

***Reports by the CEFood2022 chairs regarding scientific congress activities:**

All the reports are prepared immediately after the particular congress activity was accomplished and presents consensus between the allocated chairs.

CLASSICAL SCIENTIFIC EVENTS:

Opening and closing PLANERY lectures

Reported by *Peter Raspor*

Lučka Kajfež Bogataj: From environment to food (and back): what has to be done in the next decade; **Karl-Heinz Wagner:** Dietary challenges related to demographic shift in aging population; **Hugo de Vries:** The future partnership sustainable food systems (SFS); consequences for food science and technology (FST) and vice versa; **Daniela Borda,** jumped to the closing lecture due to Covid cancelation of originally agreed lecturer. The decision of organizer could not be better selecting her on the spot. The first tree presentations opened the challenges of current European but also global world. As agreed with invited speakers they should stress the reality in environmental challenges and mistakes done by man and possibilities to overcome these obstacles. Which was relevantly addressed by Professor Kajfež Bogataj. Professor Wagner streamed participants thinking to the aging populations and intensively demonstrated by research cases he is involved in Europe. Dr DeVries attached current food systems with research view and manager's view and intuition since he is director general in INRA one of the largest organizations of that kind in Europe. Closing lecture was designed to be in the challenges of modern nutrition. But professor Borda as attractive speaker from Romania stepped in professor Lapcik shoes with the address which was find very suitable by participants. She wrapped in contexts nutrition and food production and innovation with very profound view of food engineer.

From technology to food 28.09.2022

Two plenary lecturers streamed the space of scientific and research interactions during the day addressing technological aspects. If the first one opened the positions second one added important hint for the next day.

Atanas Pavlov: Plant in vitro technology for foods and food additives: current status, speculations and future prospects

Reported by *Elena Velickova, Vlado Mrša*

**Please consult also "After congress message to CEFood2022 participants and supporters" by Peter Raspor*

Prof. Pavlov presented broad summary about the potentials of plant in vitro techniques compared to traditional cultivation. These techniques deal with cultivation of plant cells, tissues and organs under controlled conditions in order to offer effective sustainable supply of phyto-ingredients with reduced energy, carbon and water footprints. Several examples were also given to highlight the progress in this field in different laboratories. At the end of the presentation, the progress of their laboratory for developing eco-friendly products was also explained. The conclusion wrapped up what to be expected in near future.

Session 1: Before and after the harvest

Reported by *Michael Murkovic, Bety Breznik*

Prof. Yaroslav Blume (UKR) was focused on the underutilized and forgotten crops and possibilities for future using for smart food in Ukraine. He emphasized the results of the present study are aimed at boosting cultivation of neglected and underutilized crops and their consumption in order to diversify food production in Europe and bring to the market species and varieties that have high nutritional quality.

OP1 - Polona Kogovšek (SVN): presented molecular techniques for detection and identification of plant pathogenic and food spoilage fungi.

OP2 - Sandra Bulut (SRB): presented antifungal activity of essential oils and β -cyclodextrin/essential oil microparticles against toxigenic *Aspergillus* spp.

OP3 - Chiara Rossi (ITA): presented application of a starch-based aerogel loaded with hexanal to control postharvest decay of sweet cherries.

The discussion after the session followed up on all the mentioned topics and even more, all presenters additionally explain some of the important results of their study.

Session 2: Plants - a staple food or an alternative?

Reported by *Zuzana Ciesarová, Bojan Butinar*

Prof. Katarzyna Malgorzata Majewska (POL) was focused on the controversial debate about the fear of wheat gluten in healthy people. She commented on the claims presented by Dr. Davis in the book *Wheat Belly*, which influenced many consumers to avoid gluten from their diet. She emphasized that widespread dissemination of scientifically based information is necessary to encourage healthy people to follow the rules of a healthy diet. Dr. Johana Rondevalová (CZ) presented the potential of some exotic underutilized fruits to support the demand for food enriched with valuable bioactive compounds, especially for people suffering from malnutrition or anemia. Dr. Mirjana Pešič (SVN) replaced Lovro Sinković's canceled presentation with an interesting topic of protein analysis using polyacrylamide gel electrophoresis valuable as an analytical method for assessing the authenticity and quality of food. Dr. Erika Dobrosravič (HR) presented a study on the antioxidant stability of the hydrosol of medicinal plants (thyme, sage, laurel) compared to essential oils isolated from these

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plants. The discussion after the session followed up on all the mentioned topics.

