulius Mall, Street. Aristide Demetriade
no. 1, Timișoara, Romania

19^{30} – 22^{00} **Conference Dinner**

"COMPLEX FLONTA" Restaurant
Trandafirului 200, Giroc, Timiş county, RO
(18^{00}-18^{30} - Bus transport at the parking place of the Iulius Mall - Iulius Congress Hall)

26 May 2023 (Friday)

Section: Food Chemistry, Engineering & Technology

$10^{00} – 10^{10}$	Opening of the Conference (Section: *Food Chemistry, Engineering & Technology*)
$10^{10} – 10^{45}$	Plenary Lecture PL_4
$10^{45} – 11^{00}$	Oral Communications OC_{10}
$11^{00} – 11^{15}$	Oral Communications OC_{11}
$11^{15} – 11^{30}$	Oral Communications OC_{12}
$11^{30} – 11^{45}$	Oral Communications OC_{13}
$11^{45} – 12^{00}$	Oral Communications OC_{14}
$12^{00} – 13^{00}$	Poster presentation
$13^{00} – 13^{15}$	Concluding Remarks

Senate Hall
University of Life Sciences "King Mihai I" from Timişoara
Calea Aradului, No. 119, Timişoara, RO

Scientific Programme

1st Day – 25th of May, 2023 (Thursday)

Iulius Congress Hall
Ansamblul Iulius Mall, Street. Aristide Demetriade
no. 1, Timişoara, Romania

$11^{00} – 12^{00}$	**Registration at the Iulius Congress Hall**
$12^{00} – 12^{10}$	Welcome speech **Cosmin Alin Popescu**, *Rector of the University of Life Sciences "King Mihai I" from Timişoara*
$12^{10} – 12^{15}$	Conference opening **Isidora Radulov**, *Vicerector of the University of Life Sciences "King Mihai I" from Timişoara*
$12^{15} – 12^{35}$	**PL$_1$: Piotr Prus**, The role of universities in education for sustainable agriculture, *Bydgoszcz University of Science and Technology, Faculty of Agriculture and Biotechnology, Poland*
$12^{35} – 12^{55}$	**PL$_2$: Nicolae Corcionivoschi**, The role of climate change in bacterial virulence and the biological mechanisms of natural antimicrobials *Agri-Food and Biosciences Institute, Belfast, Northern Ireland, UK*
$12^{55} – 13^{15}$	**PL$_3$: Athanasios Salifoglou**, Molecular engineering of natural antioxidant capacity drives future neuroprotective technologies in human health *Laboratory of Inorganic Chemistry and Advanced Materials, School of Chemical Engineering, Aristotle University of Thessaloniki, Greece*
$13^{15} – 13^{30}$	**IL$_1$: Phelyster K. Nafula**, Thomas O. Opiyo, Elly Ndiao, Dancea Lucretiu, Effects of climate change and variability on pastoral communities in Kenya *African International University, Kenya*
$13^{30} – 13^{45}$	**IL$_2$: Korzeniowska Małgorzata**, Natural chicken meat antioxidants stimulation by dietary selenium and methionine *Department of Functional Food Products Development, Wroclaw University of Environmental and Life Sciences, Poland*
$13^{45} – 14^{00}$	**IL$_3$: Sevasti Matsia**, Athanasios Salifoglou, Naringin and naringenin derivatives with diamines and polyamines in antioxidant activity *Laboratory of Inorganic Chemistry and Advanced Materials, School of Chemical Engineering, Aristotle University of Thessaloniki, Greece*
$14^{00} – 14^{15}$	**IL$_4$: Emilian Onișan**, Irina Petrescu, Ioan Sărac, Dorica Botău, Evaluation of Orobanche Cumana race e in the automatic rhizotron on sunflower sensitive and resistant genotypes *University of Life Sciences "King Mihai I" from Timişoara*
$14^{15} – 14^{30}$	**IL$_5$: Jerčinović Silvije**, Kantar Sandra, Svržnjak Kristina, Segmentation of the food market for special nutritional needs *Križevci College of Agriculture, Croatia*
$14^{30} – 14^{45}$	**IL$_6$: G.R. Simion**, M.D. Codreanu, M. Crivineanu, Study regarding the ultrasonographic findings of exocrine pancreatic insufficiency (EPI) in dogs *Faculty of Veterinary Medicine, University of Agronomic Sciences and Veterinary Medicine from Bucharest*
$14^{45} – 15^{30}$	**Lunch&Coffee break -** *Iulius Congress Hall, Ansamblul Iulius Mall, Street. Aristide Demetriade, no. 1, Timişoara, Romania*

$15^{30} – 15^{45}$	**OC1: V. Năstasă**, B. Minea, A.S. Pașca, A.C. Bostănaru-Iliescu, D.C. Aniță, A. Goriuc, M. Mareș, Long-term oral administration of immunoglobulin Y induces systemic immune effects in C57BL/6 mice *Faculty of Veterinary Medicine, University of Life Sciences "Ion Ionescu de la Brad" from Iaşi, Romania*
$15^{45} – 16^{00}$	**OC2: Irina-Adriana Chiurciu**, Elena Soare, Mihai Gîdea, Mirela Dușa, Ana-Maria Stanciu, Romania's commercial partners in corn and wheat trade *Faculty of Management and Rural Development, University of Agronomic Sciences and Veterinary Medicine of Bucharest*
$16^{00} – 16^{15}$	**OC3: Hadija Mtunguja**, Simon Elias Kafuku, Alexandra Becherescu, Veronica Sărățeanu, Marius Balint, Anca Drăgunescu, Overview on vegetable farming in Tanzania *University of Life Sciences "King Mihai I" from Timişoara*
$16^{15} – 16^{30}$	**OC4:** Evolution of quality characteristics of green tomatoes during fermentation in low-sodium regime Daniela Constandache, **Doina Georgeta Andronoiu**, Oana Viorela Nistor, Gabriel Dănuț Mocanu, Elisabeta Botez – *"Dunărea de Jos" University, Faculty of Food science and Engineering, 111 Domnească Street, Galați, Romania*
$16^{30} – 16^{45}$	**OC5: Saša Krstović**, Miloš Petrović, Marko Vukadinović, Dejan Beuković, Igor Jajić, Will food in future have rather more legs than we might like? Tenebrio Molitor as a novel feed source *University of Novi Sad, Faculty of Agriculture, Novi Sad, Serbia*
$16^{45} – 17^{00}$	**OC6: Salvatore Cuomo**, Scientific Machine Learning for Agricultural Science *University of Naples Federico II, Napoli – Italy*
$17^{00} – 17^{15}$	**OC7: Anca Peter**, Raluca Paul, Iulia Benko, Laura Adela Pop, Maria Romanyuk, Leonard Mihaly Cozmuta, Camelia Nicula, Anca Mihaly Cozmuta, Bio-materials based on polyvinyl alcohol (PVA) with barrier properties against water vapor *Technical University of Cluj Napoca, North Universitary Center of Baia Mare, Faculty of Sciences, Department of Chemistry and Biology, Baia Mare, Romania*
$17^{15} – 17^{30}$	**OC8: Ludovic Toma Cziszter**, Eleonora-Timea Fazekas, Radu Ionel Neamț, Daniela Elena Ilie, Simona Baul, Alexandru Eugeniu Mizeranschi, Mircea-Nicolae Rațiu, Ciprian Valentin Mihali, Silvia Elena Erina, Study on growth and feeding efficiency in charolais suckling calves *University of Life Sciences "King Mihai I" from Timişoara, Faculty of Bioengineering of Animal Resources*
$17^{30} – 17^{45}$	**OC9: Bere – Semeredi Iudit Roxana Sirbu**, Anca Drăghici, Nature-based solutions - a brief overview of the perspective of the cities in the light of climate change *Politehnica University of Timisoara, Romania*
$19^{00} – 22^{00}$	**Conference Dinner - *"COMPLEX FLONTA" Restaurant*, *Trandafirului 200, Giroc, Timiş county, RO*** *(18^{00}-18^{30} - Bus transport at the parking place of the Iulius Mall - Iulius Congress Hall)*

Section: Food Chemistry, Engineering & Technology

Senate Hall
University of Life Sciences "King Mihai I" from Timişoara
2nd Day – 26th of May, 2023 (Friday)

10^{00} – 10^{10} Opening of the Conference (Section: *Food Chemistry, Engineering & Technology*)
Adrian Riviş, *Dean of the Faculty of Food Engineering, University of Life Sciences "King Mihai I" from Timişoara*

Nicoleta Gabriela Hădărugă, *Vice-dean of the Faculty of Food Engineering, University of Life Sciences "King Mihai I" from Timişoara*

Chaired by: Florina Adriana Radu

Senate Hall
University of Life Sciences "King Mihai I" from Timişoara

10^{10} – 10^{45} **PL4:** Hybrid chromium-flavonoid materials promoting antioxidant capacity roles in human (patho)physiology
Athanasios Salifoglou - *Laboratory of Inorganic Chemistry and Advanced Materials, School of Chemical Engineering, Aristotle University of Thessaloniki, Thessaloniki 54124, Greece*

10^{45} – 11^{00} **OC10:** Development of allantoin-based hydrogels for chronic wound healing and cell regeneration
Evangelia Bougioukli, Sevasti Matsia, Christos Ritzoulis, Athanasios Salifoglou - *Laboratory of Inorganic Chemistry and Advanced Materials, School of Chemical Engineering, Aristotle University of Thessaloniki, Thessaloniki 54124, Greece*

11^{00} – 11^{15} **OC11:** In-vitro evaluation of bioactive profile of *Cornus mas* L. extract
Georgios Lazopoulos, Sevasti Matsia, Anastasia Loukri, Anastasia Kyriakoudi, Ioannis Mourtzinos, Athanasios Salifoglou - *Laboratory of Inorganic Chemistry and Advanced Materials, School of Chemical Engineering, Aristotle University of Thessaloniki, Thessaloniki 54124, Greece*

11^{15} – 11^{30} **OC12:** In-vitro studies of neuroprotective properties of oleuropein
Georgios Lazopoulos, Marios Maroulis, Sevasti Matsia, Athanasios Salifoglou - *Laboratory of Inorganic Chemistry and Advanced Materials, School of Chemical Engineering, Aristotle University of Thessaloniki, Thessaloniki 54124, Greece*

11^{30} – 11^{45} **OC$_{13}$:** Antimicrobial activity in the solid state and solution of blue marine resources
Polyxeni Kalisperati, Sevasti Matsia, Marios Maroulis, Maria Perikli, Oana Cristina Parvulescu, Violeta Alexandra Ion, Anne-Kristin Løes, Joshua Cabell, Athanasios Salifoglou - *Laboratory of Inorganic Chemistry and Advanced Materials, School of Chemical Engineering, Aristotle University of Thessaloniki, Thessaloniki 54124, Greece; Norwegian Centre for Organic Agriculture (NORSØK), Gunnars veg 6, Tingvoll N-6630, Norway*

11^{45} – 12^{00} **OC$_{14}$:** Design and synthesis of polymeric microparticles for the encapsulation of pharmaceuticals
Sevasti Matsia, Christos Ritzoulis, Nikos Boukos, Elias Sakellis, Ioannis Kioumis, Athanasios Salifoglou - *Laboratory of Inorganic Chemistry and Advanced Materials, School of Chemical Engineering, Aristotle University of Thessaloniki, Thessaloniki 54124, Greece*

12^{00} – 13^{00} Poster presentation

13^{00} – 13^{15} Concluding Remarks

Faculty of Food Engineering
University of Life Sciences "King Mihai I" from Timişoara

POSTERS

P1 Phytoproducts and functional digestive disorders in female patients
Doina Georgescu, Ana Lascu, Ciprian Rosca, Oana-Elena Ancusa, Ioana Suceava, Norina Basa, Liviu-Andrei Georgescu - *Department of Internal Medicine I, "V Babes" University of Medicine and Pharmacy, Timisoara, Romania*

P2 Evaluation of the nutritional value of acacia honey with nuts
Laura Rădulescu, Nicoleta Gabriela Hădărugă, Ariana Bianca Velciov, Despina-Maria Bordean, Liana Maria Alda, Cristina Liliana Mitroi, Corina Iuliana Megyesi - *Faculty of Food Engineering, University of Life Sciences "King Mihai I" from Timişoara*

P3 Sensory and physical-chemical characterization of a homemade raspberry jelly
Corina I. Megyesi, Ariana B. Velciov, Gabriel Bujancă, Nicoleta G. Hădărugă, Laura Rădulescu, Cristina Mitroi, Adrian Riviș - *Faculty of Food Engineering, University of Life Sciences "King Mihai I" from Timişoara*

P4 Quantitative determination of some antioxidant compounds from the *Vaccinum myrtills* extracts
Dumitru Condrat, Virgiliu Ciutina, Mihaela Meșter, Anca Dicu, Monica Zdremțan, Daniela Diaconescu - *Faculty of Food Engineering, Tourism and Environmental Protection, "Aurel Vlaicu" University, Arad, Romania*

P5 Preliminary results on the recovery of coenzyme Q10 from vegetable and animal waste
Andersina Simina Podar, Cristina Anamaria Semeniuc, Floricuța Ranga, Maria-Ioana Socaciu, Melinda Fogarasi, Anca Corina Fărcaș, Dan Cristian Vodnar, Simona Raluca Ionescu, Sonia Ancuța Socaci - *Faculty of Food Science and Technology, University of Agricultural Sciences and Veterinary Medicine from Cluj-Napoca, Romania*

P6 Evaluation of bacterial contamination of some Red velvet cakes
Zorica Vosgan, Anca Dumuta, Lucia Mihalescu, Flavia Pop - *FTechnical University of Cluj-Napoca, Faculty of Sciences, Department of Chemistry and Biology, Baia Mare, Romania*

P7 Study on the nutritional value of some cereal bars assortments from the Romanian market
Liana Maria Alda, Claudia Sirbulescu, Daniela Scedei, Diana Moigradean, Despina Maria Bordean, Mihaela Moatar, Raluca Spatariuc, Simion Alda - *Faculty of Food Engineering, University of Life Sciences "King Mihai I" from Timişoara*

P8 The use of PCR and elisa methods to detect and monitor the infection of domestic pigs and wild boars with african swine fever virus
L. Anghel (Cireașa), M.V. Tanasa (Acretei), C.O. Vrancianu, N. Roșoiu - *D.S.V.S.A. Constanta, Molecular Biology Laboratory, Veterinary Health and Food Safety Department, Constanta, Romania*

P9 Design, synthesis, and physicochemical properties of ternary Nd(III) systems with flavonoids. Relevance to human health
Anastasios Papadopoulos, Sevasti Matsia, Antonios Hatzidimitriou, Athanasios Salifoglou - *Laboratory of Inorganic Chemistry and Advanced Materials, School of Chemical Engineering, Aristotle University of Thessaloniki, Thessaloniki 54124, Greece*

P10 Production of bilayer polymeric films for future use in active food packaging materials
Charalampos Giannios, Sevasti Matsia, Athanasios Salifoglou – *Laboratory of Inorganic Chemistry and Advanced Materials, School of Chemical Engineering, Aristotle University of Thessaloniki, Thessaloniki 54124, Greece*

