

# Phages for active food packaging: preliminary results in food

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## Introduction

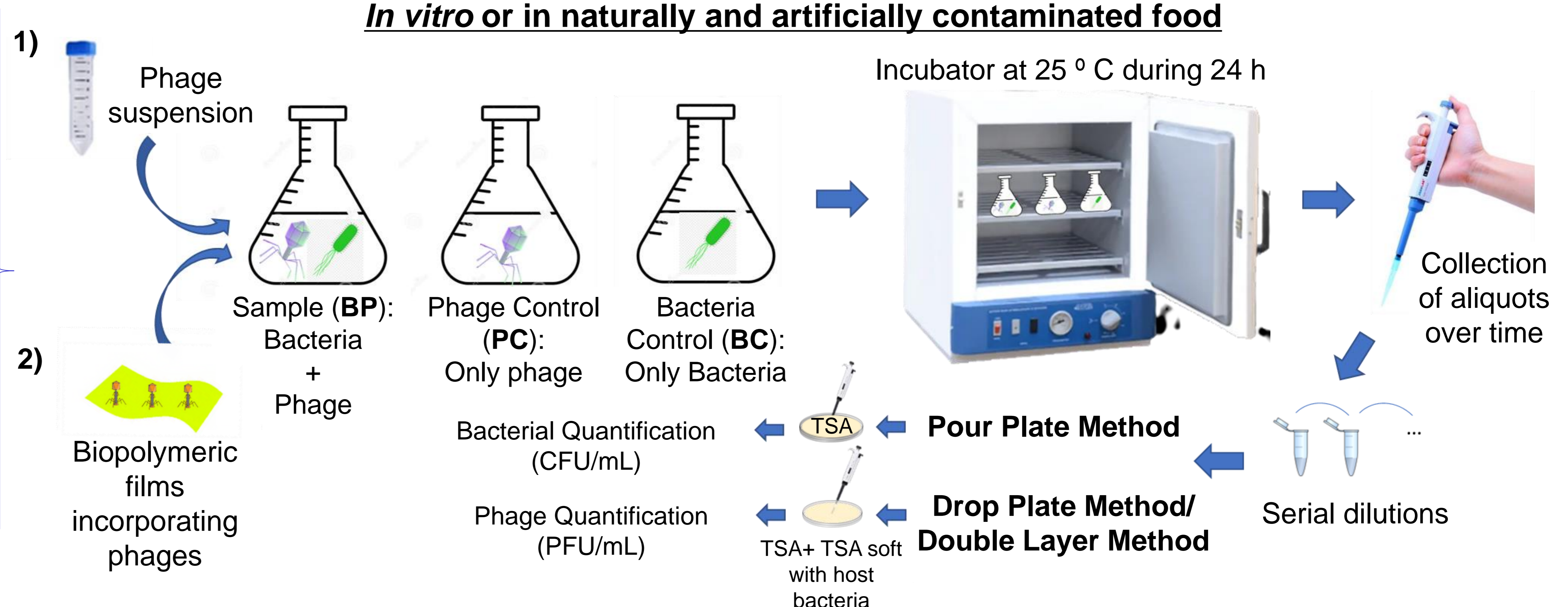
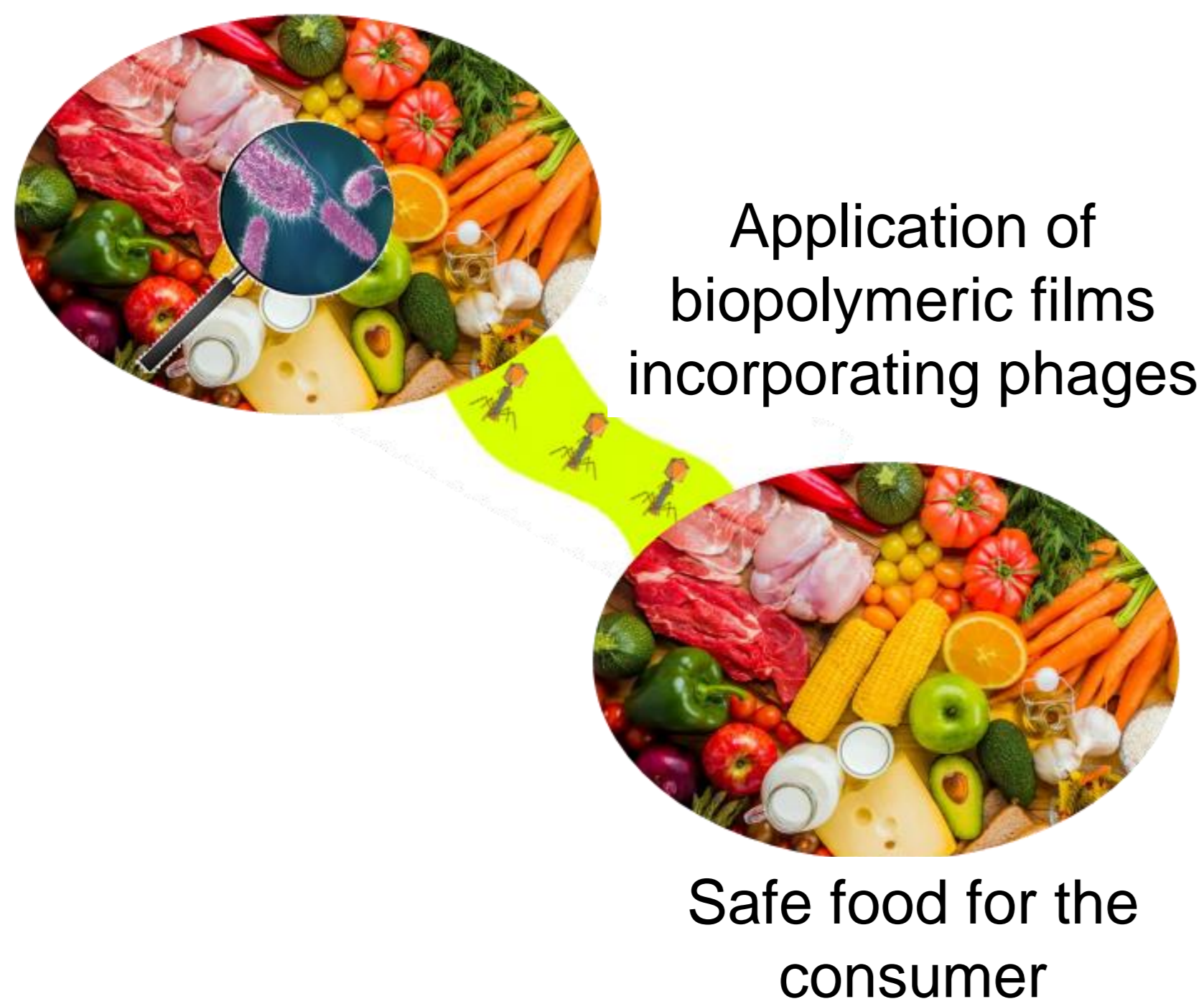
- The recurrent use of antibiotics, including in animal production, significantly increases the appearance of multiresistant bacterial strains, resistant to antibiotics commonly used<sup>1</sup>;
- These bacteria are responsible for foodborne illnesses which are a serious social problem;
- Alternatives are needed to overcome this problem, namely in food industry, where an effective bacterial control is crucial to public health;
- Phages, viruses that only infect bacteria<sup>2</sup>, can be a suitable approach to inactivate bacteria, with promising results and producing fewer resistant mutants than the common antibiotics<sup>3,4</sup>;
- In order to protect phages from environmental challenges and improve its efficacy, allowing slower and continuous release, the incorporation of phages in food packaging can be a more effective alternative.

