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## INTRODUCTION

- Shiga Toxin-producing *E. coli* (STEC) is considered adulterant by the USDA.
- Bacteriophage solutions targeting **O157:H7** are FDA GRAS and regulated by the FSIS (directive 7120.1).

## OBJECTIVES

- To determine the killing efficiency of the Mello-Shebs O157:H7 bacteriophage on three strains of adulterant *E. coli* O157:H7

## MATERIALS & METHODS

- Whole *Cutaneous Trunci* muscles were sourced from a USDA inspected facility and cut into 10 x 10 cm<sup>2</sup> squares
- Samples were inoculated with a STEC cocktail (ATCC® 43895™, ATCC® 43894™, and Microcos 128) to result in a contamination level of approximately 3 log CFU/cm<sup>2</sup>
- After bacterial attachment, the samples were treated with sterile Buffered Peptone Water (BPW, Control) or MS bacteriophage solution (10<sup>8</sup> PFU/mL)
- Samples were swabbed, and plated onto LB agar plates for bacterial enumeration
- Statistical analysis: Data was analyzed as a completely randomized design using SAS

Figure 2. Bacteriophage lytic cycle

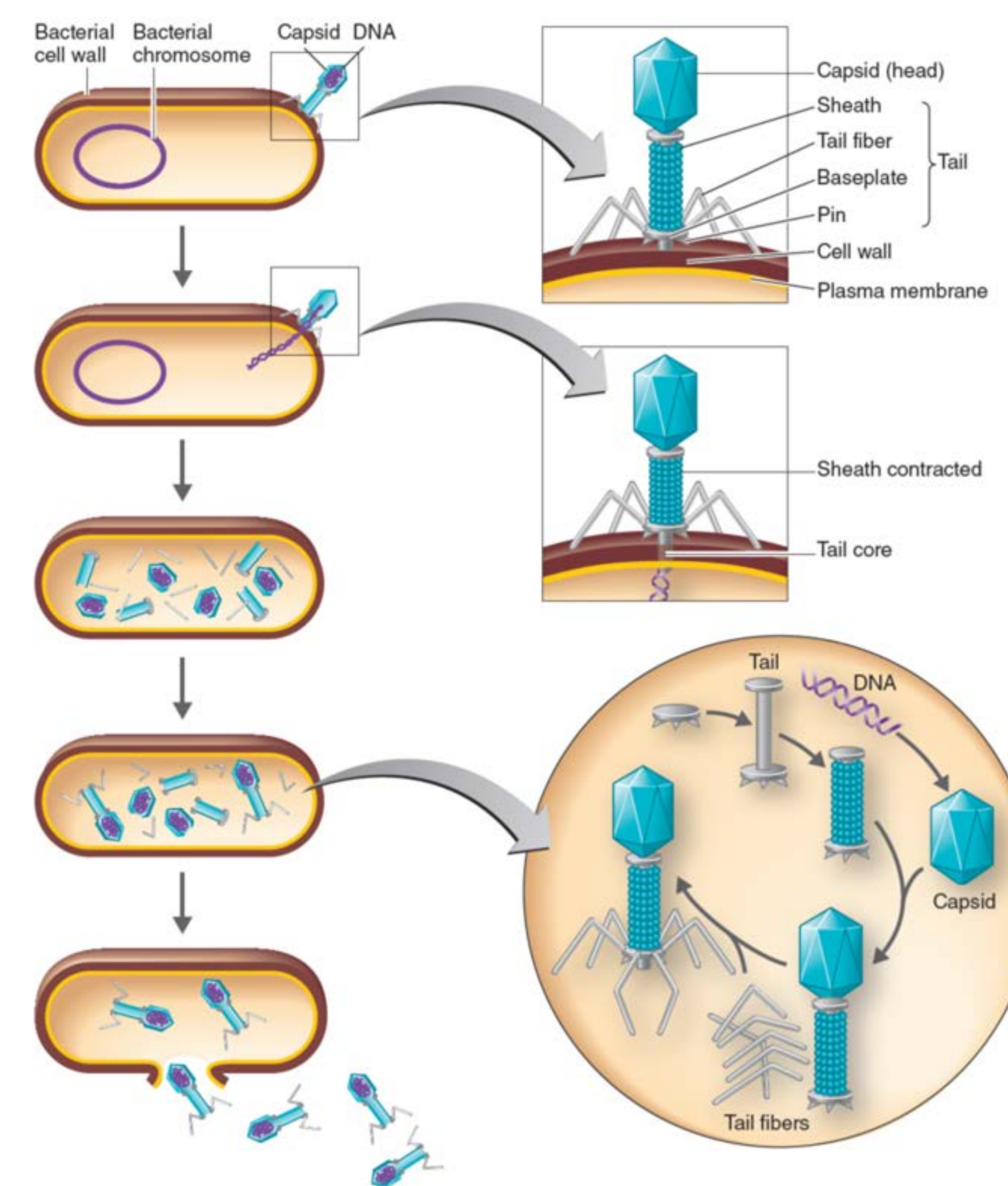
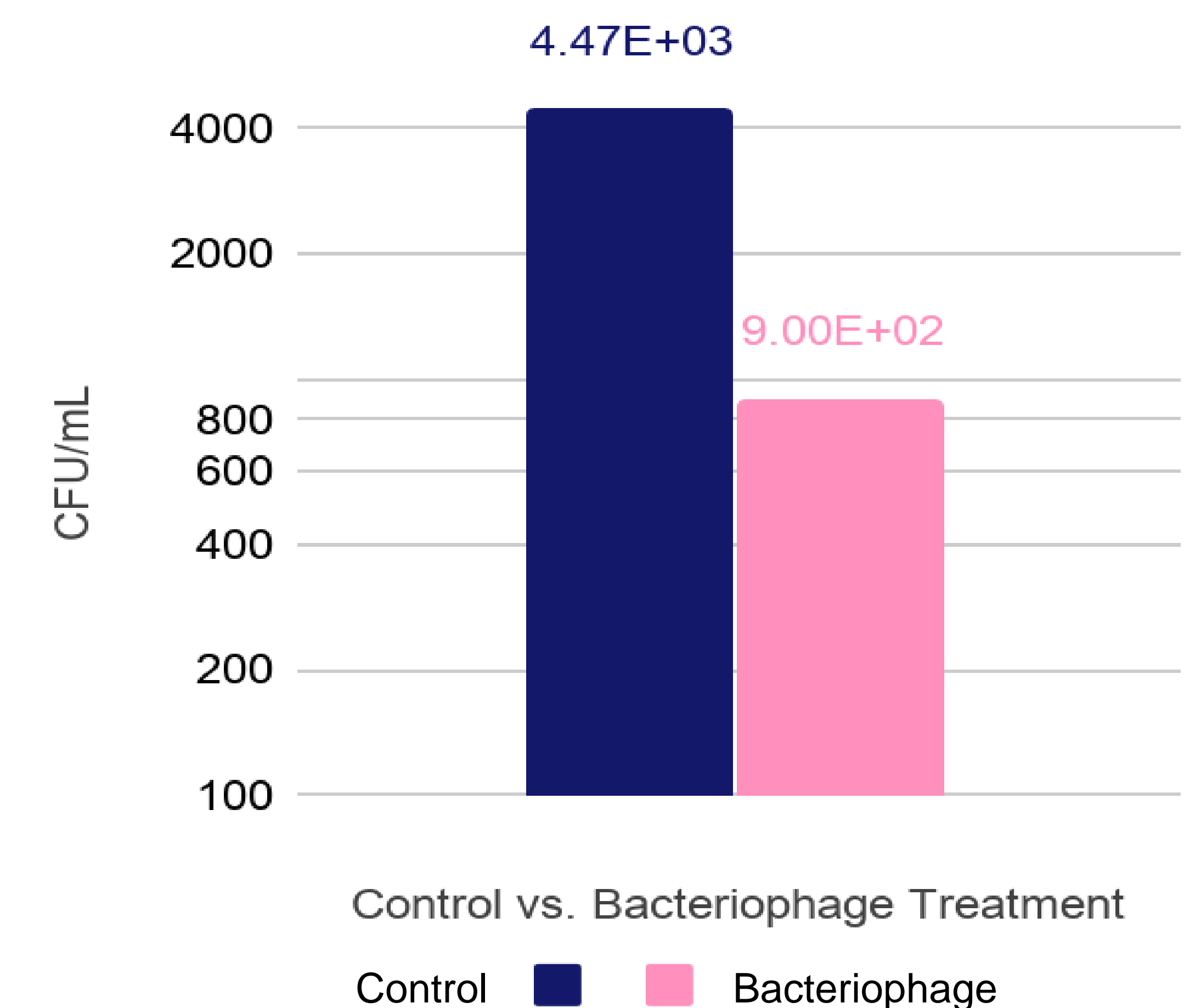


Figure 1. Average reduction of *E. coli* strain cocktail on fresh beef surface followed by application of BPW or lytic bacteriophage solution (10<sup>8</sup> PFU/mL) for a one hour dwell time.

Effectiveness of MS Bacteriophage Treatment



## RESULTS

- On beef, bacteriophage application significantly decreased STEC loads by approximately 0.626 log CFU/cm<sup>2</sup> (*P*=0.0184).

