



GUT HEALTH SOLUTIONS

GUT HEALTH TRIPLE CHECK: KNOCK OUT

The Kemin Gut Health Triple Check program helps establish intestinal integrity and protection. Kemin offers products to **CLEAN UP** contaminants in feed and water prior to animal exposure, **BUILD UP** intestinal strength to reduce leaky gut and **KNOCK OUT** harmful pathogens for healthier poultry. FORMYL Na was developed for the **KNOCK OUT** category to support intestinal balance to inhibit or eliminate harmful pathogens from infiltrating the body.

FORMYLTM Na



FOR POULTRY



kemin.com/formylna
1-800-752-2864

FORMYLTM Na is a safe, proven source of pathogen-fighting formic acid for use in poultry.

References
1. The inhibitory effect of encapsulated sodium formate on the growth of *Salmonella* spp., *E. Coli* and *Campylobacter* spp. 19-436.
2. Strauss, G., and R. Haylor. (2001). Effects of organic acids on microorganisms. *Kraftfutter*. 4:147-151.

MODE OF ACTION FOR POULTRY

- 1 Formic acid fights pathogens by damaging their cell membranes and mitochondria, ultimately leading to the death of the pathogen.
- 2 Acidification of the gut creates an environment that's hostile to bacterial growth and prevents bacteria from crossing the intestinal barrier.
- 3 FORMYL Na ingredients are encapsulated, allowing for release to the gastrointestinal (GI) tract for maximum efficacy on pathogens.

PATHOGEN-FIGHTING FORMIC ACID

FORMYL Na is a safe, proven source of pathogen-fighting formic acid for use in poultry. A proprietary blend of organic acids and sodium formate is encapsulated in a fatty matrix for release into the GI tract for maximum efficacy.

FORMYL Na is a dry feed product that can be added to poultry diets. Formic acid can decrease *Salmonella*, *Campylobacter* and *Escherichia coli* prevalence in the animal, resulting in improved efficiency and profitability — adding another tool to your production program or reducing chemical treatments at the processing plant.

Active ingredient: Formic acid

Formic acid is widely recognized as an effective feed acidifier and antimicrobial agent and was one of the first acidifiers used to combat pathogens in poultry.

Delivery method: Encapsulation technology

Manufactured using a proprietary encapsulation process developed from more than 10 years of research by Kemin scientists and engineers, FORMYL Na is an encapsulate containing formic acid, protected by a fatty matrix.

ADVANTAGES OF FORMYL Na

- Proprietary blend of organic acids offers a unique source of pathogen-fighting formic acid for use in poultry.
- Unlike liquid formic acid, FORMYL Na is easier to handle and is stable in feed to deliver in-animal gut acidification and pathogen inhibition. As a volatile substance, unprotected formic acid can damage skin, corrode equipment and negatively affect digestion.
- Encapsulation allows for a release in the digestive tract for maximum efficacy and minimum gastric irritation.
- Formic acid has been shown to decrease *Salmonella* and *Campylobacter* load in poultry, which provides a new tool for your poultry production program.^{1,2}

PROVEN PERFORMANCE IN POULTRY

Pathogen control is and will continue to be a crucial management practice in any poultry operation. *Salmonella* and *Campylobacter* highly impact the feed and food chain, contaminating meats and eggs — causing illness and mortality in humans. Formic acid can reduce the prevalence of *Salmonella* and *Campylobacter* in poultry, providing a new tool for your production program and reducing the need for chemical treatments at the processing plant. Previous research has shown that formic acid has a higher efficacy (lower minimum inhibitory concentration) against *Salmonella* than propionic acid and lactic acid.²

Materials and methods

A microtiter assay was used to evaluate *Salmonella* and *Campylobacter* growth by culturing it with treatment levels of 1, 5 or 10 lb/ton* of the active ingredients of FORMYL Na.

At the 20-hour time point, colony enumeration was performed for the *Salmonella* species.

At the 48-hour time point, colony enumeration was performed for the *Campylobacter*.

