

Bacteriophage Interventions in Foods to Combat Unwanted Bacterial Pathogens

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ABSTRACT

Bacteriophages (phages) are a superb and unique tool for food safety. Phage biocontrol can no longer be called novel but not everyone will be overly familiar with their working. Phage can reduce the presence of specific pathogens in a wide variety of foods by 1-3 log, depending on dosage and type of food treated. While they offer numerous unique advantages over other interventions (no consequences for organoleptic properties of treated foodstuffs, for example) and implementation is often very simple, it is important to understand some basics on their mode of action to reap maximum benefit from them. Here we will attempt to briefly summarize phage biocontrol of pathogens in foods and food processing environments. The sub-topics covered will be: phage biology; specifically phage-host recognition and specificity, the dose response effect observed in applications - which requires understanding the relative size of phages and their target bacteria in relation to the food surface, why phages only function for a short time after application (a fact that is instrumental in their being considered processing aids), factors that are required for their functioning and environmental factors that could prove detrimental to their implementation. We shall provide case studies, explaining how pathogens can be targeted in a variety of specific foods as well as considering their use for environmental pathogen control in food processing facilities, including their ability to reduce biofilms.

Keywords: Bacteriophages, Phage biocontrol, Food processing, Pathogens

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