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Why probiotics rarely deliver consistently in poultry

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This issue examines the inherent biological variability in poultry systems and argues that probiotics may deliver their greatest value by reducing variation across flocks rather than maximizing performance.

Recently, I had a discussion with a senior poultry executive from a large integrated operation. What surprised me was not that they had tested probiotics extensively. Most large poultry companies have already done that. What surprised me was his observation that, despite having evaluated almost every major commercial product available, responses remained frustratingly inconsistent, when these products were used in the field.

This conversation stayed with me because I have heard similar observations before, including during my recent visit to VIV Europe 2026.

Perhaps, the problem is not that probiotics do not work. Perhaps, the problem is that we are measuring them the wrong way. Probiotics are biological tools operating inside biological systems. And, biological systems are inherently variable. Let me explain…

Probiotics are biological systems
Unlike synthetic additives, probiotics consist of living organisms. Even products from the same supplier and manufactured to the same specification will naturally exhibit some degree of biological variation.

Absolute consistency should not be expected from living systems. Expecting otherwise is defying nature.

Birds are never identical
Commercial poultry genetics are highly uniform compared with other livestock species. Yet even birds from the same breeder flock are not completely identical. Differences in hatch quality, immune status, early feed intake, and growth potential already create variability before probiotics even enter the discussion. Not all eggs are the same size, so how do we expect all chicks to be identical?

Similar farms are never truly the same
Two houses may appear identical on paper or sitting on the ground next to each other. In reality, differences in temperature, humidity, litter quality, ventilation, water systems, and especially management practices create unique micro-environments. Small environmental differences often translate into different biological responses.

Feed ingredients never remain constant
Nutrition programs and formulas may remain unchanged, but ingredients do not. Cereal quality changes.

Protein sources quality changes. Particle size changes. Oil quality changes. And nutrient digestibility changes. Not to mention the variability introduced during weighing, mixing, pelleting, and feed delivery from the moment a formula leaves the paper until feed reaches the bird's pan. The bird experiences these differences even when the formulation software says the feed is identical.

Health status constantly changes

No two flocks face exactly the same microbial pressure. Vaccination responses differ. Pathogen challenges differ. Immune activation differs. And, of course, all the above-mentioned factors interact with the bird's response. Because probiotics interact directly with the intestinal ecosystem, differences in health status inevitably influence their response.

Perhaps variability control is the correct metric

Most probiotic evaluations focus on improvements in body weight or feed conversion within a single flock. But, perhaps the greater value of probiotics lies elsewhere - and this remains to be proven.

Maybe the real question is whether probiotics help reduce variability between flocks, houses, seasons, and production cycles. In other words, perhaps their greatest value is not maximizing peak performance, but improving consistency across poultry systems.

In brief, large poultry systems are already highly optimized. In such systems, expecting dramatic performance improvements from any single additive may be unrealistic.

But, reducing variation across multiple flocks over an entire year can create substantial economic value. Perhaps, probiotics should be evaluated not by how much they improve the best flock, but by how much they protect the average flock.

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