



# Bacteriophage cocktail for food decontamination

A cocktail of bacteriophages for specific targeting and eradication of foodborne Salmonella and Shiga toxigenic E.coli.

Technology No. 2021-248

**IP Status:** Provisional Patent Application Filed

## Applications

- Reduce the presence of foodborne pathogens Salmonella and E. coli
  - Food processing plants
  - Food service environments
  - Meat, poultry, dairy, egg, and fresh produce industries

## Key Benefits & Differentiators

- **Negligible impact on organoleptic properties:** Bacteriophage treatment doesn't affect organoleptic properties of foods like some other processing steps, such as thermal treatment
- **"Label-free" treatment:** Bacteriophage treatment doesn't require special labeling of products
- **Specific targeting:** Bacteriophage are predominantly active upon foodborne pathogens Salmonella and E. coli
- **Sprayable formulation** makes it easy to administer on various food processing surfaces and meat products.

## Foodborne pathogens are concerning

Salmonella and Shiga toxigenic E. coli are particularly concerning foodborne pathogens causing hundreds of millions of infections annually. These bacteria are relevant in essentially all food industries, with the potential to contaminate meat, poultry, dairy, egg, and fresh produce products. However, current food processing options don't adequately address these pathogens. Some preservatives and thermal processing options have detrimental impacts on the safety and organoleptic properties of the food, while other procedures require additional

labeling which can negatively affect consumer interest in products.

## **A phage cocktail capable of targeting Salmonella and E. coli**

Professor Bowden's research group at the University of Minnesota has identified a new cocktail of bacteriophages capable of inactivating both Salmonella and Shiga toxigenic E. coli. While previous commercial phage cocktails targeted either Salmonella or E. coli, this first-of-its-kind cocktail could enable food processors to control numerous serotypes of both Salmonella and E. coli (such as O157:H7) pathogens with a single product. Additionally, this bacteriophage cocktail could be formulated as a product that can be sprayed on infected surfaces. Moreover, this cocktail has negligible impact on the organoleptic properties of the food and doesn't require additional labeling when used in food processing. Thus, use of this product could be an efficient treatment of prevalent foodborne pathogens on foods, food packaging, or processing surfaces across the meat, poultry, dairy, egg, and fresh produce industries.

## **Phase of Development**

### **TRL: 3**

Phages have been isolated and tested for activity in vitro. The cocktail is found to lyse 17 serotypes of Salmonella enterica and 7 serotypes of Shiga toxigenic E. coli. Identification of phage receptors, sequencing of phage genomes, and testing of phages in a raw chicken breast model are underway.

## **Desired Partnerships**

This technology is now available for:

- License
- Sponsored research
- Co-development

Please contact our office to share your business' needs and learn more.

## **Researchers**

- [Steven Bowden, PhD](#), Assistant Professor, Department of Food Science and Nutrition

## **References**

Hansen, Eleanore., <https://hdl.handle.net/11299/224922>

<https://license.umn.edu/product/bacteriophage-cocktail-for-food-decontamination>