



## Antibiotic Stewardship: Antibiotic Alternatives

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### INTRODUCTION

The issue of antibiotic resistance is complex and multifaceted. At Hormel Foods, we believe we can impact antibiotic resistance through a holistic approach to antibiotic stewardship. When an antibiotic stewardship program functions effectively, the health of animals is optimized while the use of antibiotics is minimized. Through stewardship, we can make an impact on antibiotic resistance while maintaining one of our core cultural beliefs — putting safety first, and this includes the health and well-being of animals in our care.

Our Jennie-O Turkey Store subsidiary is striving to do its part to minimize the use of antibiotics on farms by applying a holistic approach following the four principles of our antibiotic stewardship program: management, preventive medicine, veterinary oversight and continuous improvement. While each principle stands strong on its own merits, they must also work together for the antibiotic stewardship program to be successful.

This article discusses techniques we are implementing to continuously improve our preventive-medicine pillar through research initiatives in antibiotic alternative products.

### ANTIBIOTIC ALTERNATIVES

In general, an antibiotic alternative is a non-antibiotic substance that elicits a biological response. The Jennie-O technical team consists of veterinarians, nutritionists and production research specialists who conduct a variety of studies to understand how to best use antibiotic alternatives to promote animal health. The team has explored three general categories of antibiotic alternatives as part of its preventative medicine program: prebiotics, probiotics and essential oils. In addition, the live production team is committed to finding ways to improve health outcomes through innovation in animal husbandry and vaccination practices.

Jennie-O utilizes its research farm to compare products and determine if there is a measurable impact on turkey health and performance. The research process is lengthy due to the long life cycle of turkeys. In fact, it can take up to 18 months and countless repetitions to obtain conclusive results.

If a product has a positive impact in a research setting, we will conduct additional trials on a small number of select farms. This process allows us to determine if the results are repeatable within the production system, where more variability exists. This step is crucial in determining if a product's impact on turkey health and performance can be maintained in a production setting. Internally analyzing antibiotic alternatives is important in deciding whether the product meets the company's high standards for efficacy.

"Antibiotic alternatives have a lower regulatory threshold than traditional antibiotics, and therefore require more time and effort to truly understand their functionality in a farming system," said Dr. Michelle Kromm, vice president of animal health and welfare at Hormel Foods.

Products within the three alternative categories — prebiotics, probiotics and essential oils, which have demonstrated efficacy are integrated into the preventative medicine program for the turkeys. Below is a summary of the antibiotic alternative categories and some of the company's studies and efforts.



## **PREBIOTICS**

Prebiotics work by providing nutrients to the good bacteria that live in the digestive tract. We feed our turkeys prebiotics due to their ability to promote an ideal environment for bacteria in the gut to grow and function properly. Having high-functioning, healthy gut bacteria is vital to ensuring proper function and movement of nutrients through the digestive tract.

A prebiotic containing a component of bark extract is used in the Jennie-O raised-without-antibiotics (RWOA) program. This prebiotic is administered daily through feed to help the intestinal bacteria create a stable digestive tract. A stable digestive tract requires less energy to be expended in breaking down and absorbing food, making the turkeys more efficient in converting feed to weight.

A feed additive that contains prebiotics can also be paired with other natural compounds, such as essential oils and probiotics. One feed additive Jennie-O has studied extensively showed that the addition of prebiotics in combination with other natural compounds decreased mortality and provided antibacterial activity. As a result, the prebiotic was added to the feed program.

## **PROBIOTICS**

Prebiotics and probiotics can work together to create an ideal gut microbiome for turkeys. Probiotics are live bacteria that have beneficial effects on turkey health and production. These bacteria utilize the nutrients in the gut and establish a microbiome that promotes optimal gut health. Turkeys receive probiotics daily in the feed to replenish the population of “good” bacteria. Probiotics can be supplemented through the water, providing an added boost after a stressful event, such as a vaccination or exposure to a pathogen.

Jennie-O has studied feed probiotics extensively. For example, the Jennie-O technical team explored the use of probiotics to minimize the impact of *E. coli*. *E. coli* infections are a common disease that can require antibiotic treatment. Probiotic bacteria are important because they help birds fight off pathogenic *E. coli* in the intestinal tract, where *E. coli* is a common inhabitant. This probiotic was successful in minimizing both the occurrence of colibacillosis and the use of antibiotics in the study, and has subsequently been incorporated into the preventive medicine program at Jennie-O.

## **ESSENTIAL OILS**

Essential oils have been a tool in the antibiotic alternative toolbox at Jennie-O for many years. Research regarding inclusion of essential oils in production has shown countless benefits, from anti-inflammatory effects to improvement in feed palatability. Turkeys receive essential oils primarily through feed. Sources of essential oils include thyme, oregano, rosemary and cinnamon. If a turkey flock appears stressed, supplemental essential oils can be added to the drinking water, reducing the need to use therapeutic antibiotics.

A study conducted at the Jennie-O research farm compared an essential oil feed additive to a control diet that did not contain any special alternatives. The additive contained essential oil properties that claim to help birds fight off health challenges and adapt to stress factors, ultimately improving performance. This study yielded positive results and the product is now being included in some of our turkeys’ diets.



## **CONCLUSION**

We will continue to advance our antibiotic stewardship efforts based on the leading-edge work that is currently being undertaken by Kromm and her team. The use of prebiotics, probiotics and essential oils, combined with the other three pillars of our antibiotic stewardship program, demonstrates our commitment to reducing the need for antibiotics. Jennie-O is a leader in these efforts because of its entire live production team, including farm workers, supervisors, cleaning crews, etc., who work continuously and vigilantly to research new products and enhance every facet of the program.