



Axtra[®] PHY

THE COMPLETE PHYTATE SOLUTION

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The complete phytate solution

Lower feed costs

- Increased nutrient and energy availability
- Reduced inorganic phosphate use
- Greater flexibility in ingredient use

Confidence in use

- Reliable matrix values
- Proven superior bioefficacy versus other phytases
- Online Optimize Feed[™] tool and FASTKit[™] in feed assay
- Heat stability ideal for feed pelleting

What is Axtra[®] PHY?

Axtra[®] PHY is a patented new, unique bacterial phytase developed by Danisco Animal Nutrition. Axtra[®] PHY is sourced from a *Buttiauxella* species bacterium and is expressed in a *Trichoderma reesei* fungus.

What is phytate?

Phytate, also known as phytic acid and inositol hexaphosphate (IP6), is the main natural store of phosphorus contained in variable amounts in plants. Phosphorus is an essential mineral but when bound in dietary phytate is inaccessible to monogastric animals as they lack the digestive enzyme phytase.

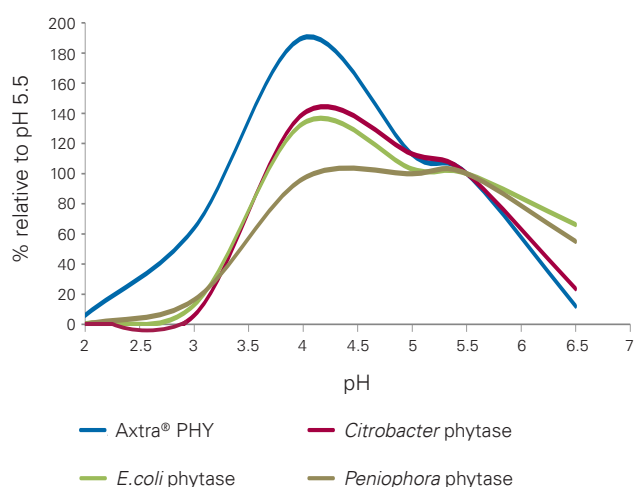
Why is phytate a problem?

Phytate is both a potential phosphorus source and an 'anti-nutrient' because of its ability to bind to essential nutrients needed by the animal. In the upper digestive system, at low pH, phytate binds to proteins and amino acids. Further down the digestive system, at higher pH levels, phytate binds to minerals such as calcium and trace elements.

Phytate interferes with digestion and stimulates the animal to increase its production of digestive secretions which is an energy and nutrient consuming process. The net result is a reduction in animal performance.

Furthermore, unabsorbed phytate phosphorus is excreted by the animal, creating a major problem for the environment.

Phytase activity at varying pH - Axtra[®] PHY versus competitors



How does phytase help?

Phytase enzymes cleave phosphorus and the associated bound nutrients from the phytate molecule reducing its anti-nutrient effects. It is very important for phytase to start working rapidly at low pH levels which are found in the upper digestive system, e.g. pig's stomach and poultry gizzard. This minimizes the anti-nutrient effects of phytate throughout the digestive system and maximizes the time available for the animal to absorb the released nutrients.

Axtra[®] PHY has an exceptionally high relative activity at low pH levels compared to *E. coli* phytases. It also has enhanced resistance to pepsin produced by the animal. This means it works very quickly in the upper digestive tract to both release phosphorus and overcome phytate's anti-nutrient effects.



Axtra® PHY benefits

Axtra® PHY rapidly degrades phytate, releasing more nutrients such as phosphorus, energy and amino acids compared to competitor phytase products. This offers many benefits in animal production.

Axtra® PHY is more bio-efficacious than *E. coli* and other commercially available phytases. The net result is ~20% improvement in the release of phosphorus and calcium and up to 30% improvement (species dependent) in energy and amino acids at standard phytase inclusion levels.

Feed cost savings

- Further reductions in dietary inorganic phosphate, energy and amino acids compared to *E. coli* phytases
 - ◆ Faster and superior breakdown of dietary phytate
 - ◆ Greater phosphorus release
 - ◆ Increased nutrient availability from phytate