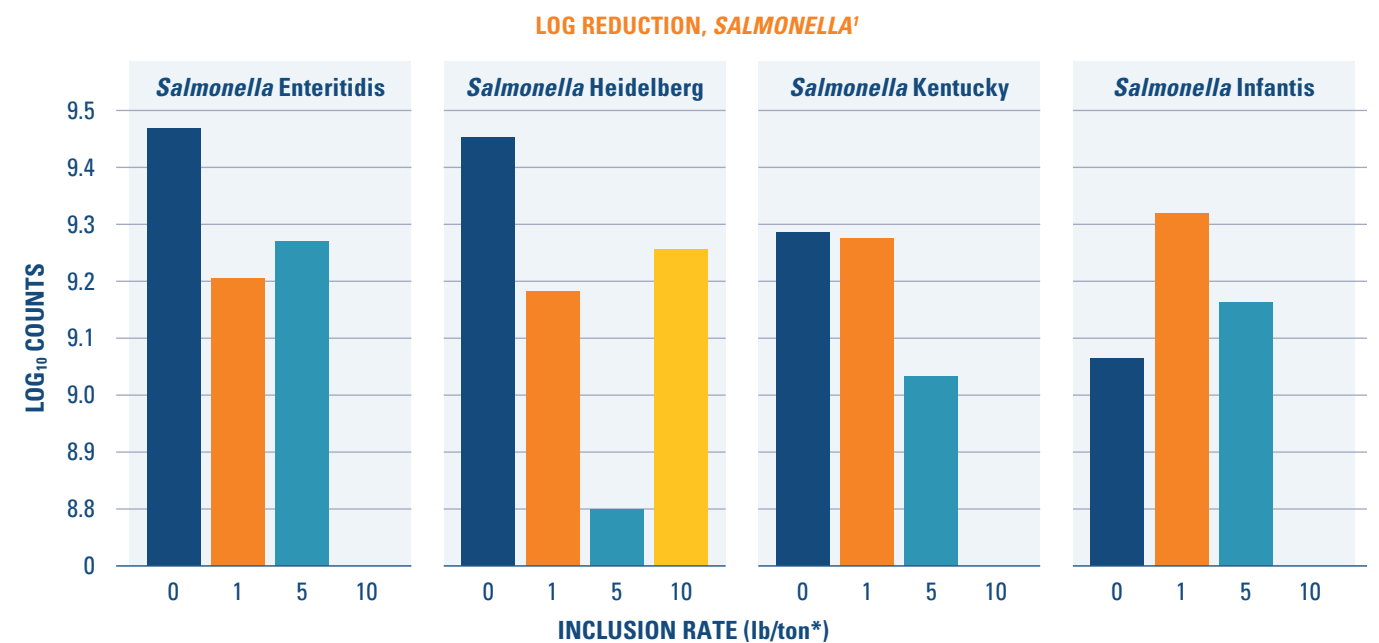


Figure 1: The log₁₀ counts of each treated sample x *Salmonella* spp.

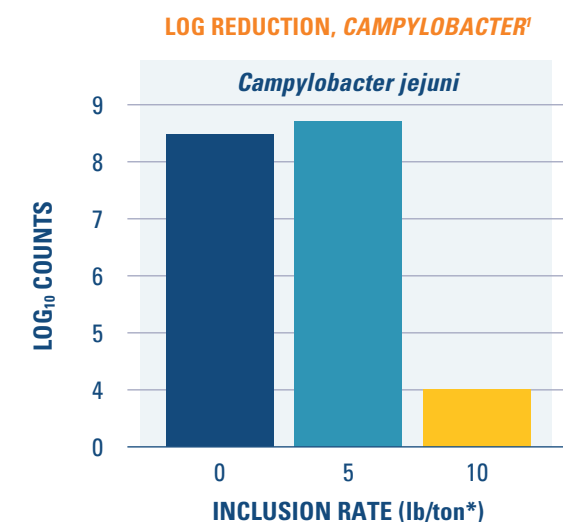


Figure 2: The log₁₀ counts of each treated sample x *Campylobacter jejuni*.

