



THE COMPLETE PHYTATE SOLUTION

Aextra® PHY starts working high up in the digestive tract to release even more phytate-bound nutrients from your diets for improved performance and profit.

- Optimize your feed cost savings
- Faster, more effective anti-nutrient breakdown
- Further reduces the need for inorganic phosphorus
- Reduces risk with reliable matrix values and services

Contact our authorized distributor Chemuniqué International (Pty) Ltd,
tel +27 11 789 2414, email nutri@chemuniqué.co.za

Aextra® PHY

Selecting the Best Phytase for your Feed Formulation

Five characteristics to consider for achieving optimal levels of performance and profitability

A better understanding of the phytate molecule in recent years has led to the realisation that novel phytases have benefits beyond phosphorus release. Phytases have been shown to reduce the anti-nutrient effects of phytate in animal diets by degrading it, thereby, increasing the availability of energy and amino acids. The ability of phytate to complex with protein, calcium and trace elements in the digestive tract decreases the value of dietary formulations. At acidic pH levels in the upper part of the digestive tract, phytate will bind to proteins and form complexes. These protein-phytate complexes are not a

suitable substrate for endogenous proteases.

The type of phytase to choose depends on the degree of cost saving you want to make from improving nutrient uptake. Research has shown significant differences between phytases in bio-efficacy, both in terms of improving digestibility and reducing the anti-nutrient effects of phytate in animal diets. Five factors are presented that may be considered to achieve stronger levels of performance and profitability from phytase, as follows:

1. High activity at low pH

Phytases have individual pH optima. In order to improve P uptake and reduce the anti-nutrient effects of phytate a phytase needs to be highly active at low pH conditions. **Figure 1** highlights the difference between the *E. Coli* phytases and a new *Buttiauxella* phytase in this regard.

2. High affinity for IP6 phytate

Phytate consists of an inositol ring with six P groups (IP6). Studies have shown that the anti-nutritive effect from phytate is considerably reduced as soon as phytase removes one P group from the IP6 ring. Consequently a phytase that rapidly cleaves a P group from an IP6 molecule and then preferentially moves on to another IP6 molecule will be very powerful in terms of reducing the anti-nutrient effects of phytate as well as making P more available to the animal.

3. Speed of release

The speed at which the phytase cleaves a P group from from the IP6 ring will also determine the bio-efficacy of the phytase in the animal. The faster the phytase goes to work the more the anti-nutritive effect of the phytate can be reduced, and hence more nutrients are released for the animal to absorb from the digestive tract.

4. High thermostability up to 95°C

Significant loss of phytase activity during production of feed is a limiting factor in phytase use. Coating to protect the enzyme increases heat stability. A good coating needs to protect the enzyme during processing, but also needs to release the enzyme quickly in upper part of the gut.

5. In vivo scientific proof

Costly animal validation trials are a necessity to establish reliable matrix values for a phytase. The amount of data behind a phytase will determine how confident you can be in applying the matrix values in a feed formulation.

FIGURE 1: Relative activity of *Buttiauxella* phytase versus other phytases at varying pH

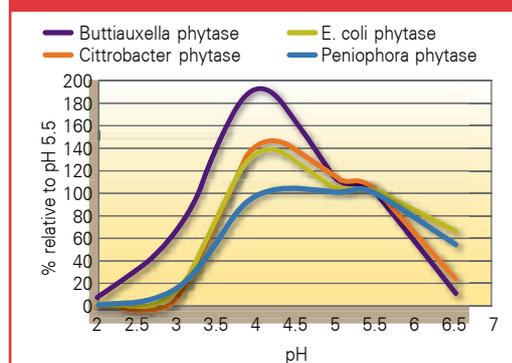


Figure 1: The difference between *E. Coli* phytases and a new *Buttiauxella* phytase in terms of activity at low pH. The *Buttiauxella* phytase shows a clear advantage.

FIGURE 2: *E.coli* phytase versus *Buttiauxella* phytase

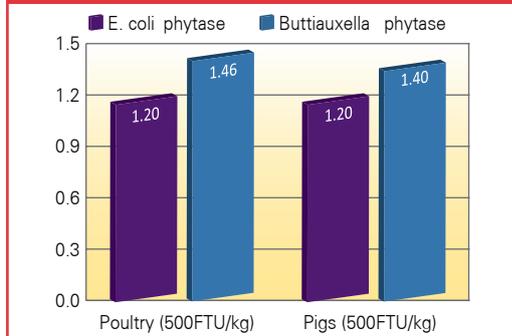


Figure 2: *E.Coli* vs. phytase in terms of the relative available phosphorus release (g/kg feed) from a 500 FTU/kg feed addition.