

Scientific Report of the 9th International Congress “Flour-Bread ’17”

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The scientific programme of the 9th International Congress “Flour-Bread ’17” and the 11th Croatian Congress of Cereal Technologists “Brašno-Kruh ’17” held from 25 to 27 October in Grand Hotel Adriatic, Opatija, Croatia, included 39 oral and 38 poster presentations. Three plenary lectures, 11 invited lectures, 19 oral presentations, three sponsor advertisement presentations, 3 interactive workshop lectures and 38 poster presentations were within one of five different Congress topics: Cereals and Cereal Product Quality, Cereal Processing Technologies, Cereals and Health, Cereal Food Safety, and Cereal Waste Management.

Cereal Food Safety Topic with the emphasis on Mycotoxins was in the focus of this year’s Congress. Numerous interesting presentations within this topic pointed out that mycotoxins represent a serious health concern worldwide due to their toxicity, contamination of several different crops, as well as frequent mycotoxin co-occurrence. Furthermore, it has been shown that modified mycotoxins represent a consistent issue, especially if their significant occurrence and co-occurrence with the native form in contaminated crops are taken into account. The need for including modified mycotoxins in the legislation was suggested. The Congress participants were informed that some mycotoxins such as *Alternaria* toxins and ergot alkaloids are under consideration due to their toxicity and occurrence in crops to be included in legislation that define maximum limit allowed in raw and processed products. The impact of climate change on mycotoxin contamination in EU and worldwide was demonstrated. Variability in mycotoxin contamination is expected in the forthcoming years and in different geographic areas. The crucial mycotoxin for each crop is expected to change in different years, in particular in cereals, due to extreme weather conditions and their variability during the growing season. Climate change scenarios, including + 2 °C and + 5 °C increase in global temperature, demonstrated the increased risk for aflatoxin B₁ contamination in maize. In general, in the +2 °C scenario, higher levels of contamination are expected, compared to the present situation, in the areas where maize is currently grown. On the contrary, in the +5 °C scenario, levels of contamination are predicted to be comparable to the actual situation, but the risk of AFB₁ contamination is expected to be wider and enlarged towards northern EU countries. The effect of climate change on *Fusarium* sp. crop contamination was shown. *Fusarium*, the most mycotoxigenic species, are confirmed to move towards northern Europe and *Fusarium* species profile was shown to change in different geographic areas. In addition, Congress participants were acquainted with preventive actions for mycotoxin contamination in several crops, mainly cereals, as well as biocontrol actions that are improving and their usage becoming more effective. On the basis of presented data, these Cereal Food Safety topic conclusions were reached: 1) the presented research results gave relevant support to mitigate mycotoxins; 2) research on mycotoxin contamination must go on to fill the gaps in knowledge, improve tools available to support stakeholders in a correct value chain management, including the improvement of detoxification strategies and predictive models, very useful in mycotoxin management for farmers, stakeholders, decision makers and politicians; 3) preventive actions for mycotoxin contamination should be sustainable with low impact on the environment.

Production of high quality bakery products, as well as functional cereal based foods were presented within **Cereal Processing Technologies** topics. Powder of pepper fruit flesh and/or of pepper calix was reported as a suitable natural additive for the production of breads fortified with soluble dietary fibres. Amaranth, quinoa, and buckwheat flours were reported to nutritionally enrich gluten-free cookies. Apple pomace was found suitable for improving quality of cookies. Furthermore, French bread baking using superheated steam was shown as an energy-efficient method, while extrusion cooking of wheat and hullless barley flours as a suitable technology for the production of

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high quality improver flours. The new techniques for starch modification and the application of modified starch in the production of new products were presented. The need for further investigation on the addition of various raw materials, especially by-products, and applicability of new processing technologies in the production of improved raw materials as well as production of functional cereal based products were pointed out as major conclusions of Cereal Processing Technologies topic.

Research on the quality of cereals, flours and flour mixtures, bakery products, cookies, and nutritionally enriched products, as well as the research on the application of new analytical methods for cereal quality determination and detection of sun pest grain infestation were presented within Congress topic **Cereals and Cereal Product Quality**. Participants were informed about the quality of flour composites based on wheat and barley mixtures, quality of ready-to-eat extruded snacks fortified with dietary fibres originating from grape pomace, as well as about *trans*-fatty acid content in bakery products and cookies. Furthermore, research on novel bread improver for the prolongation of shelf life of white flour bread, usage of Lab-on-Chip device for the determination of gluten proteins and quality of wheats, as well as the development of fluorescent methods for the detection of sun pest grain damage, were presented. The future of cereals/flours regarding sustainability and health concerns was discussed. On the basis of presented it was concluded that quality demands on cereals and cereal based products are moving toward nutritional and health issues. Therefore, investigation of new raw materials and novel processing technologies for the development of nutritionally enriched and healthier cereal based products plays a pivotal role. However, prerequisite for the usage of new raw materials should not neglect demands on the technological quality of products. Based on the data on *trans*-fatty acid content in bakery products and cookies from Croatia, it was concluded that content of *trans*-fatty acids in Croatian products is satisfactory considering the fact it does not exceed the limits defined by the EU Regulation.

Congress participants have shown great interest in topic **Cereals and Health**. The focus of the topic was on recognising whole grain products in general population. It encompassed legislation regarding whole grain products, with the emphasis on the nutritional and health claims used in whole grain promotion. It continued with an overview of scientific studies which confirmed that whole grain products are not a risk factor in development of health problems like overweight, obesity, diabetes and other rising noncommunicable diseases. Considering the increasing interest of the public toward gluten-free diets, the positive and negative aspects of this dietary regime have been presented, along with the cereals which are acceptable for people facing gluten enteropathy. The usage of variety of cereals in daily diet including explanation of their selection and combining into a new healthy nutritional choice was set as an example and presented in theory and practice when preparing millet cake and gluten-free cookies. Presentations also included the implementation of the quality assurance system for bread and bakery products selection in preschool education institutions and the connection of the acceptability of whole grain products in children depending on the dietary habits of parents. Based on the fact that dietary habits are mostly gained in the early stages of life, it was recommended to focus on the promotion of whole grains and their products on children. General conclusion of the topic, based on the presentations held, was that the awareness about whole grain cereals should be raised, considering their positive effect. However, due to insufficient knowledge, their intake is low. In this process, preschool and school children are key population, while their dietary choices are easily accepted as family choices. Dietary and health claims that are in line with legislative frame, but at the same time recognisable and easy to follow by public would also contribute in reaching that goal.

Within the Congress topic **Cereal Waste Management** participants were informed on the possibility of the usage of cereal crop waste as biomass feedstock for biofuel production, on brewers' spent grains in the production of extruded snacks, on extruded wheat germ in cookie production, as well as on possible application of e-marketing in the recycling of bakery products. Great potential of cereal waste products for the production of wide spectrum of products ranging from forage to biofuels, especially those intended for production of functional foods, was pointed out as the major conclusion of topic.

The abstracts of oral and poster presentations were published in the official Congress publication – the Book of abstracts. There was a total of 78 abstracts submitted by 235 authors/co-authors from 22 different countries (Austria, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, France, Germany, Hungary, India, Iran, Italy, the Netherlands, Poland, Portugal, Russia, Serbia, Slovenia, Spain, Sri Lanka, Taiwan, Turkey and Great Britain).