P11 Unusual catalytic reactivity in new vanadium-peroxido-zwitterion materials
Efrosini Kioseoglou, Antonios Hatzidimitriou, Athanasios Salifoglou - *Laboratory of Inorganic Chemistry, School of Chemical Engineering, Aristotle University of Thessaloniki, Thessaloniki 54124,Greece*

P12 Synthesis and characterization of vanadium hybrid materials with physiological substrates as potential insulin mimics in *Diabetes mellitus* II
Georgios Lazopoulos, Antonios Hatzidimitriou, Athanasios Salifoglou - *Laboratory of Inorganic Chemistry and Advanced Materials, School of Chemical Engineering, Aristotle University of Thessaloniki, Thessaloniki 54124, Greece*

P13 Seaweed and ground fish bone product characterization and antioxidant activity as potential plant growth stimulants in agriculture
Sevasti Matsia, Marios Maroulis, Maria Perikli, Oana Cristina Parvulescu, Violeta Alexandra Ion, Anne-Kristin Løes, Joshua Cabell, Athanasios Salifoglou- Laboratory of Inorganic Chemistry and Advanced Materials, School of Chemical Engineering, Aristotle University of Thessaloniki, Thessaloniki 54124, Greece, Norwegian Centre for Organic Agriculture (NORSØK), Gunnars veg 6, Tingvoll N-6630, Norway

P14 Chemical reactivity of lanthanide metal ions with natural antioxidant agents
Veroniki Dakoura, Sevasti Matsia, Antonios Hatzidimitriou, Athanasios Salifoglou - *Laboratory of Inorganic Chemistry and Advanced Materials, School of Chemical Engineering, Aristotle University of Thessaloniki, Thessaloniki 54124, Greece*

P15 Design, synthesis and physicochemical properties of ternary La(III) systems with dietary flavonoids
Evangelos Pozarlis, Sevasti Matsia, Antonios Hatzidimitriou, Athanasios Salifoglou – *Laboratory of Inorganic Chemistry and Advanced Materials, School of Chemical Engineering, Aristotle University of Thessaloniki, Thessaloniki 54124, Greece*

P16 The barrier between toxic and nutritious seeds
Despina-Maria Bordean, Ducu Sandu Stef, Aurica Breica Borozan, Liana Maria Alda, Luminita Pirvulescu, Laura Rădulescu, Corina Iuliana Megyesi - *Faculty of Food Engineering, University of Life Sciences "King Mihai I" from Timişoara, Romania*

P17 Challenges and approaches in the use of natural bioactive compounds of plant origin as food additives in meat products
Sofia Popescu, Florina Radu, Ariana Velciov, Luminita Pirvulescu - *Faculty of Food Engineering, University of Life Sciences "King Mihai I" from Timişoara*

P18 Preliminary Studies for the Determination of Niacin
Ivana Pantea, Alexandru Pahomi, Daniela Dascălu - *West University of Timișoara, Faculty of Chemistry, Biology, Geography, Department of Biology-Chemistry, J.H. Pestalozzi 16, 300115, Timișoara, Romania*

P19 Research perspective in Romanian military while on duty diet
Ana-Maria Fundeanu, Oana-Viorela Nistor, Doina-Georgeta Andronoiu, Gabriel-Dănuț Mocanu, Elisabeta Botez - *"Dunărea de Jos" University of Galati, Faculty of Food Science and Engineering 111 Domnească Street, RO-800201, Galati, Romania*

P20 Use of rosehip and carob powder as unconventional plant materials to design novel functional and nutritional chocolate formulations
Ioana-Alina Pop, Camelia Moldovan, Diana Moigradean, Mirela Popa, Daniela Stoin, Adrian Rivis, Delia Dumbrava, Diana Raba, Mariana-Atena Poiana - *Faculty of Food Engineering, University of Life Sciences "King Mihai I" from Timişoara, Romania*

P21 Development and nutritional characterization of pomegranate peel powder. Preliminary research
Ariana – Bianca Velciov, Adrian Riviș, Daniela Stoin, Georgeta – Sofia Popescu, Iasmina – Madalina Anghel, Antoanela Cozma, Alexandru Rinovetz, Laura Rădulescu, Corina Iuliana – Megyesi, Maria Rada - *Faculty of Food Engineering, University of Life Sciences "King Mihai I" from Timişoara, Romania*

P22 Sourdough lactic acid bacteria impact on bread quality and conservation
Alina A. Dobre, Elena Mirela Cucu, Nastasia Belc - *National Research and Development Institute for Food Bioresources - IBA Bucharest, Băneasa Ancuța 5, 020323, Bucharest, Romania*

P23 Boron compounds: Challenges and Applications in food industry
Veronica Filimon, Alexandra Virginia Bounegru, Simona Butan -"*Dunarea de Jos" University of Galati, Galati, Romania*

P24 Research on obtaining an assortment of hypoglycemic ice cream
Mariana-Violeta Popescu, Andreea Juncanariu, Adriana Dabija - *Ștefan cel Mare University of Suceava, Faculty of Food Engineering, University Street 13,720229, Suceava, Romania*

P25 The study of the Bican roz 6 Mf clone in the climate conditions of the murfatlar vineyard
Anamaria Negraru (Tănase), Mihai Botu, Aurora Ranca, Traian Ștefan Cosma, Ionica Dina, Grigore-Valentin Beleniuc - *Murfatlar Viticulture and Vinification Research and Development Station; University of Craiova, 13 Street A.I. Cuza , Faculty of Horticulture, Craiova, România*

P26 Interactions of sporobiota with other soil species
Laurențiu Adrian Urucu, Ionel Popescu-Mitroi, Radu Dana Gina - *"Aurel Vlaicu" University of Arad, Faculty of Food Engineering, Tourism & Environmental Protection, 310330 Arad, 2 – 4 E. Dragoi Street, Romania*

P27 Studies on the fatty acid profile and quality characteristics of linseed oil
Viorica – Mirela Popa, Despina – Maria Bordean, Aurica Breica Borozan, Delia – Gabriela Dumbravă, Corina – Dana Mișcă, Camelia Moldovan, Mariana – Atena Poiană, Diana – Nicoleta Raba - *Faculty of Food Engineering, University of Life Sciences "King Mihai I" from Timişoara, Romania*

P28 Plant-based alternatives to cheese - antioxidant, nutritional and sensory characteristics
Delia-Gabriela Dumbrava, Camelia Moldovan, Mariana-Atena Poiana, Ducu Sandu Stef, Corina Dana Misca, Viorica-Mirela Popa, Diana-Nicoleta Raba, Nicoleta-Gabriela Hadaruga - *Faculty of Food Engineering, University of Life Sciences "King Mihai I" from Timişoara, Romania*

P29 Eco-innovating of organic rhubarb granules used to correct the acidity marker of the sugar syrups
Steluța V. Radu - *"Ion Ionescu de la Brad" University of Life Science Iaşi, Romania*

P30 Influence of red kidney bean (*Phaseolus vulgaris* L.) flour on baker's confectionery products quality
Cristina Natalia Butunoi, Bogdan Păcularu – Burada, Doina Georgeta Andronoiu, Gabriel – Dănuț Mocanu, Gabriela Elena Bahrim - *Department of Food Science, Food Engineering, Biotechnology and Aquaculture, Food Science and Engineering Faculty, „Dunarea de Jos" University of Galati, Romania*

P31 Quality evaluation of different types of sunflower oils
Cosmina Gabriela Murgoci, Luiza – Andreea Tănase (Butnariu), Oana – Viorela Nistor, Gabriel – Dănuț Mocanu - *Department of Food Science, Food Engineering, Biotechnology and Aquaculture, Food Science and Engineering Faculty, „Dunarea de Jos" University of Galati, Romania*

P32 Effects of different levels of basil (*Ocimum basilicum* L.) powder or extract on physicochemical, textural and sensorial characteristics of bread
Andra Maria Popovici, Silviu Mântăilă, Luiza – Andreea Tănase (Butnariu), Doina Georgeta Andronoiu, Gabriel – Dănuț Mocanu - *Department of Food Science, Food Engineering, Biotechnology and Aquaculture, Food Science and Engineering Faculty, „Dunarea de Jos" University of Galati, Romania*

P33 Influence of different drying methods on bioactive compounds, colour and antibacterial properties of some aromatic plants
Georgiana Gabriela Popovici, Silviu Mântăilă, Luiza – Andreea Tănase (Butnariu), Mihaela Cotârleț, Gabriel – Dănuț Mocanu - *Department of Food Science, Food Engineering, Biotechnology and Aquaculture, Food Science and Engineering Faculty, „Dunarea de Jos" University of Galati, Romania*

P34 The use of bamboo, coconut and almond flour to obtain gluten-free and hypoglucidic cookies
Camelia Moldovan, Maria Laura Szasz-Toma, Ancuța Maria Popa, Cristina Toța, Viorica-Mirela Popa, Diana-Nicoleta Raba, Aurica-Breica Borozan, Corina-Dana Mișcă, Despina-Maria Bordean, Mariana-Atena Poiana, Delia-Gabriela Dumbravă - *Faculty of Food Engineering, University of Life Sciences "King Mihai I" from Timişoara, Romania*

P35 Quality evaluation of functional biscuits developed from wheat flour and malted barley flour mixtures
Daniela Stoin, Călin Jianu, Mariana-Atena Poiană, Ariana-Bianca Velciov, Ileana Cocan, Monica Negrea - *Faculty of Food Engineering, University of Life Sciences "King Mihai I" from Timişoara, Romania*

P36 Studies on the influence of the shelf life of Cottage cheese on the content of the B vitamin complex
Florina Radu, Georgeta- Sofia Popescu, Mihaela Maria Stanciugelu, Daniela- Florentina Marcu - *Faculty of Food Engineering, University of Life Sciences "King Mihai I" from Timişoara, Romania*

P37 Filtration in the fractionation of natural semi-solid fats
Alexandru Rinovetz, Adrian Riviș, Corina Mișcă, Ariana Velciov, Florina Radu, Gabriel Hegheduș-Mîndru, Bogdan Petru Rădoi, Gabriel Bujancă, Alina Tunsu, Mihaela-Gianina Fraiu, Oana-Alina Marcu, S. Coste, B. Vaipan, Nicoleta Hădărugă , Teodor Ioan Trașcă - *Faculty of Food Engineering, University of Life Sciences "King Mihai I" from Timişoara, Romania*

P38 Formulated lipids vs shortenings. Short communication
Alexandru Rinovetz, Adrian Riviș, Corina Mișcă, Ariana Velciov, Daniela Stoin, Gabriel Hegheduș-Mîndru, Bogdan Petru Rădoi, Corina Megyesi, Mihaela-Gianina Fraiu, Oana-Alina Marcu, S. Coste, B.Vaipan, Teodor Ioan Trașcă, Nicoleta Hădărugă - *Faculty of Food Engineering, University of Life Sciences "King Mihai I" from Timişoara, Romania*

P39 Setting the sole purpose as well as the advantages and disadvantages of the PCR (Polymerase Chain Reaction) versus Elisa (Enzyme – Linked Immunosorbent Assay) laboratory techniques used to confirm the presence of African Swine Fever virus in domestic pigs and wild boars
Larisa Anghel (Cireasa), Maria-Virginia Tanasa (Acretei), Valentin Balteanu, Carmen Chifiriuc, Natalia Roșoiu - *D.S.V.S.A. Constanta, Molecular Biology Laboratory, Veterinary Health and Food Safety Department, Constanta, Romania*

P40 The quality of pumpkin oil using in food industry
Bianca Florina Pascotescu, Mariana-Atena Poiana, Simion Alda, Liana-Maria Alda, Despina-Maria Bordean, Camelia Moldovan, Delia-Gabriela Dumbrava, **Diana Moigradean**, *Faculty of Food Engineering, University of Life Sciences "King Mihai I" from Timişoara, Romania*

P41 Hops substitutes for brewing beer: a review
Marius Eduard Ciocan, Ancuța Chetrariu, Rozália Veronika Salamon, Adriana Dabija
Ștefan cel Mare University of Suceava, Faculty of Food Engineering, University Street 13,720229, Suceava, Romania

P42 Antioxidant activity and kinetic studies on some hydrophilic extracts of fruits from the rose family (*Rosaceae*)
Dina Gligor (Pane), Cristina Liliana Mitroi, Nicoleta G. Hădărugă, Daniel I. Hădărugă, *Doctoral School "Engineering of Vegetable and Animal Resources", University of Life Sciences "King Mihai I" from Timişoara, Calea Aradului 119, 300645 - Timişoara, Romania*

P43 The obtaining and characterizing of some low-fat pork sausages
Ducu Stef, Adrian Riviș, Teodor Ioan Trașcă, Nicoleta Hădărugă, Gabriel Hegheduș-Mîndru, Despina Bordean, Delia Dumbravă, Camelia Moldovan, Mirela Popa, Corina Mișcă, Mihaela Cazacu, Lavinia Ștef, Ramona Hegheduș-Mîndru, Gabriel Bujancă
University of Life Sciences "King Mihai I" from Timişoara, Calea Aradului 119, 300645 - Timişoara, Romania

Section: Food Chemistry, Engineering & Technology

25-26 May 2023

BOOK OF ABSTRACT

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PL$_3$

Molecular engineering of natural antioxidant capacity drives future neuroprotective technologies in human health

Athanasios Salifoglou

Laboratory of Inorganic Chemistry and Advanced Materials, School of Chemical Engineering, Aristotle University of Thessaloniki, Greece

IL$_3$

Naringin and naringenin derivatives with diamines and polyamines in antioxidant activity

Sevasti Matsia, Athanasios Salifoglou

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Naringin and naringenin are the main bioactive polyphenols encountered in the plant kingdom, encountered abundantly in citrus fruit, including lemon, orange, mandarin, and grapefruit [1]. Their anticancer activities are pleiotropic, and they can modulate different cellular signalling pathways, suppress cytokine, and arrest the cell cycle [2]**.**

Cognizant of the fact that the antioxidant properties of flavonoids are distinct in their own nature and application(s) in each plant (parts and products), thereby affecting human nutrition, dietetic habits and cellular protection at the molecular level, the possibility was explored that appropriate derivatization of a select group of such molecules could be modified in vitro so as to exhibit potentially new properties or enhanced properties with respect to their antioxidant-therapeutic potential [3], thereby averting deleterious cellular chemical reactions from taking place. Consequently, research was undertaken in our lab, wherein a select group of flavonoids was chosen, essentially targeting improvement of antioxidant potential through derivatization. The so chosen flavonoids, naringin and naringenin [4], have been further modified in their substituents peripheral to the C ring, including diamines (i.e. putrescine, spermine, spermidine). The derived products, mainly involving ether and oxime moieties, were fully physicochemically characterized, showing enhanced luminescence properties and subsequently employed in microbiological studies, essentially seeking to determine their antimicrobial properties and evaluate the extent of their antioxidant capacity. The result of the study set the stage for the development of new hybrid flavonoids and derivatives thereof, so as to enhance the antimicrobial arsenal of options when bacterial insurgents find their way into a) nutritional resources, traditionally used in human diet or products destined for human consumption, and b) humans, thereby affecting their health.

