

The Phenomenon of Biofilm Formation and the Subsequent Management of Foodborne Pathogenic Bacteria

Authors : Raana Babadi Fathipour

Abstract : Biofilms, those intricate structures of microbial aggregation that emerge as microorganisms adhere to animate or inanimate surfaces, possess an innate capacity to shield their inhabitants from adversities within the environment whilst fortifying their endurance against antimicrobial agents. This remarkable aspect facilitates the persistence and virulence of said microorganisms, establishing biofilm formation as an integral component of bacterial survival mechanisms. However, should foodborne pathogens adopt this mode of existence, the potentiality for foodborne disease infections becomes alarmingly intensified—an alarming prospect that harbors significant public health hazards and engenders deleterious economic ramifications. Thus, due to these consequences lurking on the horizon, extensive research concentrating upon comprehending biofilms and devising efficacious removal strategies assumes a position imbued with paramount importance within the realm of the food industry. The problem of food waste resulting from spoilage in the food industry continues to present a widespread challenge to both environmental sustainability and the security of our food supplies. In this comprehensive analysis, we delve into the formation of bacterial biofilms, highlighting the specific issues they pose within the realm of food production. Additionally, we provide an overview of various types of common foodborne pathogens that tend to thrive in these biofilms. Furthermore, we summarize existing strategies aimed at tackling or managing detrimental bacterial biofilm growth. We also introduce contemporary approaches that show promise in terms of controlling this issue and highlight their potential for further advancement. Ultimately, our focus lies on outlining prospects for future development as they pertain specifically to combatting bacterial biofilms within the field.

Keywords : foodborne pathogens, food safety, biofilm, resistance, quorum-sensing

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