## CONCLUSION

- Bacteriophage MS-O157:H7 application as an antimicrobial on beef reduces STEC O157:H7 populations on contaminated beef surfaces
- Bacteriophage applications may improve STEC control in meat products

Strain	ATCC® 43895	ATCC® 43894	Microcos 128
Efficiency	98.89%	85%	97.16%

Table 1. In vitro killing efficiency of MS-157:H7 against three strains of *E. coli* O157:H7 when plated onto LB plates in quadruplicate

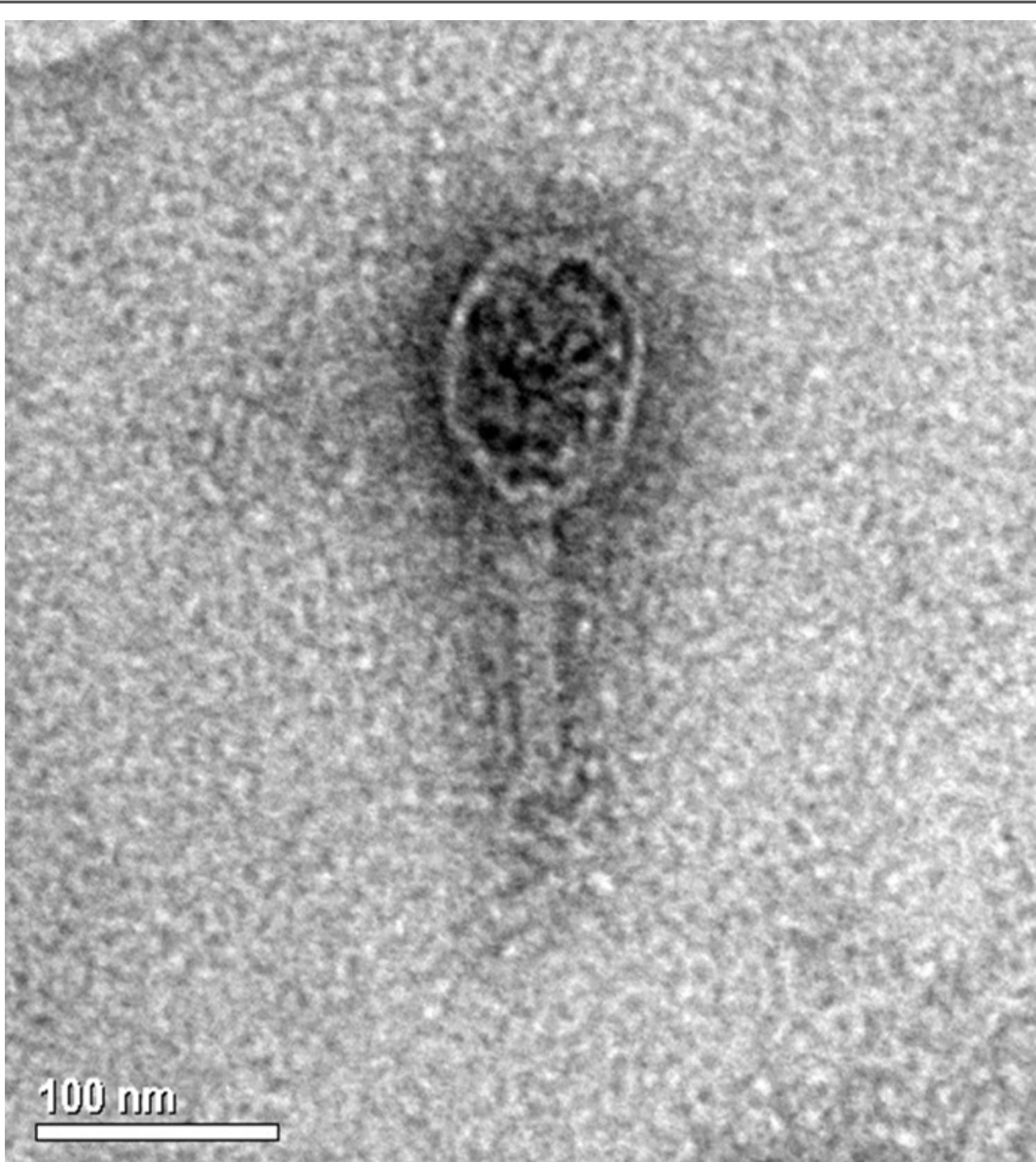


Figure 3. T4-like Bacteriophage MS1-O157:H7 (TEM 20K) Source: Electron Microscopy and Microanalysis Facility At the University of Nevada, Reno