

## Special Issue on Sustainable Plastics for Food Related Applications

# CALL FOR PAPERS

Nowadays, there is a growing worldwide trend on the production and consumption of sustainable food. Although there is no official definition of sustainable food, it is known that it should include several issues such as security of the supply of food, health, safety, affordability, and quality as well as environmental sustainability. Simultaneously, the continuous growing urbanization with the consequent changes in daily life that tend to a busier lifestyle is making it harder to eat fresh food, which inevitably leads to the consumption of more processed and packaged food products. Furthermore, consumers expect that processing techniques, involved materials, and applied technologies handle the primary products in a gentle way preserving the high quality of the primary food ingredients, use low levels of additives, and have a low environmental impact. To fulfill a fully sustainable food concept, the packaging used for these food products should be also produced in a sustainable way as well as it should guarantee a green end of life option. In this regard, traditional polymers used in the food packaging industry present serious environmental concerns due to their petrochemical origin and nonbiodegradability. Over the last decade, more than 250 million tons of plastics were produced per year, and thus a large number of nonrenewable petrochemical sources were consumed to produce polymers, with the packaging field being one of the most demanded areas. In particular, polymers used for food packaging represent short-term applications that, due to economic disadvantages or technical limitations of recycling plastics coming from the food industry, usually end in landfills creating an enormous amount of waste without energy or material recovery, with a negative impact on the environment and the human health. Many conventional plastics are currently synthesized from renewable resources, and after their useful life they can be easily recycled, which makes them very interesting for packaging developments. In the case of short-term applications, the ideal approach is the use of plastics obtained from renewable sources but with biodegradable properties. Thus, the global production of sustainable plastics, both bio-based and biodegradable, is growing up in alignment to build a more sustainable economy. However, these sustainable plastics do not fulfill the high performance standards required to protect food products against contamination or from the loss of food quality during their shelf life. Moreover, the higher production costs of bio-based and biodegradable plastics limit their full introduction into the market.

The introduction of more sustainable plastics into the food industry as an alternative to petrochemical source plastics, due to their fossil origin and the intention to reduce the nondegradable plastic waste, plays a decisive role in the challenge of achieving a fully sustainable food concept. However, sustainable plastics still present reduced performance with respect to traditional plastics. In the recent years, significant contributions from several authors regarding the improvement in the performance of sustainable plastics, through chemical modifications, nanotechnology, development of multilayer systems, and blending approaches, have been provided in order to extend the applications of bioplastics in the food industry, such as food packaging, agricultural mulch films, and edible polymers.

The proposed special issue is intended to cover all aspects related to recent innovations in sustainable materials for food applications, integrating the environmental aspects of the product design and development, aligned with a fully sustainable food concept. Contributions on novel strategies to introduce sustainable polymeric formulations into the food industry, concerning not only sustainable and food safety issues but also improvements on those aspects with particular interest in the food packaging industry (i.e., easy processability, economics, mechanical resistance, optical properties, and gases and water permeation), will be particularly welcome.

Potential topics include but are not limited to the following:

- ▶ Bio-based composites and nanocomposites for food packaging applications
- ▶ Intelligent/active based systems (i.e., antioxidant, antibacterial, traceability, etc.)
- ▶ Biodegradability of food packaging materials
- ▶ New developments in edible sustainable materials
- ▶ Bio-based nonbiodegradable but recyclable polymeric systems
- ▶ Use of agroindustrial residues for development of bio-based materials for food contact applications
- ▶ Improvements in bio-based and/or biodegradable polymers
- ▶ New natural resources for biofilms developments

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