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PL4

Hybrid chromium-flavonoid materials promoting antioxidant capacity roles in human (patho)physiology

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Human pathophysiology rides on a very sensitive balance of pro-oxidant and antioxidant processes, often gliding away as a result of aberrant mechanisms of metabolic activities. As a result of such dishomeostatic processes, reactive oxygen and reactive nitrogen species emerge prominently to contribute to the misbalance of natural activities at the molecular level, thus leading to the gradual demise of tissue function in multicellular organisms, such as humans. The repercussions of such aberrant processes bear down on the physiology of one or more homeostatically conserved metabolic pathways, thereby creating phenotypic changes of systemic proportions.

Flavonoids are molecular entities of diverse nature, with often encountered polyphenolic moieties, which are sufficiently reactive toward reactive oxygen species so as to neutralize them.[1] Thus, they act as efficient antioxidants averting oxidative stress damage or reversing oxidative damage to a functional molecule in metabolism. The nature of the core of flavonoids in combination with their phenolic substituents stands witness to their capacity to react and by doing so enhance their profile as quintessential ingredients in the habitual diet of every day life for humans. Combination of such exogenously introduced molecules to human diet with appropriately configured metal ions appear to proffer merit in pursuing hybrid metalloforms, that could enhance the antioxidant activity of flavonoids as a consequence of their coordination to a metal ion. Such a prospect emerged as a goal in our research, thereby leading to the synthetic investigation of binary and ternary systems of Cr(III) (linked to metabolic syndromes) with select flavonoids and ternary ancillary chelators (phen and bipy).[2] The so arisen crystalline products were physicochemically characterized, thus, allowing for subsequent in vitro biological studies probing into the biotoxicity and antioxidant activity of the selected materials. Further employment of the hybrid materials in in vitro biological assays probing into their osteogenic potential was successful, essentially pointing out the salient features contributing to the collective properties rendering them multifunctional in (patho)physiological processes.

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OC4

Evolution of quality characteristics of green tomatoes during fermentation in low-sodium regime

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Pickled green tomatoes are included for centuries in the Romanian gastronomic patrimony. Despite multiple health benefits induced by macro and micronutrients from green tomatoes, as well as by the microorganisms involved in the fermentation process, pickles are incriminated for a high sodium content. The main objective of this study is to obtain low sodium pickled green tomatoes by substitution of sodium chloride with potassium and magnesium chloride. In order to investigate the effects of this substitution on the quality characteristics of the pickles, a series of analysis have been achieved during the fermentation, at 7, 14, 21 and 28 days: physical (mass, dimensions, color and texture), chemical (dry matter, lactic acid content, Na, K and Mg ions), microbiological (evolution of lactic bacteria), phytochemical (total polyphenols, total flavonoids, total carotenoids) and antioxidant activity. At the end of the fermentation process, sensorial analysis has been done, in order to find out the consumers acceptability related to these products.

The results revealed that the substitution of sodium chloride with potassium and magnesium chlorides increased the water and weight loss and reduced the number of lactic bacteria. Similarly, after 28 days of fermentation, the lactic acid content in NaCl samples was 1582.88 mg/100 g, while in KCl and $MgCl_2$ samples was 1136.17 mg/100g and 1097.71 mg/100 g, respectively. The antioxidant activity of the samples increased constantly during fermentation process, simultaneous with phytochemical compounds. The substitution salts induced brighter color and firmer texture for the pickles at the end of fermentation process.

Furthermore, even though the taste was influenced by the substitution salts, all the samples presented a good acceptability.

In conclusion, potassium and magnesium chloride could be good alternatives for sodium chloride substitution in green tomatoes fermentation.

Keywords: low-sodium pickles, antioxidant activity, color, texture

OC7

Bio-materials based on polyvinyl alcohol (PVA) with barrier properties against water vapor

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The increased permeability of polyvinyl alcohol (PVA) to water vapors is well documented in the literature (Bellelli et al 2018). Establishing which type of material, out of a set of 18 PVA-based films would have better barrier properties against water vapors as compared to neat PVA was the goal of this research study. Citric acid and lauryl glucoside extracted from coconut were the cross-linking agents. The 18 samples were differentiated based on the variation of three parameters, namely the content of citric acid, the concentration of the solution of surfactant and respectively the parameters of the heat treatment. The best option of biomaterial is one whose water vapors permeability (WVP) is only three times higher as compared to polypropylene (PP), considered as reference material, while the WVP of the unchanged PVA was 26 times higher as compared to PP. This is due to a complex structure formed by the PVA chain and hydrocarbons from beeswax, interconnected by surfactant molecules and fixed by the citric acid used as cross-linking agent (Figure 1). Because the film of biomaterial we selected could replace materials with low biodegradability currently in use to produce dry food packaging, our research generates immediate practical applicability.

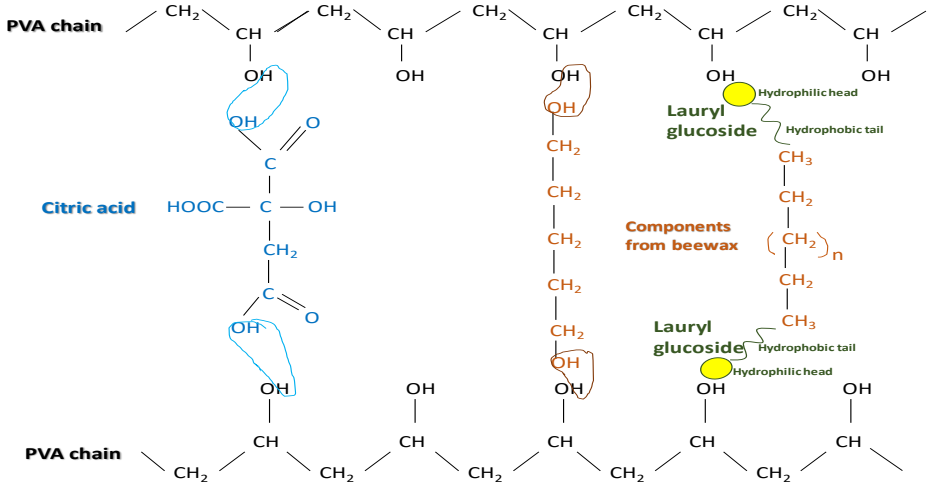

Figure 1. Structure of the biomaterial based on P VA

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OC$_{10}$

Development of allantoin-based hydrogels for chronic wound healing and cell regeneration.

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Wound healing is a physiological process, which restores skin integrity, aiming to repair damaged tissues [1,2]. This process starts with the establishment of hemostasis and proceeds through three interrelated dynamic and overlapping phases: inflammation, proliferation, and remodeling [3,4]. Poised to pursue the fabrication of such a product, research was launched in our labs targeting hydrogels destined to facilitate would healing. In this context, the current research objectives focused on a) hydrogel synthesis, b) optimization of fabrication conditions, c) enrichment with a biologically active substance, and d) physicochemical characterization and stability studies (swelling rate, moisture percentage, weight fluctuations, mechanical properties, etc.). For the preparation of wound healing hydrogels, the following reagents were used: Sodium Alginate (SA) and Methyl Cellulose (MC) as basic materials. Further use of Agarose and Sucrose was envisioned to strengthen the hydrogels, keeping in mind that the final products will be used in the promotion of cell growth. After the process of optimizing the method of synthesis and stabilization of the hydrogel, the latter was enriched with allantoin, which is known for its regenerative, wound healing, and antioxidant properties, with the gel coming from the aloe plant supporting the intended process.

The purpose of the undertaken research was to a) investigate and clarify defined ways of preparing composite hydrogels enriched with allantoin, b) develop scaffolds for biomedical applications, such as tissue healing and regeneration, and c) restore the original state of chronic wounds and ulcers. Enriched hydrogels are used to create dressings that will aid faster wound healing and antisepsis. All starting materials, as well as hydrogels cross-linked with calcium chloride (or not), were characterized in terms of their composition by Fourier Transform Infrared Spectroscopy (FT-IR) and, subsequently, Thermogravimetric Analysis (TGA). The collective results suggest strongly that optimized and enriched hydrogels formulate defined profiles, thus lending credence to fundamental research in the development of materials for tissue healing and regeneration, with the composition and physicochemical attributed dictating the potency of the biological process of healing.

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OC$_{11}$

In-vitro evaluation of bioactive profile of *Cornus mas* L. extract

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Cornelian cherry (*Cornus mas* L.) is a fruit widely used since ancient times in folk medicine, due to its pro-health potency. This potency is mainly attributed to the presence of high amounts of polyphenols, including anthocyanins, which are significantly higher than other fruit. The known beneficial properties include mitigation of influenza and angina symptoms, antioxidant and anti-inflammatory properties, antigenotoxic activity without toxicity and atherosclerotic properties [1]. The central nervous system is particularly vulnerable to oxidative stress, since neuronal membranes contain highly susceptible poly-unsaturated fatty acids, the antioxidant defense mechanisms are comparatively weak, and the oxygen consumption is relatively high [2].

Being cognizant of the aforementioned thesis, our research has focused on the biological profile of Cornelian cherry extract, generated through extraction of an aqueous solution of cyclodextrins. The resulting extract was characterized by determination of total polyphenolic content, DPPH radical scavenging activity, total monomeric anthocyanin concentration, and loganic acid and total flavonoid concentration, prior to in vitro studies. Subsequently, the in-vitro biological characterization of the extract was launched, to determine the biotoxicity profile of the Cornus mas L. extract. The cell lines used were both brain tissue cell lines, one physiological mouse neuronal (N2a) and one pathological human neuroblastoma (SH-SY5Y) cell lines. These in vitro studies were formulated through the investigation of the biotoxicity profile of the extract, further supplemented by antioxidant and anti-inflammatory investigation. In depth studies included a) viability, b) morphology, and c) chemotacticity determination in a time- and dose-dependent fashion. The results project an atoxic extract, up to very high concentrations (5 mg/mL), containing high amounts of polyphenolic compounds, thereby justifying further use of such products as nutraceutical agents in human diet.

Acknowledgements: This research has been conducted in the frame of the Regional Operational Programme Central Macedonia 2014-2020 (“Development of natural product with neuroprotective action based on the plant Cornelian cherry”, action code: KMP6-0079229) that was co-financed by Greek national funds and the European Union (European Regional Development Fund).

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OC12

In-vitro studies of neuroprotective properties of oleuropein

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Neurodegenerative diseases are a heterogeneous group of pathologies, characterized by progressive damage to the nervous system. There are numerous pathological mechanisms leading to neurodegeneration, involving accumulation of reactive oxygen species (ROS), neuroinflammation, etc. To that end, extensive research has been conducted over the past decades, proving the potency of phytochemicals, such as polyphenols, as protecting agents due to various beneficial effects countering neurodegeneration through anti-inflammatory, antioxidative, and anti-amyloidogenic activity [1] [i]. The study of natural products in the field could be discerned into two approaches. The first one involves determination of the potency of the natural products in the form of extracts, which utilizes the synergistic actions of the various extract constituents, with the second one involving isolation of the desired product(s) in pure form, to specifically define the bioactive compounds of a food or an extract and study cellular and molecular mechanisms, affected by the compound [2] [ii]. One natural product that has attracted recently considerable attention is oleuropein. Oleuropein is a naturally occurring phenolic compound, the extracts of which have shown various health benefits, such as blood pressure lowering, cardioprotective, antioxidant, anti-inflammatory, and neuroprotective activities [3] [iii].

In an effort to discover clinically potent nutraceuticals against neurodegeneration, in vitro biological research in our lab was launched to determine the efficacy of high purity oleuropein isolated in our lab. To achieve that, two highly sensitive brain tissue cell lines were used. The first one is a physiological mouse neuronal (N2a) cell line, while the second one is a pathological human neuroblastoma (SH-SY5Y) cell line. The first step included an depth study of the biotoxicity profile of the compound. That was done by invoking the standard metabolic activity assay (XTT in this case), followed by morphological and chemotacticity studies. Moreover, the antioxidant ability of the compound was determined in the presence of oxidative stress, while at the same time, the corresponding genes were examined using PCR. All of the stated studies were performed in a time- and concentration-dependent fashion. The results show an atoxic compound up to very high concentrations (1 mM), thus providing justification for further in vitro and ex vivo investigation.

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OC13

Antimicrobial activity in the solid state and solution of blue marine resources

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Nowadays, the need for sustainability of natural sources in fertilizers, biostimulants, and soil amendments has risen significantly due to the dire consequences that conventional farming methods have generated, including environmental pollution, CO2 emissions linked to the Greenhouse Effect, and bacterial and fungal diseases affecting both water and soil. To that end, alternative agricultural practices are needed, thus necessitating the advent of new approaches involving natural resources with no carbon imprint [1]. From the point of view of the marine natural resources, seaweed extracts (High Nitrogen seaweed, Low Nitrogen seaweed and fish bones [2] were collected from the Norwegian coast as industrial emerging waste, which could be used as starting raw material with potentially beneficial biological activities in plant growth [3]. To that end, employment of such natural resource products in the quest for molecular enhancers in plant growth, sets new standards in pursuing broad agricultural crop production practices in an ecofriendly manner. Consequently, in this particular study, the aforementioned raw materials have been screened, characterized, and processed to divulge molecular factors acting as natural fertilizers, while concurrently enhancing plant crop growth in the field.

Initially, seaweed extract and fish bone processed waste was extracted using eco-friendly (green) solvents. Subsequently, their antimicrobial potential was investigated in Gram-positive (S. aureus) and Gram-negative (E. coli) bacterial cultures, both in the solid state and in solution. Specifically, optimal conditions were probed into and established to facilitate determination of the antimicrobial potential of the natural extracts, through quantitation of the Zone of Inhibition (ZOI). Solution work was equally informative in pointing out growth characteristics revealing the antimicrobial potential of the materials involved. The results indicate that seaweed and fish bone extracts contain essential molecular nutrients promoting biologically safe and efficient enhancement of crop plant growth in contemporary agriculture.

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OC14

Design and synthesis of polymeric microparticles for the encapsulation of pharmaceuticals

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The study of microparticles (MPs) in medicine has been rapidly advancing and extends into the physiology of health, the pathophysiology of disease, and their role in transfusion medicine. Microparticles (microspheres, microcapsules, coated pellets, etc.) are generally in the 1–1000 μm size range [1] [iv]. They are known to exist in multiunit drug delivery systems with well-defined physiological and pharmacokinetic benefits in order to improve effectiveness, tolerability, and patient compliance.

In the medical treatment of turbeculosis [2] [v], the most important parameter in the administration of inhaled drugs is the particle size of the drug carrier, since particles larger than 10 μm cannot pass through the esophagus. As a result, there is a need for research into the synthesis of molecular hosts of appropriate size and ability to encapsulate the appropriate drugs (amikacin and colistin) in order for them to reach the alveoli in the lungs and be delivered. In the context of the development of such drugs, capable of enhancing the therapeutic power of clinical trials in the treatment of the disease, the aim of the undertaken research was the synthesis of particles in the range from 2 to 5 μm, with primary starting materials affording biodegradable and bioavailable microparticles.

