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Food Science and Technology

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Section Information

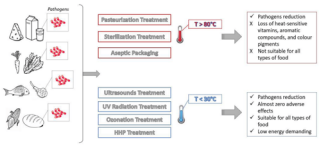
The Section on Food Science and Technology deals with the advancement of food quality; (bio)chemical characterization such as of nutritional composition, flavor compounds (volatiles and non-volatile compounds), bioactive compounds (antioxidants and other phytochemicals), and bioactivity; microbiological issues; and the design and evaluation of new formulated foods. It also includes some other aspects related to food technology, such as the effects of processing, stor-age, and preservation to maintain not only the quality but also the safety of foods. The main focus is on novel techniques for analytical purposes that could lead to increased food quality and safety and the development of new foods and in-gredients. Applied Sciences, in general, and this Section on Food Science and Technology, in particular, offer high-quality peer review followed by rapid publication.

Featured Papers

DOI:10.3390/app12042202

Advances, Applications, and Comparison of Thermal (Pasteurization, Sterilization, and Aseptic Packaging) against Non-Thermal (Ultrasounds, UV Radiation, Ozonation, High Hydrostatic Pressure) Technologies in Food Processing

Authors: Viola Chiozzi, Sofia Agriopoulou and Theodoros Varzakas

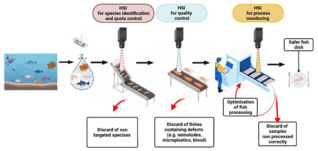


Abstract: Nowadays, food treatment technologies are constantly evolving due to an increasing demand for healthier and tastier food with longer shelf lives. In this review, our aim is to highlight the advantages and disadvantages of some of the most exploited industrial techniques for food processing and microorganism deactivation, dividing them into those that exploit high temperatures (pasteurization, sterilization, aseptic packaging) and those that operate thanks to their inherent chemical–physical principles (ultrasound, ultraviolet radiation, ozonation, high hydrostatic pressure). The traditional thermal methods can reduce the number of pathogenic microorganisms to safe levels, but non-thermal technologies can also reduce or remove the adverse effects that occur using high temperatures. In the case of ultrasound, which inactivates pathogens, recent advances in food treatment are reported. Throughout the text, novel discoveries of the last decade are presented, and non-thermal methods have been demonstrated to be more attractive for processing a huge variety of foods. Preserving the quality and nutritional values of the product itself and at the same time reducing bacteria and extending shelf life are the primary targets of conscious producers, and with non-thermal technologies, they are increasingly possible.

DOI:10.3390/app12031703

Seafood Processing, Preservation, and Analytical Techniques in the Age of Industry 4.0

Authors: Abdo Hassoun, Shahida Anusha Siddiqui, Slim Smaoui, İlknur Ucak, Rai Naveed Arshad, Paula Garcia-Oliveira, Miguel A. Prieto, Abderrahmane Aït-Kaddour, Rosa Perestrelo, José S. Câmara and Gioacchino Bono

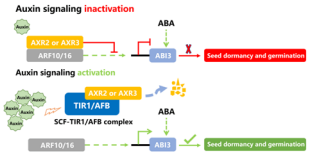


Abstract: Fish and other seafood products are essential dietary components that are highly appreciated and consumed worldwide. However, the high perishability of these products has driven the development of a wide range of processing, preservation, and analytical techniques. This development has been accelerated in recent years with the advent of the fourth industrial revolution (Industry 4.0) technologies, digitally transforming almost every industry, including the food and seafood industry. The purpose of this review paper is to provide an updated overview of recent thermal and nonthermal processing and preservation technologies, as well as advanced analytical techniques used in the seafood industry. A special focus will be given to the role of different Industry 4.0 technologies to achieve smart seafood manufacturing, with high automation and digitalization. The literature discussed in this work showed that emerging technologies (e.g., ohmic heating, pulsed electric field, high pressure processing, nanotechnology, advanced mass spectrometry and spectroscopic techniques, and hyperspectral imaging sensors) are key elements in industrial revolutions not only in the seafood industry but also in all food industry sectors. More research is still needed to explore how to harness the Industry 4.0 innovations in order to achieve a green transition toward more profitable and sustainable food production systems.