Session 3: Potentials and limitations of bioactive compounds

Reported by *Jaroslav Havlik, Primož Treven*

Stela Jokič presented research conducted by Faculty of Technology Osijek. The faculty is involved into various EU projects after large investments in the last years. Green extraction methods such as supercritical fluid extraction have vast use in production of value-added products for any field of food research. Aida Kunčič presented a notable screening study about antimicrobial and antioxidative effect of unifloral honeys. Buckwheat honey showed the strongest antioxidant and antimicrobial activity. The antimicrobial and antioxidative effect against the screened pathogens, which were linked to polyphenols. Research helps to the honey producing company to promote the brand. Guilia Tabanelli showed results of potent fraction from ribes and juniper fractions and essential oil thereof against *Listeria monocytogenes* using the broth well plate assay. Fractions showed antimicrobial activity at 2 mg/mL. The potential application could be washing the foods or active packaging as added in the discussion. Ena Cegledi presented research focused on the extraction of nettle, measured total phenolic composition, Biological activities from collected nettle as well as cultivated nettle extracts. These were obtained by advanced extraction techniques, such as microwave assisted extraction and were comparable with classical extraction. First harvest showed the highest contents of bioactives. Cinnamic acid was most abundant. I noticed that many presenters showed or planned research in collaboration with the industry.

Session 4: New food products, technologies and techniques

Reported by *Gerhard Schleining, Evgen Benedik*

In this session we talked about several examples to develop healthy sweet bakery products and aging techniques to improve the eating quality of eland antelope meat. We continued discussing the potential of irradiation technologies for improving the safety of cheese made from raw milk and concluded the session by discussing the use of chitosan formulations enriched with encapsulated phyto/phytochemicals as an active coating for polylactic packaging foil which have great potential in the food packaging industry.

Session 5: Can we improve food properties and prevent food fraud at the same time?

Reported by *Yaroslav Blume, Mojca Jevšnik*

Prof. Jaroslav Havlik (CZE) was focused on the Nuclear magnetic resonance spectroscopy (NMR) as an important tool for food

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authentication and food fraud detection. He emphasized that the method shows unprecedented robustness, minimum sample preparation and quantitative capability, without relying on a calibration with authentic standards. In the end he concluded that NMR metabolomic research can massively profit from open data databases and standardized workflows, which will be discussed in concluding remarks. Dr. Andreja Ramšak (SVN) presented a Slovenian case study regarding seafood traceability. She emphasized that global fisheries cannot meet the global demand for fish products due to depleted stocks. During the project diagnostic tests for some squid species were developed. Dr. Tomislav Mikuš (CRO) presented influence of the addition of white button mushroom supplement in the diet on the sensory and technological properties of lamb meat. In conclusion he emphasized that by adding specific supplement to the lambs diet, the meat retained all the positive sensory and technological properties. Dr. Sandra Balbino (CRO) presented a study on the optimization of almond based dairy-free milk alternative formulation fortified with myrtle, laurel, and fennel extracts. She concluded that the addition of lecithin resulted in a darker color and sweetness was increased by xylitol content. The discussion after the session followed up on all the mentioned topics and even more, all presenters additionally explain some of the important results of their study.

PL5 - Livia Simon Sarkadi: Importance of amino acids and biogenic amines in food quality and nutrition

Reported by *Anca Nicolau Andrej Ovca*

Because of their essential role in the body, amino acids and their derivatives, biogenic amines, can be of great importance in food quality and nutrition. Consumption of foods containing high levels of biogenic amines is responsible for many pseudo allergic reactions associated with foods, and elevated levels of biogenic amines in foods are an indicator of their microbiological quality. Better knowledge of the nutritional content of foods is needed to fully understand food-health interactions, which could facilitate more efficient production of foods tailored to promote human health

From food to nutrition 29.09.2022

Two plenary lecturers some scientific, research but also practical and health implications important for food supply chains. If the first one opened the health face toward the research second one added important element of human as an actor in the food supply networks touching food culture in most elementary stage- education.

PL6 - Blaženka Kos: Next-generation probiotics and prebiotics – an efficient strategy for balancing the human microbiota.

Reported by *Viktor Nedović*

**Please consult also "After congress message to CEFood2022 participants and supporters" by Peter Raspor*

Research of the human gut microbiome has already long history. The lecture was build on that and confirmed the importance of presence of phylogenetically diverse bacterial species in human intestine. The microflora with health-promoting effects based on nutrition but also in specific cases taking the potential of faecal microbiota transplantation. Dr. Kos shared bunch of results of long-lasting research and demonstrated selected isolated from Balkan area and their functionally. They characterized autochthonous strains of lactic acid bacteria (LAB), isolated either from the breast milk microbiota or artisanal fermented food, have a huge potential as a next-generation of probiotics, which she addressed in her lecture, showing reasonable expectations in this area for daily practice in nutrition and technology.

