In the phytase market today, there are several criteria (origin, ideal pH, attacked group, units, etc.) that attempt to differentiate existing products, but not all such criteria are fully valid. This is of particular importance when we try to differentiate phytase products in terms of efficacy in releasing phosphorus for production purposes under commercial conditions.

One of the most common characteristics that ‘distinguishes’ the numerous commercial phytase products is the classification as a 3- or a 6-phytase. Yet, little attention has been paid into explaining the validity of these numbers or to what these numbers actually mean or where they come from. A 3-phytase is simply a phytase that initiates the dephosphorylation of phytic acid at position 3’ on the inositol ring (see diagram). In analogy, a 6-phytase initiates the dephosphorylation at position 6’. Based on this trait, the International Committee of Biochemical Nomenclature has classified phytases in two groups: group-3 and group-6. Current commercially available 3-phytase products originate from Aspergillus niger, whereas commercial products belonging to the 6-phytase group are currently derived from Escherichia coli or Peniophora lycii.

These two distinct classes of enzymes hydrolyze phytic acid in a stepwise manner, yielding products that in turn become substrates for further hydrolysis until phosphorus is released. A 3-phytase may not always completely dephosphorylate a phytic acid molecule, whereas under perfect laboratory conditions (e.g. pH, temperature, purity, time,...) with the presence of phytic acid and a phytase only a 6-phytase can dephosphorylate it completely. But there is disagreement around and this is just the theory under perfect laboratory conditions.

Under commercial conditions, results have not been so clear-cut when comparing the two types of phytase. Numerous scientific reports have shown that this group characterization does not represent any meaningful difference in terms of efficacy in releasing phosphorus. As such, for all practical purposes, there is no real value in differentiating a commercial phytase product based on its classification as belonging to group-3 or group-6. After all, this is a biochemical classification based on mode of action, not on efficacy. When it comes to feeding pigs and poultry, there are more relevant factors that can differentiate the commercial performance of two phytase products, other than their 3- or 6-phytase classification.