

Meta-Analysis of Bacteriophage Use in Managing Mastitis and Diarrhea in Cattle Infected with *E. coli*



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Introduction

Calf diarrhea and bovine mastitis caused by *E. coli* represent globally significant diseases that impose substantial economic burdens on the dairy industry. The widespread and indiscriminate use of antibiotics has accelerated the emergence of multidrug-resistant bacterial strains, posing serious threats to both animal health and ecological stability.

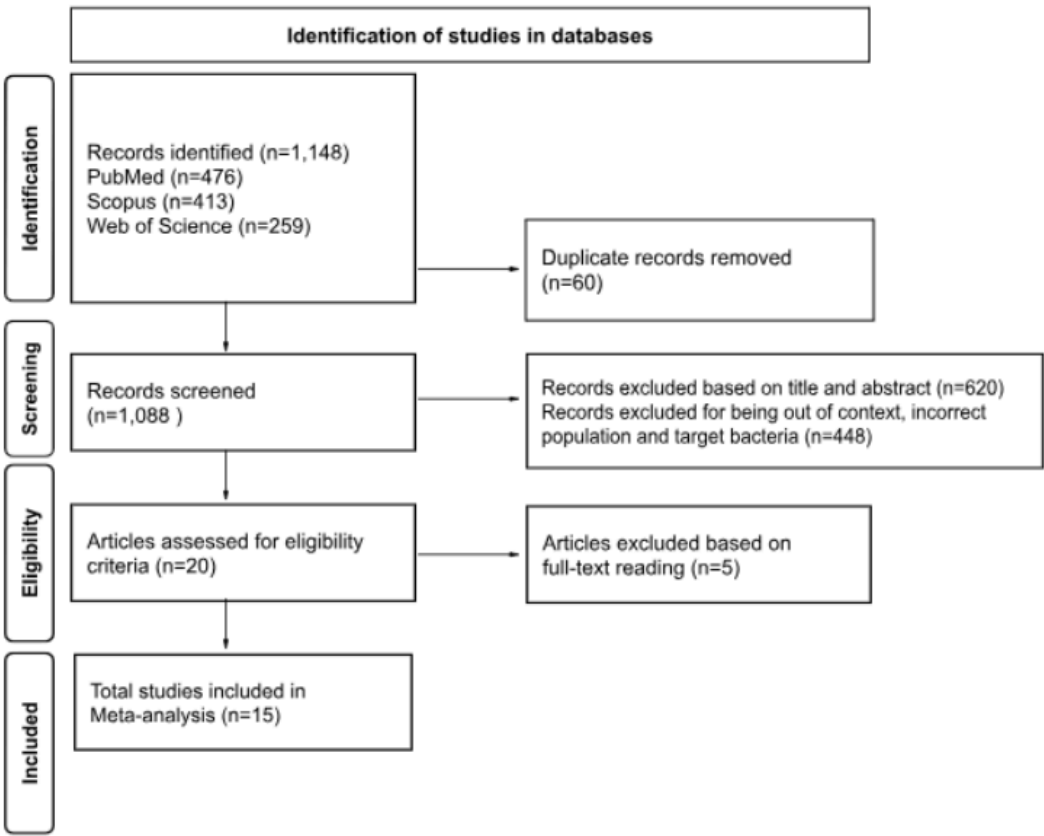
Objective

This study aimed to explore the therapeutic potential of bacteriophages as a viable and innovative alternative to conventional antibiotics for managing these infections in cattle.

Methodology

A meta-analysis was conducted to evaluate the current status of bacteriophage therapy in this field. An initial screening and review of 1,148 articles was performed, drawing from PubMed, Scopus, and Web of Science databases, spanning the years 1983 to 2021. Based on the inclusion criteria, 15 articles were selected for detailed meta-analysis.

Flowchart of the identification and selection process of studies for the meta-analysis following the PRISMA methodology.



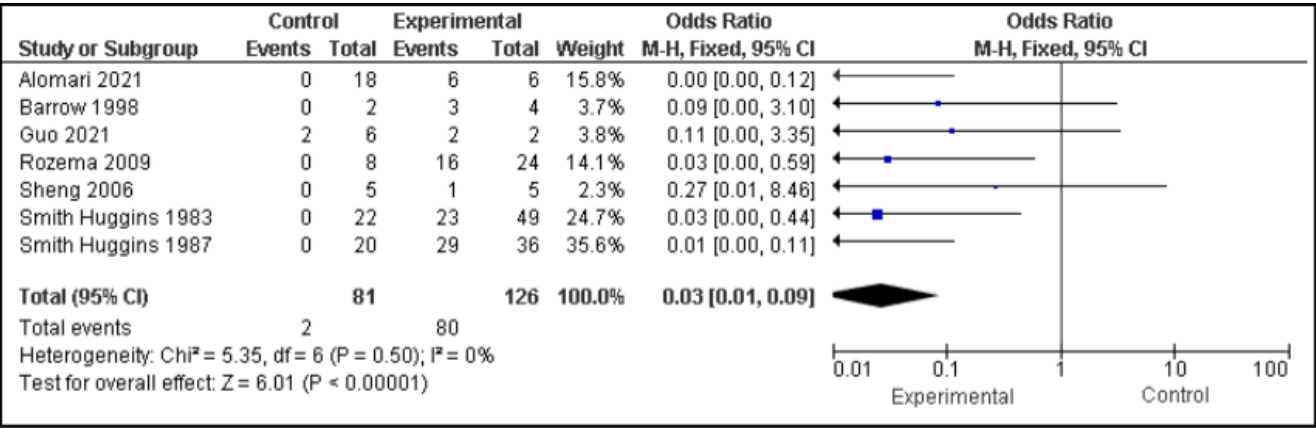
Conclusion

The results presented in this meta-analysis, highlight the promising efficacy, safety, and potential of bacteriophages as an alternative therapeutic strategy to control *E. coli*-induced diarrhea in calves and bovine mastitis, offering a sustainable alternative to traditional antimicrobial treatments.

Results

In vivo assessments covered a total of 126 cattle treated with bacteriophages in 7 different studies. Of these, six focused on treating calf diarrhea, while one addressed bovine coliform mastitis, with all treated animals achieving clinical recovery.

Forest plot representing the published *in vivo* studies on the use of bacteriophages in the treatment of cattle with mastitis or diarrhea caused by *E. coli*.



Eight *in vitro* experiments analyzed 738 *E. coli* strains subjected to bacteriophage lysis, resulting in an overall microbiological cure rate of 84.20%.

Forest plot representing the published *in vitro* studies on the use of bacteriophages in the treatment of cattle with mastitis or diarrhea caused by *E. coli*.