## Aim

**Establish a safe and effective protocol by producing new antibacterial biopolymeric films incorporating phages for active food packaging in order to inactivate dangerous food pathogens and to improve food security.**

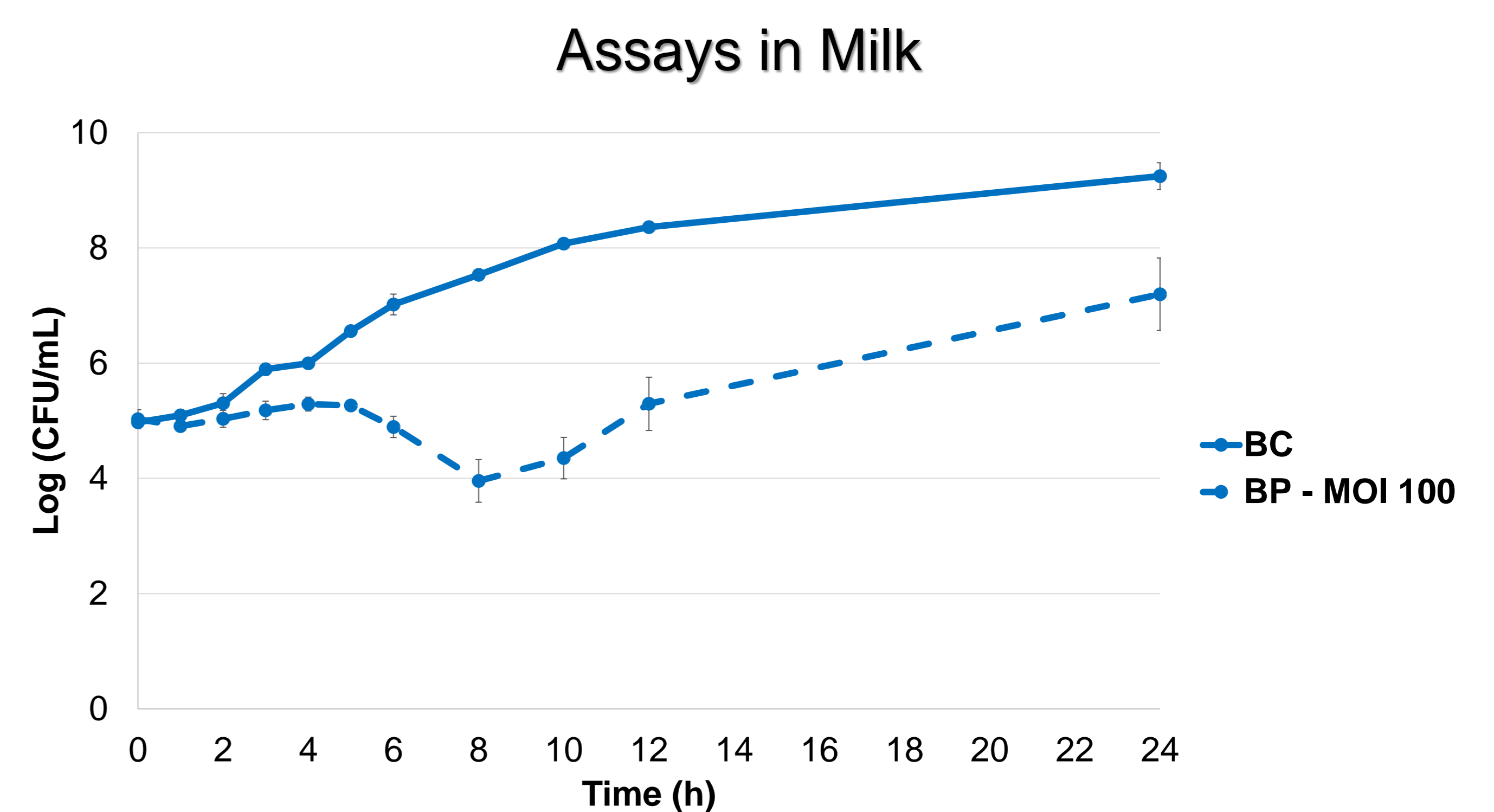
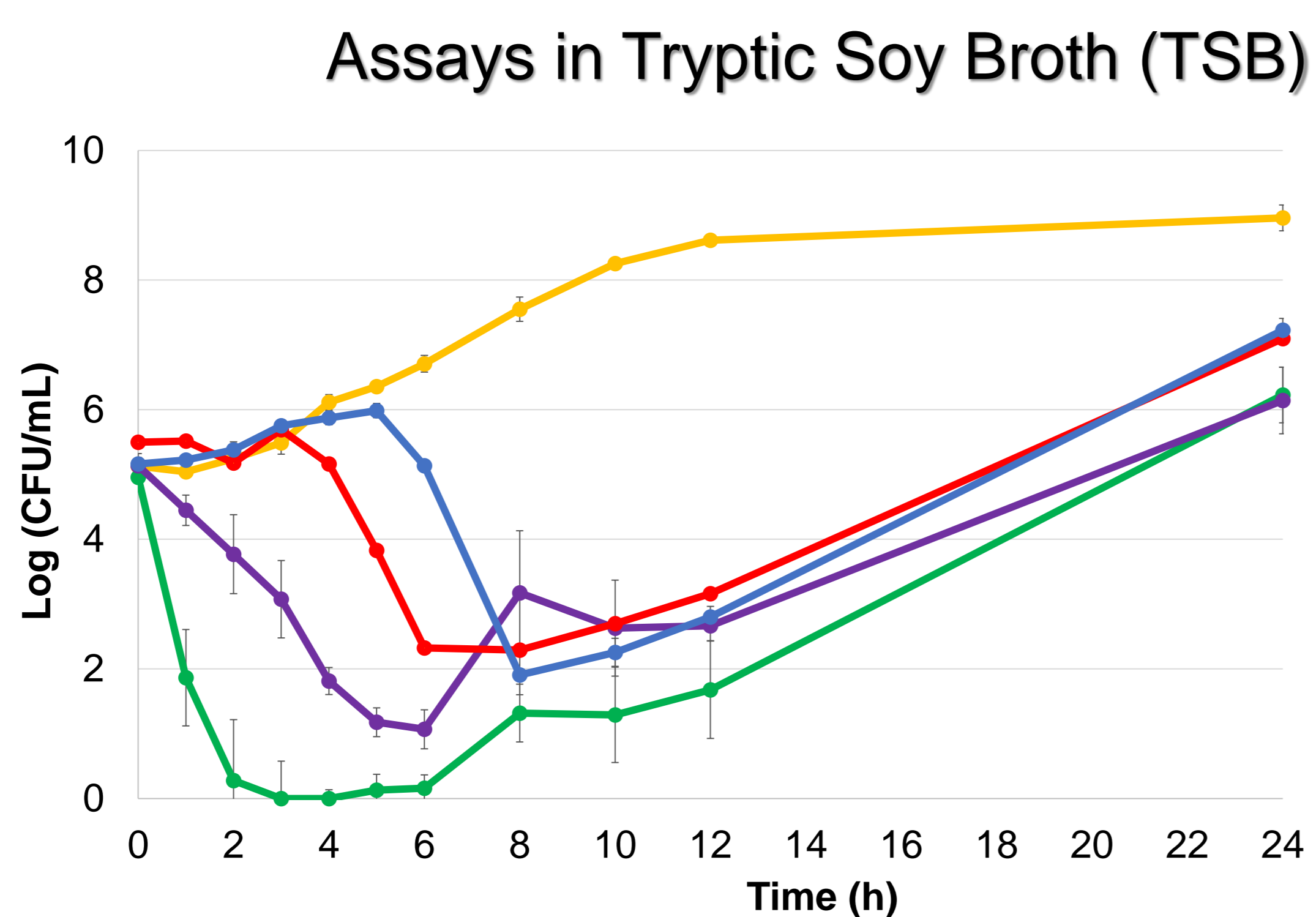
## Methods

Contaminated food by bacteria



## Results

*Escherichia coli* + Phage T4



MOI (Multiplicity of Infection) - ratio between the number of phages and the number of bacterial cells.

## Conclusions

- Phage T4 was effective to inactivate *E. coli* in TSB and in milk;
- *In vitro*, for all values of MOI, a bacterial inactivation of about 6 Log (CFU/mL) was obtained, differing only the time at which the maximum inactivation occurs with the MOI;
- In milk, a more complex matrix, a maximum inactivation of about 4 Log (CFU/mL) was obtained;
- Although more assays with different bacteria and phages and with the biopolymeric films in food must be done, **phage treatment seems to be a promising approach for the inactivation of food pathogens in order to improve food security.**