Biodegradable polymers, such as poly(ε-caprolactone) (PCL) and chitosan, were used to synthesize such microparticles, using the emulsion solvent evaporation method [3] [vi] and ionic gelation, respectively [4,5] [vii,viii]. The actually employed antibiotic drugs were amikacin and colistin. In either case, the drug is added to the aqueous phase, with the emerging microparticles exhibiting physical and chemical characteristics commensurate to their original design. All materials have been characterized by FT-IR and TEM microscopy for their morphology, structure and particle size. Release studies were performed through UV-Visible spectroscopy and indicate the efficacy of the carriers in drug delivery. The results a) detail the formation of hybrid particulate drug carriers, and b) support their further introduction into clinical application for the treatment of tuberculosis and similar pathologies.

POSTERS

P1

Phytoproducts and functional digestive disorders in female patients

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Background: Functional digestive disorders frequently seen in female gender are characterized by dyspeptic complaints with impact over the life quality.

Aim Assessment of the efficacy of natural extracts on dyspeptic complaints in female patients with irritable bowel syndrome (IBS).

Patients and methods 35 female outpatients, age between 21-72 years, with confirmed predominant constipation form of IBS joined this study. A lot of organic diseases and conditions were ruled out. Patients undertook a thoroughly clinical examination. Symptoms characterizing IBS such as: abdominal pain, bloating and transit disturbances were scored using a scale ranging from 0=absent to 3= severe. Laboratory work- ups from blood, urine and stool, as well as transabdominal ultrasonography, upper and lower digestive endoscopy were performed. Symptoms were assessed before and after administration of over the counter supplements containing a mixture of phytoextracts from Aconitum palmatum, Cowrie Shell Calx, Piper nigrum, Embelia ribes, Triphala (Emblica officinalis, Terminalia chebula, Terminalia bellerica), and Zingiber officinale 3 times/day, at table, for 3 months long., together with the usual medication for IBS.

Results Vast majority of patients had an urban location (71.4%) The age distribution revealed that 82.85% were under 50 years and only 17.15% were over 51 years old. Abdominal pain score before treatment was 2.44 0.33±vs 2.21±0.42, after the treatment, p=0.0131. The score for bloating complaints before treatment was 2.31±0.71 vs. 1.33±0.34, after the treatment, p<0.0001. The score of transit disturbances before treatment was 1.88 ±0.51 vs1.42± 0.47 after treatment, p=0.0002.

Conclusions: Female patients with constipation predominant IBS displayed significant alleviation of complaints for bloating and transit disturbances, after using phytoextracts from supplements. However, abdominal pain was only mitigated.

Key words: Phytoextracts, dyspepsia, IBS

P2

Evaluation of the nutritional value of acacia honey with nuts

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Bee honey has been present in human nutrition since ancient times, having a superior nutritional value. The nutritional value of honey consists primarily in its richness in sugars (70-80%), from this point of view, being a food energetic par excellence. This paper aims to analyze the assortment of acacia honey with the addition of nuts from a qualitative and nutritional point of view. The content of protein, fat, carbohydrates and the energy value of the obtained product will be determined. . The mixture of acacia honey and walnut ideally combines the properties of the two foods, thus obtaining a product with a high nutritional value.

Keywords: bee honey, acacia honey, acacia honey with nuts

P3

Sensory and physical-chemical characterization of a homemade raspberry jelly

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The aim of the paper was to create an authentic food - raspberry jelly, and to characterize it from a sensory and physicochemical point of view. Thus, we decide to obtain a food as natural as possible, with special nutritional qualities due to the reach content of nutrients from raspberries. Without the addition of preservatives or other chemical additives, a "jelly" type product was created, made of raspberry, which is a rich source of valuable vitamins (A, D, C, E, B3, B2, B6), minerals (K, Mn, Cu, Fe, Mg) and helps to reduce the risk of illness, obesity and diabetes.

2 types of jelly were obtained (raspberry jelly with raw sugar and raspberry jelly with stevia sugar), which were subsequently analyzed from sensory and physicochemical point of view. After the analyzes carried out, it was found that the raspberry jelly obtained with the addition of stevia sugar was more appreciated than the jelly obtained with raw sugar, both due to the appearance and color, but also due to the consistency of the finite product. Regarding the physicochemical analyzes performed (determination of total acidity, sugar content and refractive index) for the 2 samples of raspberry jelly, higher values were obtained in the case of raspberry jelly with stevia sugar, for all 3 monitored characteristics.

Keywords: raspberry, jelly type products, stevia sugar, sensory analysis.

P4

Quantitative determination of some antioxidant compounds from the *Vaccinum myrtills* extracts

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The profile of antioxidant compounds of the analyzed extracts was investigated by chromatographic analysis using a Shimadzu Nexera X2 ultra-high performance liquid chromatograph (UHPLC) equipped with a Shimadzu DAD detector and a Nucleosil 100-3-C13 reversed-phase column. Measurements were performed in the wavelength range of 200-600 nm. The plant material subjected to extraction was hawthorn leaves (*Vaccinum myrtills*).

Different solvent extracts were tested and we found that the 70% hydroalcoholic extracts have the highest content in antioxidant compounds, the content of the extracts varying between 8.05 – 3258.73 mg/L.

Keywords: antioxidant, hawthorn, ethanolic extract, high performance liquid chromatography.

P5

Preliminary results on the recovery of coenzyme Q10 from vegetable and animal waste

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Introduction: Most animal-originated foods, such as meat, egg, and dairy products, are critical sources of Coenzyme Q10 (CoQ10)[1]; other available food sources include vegetable oil, fish, bee pollen and microorganisms[2].

Aim: This work involved the recovery of CoQ10 from vegetable and animal waste for possible utilization as a food supplement.

Materials and Methods: Six different press cakes resulting from the cold extraction process of rapeseed, sunflower, pumpkin, linseed, walnut, and hempseed oils, respectively, minced samples of whole fish and chicken hearts, have been tested for CoQ10 content using the ultrasonic extraction with 2-propanol.

Results: Pumpkin press cake showed the highest level of CoQ10 (84.80 µg CoQ10/g material) among the vegetable waste studied and chicken heart (114.39 µg CoQ10/g material) among the animal ones.

Conclusion: The ultrasound-assisted extraction using 2-propanol is suitable for recovering CoQ10 both from vegetable and animal matrices; it is simple to perform and environmentally friendly.

Keywords: chicken heart, coenzyme Q10, extraction, press cakes, whole fish

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P6

Evaluation of bacterial contamination of some Red velvet cakes

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Cakes are important and highly diversified bakery products to meet the challenges of the market. They have a high potential contamination with microorganisms because of the ingredients which they contain. However we are trying to find some solutions to increase the validity period, respectively to reduce the costs. The purpose of this study is to evaluate the degree of bacterial contamination of some Red velvet assortments, having in the composition of the counter, on besides the basic ingredients, additions of beetroot powder or juice that provide approximately the same intense shade of red color as the food dyes. The determination of the total number of germs, the presence of enterobacteria, as well as of coagulase-positive staphylococci, was carried out, both at the moment ready for consumption and after a period of refrigeration for seven days. The results showed that the samples were contaminated with these germs, but the infection falls within the standards. The control of primary contaminants, the addition of some natural compounds with antimicrobial properties, as well as compliance with hygiene standards are essential for the promotion of some quality desserts.

P7

Study on the nutritional value of some cereal bars assortments from the Romanian market

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Through the varied content of cereals and fruits, cereal bars are designed to deliver healthy nutritional values unlike many other snacks. There is a growing orientation towards the consumption of healthy products and towards innovative assortments. The purpose of this study was an analysis regarding the nutritional value, especially the mineral content of this type of snack. 10 assortments of cereal bars from the Romanian market were targeted and a comparative study of their nutritional values was carried out. To determine the mineral content, was used the X-ray fluorescence technique (FRX).
From the analysis of the assortments taken in the study, we concluded that although there are very big differences between the nutritional values of the assortments, these bars are good sources of fiber and mineral elements, especially Ca and Fe, but they also have a high carbohydrate content.

Key words: FRX method, cereal bars assortments, nutritional value

P8

The use of PCR and elisa methods to detect and monitor the infection of domestic pigs and wild boars with african swine fever virus

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African Swine Fever is an infectious disease affecting domestic pigs, wild boars and other related species. It is caused by a double-stranded DNA virus from *Asfarviridae* family. Currently 22 ASFV genotypes have been identified; the genotype I is the one circulating in Europe, South America and Western Africa. The infection causes high mortality rates in animals especially due to hemorrhagic fever. The first signalling of the ASF was in 1921 in Kenya. Subsequently, the virus was reported in 1957 in Portugal and afterwards in Spain, but it was eradicated from the Iberian Peninsula in the '80s. In Romania the ASF virus entered probably *via* Danube Delta, causing a major outbreak in 2018. Currently, in Romania, the outbreak is under control due to implementation of a molecular diagnostic program together with a slaughter policy. The objective of our current work was to present the diagnostic results of ASF virus in pigs and wild boars obtained in 2019 by PCR and ELISA in Constanta County. To evaluate the presence of post infection antibodies with ELISA we used blood samples collected on clot activator. For detection of active ASF virus infection by Real-Time PCR we collected blood or different organs. Using PCR, we confirmed 28 cases of ASF infection in wild boars out of 256 analysed samples and 15 in domestic pigs from private households out of 64 analysed samples. However, we did not detect the ASF virus in 1370 samples analysed from commercial farms. With ELISA we confirmed 18 wild boar out of 199 analysed samples and positive cases and 5 in domestic pigs from private households out of 879 analysed samples. We concluded that Real-Time PCR method allows a rapid detection of ASF virus few days after infection, while ELISA can be used to monitor the post infection immunological status of pigs / wild boar populations in response to ASF virus.

Keywords: pigs, African Swine Fever, PCR, ELISA, molecular diagnosis.

P9

Design, synthesis, and physicochemical properties of ternary Nd(III) systems with flavonoids. Relevance to human health.

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Design and synthesis of hybrid ternary metal-based flavonoid materials appears as a real challenge in the domain of metabolic syndromes and neurodegenerative diseases. Flavonoids are secondary metabolites very abundant in plants, fruit, and seeds, broadly responsible for color, fragrance, and flavor characteristics [1]. In that respect, flavonoids have been steadily gaining prominence in many nutraceutical, pharmaceutical, and medicinal applications due to their anti-oxidant, anti-inflammatory, and anti-tumor properties. On the other hand, neodymium(III), a rare earth metal, has been among the lanthanides employed in treating and diagnosing cancer and neurological diseases through therapeutic and diagnostic protocols [2]. Henceforth, complexation of certain flavonoids with a unique metal ion, such as a lanthanide, has the potential to create new hybrid species with unique biological properties, not unlike those exhibited by organic drugs currently in the market. The prospect of generating hybrid metallo-drugs based on lanthanides and flavonoids emerges as a contemporary challenge, the pursuit of which could provide enhanced clinical profiles and pharmacological activities, when compared to parent flavonoids [3].

In an effort to pursue such new hybrid molecules, synthetic research was launched in our lab, employing a limited selection of flavonoids for examination. The so arisen hybrid species could enhance their antioxidant capacity of flavonoids through derivatization or coordination to Nd(III). Chrysin and quercetin were chosen for that purpose, with N,N-terminal aromatic chelators (1,10-phenanthroline, 2,2'-bipyridine) serving as ancillary ligands in the ternary Nd(III)-Flavonoid-aromatic chelator systems. Characterization of the isolated product(s) was pursued through elemental analysis, Fourier Transform Infrared Spectroscopy (FT-IR), Electron Spray Ionization ESI-MS, and X-ray crystallography. The electronic characteristics of the materials were examined through Ultraviolet-Visible and Luminescence spectroscopy, collectively formulating a physicochemical profile, thus enabling further perusal into the biological function and properties in vitro.

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P10

Production of bilayer polymeric films for future use in active food packaging materials

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Packaging materials, widely used in food products, are usually made of petroleum-based plastics. However, the use of biopolymers is more likely to be accepted by consumers [1]. Therefore, the specific industry has focused on developing organic packaging materials that have biologically active properties to preserve and extend the shelf-life of food products [2]. In that respect, biological packaging materials, such as chitosan (CH), can be used in biomanufacturing antimicrobial films [1], with the latter acting as a) barriers to control the transfer of oxygen, and carbon dioxide, and b) carriers of active compounds, such as essential oils [3].

On the basis of the aforementioned grounds, the purpose of the present research in our laboratory has been to create bilayer films for use in packaging for foodstuffs, with the generated films being biodegradable and capable of preventing growth of microorganisms, all as a consequence of using the antioxidant substance carvacrol. Thus, to create the desired films, PLA was used as the first layer, and then after extensive study, the second layer was created with chitosan and glycerol. A number of experiments were carried out using 6x6 cm glass molds to prepare the bilayer films. Optimized films, in terms of thickness and morphology, were characterized physicochemically by Fourier Transform Infrared Spectroscopy (FT-IR), XRD, and TGA-DTG techniques. Along the same lines, mechanical properties have been investigated under tensile tests using an Instron 5969 instrument. Consequently, specific parameters such tensile as strength (TS) and Young's Modulus, were measured. Finally, weight variation and the moisture content were investigated and measured experimentally and theoretically, with the derived experimental results subjected to statistical tests with ANOVA in an attempt to signify the importance of the derived p-values. The results project a well-structured film, which can be used as biodegradable material in antimicrobial packaging of a variety of food products.

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P11

Unusual catalytic reactivity in new vanadium-peroxido-zwitterion materials

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Vanadium is the 22nd most abundant element in the earth's crust and its uses are thoroughly discussed. Some of them include catalysis, nanotechnology, biochemical processes, medicinal chemistry, anticancer insulin-mimetic, antiparasitic, antibacterial and antiviral properties. Moreover, it purportedly plays an important role as a metallodrug in immunotherapy. Its employment, on the other hand, in catalytic reactivity toward industrially important starting organic substrates has attracted keen interest considering the challenge of developing processes that take place at energetically favorable conditions and high yields of high value-added products.

Traditionally, single and bis(peroxido)vanadium(V) compounds have been shown to transfer oxygen effectively, thus leading to the generation of valuable synthetic molecules, derived from a broad family of substrates through oxidation, with enhanced selectivity. In an effort to develop new catalysts, capable of operating at low temperatures and performing efficiently on catalytic transformations of organic substrates of importance to industrial synthetic processes, new V(V)-(zwitter ion)-peroxido complexes were synthesized in the presence of well-defined zwitterionic substrates. The new hydrolytically stable and highly effective vanadium(V)-peroxido materials were characterized by elemental analysis, FT-IR, Raman, NMR spectroscopy in solution and the solid state, UV-Visible, cyclic voltammetry, thermogravimetric analysis and (TGA), and X-ray crystallography. The physicochemical properties of the title compounds were amply exemplified in their catalytic reactivity toward organic substrates, employing GC-MS-TIC and GC-FID techniques. The results place an emphasis on the importance of appropriately designed and synthetically isolated vanadium-peroxido species in catalytic reactivity at the abiotic and biological level.