Session 6: Food related health hazards and risks

Reported by Gabriella Kiskó, Primož Treven

In the presentation of Zuzana Ciesarová acrylamide has been in the focus. She discussed possibilities for the elimination of acrylamide from foods concentrating on the application of asparaginase in cereal and fruit-based products. Although its complete elimination is not possible, it is a good example how to reduce acrylamide to an extent that meets the benchmark levels set out in European Regulation. Petra Mohar Lorbeg presented her research on the potential risk for the spread of antibiotic resistance by probiotic and starter culture bacteria, because they can serve as reservoirs for the the transmission of antibiotic resistance genes. Their study showed that starter cultures contain less antibiotic resistance genes compared to gut microbiota and the microbiota of dairy products made from raw milk without starter cultures, and therefore do not pose a significant risk. In the talk of Krisztina Takács within the food safety assessment the allergenic risk assessment of novel food was in focus with a special regard to the insect proteins. She highlighted the use of human *in vitro* digestion combined with immune-proteomic approach as a new tool for the prediction of allergenic risks besides the existing methods. Levent Şen in his talk highlighted the need for new plant-based substitutes alternatives into dairy products. They prepared different formulation plant based milk. Their physicochemical and structural properties were extremely affected by heat treatments and ultrasound applications regardless of the plant type. The presentation of Nada Smigic focused on the consumer perception of ready-to-eat and cut-to-order foods in „at risk” consumers older than 60 years. Their result emphasize the need for preparing clear recommendations for adequate food safety practices at home to improve specific risky behaviors.

Session 7: Nutrition: is the point in the food or in the gut?

Reported by Ladislav Kokoška, Mojca Jevšnik

**Please consult also "After congress message to CEFood2022 participants and supporters" by Peter Raspor*

At first, chairs opened the session and introduced its scientific focus. Then, the keynote lecture comprehensively summarizing novel approaches in enhancing bioavailability of bioactive compounds was provided by Professor Nataša Poklar Ulrih. Special emphasis has been placed on poorly soluble bioactive components. Next lecture presented by Dr Maja Berlic demonstrated results of the study evaluating contribution of kindergarten meals to the daily nutrition. The last speaker of the session, Dr Snezana Barjaktarovic Labovic, showed in her presentation the findings of the research monitoring iodine status of breastfeeding mothers in Montenegro. The solubility of resveratrol, the most typical species of fruits and vegetables served in kindergartens and natural variability of iodine content in the samples were the main topics of the discussion.

Session 8: Biotechnology: evolution or revolution?

Reported by *Aleksandra Djukić- Vuković, Andrej Ovca*

Very ambitious title of the session stimulated presenters and the audience to put their scientific work in the broader context of biotechnology nowadays. We got the insights in the current analytical techniques convenient to study encapsulation. Colleague Lević delivered very hands-on lecture and provided valuable advises which were highly appreciated by the audience. The value of the preservation of microorganisms through encapsulation was also emphasized in the lecture of colleague Črnivec. It was concluded that encapsulation plays significant role as a antool to mediate stress often present in biotech processes, either from low pH or other stressors. Encapsulation expands potential for biotech processes on new substrates which are needed in future for food production. These new processes also require efficient microorganisms, and colleague Čadež presented the results of adaptive evolution directed towards *Saccharomyces* strains capable to efficiently metabolize alternative substrates. The value of advanced techniques for analysis of the obtained clones is for sure the important tool which brought the revolution in the field of biotech and will lead the detailed further works on the impact of independent stressors to elucidate mechanisms and apply it in other microorganisms for novel biotransformations. The work of colleague Olsperť gave a good overview of what can be achieved to upscale the underutilized brewer spent grains for human nutrition by cleverly designed bioprocessing and it ignited discussion and exchange of ideas once more emphasizing the evolution in a way the biotechnology is perceived. Potential of betalains as compounds from plants which are used in our nutrition was delivered by colleague Sawicki and provided some links between chemical structure and biological activity in vitro. It also emphasized the need to look into the new sources for food or biotechnological purposes. During the discussion and closing remarks, an interesting topic of synthetic biology emerged, so maybe, for the next CEFood Congress, this topic should be considered.

**Please consult also "After congress message to CEFood2022 participants and supporters" by Peter Raspor*

Session 9: Food microbes: friends or foes?

Reported by *Antoanello Paparella, Sonja Smole Možina*

Four presentations were given in session 9, started by KN lecture of professor Raffaella Di Cagno from the Univ. of Bolzano, IT, given an extended overview of metabolic and functional paths of microorganisms in plant-based food products. The role of versatile LAB and also yeasts was presented in interaction with fruit and vegetables matrices to increase their nutritional value of food due to synthesis of different microbial bio-actives or enzymes which enable to increase bio-accessibility of plant nutritional components and decreasing anti-nutritional factors present. The following presentations with the authors from Slovenia, Austria and Spain were dedicated to microbial interactions in food and food production in animal-based products, mainly poultry meat and cheese production. In all cases interactions of indigenous microbiota (on one side molds or *Pseudomonas* contamination in cheese production and bacterial pathogens present in poultry on the other side) can strongly interact with either starter cultures during cheese ripening or newly developed bacterial probiotic strains application in chicken breeding. In all cases the consequences of these interactions were discussed by the lecturers in the context safety and quality of the products. Contributory comments and questions from the audience pointed on the importance of microbial interactions and microbiome research to understand microbial dynamics in different food environments, also in the future.

