Prevalence and Characterization of *Salmonella enterica* and *Salmonella* Bacteriophages Recovered from Beef Cattle Feedlots in South Texas

Xie, Yicheng; Savell, Jeffrey W.; Arnold, Ashley N.; Gehring, Kerri B.; Gill, Jason J.; Taylor, T. Matthew
Texas A&M University, College Station, Texas 77843-2471, USA

Abstract

Asymptomatic *Salmonella* carriage in beef cattle is a food safety concern, and the beef feedlot environment may function as a reservoir of this pathogen. The goal of this study was to identify and isolate *Salmonella* and *Salmonella* bacteriophages from beef cattle feedlot environments in order to better understand the microbial ecology of *Salmonella* and identify phages that might be useful as anti-*Salmonella* beef safety interventions. Three feedlots in south Texas were visited, and 27 distinct samples from each source were collected from dropped feces, feed from feed bunks, drinking water from troughs, and soil in cattle pens (n = 108 samples). Pre-enrichment, selective enrichment, and selective/differential isolation of *Salmonella* were performed on each sample. A representative subset of presumptive *Salmonella* isolates was prepared for biochemical identification and serotyping. Samples were pooled by feedlot and sample type to create 36 samples and enriched to recover phages. Recovered phages were tested for host range against two panels of *Salmonella* hosts. *Salmonella* bacteria were identified in 20 (18.5%) of 108 samples by biochemical and/or serological testing. The serovars recovered included *Salmonella enterica* serovars Anatum, Muenchen, Altona, Kralingen, Kentucky, and Montevideo; *Salmonella* Anatum was the most frequently recovered serotype. Phage-positive samples were distributed evenly over the three feedlots, suggesting that phage prevalence is not strongly correlated with the presence of culturable *Salmonella*. Phages were found more frequently in soil and feces than in feed and water samples. The recovery of bacteriophages in the *Salmonella*-free feedlot suggests that phages might play a role in suppressing the *Salmonella* population in a feedlot environment.

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