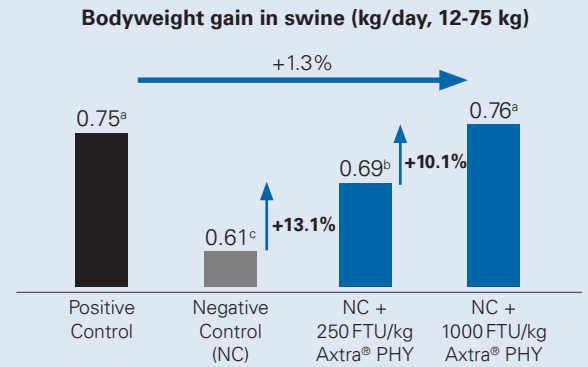
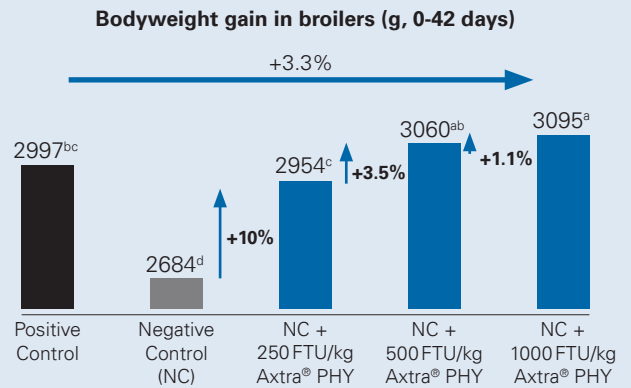
Production benefit

- Bodyweight gain and FCR benefits
 - ◆ Faster removal of phytate anti-nutrient effects at low pH
 - ◆ Release of nutrients from phytate improves energy and amino acid availability

Confidence in use

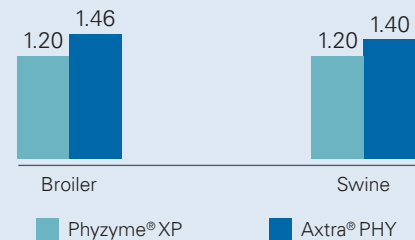
- Superior thermostability
 - ◆ Phytase protected by unique Thermo Protection Technology (TPT) coating
 - ◆ Excellent Axtra® PHY TPT recovery from feed pelleted up to 95°C/203°F
- Animal trials conducted at independent external sites
- Reliable matrix values
 - ◆ Obtained from animal digestibility responses
 - ◆ Nutrient contribution generated from ~300 data points for poultry and ~500 data points for swine
- FASTKit™ assay
 - ◆ Quickly and specifically detects **active** Axtra® PHY in feed

Increased Axtra® PHY inclusion improves performance

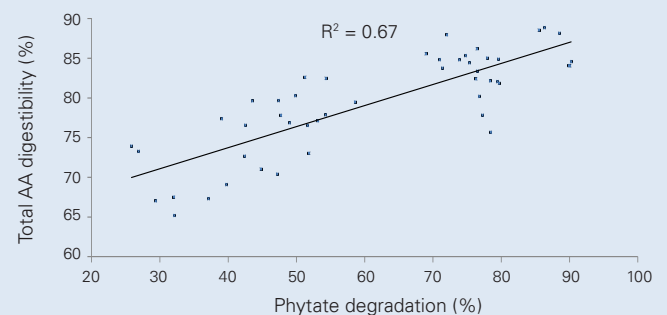


^{a-d} Values without a common superscript are significantly different (P<0.05) Where NC is reduced in phosphorus and calcium

Axtra® PHY is more bio-efficacious in liberating available phosphorus (g/kg feed) compared to *E. coli* phytase at 500 FTU/kg feed



Increased phytate degradation with Axtra® PHY improves total amino acid (AA) digestibility in broilers



Supporting services for Axtra® PHY

- The easy-to-use DuPont Optimize Feed™ Service website for cost effective dosing of Axtra® PHY. Provides accurate and specific matrices for your diets.
- Fully quantitative traditional laboratory assay for phytase.
- Easy-to-use, semi quantitative FASTKit™ assay: quickly and specifically detects the presence of **active** Axtra® PHY in the feed.
- Applications expertise of our technical and business support teams.

References:

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8. Amerah, A.M., Kumar, A., Plumstead, P.W. (2012). Effect of calcium level and phytase addition on phytate degradation and nutrient digestibility of broilers fed corn-based diets. Proceedings of the Worlds Poultry Congress, Salvador, Brazil. August 2012.

Product form and application

Axtra® PHY is a phytase feed enzyme specifically developed to increase the digestibility of phytin-bound phosphorus, calcium, energy and amino acids in animal diets.

Axtra® PHY TPT

Thermostable up to 95°C/203°F during pelleting. An off-white to light tan, fine granular product. Packed in 25 kg multi-wall polyethylene lined paper bags or 1000 kg bulk (tote) bags.

Recommended inclusion rate: 250-2000 FTU/kg of finished feed, included either directly or via a premix.

Axtra® PHY Liquid

A brown liquid. Packed in 200 kg and 1000 kg containers.

Recommended inclusion rate: 250-2000 FTU/kg of finished feed. Must apply post pelleting.

Contact your Danisco Animal Nutrition representative or distributor for recommendations about your specific application needs.

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