How targeted enzyme application can lower poultry feed costs

Taking a targeted enzyme application approach with broiler diets can bring financial benefits without compromising growth or yield.

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Poultry producers could reduce feed costs and reduce flock phosphorous and nitrogen excretion though a better understanding of the phytate and non-starch polysaccharide (NSP) composition of the diets, and practicing targeted enzyme application.

Characterizing the diet's substrate, its phytate and fiber composition, and building on the benefits of "superdosing", the practice of using high- or "super-doses" phytase to target phytate (IP6) destruction, the maximum matrix that can be achieved with the inclusion of phytase combined with xylanase has been determined to give near complete conversion of IP6 to inositol in the bird.

Matching the dose of a phytase/xylanase combination to the diet's phytate and NSP composition can result in more consistent recovery of what would appear to be extreme matrices by current standards, however, studies have shown that this approach can lead to feed cost savings without compromising broiler growth or yield.

Additionally, the financial benefits achievable with such large matrices are proportional with the nutrient contribution applied with current enzyme applications and diet phytate and fiber content.

Phytate

Phytates, and the lower phytate esters – by-products of phytate degradation by phytase – have both direct and indirect negative effects on mineral, protein and amino acid, and energy utilization by the bird. However, through the use of appropriate doses of phytase, phytate and its lower esters are rapidly degraded to inositol in a broiler's gizzard and stomach.

This effect has been associated with significant improvements in feed efficiency, through an improvement in mineral and amino acid utilization and energy sparing and the provision of inositol.

Fiber

In addition to phytate, fiber is a major component of poultry diets. Xylanase enzymes aid in the degradation of soluble and insoluble fiber by creating smaller and more fermentable fiber fractions.

These smaller fractions can be fermented in the intestinal microbiome to produce volatile fatty acids and result in the evolution of a microbial population better suited for fiber fermentation.

Furthermore, xylanase enzymes have been shown to increase retention time and promote cell wall destruction through the mechanical action of the stomach or gizzard. The overall effect of xylanase enzymes is improved nutrient digestion, increased energy digestibility and an overall improvement in gut physiology.

Precision combination

Risks can be mitigated in a precision enzyme combination strategy through the use of 90 percent confidence limits and significant safety margins around matrix recommendations, the use of

performance trials, and understand the phytate and fire concentration of ingredients. The latter is made possible with real-time ingredient analysis using near-infrared spectroscopy technology.

Knowing and understanding the concentration and variability of phytate and fiber of ingredients in final broiler diet has a direct impact on the level of nutrients that can be spared.

The financial benefits achievable with a precisely-calibrated combination of an appropriate phytase and xylanase exceed those obtained with simply superdosing phytase, while at the same time the excretion of phosphorous and nitrogen is reduced.

SIDEBAR

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How NIR poultry feed ingredient analysis increases output

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