Session 10: Consumer's food choices and risk management

Reported by *Daniela Borda, Andrej Ovca*

The common denominator of the session (during all presentations and during the discussion) was how to help the consumer. How to help consumers meet food safety requirements? How to help consumers with metabolic syndrome? How to provide consumers with higher quality food without changing the taste, and how to provide consumers with conditions that allow them to maintain a healthy lifestyle.

Session 11: Food analytics

Reported by *Livia Simon Sarkadi, Irena Vovk*

The session started in time and finished as scheduled. The session started with the introduction of professor Maks Samec (1881 – 1964) who was the pioneer of wheat starch research and contributed important knowledge on starch colloids chemistry. We had one keynote and three oral presentations with fruitful discussions from the audience with wide variety of expertise, coming from different countries. The discussion also reflected the morning workshop “Modern food: local vs. global, traditional vs. innovative in the “healthy” perspective”.

In the program of this session were the following presentations:

KN11 - Michael Murkovic (AUT): Contaminants originating from heat processing of foods

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OP32 - Vasilij Valenčič (SVN): Changes in sensory characteristics, volatile compounds, and biophenols in olive oils due to the olive fruit fly *Bactrocera oleae* (Gmelin) infestation

OP33 - Toomas Paalme (EST): Relative refractive index values of sugars, organic acids, alcohols, and those application in quantitative chromatographic analysis using RDI detector

OP34 - Katja Babič (SVN): Can we verify the origin of Slovenian pork meat on the market?

We learned from the keynote lecture that the coffee contains relatively high amount of toxic components (heterocyclic amines), but on the other hand it is very healthy and tasty drink, as well as very sensitive on technological changes and consumers expectations. Furthermore, there was interesting results on the volatile compounds and biophenols on virgin and extra virgin olive oil, showing the difference between the two types of oils. It was interesting to hear the theoretical basis on the refractive index-based calculations that could replace the chemical standards and lower the price of the quantitative analysis. Last but not least it was an excellent presentation on Slovenian pork meat varieties with emphasis on the excellences of the Krško polje traditional pork meat determined by the chemical composition discriminating by the geographical origin.

PL7 Andrej Ovca: Systematic analysis of formal education and training in the field of food safety with combined research approach,

Reported by *Eva Glencser, Bojan Butinar*

Due to vis maior the lecturer Marina Soković from Serbia could not come to the venue nor deliver her recorded presentation in time, so the POC decided to find a substitute lecturer. The chosen presenter was Andrej Ovca from Slovenia.

As a result, the lecture entitled Health promoting properties of mushrooms was substituted with the lecture *Homo sapiens alimentarius*. The lecturer successfully and with great dynamics demonstrated the effect of formal education on ensuring the Food safety illustrating it with various examples.,

Student FLASH presentations,

Reported by *Loredana Dumitrascu, Irena Vovk*

The flash presentations were given by 5 young researchers and covered topics like: (a) methods that can be used to detect contamination by anabolic-androgenic steroids; (b) identification of sustainable food additives for food fortification; (c) knowledge and behavior of consumers regarding the salt consumption. The presentations generated interesting discussions and insights that should be considered by the speakers in their future researches.

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The first speaker showed that the current advances and trends in analytical methods to detect contamination by anabolic-androgenic steroids are based on antibodies, enzymes, aptamers, oligonucleotides, cells and their receptors, artificial sensors. The second speaker isolated bioactive compounds from *Carpobrotus edulis* and used it to functionalize yoghurts. The third speaker showed that *Pseudomonas* it is not really just spoilage, as it can provide nutrients for other pathogenic bacteria. The fourth speaker used several extraction techniques like ultrasound and microwave to optimize the extraction of bioactive compounds from various seaweeds. The fifth speaker evaluated the relation between salt consumption, behavior and knowledge of Slovenian students from Biotechnical University of Ljubljana and concluded that students are aware of the need for reducing salt in their diet.

Student grants

The congress organizers instated a lot of effort to find companies willing to support student taking active participation to the congress. Organizing committee member dr Pravst dealt with this task with enthusiasm. With the help of the companies in the continuation we offered 28 fellowships. Special intensive task was to find such students, since in the countries where the participation was not encouraged enough by their country representatives.

The congress attended students from Albania, Greece, North Macedonia, Serbia and Slovenia. They are grateful for the donation received that allowed them to attend the CEFood Congress. For most, it was the first opportunity to witness such an event. They expressed an interest in future cooperation with donors. To this end, a list of interested students with contact details has been provided to donors. The companies who helped students are: Gorenje, d.d., Jožef Stefan International Postgraduate School, ETA Kamnik, d.o.o., Science and Research centre Koper, National Institute of Biology, Faculty of Chemistry and Chemical Technology, Slovenian Microbiological Society, Mlinotest, d.d., and Jagros, d.o.o

INTERACTING SCIENTIFIC AND PROFESSIONAL EVENTS:

Roundtable: Edible insects - food of the future?