DOI:10.3390/app12031360

Auxin Response Factors Are Ubiquitous in Plant Growth and Development, and Involved in Crosstalk between Plant Hormones: A Review

Authors: Xiaohong Kou, Xiaoyang Zhao, Bingda Wu, Chao Wang, Caie Wu, Sen Yang, Jiaqian Zhou and Zhaohui Xue

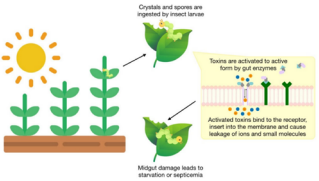


Abstract: Auxin response factors (ARFs) are an important family of transcription factors involved in the exertion of auxin in plants and play a key role in regulating the growth and development of plant nutritional and reproductive organs such as roots, stems, leaves, flowers, fruits, and seeds. Foods of plant origin occupy an important place in the nutritional structure of the human diet, and the main edible parts of different plants vary. In this paper, we review recent research reports on ARFs and summarize its role in the regulation of leaf, flower, root, and fruit growth, as well as other important life activities. We also present the challenges and opportunities that ARFs will present in the future. It will be important to deepen our understanding of the mechanisms by which ARFs interact with other proteins or genes. In addition, it is worth considering that more technical tools should be put into the study of ARFs and that the research should be oriented towards solving practical problems. In the future, it is expected that the nutrition and function of plant-derived foods can be improved through gene editing and other means.

DOI:10.3390/app12062861

Myths and Realities about Genetically Modified Food: A Risk-Benefit Analysis

Authors: Angelo Vega Rodríguez, Cristina Rodríguez-Oramas, Esther Sanjuán Velázquez, Arturo Hardisson de la Torre, Carmen Rubio Armendáriz and Conrado Carrascosa Iruzubieta

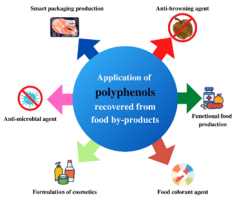


Abstract: The development and consumption of genetically modified (GM) crops are surrounded by controversy. According to proponents, only molecular biology approaches and genetic engineering tools are realistic food shortage solutions for the world's ever-growing population. The main purpose of this study is to review the impact of GM products on human, animal, and environmental health. People still reject GM crops not only because of safety concerns, but also for moral reasons. Toxicity, allergies, and possible horizontal gene transfer (HGT) to the environment or to other species have been associated with the marketing of GM products. Moreover, the scarce data available about the long-term implications of using GM crops is another opponent concern. Nevertheless, science has evidenced no harm from GM crops use to date but has, instead, reported several benefits that result from their commercialization, such as economic, environmental, and health benefits for the general public. Legislation and policies about GM product labeling standards are being discussed. To overcome emerging food security challenges, considering quality scientific information is essential rather than leaving the issue and merely moving toward moral discussion. Hence, a risk–benefit analysis is necessary.

DOI:10.3390/app12041923

Environmentally Friendly Techniques for the Recovery of Polyphenols from Food By-Products and Their Impact on Polyphenol Oxidase: A Critical Review

Authors: Peyman Ebrahimi and Anna Lante



Abstract: Even though food by-products have many negative financial and environmental impacts, they contain a considerable quantity of precious bioactive compounds such as polyphenols. The recovery of these compounds from food wastes could diminish their adverse effects in different aspects. For doing this, various nonthermal and conventional methods are used. Since conventional extraction methods may cause plenty of problems, due to their heat production and extreme need for energy and solvent, many novel technologies such as microwave, ultrasound, cold plasma, pulsed electric field, pressurized liquid, and ohmic heating technology have been regarded as alternatives assisting the extraction process. This paper highlights the competence of mild technologies in the recovery of polyphenols from food by-products, the effect of these technologies on polyphenol oxidase, and the application of the recovered polyphenols in the food industry.

Books

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Applications of Instrumental Methods for Food and Food By-Products Analysis

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