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**Improvement of Phytase Properties by Rational Design
Intended for Animal Feed**

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For application in animal feed, a phytase of interest must have high activity in the broad range prevalent industrial condition and in digestive tract of the animal. The present investigation describes approaches to rationally engineer a phytase with better activity profiles. Computer modelling is used to identify and examine active site of phyFAUIA1 phytase. The factors influencing the ligand binding strength in the active site is analyzed and computational site directed mutagenesis experiments were carried out to evaluate the effects of mutations on the binding strength before and after mutation. From the directive results of computational studies, point mutation was introduced by site directed mutagenesis using polymerase chain reaction (PCR). Mutagenesis is achieved by two steps PCR procedure. Four primers were designed and synthesized: two primers contain mutation at the point of interest which is complement to each other and the other two primers were designed for unique restriction sites. Several numbers of single, double as well as triple mutations have been introduced in phyFAUIA1 gene, and the mutant enzymes will be characterized and compared to computational results.