Reported by Diana Banati, Andrej Ovca

After Professor Banati Introductory lecture panel members: Atanas Pavlov, Anca Ioana Nicolau, Domagoj Gabrić, Michael Murkovic, Andrea Gross – Bošković had open discussion as reported by Diana Banati, Andrej Ovca which lead to following conclusions: "Green source of protein" - environmental and sustainability aspects. This aspect is strongly driven by the dietary habits of consumers. While eating insects is a sign of poverty in some countries, the traditional diet in Southern and Eastern Europe is based on meat as a source of animal protein. "Young green people" will most likely be the driving force for behavioral changes leading to a more sustainable diet, which - at least in Europe - does not necessarily include insects. Insects currently provide a good alternative source for animal feed or as an enrichment of other food like beer and flour. "Insect farms" - technology and processing issues. The challenges are mostly related to contamination with food contaminants or other insect species, especially in homogenized products, while there are no analytical methods specific or sensitive enough to solve this challenge. Moreover, we have to decide which contaminants are relevant for detection and management. From a technological point of view, solutions already exist, but they need to be upscaled and will (in case of ready to eat foods) require a redesign of food factories. Cleaning strategies must also be adopted. "Food safety hazards" - biological, chemical, physical and allergens - where is the greatest risk to be managed? However, because this is an emerging field, a complex issue in conjunction with novel foods and a lack of data in the literature, it appears that mycotoxins and allergens pose the greatest threat to be addressed. Mainly because thermal treatment does not reduce allergenic load. Novel allergens will emerge where EFSA's time-limited approval is the safety guard. "Consumer acceptance" - Priority or obstacle for innovators; Inhibitors/promoters of tampering with such products The greatest inhibitors are tradition and disgust. There are many ways to use insects as a fortification additive to conventional foods; however, care must be taken when adding insects so that they do not affect the flavor in a way that the consumer notices. From a nutritional perspective, it has been determined that insect proteins are not comparable to animal proteins and that analyses show that the protein content in this type of food is very often overestimated. Moreover, due to the various options of alternative protein sources (microgeological origin, lab-grown meat, plant-based alternatives, etc.), the consumer may or may not decide which one to choose from the abundant supply). This decision will be mainly driven by marketing strategies and final price, rather than consumer values. Finally, the question was raised whether we really want to go this way (whether this

**Please consult also "After congress message to CEFood2022 participants and supporters" by Peter Raspor*

is really the only alternative), and it was also pointed out that politics cannot be bypassed in this case.

World cafe: Supplemets in foods and nutrition,
Reported by *Slađana Šobajić, Evgen Benedik*

The World Cafe on Food Supplements was sponsored by the companies Norsan and Medis. Together with all the speakers and participants of the World Cafe, we highlight the following three important areas of the food supplements market:

- 1) The current legislation is outdated and should therefore be improved and harmonized in a way that includes all EU countries.
- 2) The control of the actual content, stability and bioavailability of active substances in food supplements is insufficient, mainly because there are no certified reference materials for laboratory analysis.
- 3) The end user of food supplements - the consumer - is on the one hand confused or influenced by the unregulated and aggressive marketing strategies of some food supplement manufacturers, and on the other hand there is a lack of nutrition experts who can educate and advise the consumer on the right food supplement. However, we all agree that a healthy diet and whole, unprocessed foods are still the first and most important step in maintaining our health, but the need for supplements is increasing due to our fast-paced and stressful lifestyles.

Workshop: Challenges for beer and wine in today's food world,

Reported by *Viktor Nedović*

Very interesting topics were raised and stimulated the audience to exchange the views, to discuss, to pose the questions. Practical testing has been performed as integral part of the workshop. By the work of Iztok Košir we got the insight in the determination of geographical origin of hops and terroir influence on quality, very important issues for brewers since the contents and compositions of bitter resins and essential oils in hop products depend not only on the genetic, but also on the environmental conditions during their growth. New analytical approach was developed and presented that include Isotope Ratio Mass Spectrometry (IRSM) and non-destructive energy dispersive X-ray fluorescence spectrometry. In another interesting presentation it was demonstrated by Franci Čuš that production site/terroir and the type of alcoholic fermentation have a greater influence on the quality of wine than the quantity of yield per vine. The impact of new technologies on beer quality and sustainability with focus on immobilized cell technology applied in main and secondary beer fermentation has been presented by Viktor Nedović. It was demonstrated that short time, fast fermentation may reach standard beer composition, quality and beer production sustainability. Last but not least we had very exciting presentation on linking beer flavour fingerprints with consumer perception and