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P12

Synthesis and characterization of vanadium hybrid materials with physiological substrates as potential insulin mimics in Diabetes mellitus II

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Vanadium is a first-row transition metal of high physiological, environmental, and industrial importance. The most common oxidation states of vanadium are V(III), V(IV) and V(V). From the biological point of view, V(III) is present only in ascidians and fan worms, but not in higher organisms, where a key redox interplay between V(IV) and V(V) emerges prominently and is considered to play an important role in the process of adipose tissue cell maturation targeting counteraction of hyperglycemia in human physiology. In aqueous solutions, vanadium projects advantageous utilization of its two physiological oxidation states, showing similarity between V(V) vanadate and phosphate ion biochemical traficcking and chemical reactivity, pronouncedly exemplifies its ability to form polyoxovanadates, shows vividly how to coordinate various ligands of biological significance, such as ATP, glutathione, and amino acids, and shows flexibility in achieving a great variety of coordination geometries through organic substrate coordination. The collective properties provide the opportunity to pursue the synthesis of highly specific binary-ternary vanadium hybrid materials (with appropriate synthetic and naturally occurring substrates) of distinct biological value and roles [1]. To that end, new vanadoforms are envisaged as alternatives to conventional drug(s), possessing more efficient hypoglycemic biological activity.

Metformin is a hypoglycemic agent prescribed to counter Diabetes mellitus II hyperglycemia. Long term use of metformin has been linked to reduced risk of coronary artery diseases, lower incidence of stroke and its severity, mortality, disability, and its neurological sequela [2]. To that end, research was launched in our lab to pursue the structural speciation of binary vanadium-metformin complex species (with third ancillary ligands) capable of delivering hypoglycemic activity in Diabetes mellitus II.

In an effort to synthesize such hybrid materials of high biological significance, various forms of vanadium (V_2O_5, $VOSO_4$, $VO(acac)_2$) were employed to diversify the experimental synthetic conditions, with the presence or absence of hydrogen peroxide (H_2O_2) playing an equally important role. The crystalline materials produced were characterized physicochemically by elemental analysis, X-ray crystallography, Fourier-Transform Infrared Spectroscopy (FT-IR), while their electronic properties were studied using UV-Visible and Luminescence spectroscopy. Characterization of the arisen hybrid materials provides justification for the ensuing in vitro experiments, slated to determine their biotoxicity profile and their selective potency against the diabetic hyperglycemic phenotype.

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P13

Seaweed and ground fish bone product characterization and antioxidant activity as potential plant growth stimulants in agriculture

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Seaweed and fish residuals generated through industrial processing, have been widely targeted as biostimulants in crop management due to their growth-promoting and stress-resistant effects [1]. In the literature, they have been pointed out as rich sources of natural antioxidants [2]. Thus, Blue bio-product materials collected from the Scandinavian coast have been used for identifying molecular and (non)metal ionic components being able to support-enhance plant growth. Specifically, Low and High Nitrogen Algal Cake have exhibited a positive effect on ryegrass growth [3]. The raw materials have been used for further a) characterization, b) green extraction (ethyl acetate, hexane) of biostimulants, and c) in vitro investigation of their antioxidant capacity. The Macro and Micro Nutrients as well as potential toxic elements (PTEs; As, Cd, Cr, Hg, Pb) were perused through Inductively Coupled Plasma (ICP-MS), seeking lower levels of detection. Further screening for organic compounds also emerged prominently in the study and was pursued through GC-MS on extracts of varying polarity solvents. Using those extracts, the lipid content was explored through GC-FID. The collective results formulate a well-defined profile for both Low and High Nitrogen Algal Cake materials, thus signifying the importance of a) screening of key ingredients in raw materials, and b) identification of organic and inorganic components in algal materials, that could be used in enhancing plant growth agricultural crops. The antioxidant capacity has also been determined using DPPH and FRAP photometric methods, collectively reflecting the importance of BlueBio materials in agricultural crop production.

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P14

Chemical reactivity of lanthanide metal ions with natural antioxidant agents

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Natural products play an important role in the discovery and development of active ingredients in food stuff and drug applications, exhibiting a wide range of roles. Interest in such materials stems mainly from their antioxidant properties, which have been widely studied over the years. In that respect, antioxidant agents can neutralize free radicals and reactive oxygen and nitrogen species, thereby counteracting oxidative damage in peptides, proteins, and enzymes key to cell physiology. Consequently, they are capable of averting molecular damage to functional biomolecular targets, thus reducing the incidence of oxidative stress-related pathophysiologies and diseases through interception and neutralization of free radical-mediated chain reactions. This notion justifies their broad range of applications in medical and therapeutic goods, cosmetics, food additives, and biomaterials in regenerative medicine [1].

In this work, naturally occurring flavonoids (important components in the plant kingdom) have been synthetically investigated, based on their ability to react with trivalent metal ions from the lanthanide series. That way, their well-known properties i.e. antioxidant, antitumor, antimicrobial, neuroprotective, and cardioprotective properties [2] might be enhanced through metal ion complexation, thus providing soluble and bioavailable hybrid species capable of delivering biological activity to distinctly defined molecular targets in (sub)cellular environments. In that respect, the new hybrid metal-organic compounds are believed to help develop new (metallo)drugs with well-defined biological profiles, more potent clinical profiles, and enhanced pharmacological activity compared to the original flavonoids. Worth noting in that respect is the research effort in our lab to design and synthesize such binary and ternary complex forms of lanthanides (such as Eu(III)) for further antioxidant activity, osteogenicity, angiogenicity, etc. in vitro biological studies [3].

Implementation of the aforementioned thesis led to the structural speciation and physicochemical characterization of hybrid ternary metal-organic coordination compounds of chrysin and quercetin [4] with trivalent Eu(III), and ancillary ligand the aromatic chelator phenanthroline. The resulting metal-coordinated flavonoids were subsequently fully examined physicochemically, using elemental analysis, Fourier-Transform Infrared Spectroscopy (FT-IR), Electron Spray Ionization ESI-MS, and X-Ray crystallography. The chemical profile of the newly arisen compounds provides sufficient grounds for further in vitro biological studies, thus justifying the original hypothesis of their utility as efficient counteracting agents of oxidative stress.

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P15

Design, synthesis and physicochemical properties of ternary La(III) systems with dietary flavonoids

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Lanthanides are a series of 15 elements, extending from lanthanum (Z = 57) to the lutetium (Z = 71), often referred to as the 4f block elements. Lanthanide complexes are characterized by high coordination numbers, rich coordination geometries and unique luminescence properties (long lifetime, narrow emission bands, etc.) [1]. Their size resemblance to Ca(II) have since long been recognized as a factor, warranting further perusal of lanthanides into diagnosis and therapeutics of human health aberrations. On the other hand, flavonoids are phenolic compounds, fully incorporated in the plant kingdom, a) well-known for their biological properties as antioxidant, antitumor, antimicrobial, neuroprotective and cardioprotective agents, and b) exhibiting protective behavior against oxidative stress in a series of human diseases, like cancer, diabetes, neurodegeneration, etc. [2]. To that end, design and synthesis of hybrid ternary metal-based flavonoid materials containing naturally-occurring flavonoids (or derivatives thereof) in their coordination sphere, including combinations of the aforementioned metal ions (e.g. La(III) and selected flavonoids (e.g. chrysin, quercetin) are poised to provide new (metallo)drugs with well-defined biological profiles and improved pharmacological activities in comparison to parent flavonoids [3].

Consequently, binary and ternary systems between La(III), selective flavonoids, and N,N'-aromatic chelators (1,10-phenathroline, 2,2'-bipyridine) have been investigated synthetically under hydrothermal conditions. The derived hybrid metal-coordinated flavonoid products were fully analyzed physicochemically (in the solid state and in solution), using elemental analysis, Fourier-Transform Infrared Spectroscopy (FT-IR), Electron Spray Ionization ESI-MS, and X-ray crystallography. Their electronic properties were studied through UV-Visible and Luminescence spectroscopy. Further intermolecular interactions have been investigated through Hirshfeld analysis, using visualisation of the surface molecules and fingerprint plots. Based on the derived experimental results, it can be concluded that La(III) hybrid materials possess physicochemical profiles warranting further exploration of their biological activity in vitro, as potential low molecular mass species, capable of efficiently counteracting oxidative stress, thereby averting or retarding pathological conditions detrimental to human health.

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P16

The barrier between toxic and nutritious seeds

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Over the last decade, chia, quinoa, hemp and flax seeds were considered as remarkably healthy food, due to a variety of beneficial compounds, such as antioxidants and anti-inflammatory agents, phytoestrogens and phytosterols with positive impact on hormonal health. But what happens if these seeds are also rich in heavy metals, like cadmium and /or arsenic, metals which are notorious for producing different forms of cancers, osteoporosis, kidney, heart and brain disorders? What if these plants have the capacity to accumulate heavy metals? What if some of these plants are recommended for phytoremediation of contaminated soils? Do we still consume or avoid them? The present paper illustrates the fine barrier between healthy and poisonous foods based on their heavy metals content.

Keywords: flax seeds, chia seeds, heavy metals, miraculous seeds, unhealthy food

P17

Challenges and approaches in the use of natural bioactive compounds of plant origin as food additives in meat products

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Sausages are currently the most popular products in the world. In the case of the Romanian people, the manufacture of sausages is one of the methods of storing meat products. We find sausages in a wide variety, under different tastes and flavours, depending on the region or country.

The aims of this study were to develop a new recipe to obtain a special innovative pork sausage, to develop the manufacturing process, technological stages, and nutritional analysis of the final product. Our research consists in developing an innovative meat product by fruit of using plums (*Prunus domestica*) and cherry plums (*Prunus cerasifera*) fruit rich in bioactive compounds. Our work has focused on evaluation of the biochemical, and nutritional characteristics some type of sausage with adding these fruits. These fruits have high content of antioxidants. The addition of antioxidants to meat products is done to prevent lipid oxidation, delay the development of off- flavours and improve colour stability. These plant materials are rich in bioactive compounds that contribute to the reducing of microbial growth and inhibit the lipid oxidation during storage, improving the quality of fresh and processed meat and meat products.

The natural antioxidants are used in meat industry in order to delay or prevent the lipid oxidation, delay the development of off-flavors, improve color stability and microbiological quality and extend the shelf-life.

This work demonstrate that this prototype can be considered a food variant due to its high nutritious properties and to its distinguished taste too.

Keywords: sausages, plum, cherry plum, antioxydant capacity, bioactive compounds

P18

Preliminary Studies for the Determination of Niacin

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Adequate intake of all vitamins is important, since they play a vital role in many biochemical functions in the human body and are essential components for maintaining optimal health [1].

Niacin is found in animal and vegetable aliments, its amounts being higher in unprepared foods compared to processed foods [2]. In addition to serving as cofactors in biochemical reactions, the representatives of the vitamin B complex are vital for normal body growth and development, healthy skin, the proper function of nerves and heart, as well as red blood cell formation. Vitamin deficiency can be compensated with food supplements [3].

Literature survey has revealed various analytical methods for the determination of vitamins from pharmaceutical formulations in combination with other drugs, such as: RP-HPLC, HPTLC, UV-Spectroscopy, or LC–MS/MS [2].

In the present study, the UV spectrophotometric method was used to determine Niacin (Vitamin B3) content in food supplements and to validate the selected method. Niacin was dissolved in ethanol as a solvent and from its UV spectra the λ_{max} was determined. Solutions of different concentrations were prepared in order to obtain the calibration curve. After the linearity calibration curve was obtained at 262 nm, preliminary concentration determinations on different food supplements were performed.

Key words: niacin, vitamin B3, food supplements, UV-Spectroscopy

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P19

Research perspective in Romanian military while on duty diet

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Military diet perspectives are of great interest, while this group of persons supposes special needs. Romanian regulations in the field of military nutrition are only a few and are not focused on the individual diet needs of the military personnel. The military personnel diet could directly influence the quality of their activity, especially when they are part of tranings, expeditionary operations and especially on the batle field.

The aim of this study refers to the knowlege of the actual state of the art in a Romanian garnison, the identification of the main possible problems of the menu plans and the antropometric (hight, corporal mass, blood pressure, blood glucose and the body mass index) changes induced by the daily while on duty diet.

For the study 50 employes in the military system, women and men, aging between 20 and 59 years old were recruted. The evaluation of the menu plans and the antropometric data was developed during 3 months.

By the menu plan evaluation it was observed that the daily macronutrients report (carbohydrates:proteins:fats) is not balanced and the quantity of animal fat is considerably high, from the total quantity of animal fat the one registered 51-74%. The corporal mass, blood pressure, blood glucose and the body mass index were directly influenced by the menu dinamics. The health of the military personnel could be negativly influenced by this status. So, further study will target the animal fat reduction with 15% reported to the main meal of the day.

P20

Use of rosehip and carob powder as unconventional plant materials to design novel functional and nutritional chocolate formulations

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Rosehip (*Rosa canina* L.) and carob (*Ceratonia* siliqua L.) powder are becoming popular due to their content and profile of bioactive components. The purpose of this paper is to design functional and nutritional value-added chocolate formulations by rosehip and carob powder incorporation as unconventional plant materials in the manufacturing recipe. Chocolate formulations were prepared in laboratory conditions by replacing cocoa powder in different percentages in the range 10-50% (w/w) with carob powder, respectively the mixture of carob and rosehip powder. The products designed were analyzed in terms of proximate composition, bioactive compounds, antioxidant properties and sensory attributes. In this regard, the proximate composition has been evaluated in accordance with standard methods, the total phenolics content was spectrophotometric evaluated on the base of Folin-Ciocalteu procedure and the vitamin C content has been assessed by titration with 2,6-dichlorophenolindophenol sodium salt solution. Also, the flavonoids content was spectrophotometric quantified. The antioxidant activity of the chocolate formulas has been investigated by 1,1-diphenyl-2-picrylhydrazyl (DPPH) radical scavenging assay and ferric reducing antioxidant power (FRAP) assay. The data obtained revealed that the rosehip powder included in the chocolate recipe has a high content of vitamin C, total phenolic compounds and flavonoids. In addition, the radical scavenging activity and FRAP value of the rosehip powder recommends it as a value-added plant ingredient for obtaining a wide range of high functionality chocolate formulas. Also, carob powder can be recommended in the investigated percentage range as a valuable substitute for cocoa in the development of nutritional and functional chocolate without impairment of sensory properties compared to a chocolate control sample. All chocolate formulas obtained by incorporating carob powder as well as a mixture of rosehip powder and carob powder into the recipe showed higher values of bioactive compound content and antioxidant properties compared to the control sample. Our results are useful for food processors to develop new value-added, low-cocoa content chocolate formulations by exploiting the bioactive potential of unconventional plant materials, underused in the food purposes.

Key words: rosehip and carob powder, bioactive compounds, antioxidant properties, novel functional and nutritional chocolate formulas

P21

Development and nutritional characterization of pomegranate peel powder. Preliminary research

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Pomegranate peel, the inedible part resulting as a by-product when processing the pomegranate fruit, contains important amounts of nutrients, such as minerals, organic acids, fats, proteins, dietary fibers, vitamins, etc. Besides this, pomegranate peel is valuable waste, rich in a wide range of bioactive compounds, with antioxidant, cardio-preventive, antimutagenic, antibacterial and antiviral activities.

