

# TECH REPORT | Poultry

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## Probiotics Are Not Commodities

**Author:** Todd J. Applegate, PhD

Purdue University - Department of Animal Sciences

### Key Points:

- Antibiotics are not 100% effective
- Probiotics gaining interest in marketplace
- Probiotic research has increased greatly
- Each probiotic on the market is unique

Often when we look at products that may have effects similar to sub-therapeutic antibiotics, we expect them to have a full array of immunological, bacteriostatic/bactericidal, and physiological responses that the sub-therapeutic antibiotics elicit. We also expect them to be efficacious 100% of the time. Rosen (2004) noted, however, in a meta-analysis of over 5000 experiments that the frequency of FCR and gain improvement for broilers fed a sub-therapeutic antibiotic was 74%. Thus, not even sub-therapeutic antibiotics are efficacious 100% of the time. Their inability to be effective in all cases could be caused by a multitude of factors, including what the bird experiences in terms of bacterial load, pathogen dose and/or virulence, and other stressors.

Thus the marketplace often creates undue expectations on products that may elicit effects on the gastrointestinal tract, expecting similar ranges of responses to antibiotics with results 100% of the time. Additional reluctance for use of these types of products may stem from:

- Unfamiliarity,
- Overselling of plausible effects,
- Documented physiological and microbiological effects *in vivo*,
- Documentation of persistence from the feed and within the intestinal tract.

Probiotics, in particular, are gaining further interest in the marketplace, in part due to their documented effects, namely specific pathogen(s) exclusion, immunological modulation (acquired and innate), improved nutrient use, and potential antimicrobial action

through pH modification and bacteriocin (antimicrobial compound) production. Indeed, research with probiotics has occurred for a few hundred years, but research with probiotics and application in poultry has greatly increased in recent years. For example, in looking at the probiotic articles published since 1952 in *Poultry Science* and *Journal of Applied Poultry Research*, over half have been published since 2006. So, much of what we know and specific modes of action of probiotics is a relatively "young" science.

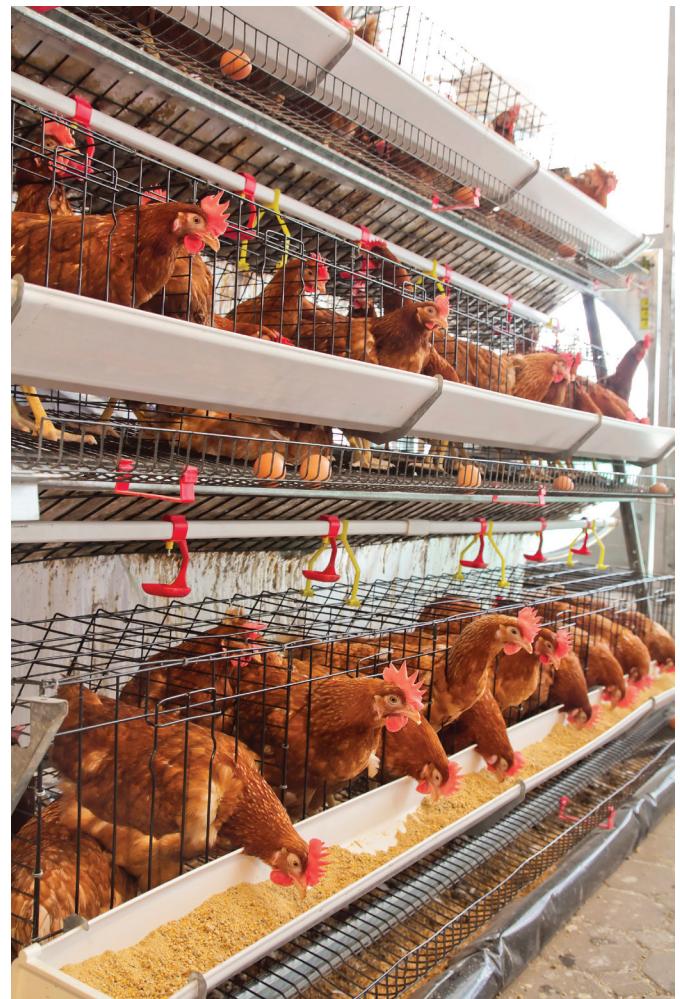
As different probiotics are developed, optimal traits for their selection include:

- Being nonpathogenic
- Technologically suitable for industrial mass production
- Acid- and bile-resistant
- Able to produce antimicrobial substances
- Able to modulate immune responses
- Able to influence the metabolic activities of the gut.



It is likely no solitary probiotic strain could have all of these attributes. Thus, the selection for and development of probiotic strain(s) is often a compromise between one or more of these effects, while being economically produced and able to survive the milling process so it can be delivered to the animal. Once these traits are identified from candidate strain(s) for production of a probiotic, they are selected and these functional trait(s) optimized through different selection methods. Therefore, due to the nature of how probiotic strains are developed, and the functional attributes that have been enhanced through generations of selection, each probiotic product on the market is inherently unique. The industry, however, often lumps probiotics together for comparison purposes. Because of the uniqueness of each selection process and distinctive attributes that have been selected, probiotics should not be considered commodities, rather, they should be considered for their traits, which have been selected and refined over time.

*Todd J. Applegate, PhD is a Professor and Extension Poultry Specialist in the Department of Animal Sciences at Purdue University and is responsible for translational research and tools for the poultry industry that minimize environmental impacts and sustain the competitiveness of the industry in the US and abroad.*



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