

DESTROY PHYTATE TO INCREASE BROILER PRODUCTION PROFITABILITY

How can broiler producers increase profitability while maintaining quality?

Phytase is commonly used in animal feed to improve phosphorus availability from phytate. However, the efficacy of phytase is dependent on its ability to rapidly and thoroughly degrade phytate in the stomach and upper part of the digestive tract. This has the effect of eliminating more anti-nutritional effects of phytate, and releasing phosphorus and other phytate bound nutrients. An efficacious phytase can improve digestibility of amino acids, energy and minerals, the main drivers for improved growth performance and feed efficiency in broilers.

Many broiler producers use a phytase dose of 500 FTU/kg. However, research shows that this only partially degrades phytate in the gastrointestinal tract (GIT) of animals. Using a higher dose, and a highly effective phytase, will degrade phytate more thoroughly in the upper part of the GIT, resulting in extra phosphoric effects and improved performance.

Academics and practitioners agree that *Buttiauxella* phytase has the highest activity at pH 3.0, showing high efficacy in degrading phytate. Studies have demonstrated that using *Buttiauxella* phytase at 1000 to 2000 FTU/kg can improve feed intake and bodyweight gain, as well as feed and energy efficiency, leading to higher economic benefits.

Phytase mode of action: Phytate degradation rate

A phytase dose of 500 FTU/kg only degrades 30-50% of the phytate (Dersjant-Li *et al.*, 2015), depending on the type of phytase and the dietary phytate sources (Selle, 2012). Thus using higher doses of a



Yueming Dersjant-Li
Senior Scientist

Danisco Animal Nutrition
info@animalnutrition.dupont.com

different commercial phytase products varied significantly at pH 3.0 which represents the pH of the early digestive tract, from 12 to 235%, a 20 fold difference in activity. *Buttiauxella* phytase showed the highest activity, 235% of its activity at pH 5.5. This superior activity translates directly into high IP6 degradation rates when using both phytic acid or phytic acid-soy protein complex as substrates (Yu *et al.*, 2014).

Extra-phosphoric effects in broilers

A recent study in broilers showed that *Buttiauxella* phytase used at 500 and 1000 FTU/kg degraded 53.8% and 75.2% of the dietary phytate, (Fig 1).

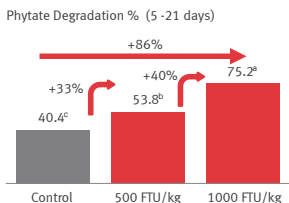


Fig 1. Effect of increasing *Buttiauxella* phytase dose on apparent ileal digestibility

Improved phytate degradation is also correlated to ileal amino acid digestibility (Fig 2). Increasing phytate degradation and ileal amino acid digestibility with *Buttiauxella* phytase reduces feed conversion rates

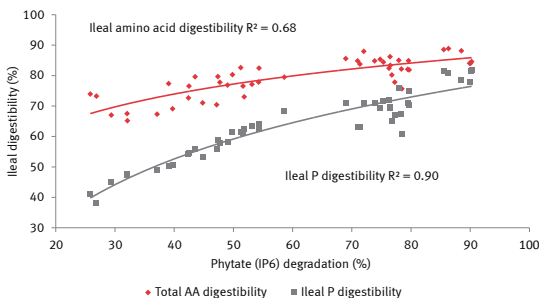


Fig 2. Correlation between phytate degradation and ileal digestibility (AID) of phosphorus and amino acids.

more efficient phytase that is highly active at low pH, will enable thorough degradation of phytate and reduce anti-nutritional effects.

Not all phytases have the same *in vivo* activity. Standard phytase activity is determined at pH 5.5. Menezes- Blackburn *et al.* (2015) reported that the activities of

by up to 12% and improves average bodyweight gain by up to 20%. Based on typical diets today, the economic benefits of increased dosing are compelling, and can lead to a 25 to 45% of additional feed cost savings above the 500 FTU/kg dose.

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