Publication abstract

Control of *Salmonella* in raw chicken meat using bacteriophage treatment with plant-based oils

Based upon:
"Control of Salmonella in chicken meat using a combination of a commercial bacteriophage and plant-based essential oils"

Sun Hee Moon, Joy Waite-Cusic, En Huang

Department of Environmental and Occupational Health, University of Arkansas for Medical Sciences, USA
Department of Food Science and Technology, Oregon State University, USA

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phageguard PGS

Poultry products are significant vehicles for *Salmonella* contamination, especially during processing. Bacteriophages have emerged as potential biocontrol agents for targeting specific pathogens like *Salmonella*. Essential oils, such as carvacrol and thymol, have also shown promise in reducing foodborne pathogens. A study conducted by the University of Arkansas and the Oregon State University, both in the United States, evaluated the effectiveness of bacteriophage (phage) product Phageguard S (PGS), formerly known as Salmonelex, combined with essential oils to control *Salmonella* in raw chicken meat.

Trial setup

In this study, chicken pieces were inoculated with a cocktail of three *Salmonella* strains (including *S.* Enteritidis and *S.* Typhimurium). Bacteriophage treatment was applied at both low and higher concentration. Essential oil emulsions of carvacrol and thymol were prepared and applied in sequential treatments following bacteriophage application. The samples were stored at 4 °C (39.2 °F) and analyzed on days 0, 1, 3, and 5 to assess the reduction of *Salmonella* populations.

Conclusion

The combination of bacteriophages with essential oils, significantly reduced *Salmonella* on chicken meat. Bacteriophage treatments alone reduced *Salmonella* populations by 0.9 to 1.6 log, depending on concentration. Combined treatments with thymol or carvacrol showed reductions by 1.5 to 2.0 log, depending on concentrations. These findings indicate that both individual bacteriophage treatment and combined treatment with essentail oils could be effective strategies to control *Salmonella* contamination in poultry products.

Salmonella reduction after bacteriophage treatment

Individual bacteriophage treatment applied to the chicken meat reduced *Salmonella* populations by 0.9 to 1.6 log, depending on dosage.

Salmonella reduction after combined treatment

Combined treatment of bacteriophages with plant-based essential oils reduced *Salmonella* populations by 1.5 to 2.0 log, depending on dosage.

Discover more about phage technology for *Salmonella* control in our Phageguard Knowledge Center
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