

Synbiotic Feed Additive for Poultry Gut Health (2024-044)

Non-antibiotic solution to improve gut health and control foodborne pathogens, including *Campylobacter* and *Salmonella*.

Market Overview

For decades, subtherapeutic doses of antibiotics have been used in poultry feed to promote growth by enhancing nutrient utilization and controlling invasive enteropathogens. However, since antibiotics are now inaccessible for poultry farming, alternative strategies are urgently needed to fill this gap. The current market has explored several antimicrobial alternatives, with prebiotics and probiotics emerging as promising replacements for antibiotics. The global probiotics in the animal feed market were estimated to be \$4.4 billion in 2020 and are expected to reach \$7.3 billion by 2030. Hence, the development of a probiotic, capable of controlling foodborne pathogens in chickens and improving their gut health, is expected to create opportunities for the US poultry industry to meet the global demand for poultry products produced in a safe and sustainable manner.

Technical Summary

In addition to their direct benefits to poultry gut health, probiotic lactobacilli play an important role in the fermentation of non-digestible carbohydrates and the production of short-chain fatty acids, which possess several beneficial effects, including improving the intestinal barrier integrity, serving as a source of energy to enterocytes, and contributing to the elimination of gut pathogens by lowering the pH of the intestine. Prebiotics, which are non-digestible compounds, act as a fuel source for probiotics despite being indigestible by the host. The prebiotic properties of have been explored in mammals with a proven ability to modulate gut microbiome composition. Our synbiotic product, have prebiotic carbohydrates and probiotic lactobacilli, to improve the composition of the gut microbiota and effectively modulate intestinal immune responses of chickens, thereby enhancing their resistance to infection with foodborne pathogens, including *Campylobacter* and *Salmonella*.

Application

- Enhance poultry growth performance and health
- Control foodborne pathogens

Development Stage

TLR 3

Advantages

- Enhance the immunocompetence of chicks post-hatching.
- Opportunity to reduce 2.9 million annual illnesses in humans, with the costliest food-pathogen pairs including *Campylobacter* and *Salmonella*.
- The first available solution targeted against *Campylobacter* and *Salmonella*.

About the Inventors



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Dr. Khaled Abdelaziz is an Assistant Professor of Immunology and Bacteriology in the Department of Animal and Veterinary Sciences. In addition to his academic experience, Dr. Abdelaziz also possesses industry experience. He worked as an Innovation and Development Scientist at Ceva Animal Health, where he contributed to developing and licensing vaccines for coccidiosis in chickens and turkeys. Dr. Abdelaziz's research interests lie in developing novel strategies to promote gut health and prevent enteric bacterial and parasitic infections in poultry. His research on disease contributes to promoting the USA agri-food brand through the production of safe, sustainable, socially responsible, and high-quality poultry products.

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