

## Natural Poultry Production Natural Production Relies on Microbials, Prebiotics, Enzymes and Diet to Maintain Health in Poultry

Author: Greg Mathis

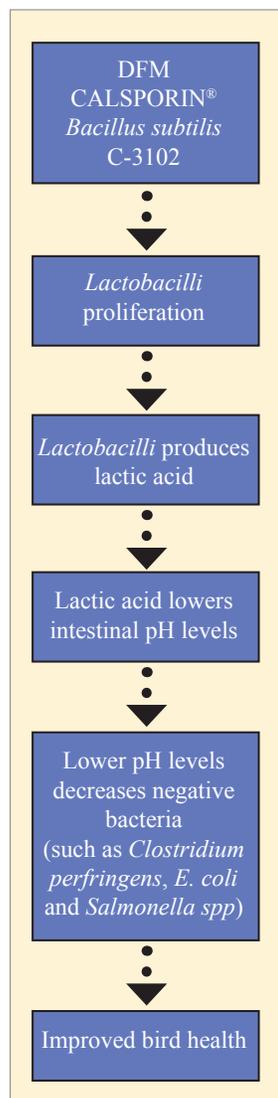
### Natural Methods for Maximum Production

Today the connotation of “Natural” in poultry production is most often associated with the absence of antibiotic growth promoters (or AGPs) in feed or water. AGPs often directly influence the bacterial

populations in the intestinal tract and reduce microbial use of nutrients. Natural alternatives to AGPs can also influence bacterial populations, modulate gut microflora and help to improve feed efficiency.

The key to profitable poultry production, with or without AGPs, is to maintain good gut health of the flock. Good intestinal health leads to improved nutrient digestion and utilization, a better balance of “beneficial” bacteria (resulting in less chance of sub-clinical or clinical enteric disease and carcass contamination), better performance, and better uniformity.

Several classes of products have become increasingly available to assist poultry producers who wish to eliminate or cut back on their use of AGPs, or are looking to provide an additional boost to their current AGP program.



### Direct-Fed Microbials (DFMs) and Prebiotics

Two of the most common “Natural” methods to improve gut health are: (1) reduce gut contamination from detrimental bacteria such as *Salmonella spp*, *Clostridium perfringens*, and *C. septicum*; and (2) develop a diverse population of “beneficial” bacterial populations. Research conducted by Southern Poultry Research, Inc. has demonstrated that the use of direct-fed microbials and prebiotics can help accomplish the goal of producing a favorable and stable intestinal microflora. Research done at leading research institutions suggests that having the proper balance of “beneficial” and “detrimental” bacteria in the intestinal tract not only impacts the severity of bacterial infections (e.g. Necrotic enteritis caused by *Clostridium perfringens*) but overall bird health.

The use of DFMs can assist in creating a better bacterial balance in the gut, either directly by colonizing the guts themselves, or indirectly, by supporting the increased colonization of usual gut microflora. The most commonly used DFMs typically contain one or more of the species *Lactobacillus spp*, or *Bacillus spp*. DFMs either help establish early development of microflora, or help restore a positive balance during stress or disease situations.

The direct fed microbial CALSPORIN®, which contains the proprietary strain *Bacillus subtilis* C-3102, for example, works by creating favorable conditions in the gut which encourages the proliferation of *Lactobacilli*. These *Lactobacilli* produce lactic acid which lowers the pH level in the intestinal tract which in turn helps depress the growth of bacteria such as *Clostridium perfringens*, *E. coli*, and *Salmonella spp*. Published research has reported on the use of CALSPORIN in reducing the intestinal as well as the environmental levels of these negative bacteria thus potentially improving bird health, performance and safety. (See chart on back.)



## Prebiotics

Prebiotics are non-digestive feed ingredients that selectively stimulate the growth and/or activity of bacteria already in residence in the digestive tract leading to improved host health. The mannanoligosaccharides (MOS) products are the most referenced poultry feed prebiotics. MOS is derived from inactivated yeast cell walls. Reported mechanisms of action include blocking of bacterial adhesion, modifying microflora fermentation, and enhancing the brush border mucin barrier.

## Enzymes

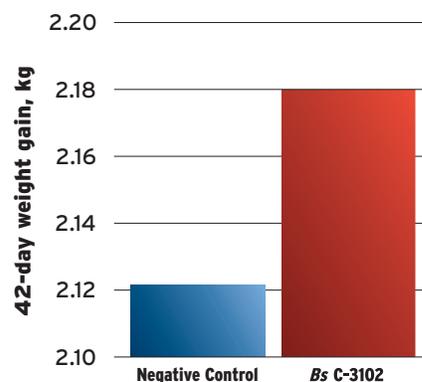
Another approach to good intestinal health is to limit free non-digested protein and non-digestible non-starch polysaccharides (NSPs) which can be used by detrimental bacteria such as *Clostridium perfringens*. This can be accomplished by modulating dietary content. Typical corn/soy diets are less viscous, allowing for better feed digestion and subsequent shorter feed passage time through the gut. Higher viscous diets such as wheat and barley, with higher levels of non-soluble fiber, can lead to intestinal health problems due to improper balance of bacteria. Use of digestive enzymes such as phytase, amylase, mannanase, and glucanase, can help increase the digestibility of high viscous grains and reduce their negative impact on intestinal health.

## Summary

“Natural” tactics to good intestinal health are multipronged. Control measures start with hygiene and management. Understanding coccidiosis vaccination programs and implementing the correct anticoccidial program will reduce coccidiosis and Necrotic enteritis. DFMs and prebiotics can be used in feed or water to establish and stabilize a “beneficial” diverse bacterial population. Feed enzymes can be beneficial when fed with feed stuffs of high viscosity. Other products such as acidifiers or essential oils may help lessen the severity of diseases such as Necrotic enteritis or help to reduce carcass contamination.

## Weight Gain Performance in Broiler Chickens

Average 42-day bodyweight gain of broiler chicken fed negative control or Bs C-3102 supplemented diets (0 or 300,000 CFU/g feed) in three built-up litter pen trials at Southern Poultry Research, Inc., Athens, Ga. (Mathis, 2007)



## About the Author - Greg Mathis



Greg Mathis is the guest author of this tech report. One of the leading authorities on the subject of poultry health, Greg is the president of Southern Poultry Research, Inc. in Athens, GA. Greg received his Ph.D. from the University of Georgia with a major in Poultry Science.

Greg has over 30 years experience in animal health and sciences. He has been published extensively in publications that include Poultry Science, Avian Diseases, Veterinary Parasitology, World Poultry Science, and others. He is often a frequent speaker at industry conferences and lectures.

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