



## EDITOR-IN-CHIEF'S WORD

A few years ago, in line with its dedication to the popularisation of technological and biotechnological sciences, the Croatian Academy of Engineering introduced a new, thematic conception of its Bulletin „Engineering Power“, which sought to enhance the public profile and awareness of the importance of these fields of science through presentation of various scientific projects on which the distinguished members of our Academy were working as project leaders and principal investigators, respectively.

The new conception of our Bulletin has proved very successful and well-accepted among our members, and their rising interest often provided the Editorial Board of the „Engineering Power“ with several thematic contributions from our members at once, lined up to be published subsequently. This year's volume of „Engineering Power“ will not be an exception, as we plan to publish at least three issues of our Bulletin in English as well as at least two issues of our Bulletin in Croatian, the „Tehničke znanosti“.

I believe that the following articles will be most interesting especially to our readers from the fields of food technology and biotechnology as well as very edifying to our membership in general, and to all other interested parties.

Editor-in-Chief

Vladimir Androćec, President of the Croatian Academy of Engineering



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## EDITOR'S WORD

The importance of food industry, which is largely a traditional (low-tech) industry, for quality of life in modern society cannot be overstated. Beside direct impact to standard of living due to the very essence of its products, it is also of high economic importance. According to documents released within FP7-funded Network of Excellence „HighTech Europe – European Network for integrating novel technologies for food processing“, the food industry sector employs over 4 million people and is the largest manufacturing sector in Europe. Moreover, the growing human population as well as the ever-rising living standards in increasingly prosperous developing world will intensify demand for food at the global level, emphasising even more the importance of food industry in times to come.

To satisfy this demand, the key-role of innovation for food industries and pertinent organisations is generally acknowledged. Therefore, it is not surprising that one of the first topics that rose as relevant within the framework of EU Scientific Advice Mechanism (that provides independent and transparent advice to European Commission working with High-Level group of Scientific Advisors and European Academies, including Croatian Academy of Engineering via Euro-CASE academy network), is related to the food sector.

To this end, it is my great pleasure to present this issue of Engineering Power, focused on the novel technologies in food industry, to our readers. The issue is guest-edited by Drago Šubarić, Member of the Croatian Academy of Engineering, Department of Bioprocess Engineering, and Dean of the Faculty of Food Technology, Osijek.

Editor

Zdravko Terze, Vice-President of the Croatian Academy of Engineering

## THE POSSIBILITY OF UTILISING FOOD INDUSTRY BY-PRODUCTS WITH THE USE OF GREEN TECHNOLOGIES – AN INNOVATIVE APPROACH

### GUEST EDITOR'S WORD

Dear Readers,

Food producers are meeting numerous challenges nowadays, starting from increasing world population, eating habits, climatic changes, use of agricultural products in energy production, migration, increasing energy costs etc. Along with all these challenges and limited resources, food producers are obliged to produce sufficient quantities of safe and high quality food for the increasing world population. On the other hand, food industry generates large quantities of by-products that represent a large environmental problem, solved in most cases through landfills, composting, or animal feed.

A large quantity of contemporary research deals with this issue and the top subject of many documents is the utilization of food industry by-products as potential raw materials for food. The reasons for this include the fact that many by-products contain a variety of nutrients, making them valuable as raw materials in the production and development of new products, among other reasons such as increasing food prices, large quantities of generated by-products, increasing cost of waste management, and increasing environmental concerns. Maintaining the quality of a product requires constant generation of certain quantities of by-products. These quantities are constantly growing, as the result of the increasing food production.

The application of food industry by-products in food production results in various changes in products, depending on both the properties of the by-product, which includes the mode of application, and production conditions. To develop a product with desirable organoleptic characteristics, one has to know the properties of the raw materials and processes, and how to adjust recipes and introduce new technologies and/or processes, in order to obtain products as similar to the original as possible.

During the realization of the project *Application of Food Industry By-products in the Development of Functional and Environmentally Friendly Extruded Food Products and Additives* (funded by the Croatian Science Foundation), we used raw materials and technologies that enabled us to develop products with increased nutritional value and desirable organoleptic characteristics. „Green“ technologies (supercritical CO<sub>2</sub> extraction, extrusion with supercritical CO<sub>2</sub>) were used in by-product preparation and product finalization in order to obtain safe, high quality products and modified half-products that may be used in food production.

I hope you will enjoy reading these articles!

Sincerely

Guest-Editor

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