

Publication abstract

Efficacy of bacteriophages, organic acids, and UV light for reduction of *Salmonella* populations in ground beef

Based upon:

“Effect of ultraviolet light, organic acids, and bacteriophage on Salmonella populations in ground beef”

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Salmonella is a leading cause of foodborne illnesses in the U.S., responsible for one million cases annually. To address this, the USDA's Food Safety and Inspection Service (FSIS) has introduced strategies to reduce contamination in meat and poultry products. Ground beef, in particular, is prone to cross-contamination during processing. A study conducted by the University of Nevada in the United States evaluated the effectiveness of bacteriophage (phage) product [Phageguard S \(PGS\)](#), organic acids, and UV light to assess the efficacy of these interventions on *Salmonella* in ground beef.

Trial setup

The study used four strains of *Salmonella* to inoculate beef trim, simulating contamination. The beef trim was sourced from five different carcasses and divided into batches. Bacteriophages, lactic acid (LA), peroxyacetic acid (PAA), and ultraviolet (UV) light were applied to test their effectiveness individually and in combination. Ground beef samples were prepared by grinding treated beef trim, followed by microbial analysis of *Salmonella* counts.

Conclusion

The study demonstrated that the combination of UV light and bacteriophages was the most effective treatment for reducing *Salmonella* populations in ground beef, achieving a 2.0 log reduction. Individual bacteriophage treatment reduced *Salmonella* levels by approximately 1.0 log. Treatments with lactic acid (LA) and peroxyacetic acid (PAA) did not significantly reduce *Salmonella* contamination. These results substantiates that individual bacteriophage treatment, including combined treatment with UV light, holds promise for meat industry applications, providing effective reduction without affecting meat quality.

1.0 log
Reduction

Salmonella reduction after bacteriophage treatment

Individual bacteriophage treatment applied to ground beef reduced *Salmonella* counts by approximately 1.0 log, without affecting meat quality.

2.0 log
Reduction

Salmonella reduction after combined treatment

Combined treatment of bacteriophages and UV light on ground beef reduced *Salmonella* counts by up to 2.0 log, without affecting meat quality.

