Reducing APEC by supporting healthy chick gut microbiota

by Tom Rehberger, PhD, Director, Research and Product Development, Arm & Hammer Animal and Food Production

With an industry that is shifting increasingly to no-antibiotics-ever production, there is a critical need for new solutions to control disease-causing pathogens. Among the most disruptive pathogens in broiler production is avian pathogenic E. coli (APEC). The pathogen is responsible for detrimental profit losses, decreased chick productivity and in some cases, death. One solution to combating APEC may lie in supporting a healthy gut microbiota in chicks.

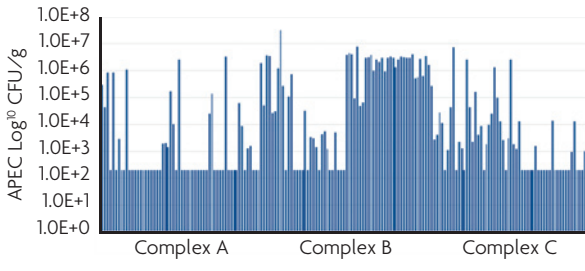
EFFECTS OF EARLY COLONISING BACTERIA ON THE GUT

From the moment chicks hatch they are exposed to an abundance of pathogens. The bacteria make their way to the gastrointestinal (GI) tract and set the stage for inappropriate immune function, bacterial dysbiosis and reduced nutritional utilisation. In modern production systems, ultra-sanitisation of eggs does not allow for vertical transmission of beneficial bacteria from hen to chick. This leaves chicks vulnerable to early colonising bacteria like APEC and the gut is the first line of defence. Early colonisation plays a key role in feed digestibility, feed uptake, protein utilisation, immune competence and immune tolerance. Protecting beneficial gut microbiota, like lactic acid bacteria, balances intestinal microbiota and allows for regulated immune response, ultimately boosting overall chick health.

RESEARCH SHOWS VARYING PATHOGEN LEVELS

Research by Arm & Hammer Animal and Food Production reveals significant variation in levels of APEC among birds and complexes (Fig. 1). APEC levels were tested in day-old chicks at three locations, showing varied infection rates among chicks and proving bacteria species in the small intestine vary from hatchery to hatchery, chick to chick, and between breeder hens at different production facilities. Furthermore, Arm & Hammer research shows that lactic acid bacteria also vary significantly between hatcheries and chicks. Maintaining a consistent level of these beneficial bacteria is critical in achieving the proper gut health needed to fight off APEC in young chicks.

Fig. 1. Levels of avian pathogenic E. coli (APEC) vary by bird in day-old chicks.



KEY TAKEAWAYS

As the industry seeks non-antibiotic solutions against APEC, maintaining beneficial lactic acid bacteria in the chicks' guts may provide a first line of defence against harmful pathogens. Feeding target microbials may be a solution to deliver beneficial bacteria chicks need to build resilient guts and strong immune systems. Regardless of your operation's practices, controlling APEC boosts overall chick health and operational profit through decreased stress, while also promoting robust immune systems and optimal performance.

To learn more about controlling pathogens on your operation, contact an Arm & Hammer representative.

References for all research cited available on request

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Mitigate mycotoxins in broiler diets by feeding BG-MAX

by Sangita Jalukar, PhD, Technical Services Manager, Arm & Hammer Animal and Food Production

Mycotoxins are prevalent in nearly all feed grains worldwide. Produced by fungi in cereal grains, corn and corn byproducts such as distillers dried grains (DDGS), mycotoxins in feed can reduce poultry performance by reducing intake and growth. Researchers have identified more than 400 different mycotoxins. Two commonly found in feeds are aflatoxin (AFLA) and deoxynivalenol (DON). If diets contain more than one mycotoxin, there can be a cumulative effect, creating an even greater risk of performance loss. Symptoms of mycotoxin contamination are wide-ranging and often seem unrelated. Therefore, producers may find it difficult to correlate mycotoxin contamination in feed with poor performance. The best approach is to assume mycotoxins are present in feed and make plans to combat them.

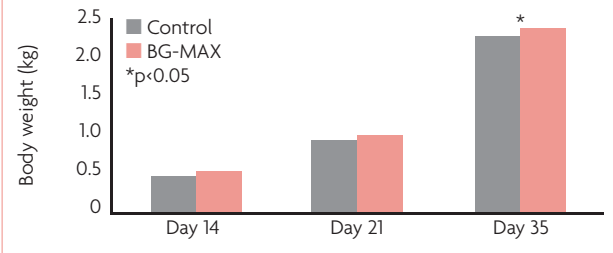
PROTECT AGAINST MYCOTOXIN THREATS

Producers may rely on binders to counteract mycotoxins. However, these solutions are not always effective against all types of mycotoxins. BG-MAX™ from Arm & Hammer Animal and Food Production combines mycotoxin binders with technologies that protect the gut from damage and make birds more resilient against harmful mycotoxin effects. BG-MAX features Refined Functional Carbohydrates™ (RFC™) technologies, which work by preventing mycotoxins from being absorbed. By combining RFCs with a specially formulated bentonite binder, BG-MAX inactivates common mycotoxins while also protecting the gut. In addition, beta 1,3/1,6 glucans and mannans present in BG-MAX can reverse immune suppression caused by mycotoxins, allowing the animal to protect itself against secondary pathogens. In vitro tests demonstrate that BG-MAX is more effective in absorbing harmful feed compounds than activated charcoal, bentonite and another yeast-derived product. Cytotoxicity tests show that BG-MAX protects epithelial cells from damage caused by leading mycotoxins.

BUILDING BROILER RESILIENCY

Field research shows feeding BG-MAX enhances broiler performance in the presence of mycotoxins. In a 35-day feeding trial at North Carolina State University (USA), researchers studied performance of male broiler chicks fed diets naturally contaminated with AFLA and DON at levels commonly found globally. Rations consisted of soybean meal, corn and wheat, along with 5% DDGS to mimic typical commercial diets. Starter diets (days 1-14) contained 131ppb AFLA and 0.6ppb DON, and grower diets (days 15-35) contained 95ppb AFLA and 0.2ppb DON. Treatment chicks received BG-MAX in their diets, while control animals received no BG-MAX supplementation. Results (Fig. 1) showed birds fed BG-MAX had significantly higher body weight (BW) at the end of the feeding period compared with controls. Birds fed BG-MAX in the diet also showed improvement in feed conversion ratio (FCR), although the differences were not statistically significant. Feeding BG-MAX helps mitigate mycotoxins in feed by building bird resiliency against their harmful effects.

Fig. 1. Effect of BG-MAX on body weight of broilers fed mycotoxin contaminated diets (based on a study done by J. Nixon, J. Grimes and J. Brake, Department of Poultry Science, North Carolina State University, USA).



References for all research cited available on request

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