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preferences of different beer styles and on trends on the market done by Boris Gadzov from FlavorActiV. It is stated that this linking provides very powerful information for beer producers and supports to secure position on the market. Study described common flavour fingerprints in different beer styles, detected in descriptive sensory evaluation of 460 different beer brands and styles all around the World. Boris prepared real-world practical examples as well and allowed participants to experience beer flavour standards and to learn about testing techniques, flavour origin and importance. Similar exercise has been prepared by Franci Cus, performing testing of 3 different wines from different terroirs, obtained by inoculated and spontaneous alcoholic fermentation, confirming practically previously stated fact about the influence of terroir and the type of alcoholic fermentation on wine quality.

Workshop: Food and its safety in a fast-changing world,

Reported by *Andreja Rajković, Peter Raspor*

Sponsored by: ICFMH – International Committee on Food Microbiology and Hygiene and Dedicated to Marko Anton plemeniti Plenčič and Marko Gerbec call attention to this important aspect of food supply and nutrition chains with the presentations of key persons on the field of food safety. It was chaired by Prof. dr. Andreja Rajkovic (president) & Prof. dr. Peter Raspor. Andreja Rajković (BEL) addressed Microplastics in food safety. The dilemma of toxicity via different mechanisms is very much relevant and need further attention. From the emerging issues of microplastics and nanoplastics (with detailed look at Horiozn2020 project ImpTox: en | IMPTOX and CUSP research cluster CUSP cluster - The European Research Cluster to Understand the Health Impacts of Micro- and Nanoplastics (cusp-research.eu) with their microbiological cargo, to established problems of Aflatoxin M1 and foodborne pathogens such as *Listeria monocytogenes*, links have been made to antibiotic residues and antibiotic resistance, as well as solutions that may come from the natural products, mainly essential oils and plant extracts, containing mixtures of highly efficient antimicrobial molecules that work in synergism. First discussed by Professor Antonello Paparella (ITA) who demonstrated plant essential oils for food safety from theoretical and research perspective to practical examples where he nicely illustrated some efficient application for human wellbeing. Gabriella Kiskó (HUN) addressed antibiotic resistance and showed many reasons and facts for human concern. In particular in connection to Food safety concern? On the other hand Peter Šimko (SVK) showed How efficient is Elimination of aflatoxin treat from milk with dextran and indicated very nicely also other positive implications on human health. Next possible game changer being machine learning and artificial intelligence that can generate, utilizes, interpret and correlate data of different (chemo)metrics to assess microbial load of foods was introduced and discussed by George Nychas (GRC) took chance to open Data Science as he see it Food Safety service. And participants took his message with respect and enthusiasm for faster integration of

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new software approaches in food production and distribution area. Peter Raspor addressed education in Food Microbiology/food safety and indicated training obstacles in virtual world.

The ICFMH Workshop "Food and its safety in a fast changing world" was held on 29/09/2022 indicated Various 'contradictions' associated with food safety in terms of cultural, environmental, production and analytical aspects were addressed including the following. The workshop was a high level, yet easy to grasp overview of some of the established and some of the emerging issues in broad understanding of term food safety. It was a coherent, interdisciplinary and complementary discussion that linked multifaceted impacts of presence of foodborne contaminants (microbial, chemical and mixtures thereof) on human health. Finally, all these new and old paradigms are essential to modern food microbiology curricula that needs to take the best put of current mixture of physical and virtual education approaches. Audience interacted, proposed, and discussed issues that were linked to the presentations and went above that by introducing their own impressions and considerations. Also young researches and students gave their inputs of a great value.

ICFMH, its activities and outreach were presented by president, and special attention as given to announcements ad PR of FoodMicro2024 in Burgos (Spain) and 12th International Conference on Predictive Modeling in Food in Sapporo (Japan). We hope to welcome there so many young and established food microbiologists and food scientists in general.

Workshop: Modern food: local vs. global, traditional vs. innovative in the "healthy" perspective,

Reported by *Nadiya Boyko, Bojan Butinar*

Bojan Opened the Workshop, Demonstrated to Participants the very prominent Slovenia Researcher Dr., Prof. Aleksandra Kornhauzer Frazer, mentioning that even three were a lot of argue during their common work finally the Aleksandra Kornhauzer Frazer had been right since experience. research into alkaloids and antibiotics for pharmaceutical companies, became the Honda prize researcher – well known Nadiya Added that the other very prominent if not unique person passed away – Dr. Roger Fenwick, who was initiator for a variety of things – Food, Biotechnology and Fisheries, worked together with EC and Prof. Dr. Christian Paterman and had permanent position in Institute of Food Research, in Norwich, huge respect from all the NTPs. Daniela Borda had presented the really amazing data about the consumer behavior different profiles connected to very sensitive Food Safety issue. The majority of the contamination are originated at home during the 1) food storage 2) food processing, thus it is very important to educate society in order to get the consumers ready to understanding of food safety issues considered their mentality and traditions. Adrien presented fantastic systemic assay last updated and the challenges we currently faced – in both detentions – global and local and the Campden network and created the stakeholder's platform is the huge value since it is the decision verification of all the novelty – from eating