These findings show that pomegranate peel has an important nutritional and therapeutic potential, being able to be used to obtain ingredients necessary for the preparation of food products with numerous health benefits. The nutritional composition of the pomegranates peel differs depending on the variety, geographical and climatic factors, etc. This preliminary study aims to obtain and nutritionally characterize pomegranate peel powder. Nutritional parameters were determined for three batches of pomegranate peel powders obtained from the peel of imported pomegranate fruits sold in the local market near Timisoara city (Romania).

The results obtained: 7.52 - 13.64 % moisture, 2.26 - 4.21% ash, 2.44 - 3.82% proteins, 0.68 - 1.26% fats, 12.34 - 15.72% fibers, 65.88 - 81.06% carbohydrates, show that the analyzed pomegranate peel samples contain significant amounts of carbohydrates, minerals, proteins and fiber.

These nutritional components make possible the use of pomegranate peels for obtaining value added food products. In addition, the superior valorization of pomegranate peels can serve as a method of economic greening of the waste resulting from the processing of pomegranate fruits.

Key words: pomegranate peel, pomegranate peel powder, nutritional composition

P22

Sourdough lactic acid bacteria impact on bread quality and conservation

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During the COVID - 19 pandemic packaged bakery products with higher shelf-life witnessed growth in demand together with fortified bread because consumers sought to maintain their immunity by consuming nutritious food.

Sourdough breads quality and extended shelf lives are attributed to a large array of organic acids and metabolites produced by lactic acid bacteria, mainly *Lactobacillus* spp. and *Leuconostoc* spp., during the fermentation process. Species belonging to the lactic acid bacteria group of microorganisms are increasingly studied regarding their antifungal activities and notably positive impact on nutritional, technological and sensory quality of breads. Sourdough breads contains lower amounts of gluten, more prebiotics, less antinutrients which makes sourdough products a healthier alternative to those made using regular dough, thus driving the market demand for sourdough. Different LAB sourdouhgs have positive effects on quality characteristics of bread, the most important ones are improvement of volume, exture, staling rate and microbial shelf life,as well as sensory characteristics. There is still an increasing interest in the topic of sourdough regards the better understanding of the fermentation processes. A inovative action involves the diversification of the flours used in sourdough production, using unconventional ones that will bring nutritional and functional properties. Also, the discovery of new microorganism strains and their performances is a current study, using them to obtain fermented products with improved properties.

This short review will summarize the findings in this context regarding the bio-preservation trend and the importance of sourdough nutrients that makes these products a preferred choice among consumers worldwide, owing to their increased health benefits.

***Key words**:* Sourdough, Lactic acid bacteria, Bio-preservation, Health benefits, Bread quality.

P23

Boron compounds: Challenges and Applications in food industry

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Boron compounds have various industrial applications, including the food industry. The most common boron compound used in the food industry is sodium borate ($Na_2B_4O_7$), which is often used as a food additive to improve the texture and stability of foods.

There is also another boron compound called fructoborate, which is a naturally occurring form of boron and is found in some fruits such as grapes and apples. Fructoborate is a form of boron that is well absorbed by the body and may have health benefits, for instance protecting bones and improving cognitive function. In the food industry, fructoborate may be used as an ingredient in some food products to provide these health benefits.

Food products containing fructoborate may include beverages, dietary supplements, and functional foods such as protein foods and baked goods. There are also dietary supplements containing fructoborate that are marketed as dietary supplements to support bone and joint health.

The use of boron compounds in food is established by regulatory agencies such as the Food and Drug Administration (FDA) in the United States and the European Food Safety Authority (EFSA) in Europe. These agencies set dosage limits and strict requirements for the safety of using boron compounds in food. In conclusion, it is important to follow these regulations and use boron compounds only in safe and approved amounts.

Keywords: boron compounds, food industry applications, fructoborate

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P24

Research on obtaining an assortment of hypoglycemic ice cream

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The tasty, healthy, and nutritional qualities of ice cream make it one of the most consumed frozen dairy desserts in the world today (global consumption of 2 L per person/year) among people of all ages. This product, which is extensively used, has an advantage over other special nutrition products on the market since it is a food that people of all ages love and has a high nutritional value. Its composition can also be readily adjusted [1,2].

According to the World Health Organization, there will be 471 million diabetics worldwide by 2035 [1]. Due to this, the ice cream business has started to manufacture foods with a lower glycemic index (GI), primarily for those with diabetes. Conventional ice cream contains a high amount of carbohydrates fats that increase bad cholesterol deposit and may cause such diseases as obesity, diabetes, atherosclerosis, and hypertension. Hence, there is a need to develop functional ice cream without the aforementioned disadvantages which would treat a wide array of metabolic diseases. Consumers desire novel flavors, healthier options, and dairy-free functional ice cream that can produce "mouth-watering appeal," thus finding new components and developing new assortments of these products is crucial.

As a natural sweetener, agave syrup has recently attracted more attention. Research on the health advantages of agave syrup concentrates on its ingredients, similar to that of honey. As a result, several agave syrup ingredients are thought to have positive effects on health, especially glucose homeostasis. Agave syrup contains phenolic compounds that can block -glucosidase activity and reduce the amount of glucose that is absorbed by the intestine after consumption [3,4].

This study compares the sensory and physico-chemical properties of an ice cream selection created with added sugar to the identical ice cream array made using agave syrup in place of sugar.

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P25

The study of the Bican roz 6 Mf clone in the climate conditions of the murfatlar vineyard

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At SCDVV Murfatlar, in the period 2018 – 2022, a study was carried out on 5 clonal elites of the 'Bican roz' variety, selected from existing trunks in the ampelographic collection of the research station. In all 5 years of studies and observations, the clonal elite 80/10/6 was superior to the other elites, this being approved under the name Bican roz 6 Mf in 2022, following testing at ISTIS (State Institute for Testing and Registration Varieties).

During the research period, average annual temperatures were 2-3°C higher in comparison with the multiannual average, while precipitation values were situated below the multiannual average (406 mm, average during the study period, compared to 522.6 mm, the multiannual average).

For all 5 clonal elites, the agrobiological properties, as well as the technological and agroeconomic characteristics, were compared to those of the original variety. Bican roz 6 Mf is a table grape clone with high growth vigor and 79% fertility. It is a productive clone, with an average grape weight of 714 g, compared to 403 g, the average grape weight for the original variety, and with yields of 10.76 kg/trunk, respectively 24 t/ha and commodity production of 75 – 80%.

Key words: table grapes, clonal elites, grapevine, resistance, quality.

P26

Interactions of sporobiota with other soil species

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Soil is a complex and dynamic habitat that provides species with physical support, water and nutrients and is home to a wide variety of organisms, including endospore-forming bacteria. Along with other species of the soil microbiome, Bacillus sp. and Clostridium sp. support vital ecosystem functions such as nutrient recycling, maintenance of soil structure and suppression of some pathogens. The quality and productivity of the soil and its microbiome depend both on abiotic factors and on competition and cooperation between the different species that compose it. Endospore formers produce and release a variety of physiologically active substances such as enzymes (glucanases, proteases, cellulases), biosurfactants, bacteriocins and antibiotics. In addition, Bacillus sp. can develop microbial biofilms to protect themselves from harmful factors in the external environment.

This literature survey aims to create the most up-to-date picture of the knowledge about the interactions of soil endospore formers and their impact.

Keywords: soil microbiome, endospore-forming bacteria, biofilms, enzymes, biosurfactants, bacteriocins and antibiotics.

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P27

Studies on the fatty acid profile and quality characteristics of linseed oil

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The nutritional character of different categories of people is assessed by a balanced intake of particularly biologically valuable nutrients such as: vitamins, polyunsaturated fatty acids, trace elements.

The current trend among consumers is increased attention to the nature of nutrition, to the ingredients of food products, in other words, a issue of healthy eating.

In this context, vegetable oils occupy an important place in products related to safe and healthy eating. And the unique properties and composition of linseed oil are highlighted and analyzed in many scientific papers.

In the present work, studies and research in the field on the valorization and characterization of linseed and linseed oil have been documented and evaluated.

The nutritional potential and profile of polyunsaturated fatty acids has also been highlighted.

Keywords: linseed oil, fatty acid composition, chemical characterization, linolenic acid, quality characteristics.

P28

Plant-based alternatives to cheese - antioxidant, nutritional and sensory characteristics

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High interest in plant-based foods has grown due to concerns about human health, sustainability and animal welfare. When it comes to conventional dairy production, there are three major areas of concern: environmental impact, human health and animal welfare. Therefore, plant-based cheese alternatives offer a more sustainable and ethical option for consumers. The first objective of this work was to obtain a vegan alternative to cheese, using cashew nuts as the basic raw material, in three assortments: a simple version (PBC1), one with the addition of dry basil and dry thyme (PBC2), respectively one with sweet paprika and black pepper (PBC3). Another objective of the work was to analyze the finished products regarding the content of total polyphenols (Folin-Ciocalteu assay), antioxidant activity (CUPRAC method) and antiradical activity (DPPH assay), as well as to determine the proximate composition, energy value and sensory properties (5-point hedonic scale method). The PBC3 product variant with the addition of sweet paprika and black pepper proved to have the highest total polyphenols content (4.64±0.08 mg GAE/g) as well as the strongest antioxidant (9.81±0.14 mg Trolox/g) and antiradical activity.

The three product assortments had very close proximate composition and energy value, and compared to conventional milk cheeses, they were lower in protein, richer in carbohydrates and cholesterol-free. The sensory analysis highlighted the fact that all product variants were well accepted by the panelists, obtaining scores above 4 for all organoleptic characteristics.

Keywords: cashew nuts, plant-based cheese, polyphenols, antioxidant activity.

P29

Eco-innovating of organic rhubarb granules used to correct the acidity marker of the sugar syrups

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The experimental applied research aimed to identify the possibilities of using Rhubarb vegetable waste as an ecological product either in dry granular form or reconstituted as an extract, to correct the acidity marker for sugar syrups in fruit compotes or in the fruit juices. Thus, the raw material Rhubarb was crushed, and after extracting the juices, the resulting mark was dried to the lowest humidity 0.02%, which ensures the shelf life of the dry material over time. Thus, the Rhubarb samples were dried obtaining the granules from the green, pink and red Rhubarb raw material. These were kept under normal conditions of the temperature of 18-20ºC and relative air humidity of 75- 80% for 12 months, without registering their degradation. Wet brand samples consisting of green, pink and red Rhubarb dry wastes were also kept at refrigeration temperature 0-9ºC for 14 days. In firstly 7 days there were no changes, and the complete alteration of the samples occurred in the 10th day. As for the dried, crushed organic products obtained from green, pink or red Rhubarb, they were used for correct the acidity of the sugar syrups that can be used to obtain fruit compotes or fruit juices. It was identifying the acidity of extract resulted after rehydration, when the results obtained were - acidity of green Rhubarb extract 16 g/100g, acidity of pink Rhubarb extract 10 g/100g, acidity of red Rhubarb extract 8 g/100g. After adding of 2-2.95% Rhubarb extracts into the sugar syrups with 23.35-34% soluble substances, the total acidity increased at the 2.8-4.9 degrees acidity, an acidity index which can ensure a redox potential to prevent reversal oxidation and to prevent the fermentation and may stopped the development of mold spores.

Key words: organic Rhubarb and marker acidity

P30

Influence of red kidney bean (*Phaseolus vulgaris* L.) flour on baker's confectionery products quality

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Legumes are a good source of macro - and micronutrients like proteins, complex carbohydrates, dietary fibre, minerals, vitamins and bioactive compounds (phenolic compounds, saponins and peptides). Red kidney bean (RKF) flour is a rich ingredient which can play an important role in bakery and confectionery products formulation and processing. The aim of this research was to evaluate the effects of partial or total substitution of wheat flour (WF) with red kidney bean (*Phaseolus vulgaris* L.) flour (RKF) on proximate composition, textural characteristics and sensorial properties of baker's confectionery products such as Swiss rolls. Red kidney bean flour was added at four levels 25%, 50%, 75% and 100%. The addition of RKF decreased the carbohydrate amount and increased the content of protein and ash. Texture analysis revealed an increase in firmness and chewiness for samples with up to 50% flour addition and a decrease for the rest. All sensory evaluation scores of produced Swiss rolls confirmed that it is possible to obtain this confectionary product without any unfavourable change in its sensory properties by utilization of red kidney bean flour.

Keywords: Red kidney bean flour, chemical composition, sensory characteristics, textural properties, Swiss rolls

P31

Quality evaluation of different types of sunflower oils

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Sunflower oil is the fourth most produced and consumed vegetable oil in the entire world. In human nutrition, vegetable oils play an important role by providing energy, fatty acids, vitamin E and some bioactive compounds demanded by the body. The aim of this study was to compare crude and refined edible sunflower oils through their physical characteristics (color, relative density and refractive index), chemical properties (saponification, iodine, acid, peroxide, ester values, fatty acid composition) and phytochemical content. The physico-chemical properties of the evaluated sunflower oils were within the demand of edible oils as it follows: refractive index varied from 1.472 ± 0.0002 to 1.467 ± 0.0002, density varied from 0.857 ± 0.043 to 0.904 ± 0.026 g/mL, peroxide value varied from 0.25 ± 0.06 to 0.12 ± 0.04 mEq O_2 /kg. Other quality properties variation according to the Romanian standards were determined in kind: acid value (from 0.851 ± 0.035 to 0.047 ± 0.005 mg KOH/g), saponification value (from 188.98 ± 2.87 to 182 ± 5.9 mg KOH/g) and iodine value (from 123.44 ± 1.58 to 78.8 ± 1.1 g I_2/100g). Regarding the fatty acids content, a significant increase could be observed in the quantity of oleic acid (2.93 ± 0.59 % and 56.27 ± 2.04%), while the linoleic acid content varied between 28.74 ± 2.18 % and 83.94 ± 1.15%. As it was expected, the refining step has an important influence on physico-chemical properties of sunflower oils, especially in the fatty acids profile.

Keywords: Crude, edible vegetable oil, refined, quality parameters, fatty acid

P32

Effects of different levels of basil (*Ocimum basilicum* L.) powder or extract on physicochemical, textural and sensorial characteristics of bread

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The influence of addition of basil powder or extract (0, 3 and 5%) in formulation were studied in order to obtain an food product with good physico-chemical, textural and sensorial properties. The obtained results showed that the addition of basil powder or extract slightly increased fiber and ash content but did not influenced protein or fat content. The study revealed that the addition of extract from basil or basil powder increased the bioactive compounds content in the bread from 35% to more than 125% compared to the control sample. The addition of basil slightly improved the textural characteristics of bread especially the hardness character. Sensory evaluation of the bread samples revealed that it is possible to obtain this product without any unfavourable changes in its sensorial attributes by utilization of basil powder or extract.

