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Bacteriophages in food safety

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Bacteriophages, the viruses which kill bacteria, are the most numerous organisms on Earth with a population of 10^{30} - 10^{32} and can exist in all kind of environment where their host live. Emergence of antibiotic resistant bacteria leads scientists to consider bacteriophages as an effective, safe and appropriate biocontrol agent and an alternative option for antibiotics and chemicals. Among two types of phages (lytic and lysogenic), lytic phages that can only multiply in bacteria and kill the cell by lysis are generally preferred towards a food safety perspective. We have studies about phages effective for *E. coli* and *L. monocytogenes*. As a result of one of our studies, we found out bacteriophage application is effective for the reduction of *E. coli* O157:H7 and we are currently studying about the effective of listeriophages in different food matrix. By bacteriophage application in a semi-solid complex food matrix as mayonnaise based RTE Italian salad, 2.7 log cfu/g reduction of *E. coli* O157:H7 ATCC 43895 was observed. In this manner, M8AEC16 can be considered as an efficient biocontrol agent of *E. coli* O157:H7 on RTE Italian salads. The highest reductions were observed at incubation temperature that supports bacterial growth (22°C). When considering the cost-effectiveness and efficiency, it was determined that 5.0 log MoI is effective for bacteriophage application. The effect of antibiotic resistance development on lytic activity of bacteriophages should be investigated detailed in further studies.

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