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not at home, developing innovative unique approach for COVID-19 stresses issues, and even more – how to come to food innovations and safety still not to lose the major value – traditions! Nadya in her presentation had been focused on the complexity of food safety and healthy food issue. She was demonstration in continuation to two previous presentations – how important is to combine only proper and exact precise diagnostic techniques to detect not only food features but also to demonstrate from medical point of view – which food ingredients and for whom? Are healthy. The harmonization is required and all the analytical data complex should be finally translated to the consumers. In order to solve this issue only the one possibility we might have – instead to teach consumers create validator platform allowing harmonize all big data, use AI and ML, and serve the different type of stakeholders. In conclusion she mentioned that healthy food – the food we trust. We have meet a lot of interest from representatives – Romania, Slovenia, Hungary, Serbia – who raised the very relevant questions

- 1) How to deal with consumer's behavior?
- 2) How to teach them?
- 3) What are the main instruments for proving food safety?
- 4) How to use new data and introduce to stakeholders?
- 5) What is next in the field?

NETWORKING EVENTS:

Central European Food Project Day 27.09.2022

Chaired by Primož Treven, Daniela Borda, Dasha Mihaylova and Mirjana Pešić and Peter Raspor,

Reported by Primož Treven.

The food project day was opened by Peter Raspor introducing the concept of Central European Food Project Day and its expectations for knowledge transfer which was followed by the lecture of Mitja Lainščak, director of Slovenian Research Agency (SRA), who presented the financing scheme of SRA and how/to what extend the field of Food technology and nutrition is financed by SRA. Next introduction lecture was held by Ana Le Marechal-Kolar, Director-General Food and Fisheries Directorate, who pointed out the tremendous importance of research and development in agri-food sector.

First session covered projects related to food security. The first presentation was by Ana Vučurović who presented the problem and epidemiology of emergent tobamo viruses in tomato. Uroš Žibrat presented novel solutions for early detection of quarantine nematodes in potatoes using remote sensing. The EU project of Małgorzata Wronkowska, was presented as a tool to equip entrepreneurs and professionals with the skills needed to transform the local and global food system. In the last presentation of this session, Mirjana B. Pešić presented large project dealing with short food supply chains and innovative approaches for the success of business with short food supply chains. However, in a global sustainable world, the advancement in science means more than laboratory work, means critically and in-depth thinking out of the box, the capacity of working with big data provided by the modern measurement tools, means the ability to communicate fast via social network/apps, means reengineering of the traditional processing food technologies to reduce waste and intelligent valorization of by-products. Nevertheless, development of sound analytical tools and technologies also plays an important role to societal development. Collaboration and bringing all the actors to the table may help bridging the current knowledge gaps. In addition, inspiring young people in doing their job with diligence it is also a way forward to develop society and stir innovation. Finally, making sense of data and converting it in valuable information that would generate knowledge and results in skills it is the path required for further sustainable development of food industry. Second session covered broad area of food and nutrition. The lectures covered very different areas such as promoting innovation and entrepreneurship in food business, shelf-life improvement, whey processing, modern approaches for personalized nutrition and modern development of kitchen appliances. The first presentation was given by Urška Pivk Kupirovič and was about a project focused on how to attract young people to the food industry, build learning activities and stimulate

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innovation and entrepreneurship among students and young entrepreneurs. Fatih Özogul presented an international project with activities against food contamination. The project deals with bioprotective microbes and bioactive plant extracts to improve the shelf life of foods. Bioactive substances have been incorporated into a food matrix and used in the development of packaging film. Bioactive plants and lactic acid bacteria have been used to improve the safety, quality and shelf life of perishable food products. Diana Paveljšek presented some highlights about whey challenge for dairy industry in Slovenia and gave information about proteins isolated from whey, namely lactoferrin and lactoferrin hydrolysates in particular and their antimicrobial activities. Kathryn Hart gave an overview lecture on an international project on personalized nutrition and in particular the development of a new mobile application that integrates technical and clinical expertise with the users' personal profile and aims to summarize the advantages of already existing applications on the market. Saša Drame presented an innovative mobile application for ovens that could monitor and control oven during baking and that should be launched in Europe soon. The session showed how broad is the field of food and nutrition and how modern techniques can help and, in some cases, also replace traditional approaches.

