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Editorial

Biofilms in Focus: A Threat to Foods

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The world of food microbiology, and by extension that of food safety, has evolved significantly at the turn of the century. In fact, from carrying out controls on the presence or absence of pathogens in finished products, we have gone on to try to detect, not only where the pathogens are found, to apply the appropriate corrective measures to the problem, but also to look beyond. At this point, the number of publications related to biofilms, considered as forms of resistance of microorganisms in food facilities, has increased significantly. Thus, according to PubMed, since 2010, 1494 articles have been published on biofilms and food safety. Therefore, the study of biofilms is being considered as an important element to improve food safety conditions nowadays.

This special issue aimed to present cutting-edge research related to the detection, evaluation, and removal of biofilms. All these without forgetting the composition of the matrix and the resistance induced, by these structures, to disinfectants and the usual systems used in the sanitization process.

A total of six papers (five research papers and one review paper) in various fields, as non-thermal treatments, disinfectants tolerance, biofilm structure, ecology and adhesion mechanisms has been included in this Special Issue. Govaert et al. [1] reported that the bactericidal effect of Cold Atmospheric Plasma (CAP) was always a combination of both damage to the membrane and the DNA, caused by (i) the generation of (intracellular) ROS and RNS, (ii) a drop in pH, and/or (iii) the potential generation of a small amount of UV

Photons. Moreover, the plasma species were able to penetrate the deeper layers of the model biofilms and some treatment conditions resulted in an increased biofilm porosity. Skowron et al. [2] reported the efficiency of the Radiant Catalytic Ionization (RCI) method in the reduction of bacteria number from a glass surface. Bonneville et al. [3] suggested that biofilm behavior depends on the strain and sub-inhibitory concentrations of disinfectants and may explain the ability of certain isolates to persist in niches of food processing plants. Rodríguez-Melcón et al. [4] reported that biovolume values were similar on glass and graphene, while higher values were observed for polystyrene. The highest biovolume levels were found in the biofilms formed on resin. No relationship was noted between cell surface hydrophobicity and biofilm-forming ability. Hascoët et al. [5], using surface sensors, showed that the surfaces of an Iberian Pig Processing Plant are dominated by *Bacillus* spp., *Pseudomonas* spp., different enterobacteria, *Mannheimia haemolytica*, *Rhizobium radiobacter*, *Staphylococcus* spp., *Aeromonas* spp., lactic acid bacteria, and yeasts and molds. Authors considered that the understanding of the resident microbiota on the surfaces of the food industry, and its relationship with pathogen presence is crucial. Achinas et al. [6] concluded that the presence of biofilms can cause hygienic problems in the industries in the case of pathogenic organisms. Microorganisms can form biofilms, which are resistant to cleaning and disinfection. Biofilms are observed in processing equipment and open surfaces, resulting in food safety problems, or weakening of production efficiency.

Although submissions for this Special Issue have been closed, more in-depth research in the field of biofilm formation, detection, and control continues to address the challenges of the food safety of the future.

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