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Ref: Bacteriophage cocktail

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References:

[Food Safety News](#)
[Bacteriophage in food](#)

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Natural bacteriophage for *Salmonella* control in animals

Overview

The use of antibiotics as growth promoters is banned in Europe and is phasing out in the U.S., meaning new ways to control pathogens in food animals are needed. As an alternative to traditional antibiotic approaches, a bacteriophage library has been assembled that targets multiple strains of *Salmonella*. Development of these phage into products for bacterial control represents an opportunity to enter a multi-billion dollar market providing alternatives to antibiotics.

Advantages

- Could be developed for administration by the farmer in feed or water to cattle, chickens, etc.
- Could be applied pre or post harvest for antibiotic-free reduction of pathogenic *Salmonella*
- Bacteriophage have low production costs and are stable for months at room temperature
- Naturally isolated for easier regulatory approval

Description

Salmonella infection remains a problem on calf raising operations and in dairy herds and could rise as the use of antibiotics are phased out. Infected cattle do not always show symptoms and can shed *Salmonella*, infecting other cattle in the herd. Regulatory changes affecting antibiotic use in animals are expected to decrease the global market for feed-based antibiotics by as much as \$15 billion by 2018, presenting a market opportunity for antibiotic alternatives.

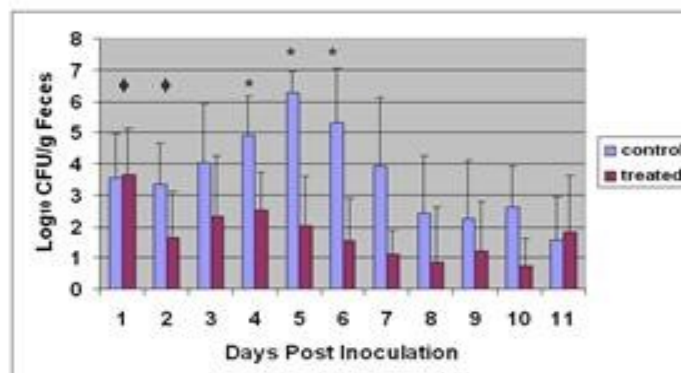
A library of naturally-isolated, *Salmonella*-specific bacteriophage has been assembled covering many of the pathogenic *Salmonella* serotypes. Phage could be developed into a cocktail of two or more phage or used as single phage. Proof of concept studies have been performed in calves using mixtures of three or five naturally occurring *Salmonella*-targeted lytic bacteriophages. Calves were infected with the pathogenic and multidrug resistant *Salmonella newport*, serotype C that infects ruminants, humans, and other animals. Reductions of up to 99% of *Salmonella* shed in feces of treated vs control animals have been observed in acutely infected animals. These phage could also be administered as prophylactics or potentially used for disinfection of dairy barns.

Status

- A library of ~70 *Salmonella*-targeted bacteriophages has been characterized
- Proof of concept studies performed in acutely infected calves using cocktails of 3-7 phage
- Studies ongoing to examine the stability of cocktails and minimum dose

Licensing Opportunities

- Bacteriophage are available as materials for exclusive or non-exclusive licensing
- Joint development opportunities include funded research or a joint venture



Protection in calves by a three-phage cocktail.

Graph is log scale. Eight 8-10 week old calves were challenged with *Salmonella Newport* by dose syringe. Four calves were treated at day 1 & 2 post-inoculation (black diamonds) with a mixture of three bacteriophages. Untreated calves served as controls. (*) denotes $P < 0.05$.