In last session, projects regarding food safety were presented. Firstly, Nives Ogrinc presented the ISO-FOOD ERA Chair for isotope techniques in food quality, safety and traceability. A COST action regarding the impacts of low pH on microorganisms in the field of food technology was presented by Aleksandra Djukić-Vuković. Anita Kušar presented different approaches of branded food labelling and composition data collection for use in research, services and policy making. The last lecture, presented by Sonja Smole Možina, covered the project tackling the gap in the fundamental knowledge of *Campylobacter jejuni* interactions. Overall, the session has shown that in the food safety area we are still dealing with basic problems such as food frauds, mislabeling, understanding of low-pH on microorganisms and bacterial interactions. However, the methodology of investigations has advanced tremendously. The key is still communication between different aspects in order to connect knowledge from different aspects of food safety. Final discussion showed that such approach was well accepted by project leaders but also by public, to be informed about actual contribution of such projects to practice and to science.

“Slovenian Day” – a fair of Slovenian food, beverages and specialties of Slovenia’s rich culinary heritage, Reported by Tjaša Vidrih

In the framework of the CEFood 2022 congress, the Slovenian Day event was held on Wednesday, 28th September 2022 and efficiently conducted by dr. Bety Breznik, a Member of the Scientific and Organizing Committee of

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the CEFood 2022 Congress and her team. The Congress President Professor Raspor extended his welcome message stressing the Minister of Agriculture, Forestry and Food, Ms Irena Šinko struggle for improvements in agri-food chain where message about Slovenia and its food heartache was clearly conveyed to Congress participants, The president of the Committee for Agriculture, Forestry and Food and member of the National Assembly, dr. Vida Čadonič – Špelič expressed first her view in wishes in Slovenian language and continue English - to please participants. A musical performance, the Brežice music school (traditional Slovenian music) enriched cultural dimension of the meeting. Finally, The lecture entitled 'Around Slovenia with a Spoon and a Glass' by the Director of The Posavje Museum Brežice, Ms Alenka Černelič-Krošelj gave to participants free test of Slovenia Heritage. After musical performance, the Brežice music school (traditional Slovenian music) an invitation to visit the stands and taste Slovenian foods and beverages, correspond with an address by Ms Anja Smrke, the 'Princess of Slovenian wine Cviček' for 2022. And she escorted them to the stands with 25 exhibitors from various Slovenian regions presented Slovenian foods and beverages. The organizers encouraged various stakeholders to bring their food stories to the fair where CEFood participants were exposed to enjoy tradition as well as modern achievements of current society. CEFood 2022 participants enjoyed different food items based on tradition. This was an opportunity to enjoy the latest improvements of some traditional masterpieces and also completely new experiences in tastes and image as accepted also with the younger generation. There was no better way for food connoisseurs to fulfil their own knowledge and experience of Slovenia. We are convinced that Slovenian Day event made a significant contribution to the fact that participants of the congress will be happy to return to Slovenia.

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CHALLENGES AND SOLUTIONS EVENT: CE-I-FooDay (Central European Inspiration Food day)30.09.2022

Presentation of position papers;

Reported by Peter Raspor

To celebrate the twentieth anniversary of CEFood congresses and to create a new challenge for future congresses, the organizer took the privilege to create a new dimension for the governance of science, education and practice along the agri-food technology and nutrition chains, embedded in the concept of CE -I-FooDay. Advisory Board members had selected one expert in each of the 17th from 18th countries to present a written position paper. Considering the quality of the position papers and the innovative approach, the leaders of the Croatian Academy of Technical Sciences (HATZ) decided to publish this milestone book. As organizers of the whole conference scenario, country representatives were present the current state of the art in research, teaching to policy making in the field of food with specific challenges that reflect the current time and are integrated into the motto of the congress: "Food, Technology and Nutrition for Healthy People in a Healthy Environment." 13 authors fulfilled this mission and 11 position papers were presented to audience after there were presented by their national Advisory committee member. The participants found this program very useful and commented very positively about the experience and potential of such approach for opening relevant challenges in dimension of science via position papers. If we compare the position papers with the Congress theme "Food, Technology and Nutrition for Healthy People in a Healthy Environment", we see a great diversity on the one hand, but also relevant focus areas that are currently needed.

1. Tackling honey adulteration patterns in current food systems.
2. Food Packaging: Food Quality, Safety and Sustainability
3. The current Challenges for salt in technology and human nutrition
4. Antimicrobial potential of plant volatile agents for food shelf life extension
5. Challenges and future prospects of gluten analysis in food
6. From Target to Untargeted chemistry to improve food safety and authenticity
7. Food waste reduction as a tool to save the planet
8. Montenegrin mountains - a powerful source of traditional food'
9. Poultry meat production and processing – beyond the challenges
10. Non-animal protein sources and resources- new strategies of valorization into value-added ingredients
11. The advantages and disadvantages of active, biodegradable materials for food packaging
12. The use of plant genetic resources for healthy food and environment
13. Traditional [Ukrainian] food - the challenges for the sustainable nutrition and pathway to success

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