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Phage-based reducing of Avian Pathogenic E. coli in poultry

Polyphage cocktail with encapsulation reduces Avian Pathogenic E. coli in poultry lungs and ceca.

Researchers at Purdue have discovered and tested the capacity of a polyphage treatment to prevent and control Avian Pathogenic E. Coli (APEC) infections in poultry and found that treatment with encapsulated phages resulted in significant reductions of APEC in the lungs and ceca of affected poultry.

The researchers isolated five different phages from poultry waste that when combined, effectively lyse 90% of the most common APEC serovars. The phages were further characterized in terms of lytic capacity in different environments and genomic sequencing. The researchers also used a microencapsulation process that significantly increased the phage viability even when exposed to the harsh environments of the gastroinstinal tract (e.g., low pH, digestive enzymes, etc.).

Technology Validation: the polyphage APEC treatment was assessed in live animals by splitting 52 male and female (total 104) broiler chicks randomly into four groups: 1) chicks uninfected with APEC and not treated with phages; 2) chicks infected with APEC and not treated with phages; 3) chicks infected with APEC and treated orally with mixture of encapsulated and unprotected phages; 4) chicks uninfected with APEC and treated orally with mixture of encapsulated and free poly-phages. On day 6,7, and 9 randomly selected chicks from each group were euthanized and the concentrations of APEC were measured in their cecal and lung contents. Phage treatment significantly reduced concentrations of APEC in key tissues including lungs and cecal contents.

Advantages:

- Significantly reduces APEC in cecal and lung contents of APEC-infected poultry

- Antibiotic-free treatment for APEC

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Category
Agriculture, Nutrition, & AgTech/Food Safety & Traceability
Agriculture, Nutrition, & AgTech/Livestock & Animal Health Solutions

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- Poultry production

- Veterinary medicine

TRL: Veterinary

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