Your Toolbox for Antibiotic Reduction Daniel Petri PhD, Global Product Line Manager - Microbials



The steady pursuit of antibiotic reduction in livestock across the globe means that the industry will have to learn to master a new set of tools to support performance and maintain competitiveness.

IN BRIEF

- Problems such as mycotoxin contamination, pathogen challenges and poor management practices are exposed when antibiotics are removed from the diet, resulting in lower performance
- There are many products available on the market to help close the performance gap
- Each production facility needs to identify their specific requirements and tailor a solution to fit



Supporting You at Each Step Along the Way



It is difficult to overlook the ongoing, long-term, global trend to reduce the application of antibiotics in farm animals, which appears driven by regulation, consumer demand and a lack of new antibiotic molecules.

Increasingly, our clients have embraced the responsible use of antibiotics, helping to preserve their medicinal value for the treatment of humans and animals. Addressing antibiotic resistance and closing the performance gap that opens up when antibiotics are removed from the diet constitute the two biggest challenges to ensuring sustainable profitability for the poultry industry while also keeping antibiotics working as intended well into the future.

Success entails a long-term journey with an overall objective, rather than a specific endpoint. At BIOMIN, we have been committed to providing natural and scientifically advanced nutrition solutions since our founding in 1983.

We have made it our mission to accompany you along the journey, and to help you stay naturally ahead in your business.

BIOMIN brings the most scientifically advanced toolkit to market so that you can achieve the most successful outcomes for your business. Our solutions can be applied to help partially or completely reduce antibiotic use while supporting animal health and welfare, and maintaining profitability.

The reduction and removal of antibiotics from poultry diets requires a 360-degree approach including good farm management, nutrition, biosecurity, hygiene and a robust health and vaccination program. We recognize that each farm has its own unique set of conditions, which is why our international expert team is available to assist you in the identification of on-site challenges while also providing you with tailor-made solutions from our toolkit to help you attain the desired level of performance.

In addition, our involvement in industry discussions, our extensive scientific research and development program, and our on-farm application strategies have continually provided expertise and knowledge to the industry—as does our magazine, Science & Solutions.

The new look and feel of Science & Solutions, along with the new tagline "Keeping you naturally informed" reflects our commitment to you, our clients, and reaffirms the value we place on scientific discovery, knowledge sharing and supporting your ultimate success.

Hannes Binder PhD Managing Director

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Clostridium spp., example visual for virulent Clostridium perfringens



Salmonella enterica serovar Typhimurium

When antibiotics are removed from modern production, other issues frequently emerge.

As countries begin down the path of antibiotic reduction, often starting with restrictions on the use of antibiotic growth promoters (AGPs), feed and livestock producers quickly find themselves searching for ways to raise animals without antibiotics. There is no silver bullet product that can take their place. The answer is a 360-degree approach that combines proper nutrition, biosecurity, hygiene, genetics, health and good farm management practices. And innovative feed additives can also play a key role.

Pulling back the curtain

According to Warren Buffet, only when the tide goes out do you discover who has been swimming naked. Part of the reason why the right solutions for one farm may be different from that of another relates to the fact that sub-therapeutic antibiotic application such as those used for growth promotion or disease prevention may mask other areas that would otherwise need attention.

When antibiotics are removed from modern production, other issues frequently emerge. Mycotoxin contamination becomes more important, pathogen challenges flare and poor management practices are laid bare—all in addition to the performance gap that must be closed.

Replacing antibiotics in livestock production opens up considerable complexity in terms of species, climate, production stage, age, production system and geography. What is needed therefore is a customizable solution that can accommodate all of these factors. This can be done by identifying the right combination of probiotic, phytogenic, organic-acid based and/or mycotoxin deactivator products that deliver the right results in a given situation.

Examination of the following scenarios shows how different poultry production systems in different countries can benefit from varying combinations of feed additives in order to best address the specific on-site challenges.

Pathogen challenge in the United States

Consider a deep litter facility in the southeastern US in which there is a high background level of spore-forming *Clostridium perfringens* and too much nitrogen in the diet the result of higher dietary protein possibly from animal by-products. *C. perfringens*, which excretes α -toxin, is not particularly virulent, though its overgrowth can decrease flock performance unless it carries specific toxin genes like NetB. Taking out antibiotics requires a solution focused on pathogen control in addition to reviewing protein source and quality.

One suitable solution would be to apply a phytogenic feed additive (PFA) to put pressure on Gram-positive bacteria,

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and apply an organic acid-based product to help counteract Gram-negative bacteria.

Gram-negative in Latin America

In another scenario, consider the case of *Salmonella* challenge, poor chick quality and inconsistent breeder flocks. Antibiotics are allowed in production and currency fluctuations discourage the prospect of switching to novel growth promoters (NGPs). Here, it would make sense to apply a probiotic early on, and an acid-based product throughout the production stages. The poultry-specific synbiotic (prebiotic + probiotic) would ideally deliver essential bacterial strains to the gastrointestinal tract to promote gut development, and to competitively exclude pathogens from colonizing the gut. The acid-based product would keep the gut environment hostile to Gram-negative bacteria. Both products can be co-applied either through feed or water application, providing full flexibility.

Europe

One example broiler facility in Europe is in fact, through excellent hygiene, overly sanitary resulting in the elimination of both the harmful and beneficial gut bacteria from the gut environment. Water application of a poultryspecific synbiotic in the first three days would quickly establish a healthy gut microbiome and support immune development. Feed application of a PFA would support digestibility, and lower inflammation, leading to optimized feed conversion. The combination could be reintroduced in the final feed.

Mycotoxins

When antibiotics are removed, mycotoxins become more important because they can impair animal health and performance, disrupt the gut barrier and worsen vaccine effectiveness. Any of the scenarios described above would be worsened from a producer's perspective. A robust mycotoxin risk management program should include regular testing of feed ingredients and preventive measures so that animals can reach their full potential. Regular application of a mycotoxin deactivator is the surest way to avoid issues.

Benefits for those sticking with AGPs

While we expect the application of antibiotics for growth promotion and preventative treatment to be sharply reduced in the years ahead, NGPs can offer benefits to producers. In fact, it is possible to use NGPs, AGPs and a robust mycotoxin risk management program simultaneously. In a recent commercial trial in New Zealand, BIOMIN experts devised an NGP solution for a high performing broiler farm that was already using a mycotoxin deactivator. In the trial, a PFA was used to reinforce the mucosa in the lumen and improve feed efficiency. In addition, a symbiotic was used to stabilize the epithelial and cecal microbiota and properly set up the birds' immune systems, all while still using the farm's existing multiple AGP regimen. The combination resulted in improved performance and significant positive return on investment.

1000 possibilities, your solution

The feed additives market offers a wide variety of options, each with their own modes of action and advantages. Ultimately, a long-term strategy to support your animals must be cost-competitive and effective. To assure a clear benefit in production, application of feed additives must be tailored to the individual situation and circumstances. There is no "one-size-fits-all" approach. BIOMIN has conducted decades of research and development to produce some of the most innovative products in their respective categories.

The choice of product relies on a host of factors, including species, geography, production stage, specific challenge and customer preferences. To further complicate matters, different combinations of additives may prove to be the best option. However, finding a solution does not have to be complicated.

At BIOMIN, our sales teams and technical support experts rely on local and global support to accompany clients through the process of identifying the right solution and ensuring that they have the knowledge and skills for successful implementation-part of a long-term partnership to deliver profitable results.

