Application of phages for the inactivation of *Escherichia coli* in ham

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Foodborne illnesses are a serious health problem worldwide due to the increasing bacterial resistance to antibiotics. Bacteriophages or simply phages (viruses that only infect bacteria) have been recognized for their effectiveness in controlling bacterial pathogens in the food industry. Phages exhibit important characteristics that make them promising antibacterial candidates, such as their ubiquity, high specificity against a target host, ability to self-replicate in the presence of the host, low toxicity and easy and economical isolation and production. Since *Escherichia coli* is one of the most important foodborne pathogens, the objective of this work was to evaluate the effectiveness of the phT4A phage in the inactivation of *E. coli* in ham. The inactivation of *E. coli* was first evaluated *in vitro* in Tryptic Soy Broth (TSB) with a reduction of about 6 log of colony forming units per milliliter (CFU/mL) for all tested values of multiplicity of infection (MOI, number of phages per bacterium), namely MOI 1, 10, 100 and 1000. In ham, a maximum reduction of about 2 log CFU/mL was obtained after 24 h (MOI of 100 and 1000). The inactivation results obtained in the ham compared to those obtained *in vitro* can be explained by the greater complexity of the ham matrix compared with the liquid medium TSB. Even so, the results are very promising, and the use of phages can be considered as a sustainable approach to improve food safety, namely ham, and thus prevent the infectious diseases that can arise from the ingestion of contaminated food.

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