Keywords: aromatic herbs, basil, quality, bread texture, sensory attributes

P33

Influence of different drying methods on bioactive compounds, colour and antibacterial properties of some aromatic plants

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The aim of the research was to analyse the influence of the drying methods on the bioactive compounds, colour and antibacterial properties of some aromatic plants. Basil (*Ocimum basilicum* L.) and sage (*Salvia officinalis* L.) leaves were dried using three different drying methods: convective drying (CD) (at 40ºC, 50ºC and 60ºC), microwave drying (MD) (at 105 W, 325 W and 525 W) and combined microwave (at 105 W, 325 W and 525 W) and convective (MC) (at 40°C) drying simultaneously. After drying, the MC (at 525 W and 40ºC) drying method was highlighted as the most the suitable for both aromatic plants in order to preserve the bioactive compounds. The highest content of total phenolics was 10.36 ± 0.11 mg GAE/g for basil and 40.06 ± 1.03 mg GAE/g for sage. Additionally, the dried aromatic plants were analysed in the CIE-Lab* colorimetric system. The colour parameters such as lightness (L*), greenness (a*), and yellowness (b*) decreased for all dried samples compared with the fresh basil or sage leaves. In the case of basil, only the sample coded MC 525 showed antibacterial activity against the *Bacillus subtilis* MIUG B1 strain, inhibition zone being 11.5 mm. On the other hand, for sage, two samples, coded MW 315 and CA50, displayed an antibacterial activity of 12 and 11 mm, respectively. The results revealed that the combined drying represent an alternative drying method for processing aromatic plants.

Keywords: convective drying, microwave drying, bioactive compounds, antimicrobial activity, colour, sage, basil

P34

The use of bamboo, coconut and almond flour to obtain gluten-free and hypoglucidic cookies

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The purpose of this work was to obtain and characterize hypoglycemic and gluten-free cookies intended for people with celiac disease, diabetics, and obese people. Thus, we obtained four types of cookies from wheat flour (control samples), bamboo flour, almond flour and coconut flour (experimental samples). The sensory characteristics of these products were very close to the usual ones, but due to the low carbohydrate content and the absence of gluten, these cookies can be consumed both by people with diabetes or celiac disease, as well as by people following a ketogenic diet. Acidity, ash and water content were lower in the experimental samples than in the control samples, giving the products better crispness and longer shelf life. The highest energy value was observed in cookies with almond flour. Bamboo, coconut or almond flours can be healthy alternatives to wheat flour for cookies intended for people with special nutritional needs.

P35

Quality evaluation of functional biscuits developed from wheatflour and malted barley flour mixtures

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Biscuits are nutritious, ready-to-eat snacks that come in different shapes and sizes. The aim of this studywas to exploit the nutritional potential of some types of malted barley flours (MBF) in order to develop a range of functional biscuits with improved nutritional value and sensory and technological qualities. Three types of brewer's MBF (*Amber, Biscuit and Chocolate*) were used to replace WF (wheat flour) inamounts of 10, 20 and 30%, respectively. Biscuits with 100% wheat flour (WF) serve as a referencesample. The proximate composition, physical and sensory characteristics, the total polyphenol content(TPC) and antioxidant capacity (AA) of the biscuit samples using standard laboratory procedures, wereevaluated. Following the evaluation it can be observed that with decreasing the percentage of WF andincreasing the percentage of MBF, the biscuit samples studied showed changes in sensorycharacteristics. Sensory analysis results showed that biscuits with added *Biscuit MBF* and *ChocolateMBF* had a pleasant, rich aroma and sweet taste, while biscuits with added Amber MBF had a lesspleasant aroma and slightly bitter taste. Centralizing the results obtained in terms of sensory analysis ofthe biscuit samples, it can be seen that the biscuit sample with 20% *Biscuit MBF* was the mostappreciated by the evaluators (flavor - 8.32 and taste - 8.44, overall acceptance - 8.67) and the biscuitsample with 10% *Chocolate MBF* (flavor - 8.12 and taste - 8.26, overall acceptance - 8.52) respectively.

The results showed an improvement in the nutritional profile of the biscuits in proportion to the increasein the proportion of MBF (30%) in the composite flour blends in terms of protein, fibre and mineralcontent, as well as a significant increase in functional attributes such as TPC (8.23 mgGAE/ g DW)and AA (68.64%). This study encourages the sustainable recovery of antioxidants from BMF and theirfurther employment as an active nutraceutical ingredient in functional biscuits.

Keywords*:*functional biscuits, malted barley flour, sensory evaluation, total polyphenol content, antioxidantactivity

P36

Studies on the influence of the shelf life of Cottage cheese on the content of the B vitamin complex

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The purpose of this study was to investigate the group B (B3; B12; folic acid) vitamin content of Cottage cheese and the factors that may alter these concentrations. The reasons for which this research topic was chosen were based on literature studies, which abound in relation to the presence of vitamins A, D, B1, B2 and ascorbic acid in cheeses. Little attention was paid to other vitamins of the B complex group, such as niacin, B6, B12 and folic acid in cottage cheese. The current interest seems to be focused on how the different stages of production and processing of dairy products affect the vitamin content and nutritional quality of the products. Cottage cheese is a common assortment of cheeses in the Anglo-Saxon countries, commercially available under two varieties, low in fat (2% fat) and non-fat cheese. The experimental manufacture of Cottage cheese samples was made using cow's milk with different fat concentrations (0.1; 1.5; 2 and 3% fat), starter culture (DVS) (CHN-22: Chr. Hansen Laboratories, Denmark), lyophilized rennet and salt. The content of niacin, B12 and folic acid was determined from skimmed milk, whey and cheese curds. Then, based on the vitamin content of skimmed milk, it was calculated their retention in cheese curds. The determination of B group complex vitamin was done by immunologic method ELISA, using Human Vitamin B3(VB3) ELISA Kit, RIDASCREEN® FAST Vitamin B12 and RIDASCREEN® FAST Folsäure respectively. Total solids, fat and protein content, pH, titrable acidity and salt content were also measured to characterize the sample variants of Cottage cheese. The overall quality and acceptability of the Cottege cheese samples have been assessed by a panel of 10 consumers on days 2, 7, 14, 21. To evaluate the results, the nine-point hedonic preference scale was used. The results showed that milk samples had an average content of 71 ug of niacin, 0.57 ug of B12 and 0.69 ug of folic acid per 100g of milk. The average content of these vitamins in whey was 40; 0.53 and 110 ug/ 100 g, respectively, which indicates the fact that considerable amounts of vitamins have been lost in whey produced during manufacturing. Cottage cheese samples had a content of 25.7 ug of niacin, 2.1 ug of B12 and 40.6 ug of folic acid / 100 g curd. The degree of retention in Cottage cheese samples ranged from 49.3% for niacin, to 77% for folic acid. On the other hand, no significant changes in the content of niacin, B12 and folic acid were observed during the two weeks storage of Cottage cheese samples. In the case of physico-chemical analysis, there was a significant difference ($P<0,01$) in relation to the fat content of the samples. The other parameters (moisture, protein, total solids content) showed no significant differences. The textural properties of the cottage cheese assortment obtained from milk with 3% fat had significantly higher scores compared to those obtained from skimmed milk.

Keywords: Cottage cheese, starter cultures, ELISA, vitamins B content

P37

Filtration in the fractionation of natural semi-solid fats

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Fats (semi-solid plastics) and vegetable oils are main source of lipids in human diet. They are essential components of a wide range of food formulations, which define their taste, texture and structure, being carriers of utilities (e.g.: flavor). The properties are "*constrained*" by composition and distribution of *saturated fatty acids* in different triglyceride positions (TAG), with an effect on the *melting/crystallization profile*. Separation *studies by fractional crystallization* and "*isolation*" by ***filtration*** (=dry fractionation), at constant temperature (*isothermal*), of *saturated/unsaturated* elements from semi-solid natural lipid (at ambient temperature (20°C)), with emphasis on palmer oil, contribute to ***isolation of chemical***, saturated/unsaturated *individuals* from the triglyceride structure (TAG). Monitoring the development of crystals, is aimed at obtaining crystals, dense, spherical, uniformly dimensional, which ensure the *effectiveness* of filtration operation. Research has shown/recommended an average diameter of less than 30μm to avoid "*sand*" sensation in oral cavity. When *filtering*, optimum size of crystals is conditioned by accessed crystallization method. It is recommended that the optimum diameter of crystals for filtration is range 200÷350 μm (centrifugal separation: 150÷200 μm). Saturates are known to have a relatively high melting range, limited by solubility in unsaturated glycerides. Result of combined operation is defined by obtaining two separate: **1.** fluid/liquid recognised as **olein**; **2.** solid crystals (=**stearin**). Of saturated class, stearin has a technological and functional value, with directed use (shortenings, margarines, cocoa butter substitutes, etc.), consisting mainly of: saturated (PPP (tripalmitoylglycerol)), di- (POP (1,3-dipalmitoyl-2-oleoyl-glycerol)) and mono-non-saturation (POO (1,2-dioleoyl-3-palmitoyl-glycerol)). Distribution of fatty acids may be different depending on origin of raw material and processing technology of lipid complex. In which case it is important to determine composition of *positional isomers* of dissaturated triglycerides involved in food formulations. Research in field records that training/presence of olein in stearin cake significantly influences the *behavior* in subsequent applications of stearine/olein (e.g. cocoa butter substitute). In terms of operation, the oelin/stearin ratio can be considered as a *critical control point of filtration* process, using as rapid methods of control the solid fat content (SFC) (solid fat content (allows to emit predictions related to the different plastic behavior of lipid assortments, in order to perform *the projected function*)), degree of unsaturation (IN - iodine number) and refractive index (RI). It is assumed that disturbance of this indicator is determined by presence of non-crystaltalized trinesaturated triglycerides and non-glycerides (non-glycerides) elements. This involves carrying out primary processing operations: vinterization, neutralization, bleaching. Previous statements may contribute to identification and characterization of a wide range of edible semi-solid fats of interest resulting from *'isolation'* by *filtration* in various dietary formulations [1–8].

Keywords: semi-solid fats, fractional crystallization, filtration, triglycerides, stearin, olein.

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P38

Formulated lipids vs shortenings. Short communication

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Formulated food industry is dynamic, upward, with accelerated development in recent years, supported both by technological development and innovation, as well as by need to cover a diverse range of problems of food raw material sources.

Currently, processing techniques (physical, chemical, biotechnological or combinations thereof) allow ***formulation*** *of the structure and properties of natural lipids, without equivalents in nature, but adapted to the technological, nutritional or prophylactic-therapeutic needs.* Techniques (e.g.: simple mixing, hydrogenation, interesterification, fractionation), continuously optimized, through scientific understanding of physico-chemical processes and development of new equipment.

Resulting "*new*" products are known in literature as ***substitutes***, ***lipid equivalents***, ***shortenings***, with significant economic implications.

The main characteristic of oils and fats is their ability to form different *type-dimensional crystals* (=***polymorphism***), generated by the wide melting/solidification temperature characteristic of each structural component. *Fractional crystallization* of lipid individuals in a mixture is subordinated to degree of non-saturation (iodine number (NI)), respectively size of hydrocarbon chain. Generic *fractional crystallization* refers to the processes of *fractional crystallization of triglycerides* in a lipid mixture. Depending on accessed fractionation technique, crystals can be obtained as follows: **1.** with surfactants (detergents), solvents (=***wet fractionation***); **2.** vinterization, deceration, pressing, filtering, centrifugation (=***dry fractionation***). Of the two techniques, ***dry fractionation*** is of interest, known as

a *thermo-mechanical* process, "*green*", characterized by the absence of chemical transformations. It involves the *selective crystallization* from the melt, under controlled conditions (="*memory destruction*" of the initial crystallization), followed by the *selective-physical* separation (decantation (vinterization), filtration, centrifugal filtration)), from initial natural lipid mixture (oil or fat), in distinct liquid and solid phases (*oleines/stearines*), with distinct physico-chemical, rheological and functional properties, compared to the chemical fractionation processes (hydrogenation, interesterification).

The integration of ***formulated lipids*** (***FL***), result of selective-physical separation from raw natural fat, into food products, is relatively recent. This determined the reorientation and revision of the food processing directions in relation to a dynamic market, resulting in *variants of food products* with new technological functionalities and bioavailability. A structurally/behaviorally modified lipid mixture through which new functional, technological competences and adaptability to "*stressors*" are generated, can be classified as a ***formulated lipid***, a class to which ***shortening*** (english: shortening; Pr.: şórtning), belongs [1]. Identification/printing of new skills/behaviors and directions of use of separate natural lipids can be combined, similarly, as an "*operating parameter*" in the dynamics of food engineering [2].

Fractionation techniques help to improve the functionality and characteristics of oils and fats by extending their use in applications other than in their primary form. Since the end of the XIX century, *fractionation* has been applied on an industrial scale to edible oils and fats to obtain raw materials for margarine, *shortenings*, oils for frying/salads, etc. As a raw material in obtaining *shortenings*, *stearin* obtained from palm oil is recommended. Versatility of the raw material for different food applications is result of fatty acids species [3, 4].

Generally, the term ***shortening*** define lipid products with a fat content of more than ***80***%, rich in monoglycerides, compared to *butter* and/or *margarine*, a *characteristic that allows mixing with hydrophilic components* (sugar, starch) [5].

A standard definition [6, 24] was not stated: **a)** initially, the term described lubricating, tenderness character that *solid lipids* transfer to the food matrix into which they were incorporated; synonymous with pork lard, but by inventing margarine by *Hippolyte Mege-Mouriès* (***1869***) (a chemist of French origin), it was also classified as ***shortening***; **b)** ***shortening*** defines animal or vegetable fats of *consequence of pork lard*, which are easily mixed and processed in food industry (english: *shortening*; Pr.: şórtning); **c)** any fat found in a solid state at room temperature, used in the manufacture of tender bakery and pastry products; **d)** the development and application in the 20th Century of hydrogenation techniques on vegetable oils, the term has come to define almost exclusively this class of products.

According to *Nor Aini* and *Miskandar* (***2007***), term ***shortenings*** defines natural solid fats at room temperature embedded in foods to "*reduce*" baking time [7].

At present, the *definition* is accepted: "*mixture of formulated lipids* (minimum ***99%*** fat), by various separation/fractionation techniques, in solid components (***stearin***) and liquids (***olein***) having as origin the same raw material" [8]. Resulting fractions acquiring new physico-chemical, rheological, functional technological and bioavailable behavioral characters.

A brief history [9, 10, 25]: **a)** ***1907***, the German chemist *Edwin Cuno Kayser*, an employee of Procter & Gamble company, obtained a product resulting from hydrogenation of cotton seed oil raw material for manufacture of soap; **b)** ***1911***, Procter & Gamble Company promotes the product as a *substitute for pork lard with culinary utility* (given the similarity of the characters with pork lard); the new product has been called *'Crisco'*, being a product formulated from cotton oil by crystallisation monitored at refrigeration temperatures; **c)** ***1976***, the use as raw material of sunflower oil, followed by canola (***1988***), as an alternative to lipid products with a *low cholesterol rate* .

