

Foreword

Prebiotics, probiotics and synbiotics are of great significance for human nutrition and are considered one of the fastest growing sectors in the functional food industry. Their health benefits have been well-established, ranging across a large number of different products. These have also been found effective in counteracting against some diseases, especially acute diseases, but have been proved ineffective or rather have failed against chronic diseases. The global market of probiotic ingredients, supplements and foods was worth US\$ 14.9 billion in 2007, and is expected to reach US\$ 19.6 billion in 2013, representing a compound annual growth rate of 4.3 %. The application of prebiotics, probiotics and synbiotics in food still poses several technical challenges to the food scientists and technologists.

The development of prebiotics, probiotics and synbiotics not only requires resolving technological issues in the development and manufacture, but also involves regulatory issues. Prebiotics are selectively fermented ingredients that allow specific changes in the gastrointestinal microflora, which provides health benefits to the host. They are dietary fibres with a well-established positive impact on the intestinal microflora. The production and applications of food-grade oligosaccharides are increasing rapidly. Amongst them, fructooligosaccharides represent one of their major classes in terms of production. They are relatively new functional food ingredients that have great potential as prebiotics, apart from having a number of desirable characteristics which are beneficial to the health of consumers. These are manufactured either by transfructosylation of sucrose using β -fructofuranosidases or hydrolysis of inulin by endo-inulinases. Microbial polysaccharides having nutraceutical potential as well as bioactive properties have been investigated in detail during the last few decades. There is an increasing demand in food industries for live microbes or polysaccharides produced by them which assert health benefits other than dietetic constituents. Although there are a large number of exo-polysaccharide-producing bacteria, their titers are low for commercialization.

Probiotics, the live cells with different beneficiary characteristics, have been extensively studied and explored commercially. *Lactobacillus* and *Bifidobacterium* are the main probiotic microorganisms. Different lactobacilli have been reported as the indigenous flora colonizing the chicken's crop, the stomach of mice and rats, and the lower ileum in humans. However, strains of *Pediococcus*, *Lactococcus*, *Bacillus* and some yeast have also been reported as potential probiotic candidates. Some of the identified probiotic strains exhibit powerful anti-inflammatory, anti-allergic and other important properties. Besides, the consumption of dairy and non-dairy products stimulates the immunity in different ways.

The term synbiotics usually refers to the products which contain both probiotics and prebiotics. A synbiotic product is considered a good functional food. Examples include yoghurt and kefir. The main reason for using a synbiotic is that a true probiotic, without its prebiotic food, does not survive well in the digestive system. To enhance the viability, not only during the storage (for sale in the market) but also in the body, the synbiotic product should provide better attachment and growth rate of the beneficial bacteria in order to control or minimize the growth of harmful bacteria.

In view of the growing significance of prebiotics, probiotics and synbiotics for human health, there have been continued efforts to research and develop new and desirable range of products or properties of the products. With this background, it was decided to bring out a special issue of the journal focusing on the most recent developments taking place in recent times and also to analyze the gaps in the knowledge to prepare the perspectives for future research and development.

We are grateful to Prof Vladimir Mrša, Editor-in-Chief of the journal, who graciously agreed to our proposal to bring out this special issue of the journal based on the (peer-reviewed) papers. We acknowledge our sincere gratitude to the reviewers who evaluated the manuscripts in a timely fashion. We are also thankful to Ms Iva Grabarić Andonovski and Ms Zrinka Pongrac Habdija and all others at the Editorial and Publisher's Office associated with bringing out this special issue.

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