Several criteria for classifying *shortenings* according to are currently recognised [11]: **1.** *physical condition* (plastic, fluid, liquid, dehydrated (powder, sequins)); **2.** *functional properties* (general destination, oxidative stability (roasting), cakes, glazes, bread and sweet pastries, dehydrated mixtures)); **3.** *household use* (baking, roasting); **4.** *packing form* (block, cubic, plate, other shapes).

The role of shortenings is a diverse one: **a)** it imprints tenderness (plasticizing/lubricating) and gloss; **b)** potentiates aeration; **c)** porosity and aroma promoters; **d)** changes the architecture of gluten; **e)** act as emulsifiers [12].

The specific functional properties of shortenings are [13, 14]: **a)** loosening factor (incorporation of fine gas bubbles into solidified fat particles $\Rightarrow$ fine structure and optimal volume); **b)** emulsification (e.g. uniform dispersion of small globules in the dough); **c)** plasticizer (depending on the consistency of the shortenings (very soft/very hard)); **d)** flavor enhancer (mono- and di-glycerides deodorized, followed by flavoring with butter flavor); **e)** conservability (extension of the shelf life (low percentage of polyunsaturated fatty acids)); **f)** structural stabilizer (rigid sortening (e.g. ice cream, whipped cream fillings)).

From previously formulated statements, *the role* of shortenings emerges: they imprint tenderness and luster; potentiates aeration; porosity and aroma promoters; changes the structure of gluten; act as emulsifiers.

Vegetable shortenings (stearin), formulated by fractionation techniques, have similar properties to pork lard: **1.** both are semi-solid fats; **2.** smoke point above butter and margarine; **3.** small amount of water; **4.** increased stability at heat treatments. Depending on the degree of unsaturation (NI)), vegetable shortenings can be classified as follows: **1.** *hydrogenated vegetable shortenings*, obtained by mixing solid fats with varying degrees of hydrogenation (NI =60÷65 g I_2/100 g); **2.** *compounded vegetable shortenings* resulting from the mixing of hydrogenated and liquid oils (NI ≈80 g I_2/100 g), or homogenized mixtures of several fat sorts as substitutes for pork lard [15, 16].

Depending on the raw material, formulation technique and operating parameters, three types of shortenings are commonly known [11, 13]: **1.** *plastic shortenings* [fat mixture → mixing → crystallization (I) (rapid cooling from 46÷49ºC to 16÷18ºC with the formation of crystallization centers)) → crystallization (II) (medium: air and/or inert gas (10÷20%), continuous stirring) → homogenization → packaging → tempering (27÷32ºC, , τ=24÷72h)] → **2.** *clear shortening* [soybean oil → hydrogenation (1) (132÷135ºC, Ni catalyst, NI=105 g I_2/100 g) → vinterization → hydrogenation (II) (134,4÷153ºC, Ni catalyst, NI=75÷85 g I_2/100 g) → gradually I cooling (at 45ºC) → gradually II cooling (at 39ºC) filtration → storage]; **3.** *fluid suspension* (vegetable oils + solid fats → mixing (at 40°C) → rapid cooling (6÷7ºC) → tempering under house stirring (16 h) → packing → storage (<35ºC)].

Jirasubkunakorn et al. (***2007***), states that crystallization behavior, crystal properties and melting/solidification interval profile of vegetable oils are conditioning parameters in later applications. *Shortenings* exhibit plastic behavior over a wide temperature range. Solid fat *content* (SFC) of raw material is major, determining parameter of texture. Thus, *polymorph and microstructure of crystal lattice* condition mechanical properties of fat. [17]. These claims recommend fractional stearine from palm oil in obtaining different types of ***shortenings***.

Degree of *incorporation* in food is dependent on three parameters [18, 19]: **1.** *olein/stearin* ratio from separate solid fraction that imprints plastic character of the product in direct relation to melting-solidification interval characterized by position of fatty acids in triglyceride chain; **2.** *polymorphic geometry* of *stearine*: it is known that triglycerides crystallize geometrically differently depending on the cooling rate [α (lowest density and melting range), β' (the most thermally steady), β]; the presence of *cis-trans* forms induces negative effects on melting/solidification range; **3.** *oxidation stability*: rate of autoxidation is directly proportional to fatty acid species and degree of unsaturation. Nature of

behavioral characters recommends ***5%*** of all raw and/or auxiliary materials. However, it influences decisively the processing parameters, behavior of material on each technological phase and sensory quality of finished product (softness, growing, elasticity, structure, volume) [20]. In particular, shortenings are initiators of gluten polymerization. Addition of a larger quantity of shortenings implicitly determines reduction of amount of water in order to obtain steady dough but elastic consistency (saturated or partially crystallized lipids added to the interface of gluten and starch granules thus, reduce absorption of water during the processes of mechanical processing of the dough. The lubricant role performed by shortenings is confirmed by formation of films at contact interface with other components. This phenomenon reduces tendency of contracting after thermo-mechanical processing (dilation). It contributes majorly to incorporation of air and stability during mixing operation, a role attributed to geometry of lipid crystals [21].

During the mixing operation, lipid crystals transfer from lipid mixture and tend to position themselves at the crystal-water interface followed by the absorption of gas bubbles at the gas-liquid interface. It should be noted that the β' shape of the lipid crystals allows the addition of small gas bubbles and gives a greater stability to the system, while the form β retains large bubbles and in a small amount [18].

At the end of the mixing operation, through the coalescence phenomenon, the triglycerides are oriented towards the gas phase [22].

Studies in field have debunked that, during the mixing operation, polar lipids are mediators of transfer of lipid crystals in aqueous phase, thus reducing tension at the oil-water interface. Scientific arguments claim that from doughs without the addition of shortenings (stearines) and doughs to which ***10%*** oil has been added, products with a much more porous structure with large alveoli and very thin, friable walls are obtained [23].

Thus formulated, shortenings are result of fractionation techniques on various principles (physical/chemical/enzymatic), of natural or hydrogenated animal/vegetable lipid mixtures resulting in 100% lipid products, but characters differentiated from the starting base.

Therefore, it can be stated that the **effect/role of shortenings** is beneficial through their attribute of "**mediation**" in relation to the structure of the food matrix, by reducing the surface tension at the liquid-solid, liquid-gas interface, the uniform distribution of structural elements in the mixing mass, with a role in defining the characteristics of sensory quality/texture of the finished product.

Keywords: formulated lipids, fractionation techniques, lipid fractions, shortening, functional properties, polymorphic geometry, role of shortening.

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P39

Setting the sole purpose as well as the advantages and disadvantages of the PCR (Polymerase Chain Reaction) versus Elisa (Enzyme – Linked Immunosorbent Assay) laboratory techniques used to confirm the presence of African Swine Fever virus in domestic pigs and wild boars

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The objective of our study was to emphasize the sole purpose of conducting the PCR test that reveals the detection of the genome specific to African Swine Fever virus to determine the active infection. The PCR test is used in the case of animals showing clinical signs of African Swine Fever, or to determine if they are contagious. The PCR is a test that allows the identification of infected animals by obtaining the result of detected genome/ undetected genome. While the ELISA test is used to detect the presence of specific antibodies to African Swine Fever from the 14th day after contact with the virus. We cannot use the ELISA test to find out if the animals have recently been infected with the ASF virus. The ELISA test is used in animals that do not show clinical signs of disease. The ELISA can help statistically to keep a record of the percentage in terms of cases that have become immune to the disease.

Keywords: African Swine Fever, viremia,antibodies.

P40

The quality of pumpkin oil using in food industry

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It is known that the cold-pressed pumpkin seed oil is a quality edible oil using in food industry as a natural fat replacer. Extracted from the seeds of a pumpkin (*Cucurbita maxima* L.), pumpkin seed oil is rich in fats and antioxidants, reducing the risk of heart diseases. The pumpkin seeds have 28–38% oil (w/w) consisting in oleic, linoleic and palmitic acid. The objective of this study was to evaluate the quality parameters including moisture content, acid value, refractive index, saponification value, iodine value and peroxide value for pumpkin seed oil using standard methods. Were used pumpkin oil samples from local made and imported from UE countries. Pumpkin seed oil may be used as cooking oil but, the frying at a high temperature can turn the oil taste in bitter and decrease its nutritional value. Pumpkin oil presents a unique coloring characteristic – dichromatism; with his dark red color in bottle and bright green in mixtures with other ingredients. With a pleasant nutty flavor, the pumpkin oil can be used as dressing for every type of salad. The pumpkin seed oil can also use as natural flavor enhancer for many sweet dishes (vanilla ice cream). Additionally, is taken as a supplement and can be found in the cosmetic products for skin and hair. However, the consumers with food allergies or sensitivities may be can feel gastrointestinal symptoms.

Keywords: pumpkin seed oil, cold pressing, quality parameters

P41

Hops substitutes for brewing beer: a review

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Hops is a very important specific raw material for the manufacture of beer, its role being immediately after malt, it represents the "condiment" that is added to beer. Worldwide, the entire production of beer is made with hops or products derived from hops [1]. Lupulin from hops cones has not yet been successfully replaced by a synthetic chemical substance, thus research is still being done to identify alternatives, especially for regions where it is not viable to cultivate this plant, which results in a high purchase price. On the other side, consumers desire fresh flavours, which is why researchers in the field are concerned about substituting other raw materials for hops.

Hops are used in the beer industry because of their benefits: give bitter taste and specific aroma to beer; improves the foam and colloidal stability of beer; has an antiseptic action, being a natural beer preservative.

According to research done to date, it is possible to successfully substitute other raw materials for the hops used in the brewing of beer, resulting in a final product with characteristics very similar to those of beer but with a cost price adapted to various local markets.

Among the plants tested so far, we can mention: *Gongronema latifolium*, *Vernonia amygdalina*, *Garcinia kola*, *Azadirachta indica*, *Cannabis sativa*, *Mangifera indica*, *Cynara scolymus, and Baccharis trimera* [2]. In addition to these plants, fruit addition as a hops alternative has also been tested. For example, trying to replace hops with artichokes has paid off, yielding a viable product. A 2019 study in Brazil set out to evaluate the use of artichoke as a total hop replacement in American craft lager beer production. The replacement of hops with up to 2 g/L artichoke resulted in a beer with a quality similar to that of American lagers traditionally found on the market. So, artichoke has been confirmed to be a viable alternative for hops, having satisfactory physico-chemical characteristics and good sensory acceptance [4].

This paper presents a documentary study on the state of research carried out on the possible raw materials that can be used in the manufacture of beer as substitutes for hops.

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P42

Antioxidant activity and kinetic studies on some hydrophilic extracts of fruits from the rose family (*Rosaceae*)

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The study deals with the evaluation of the antioxidant activity and kinetic parameters of some hydrophilic extracts from various fruits of rose family (*Rosaceae*). Plum (*Prunus domestica* L. var. "Bistrița"), blackthorn (*Prunus spinosa* L.) and hawthorn (*Crataegus monogyna* L.) ethanolic extracts [1-6]. Extraction conditions were set in order to have minimum degradation level for the labile antioxidant compounds: sample to solvent ratio of 1:5 (*m/v*), extraction temperature of 25 °C, extraction time 12 weeks in the dark. The clear extracts were then subjected to spectrophotometric monitoring at 517 nm for 15 min, in the presence of 1 mM DPPH· solution (extract:DPPH· solution:ethanol 96% volume ratio of 1:1:4). The antioxidant activity was expressed as the radical scavenging activity (*RSA*, %), according to the equation below (Eq. 1), where the Abs_t and Abs_0 stand for the absorbance of the mixture at the moment t and t = 0 s, respectively. There was a difference between the antioxidant behaviors of extracts during time. Thus, *Prunus* fruits had a slow but last longer antioxidant effect, in comparison with the *Crataegus* species. The *RSA* values reached 82% for the hawthorn extracts after 15 min.

$$RSA\ (\%) = 100 - 100 * Abs_t / Abs_0 \quad \text{(Eq. 1)}$$

The kinetic of the reaction of antioxidants with the DPPH· free radical was determined using the following rate low (Eq. 2), where C_{DPPH} stand for the actual DPPH· concentration (mM), $k_{(n)}$ and n stand for the rate constant and the rate order, respectively. The actual DPPH· concentration was determined according to the actual absorbance of the reaction mixture at 517 nm (only DPPH· has significant absorbance at this wavelength). The experimental data for the studied extracts were fitted to the Eq. 2, using zero-order, first-order and second-order kinetics and various time ranges (t_1 = 30 s and t_2 = 180 s). The best results were obtained for hawthorn extracts at first-order kinetics for t_1 and t_2 time ranges (r^2 = 0.99), with $t_{1/2}$ = 169-171 s and $k_{(1)} = 3.0\text{-}4.1 \cdot 10^{-3}$ 1/s. Extracts from *Prunus* fruits revealed best results for first- and second-order kinetics for t_2 time range with $t_{1/2}$ = 408s and $k_{(1)} = 1.7 \cdot 10^{-3}$ 1/s.

$$-\frac{\partial[C_{DPPH}]}{\partial t} = k_{(n)} \cdot [C_{DPPH}]^n \quad \text{(Eq. 2)}$$

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P42

The obtaining and characterizing of some low-fat pork sausages

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The main objective of this work was to develop the healthier low-fat pork sausages enriched in PUFA by replacing animal fat with some emulsions based on vegetable oils.

The intake of animal fat, whith high content in saturated fatty acids, increases the risk factors related to cardiovascular diseases (Blekkenhorst et al., 2015). That is why there is a growing concern of the meat industry to nutritionally improve the lipid profile of meat products. The replacement of animal fat by oils rich in n-3 PUFAs may be a very effective alternative (Dominguez, Pateiro, Agregán, & Lorenzo, 2017). The use, in meat products, of ingredients considered beneficial for health offers processors the opportunity to improve the nutritional and health qualities of their products (Fernandez-Gines et al., 2005).

Animal fat is an important factor that determines the quality of meat products including texture, flavor and mouth-feel. Therefore, reducing fat levels in meat products, as using less amounts of fat in the formulation, is not so simple.

Ayo et al., 2008, showed that healthier meat product formulations need either to contain less saturated fat or promote the presence of specific healthy compounds (nonmeat ingredients). Anyway the meat processors could use both variants. The researchers have used different ways to improve health related qualities and to maintain the sensorial properties at good level. Yilmaz et al. (2002) showed that different low-fat meat products or chicken sausages using sunflower oil had no negative sensory characteristics.

Twenty percent or higher reduction of fat content in meat products can lead to an unacceptable product texture, flavor and appearance. Total substitution of fat with water produces unacceptably soft and rubbery product with an increased moisture loss during processing (Claus & Hunt, 1991).

The formulas containing n-3 PUFA components could result in potentially issues due to their susceptibility at oxidizing processes (Lee et al., 2005). Also, the muscles by themselves can be oxidized. Moreover, addition of some potential prooxidant ingredients, the meat processing operations with particle size reduction and an increasing of exposed surface area, as well as heat-induced changes affect oxidative stability of final products.

In the recipes of the experimental variants different levels of emulsions were used. The assess of physicochemical and sensory properties was made in order to compare the quality attributes of low-fat pork sausages containing vegetable oils.

Key words: *meat products, health, oils*

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