

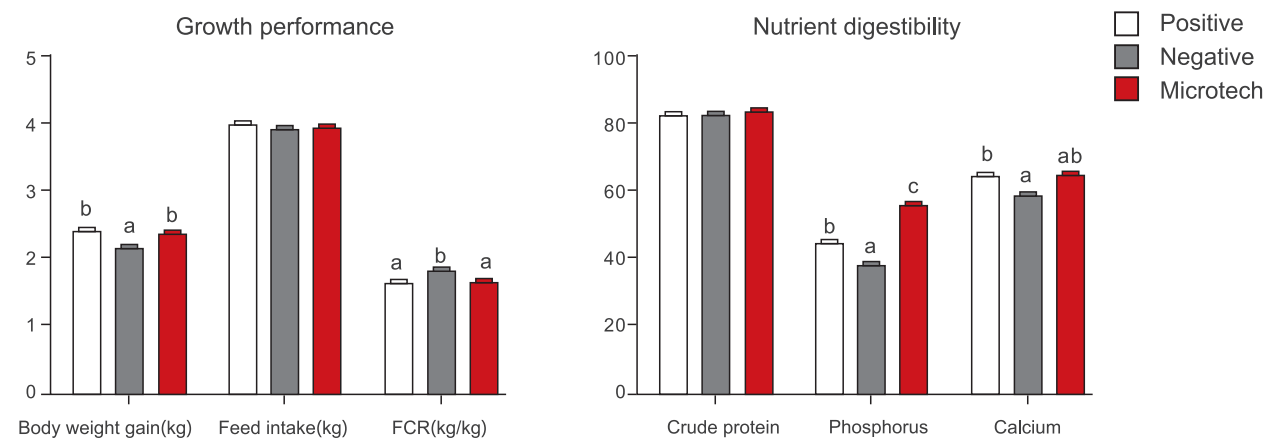
04 Microtech 5000/10000



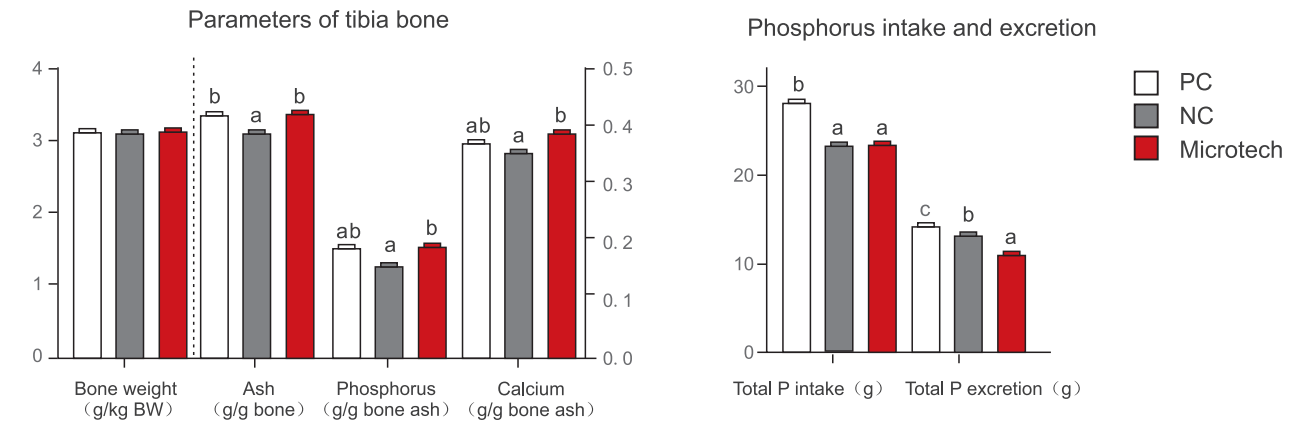
■ Uniformity distribution

Enzyme and carriers are mixed and spray dried to be mini-granular product by special dosage preparation technology to make sure its mobility and stability.

Application effects on Broilers



Six hundred broilers (1 days of age) were randomly assigned to positive control (PC, corn-soybean based meal); negative control (NC, reducing 0.1% available phosphorus from corn-soybean based meal); and Treatment (Microtech, negative control diet with 100g/t Microtech 5000), respectively. After 42 days feeding trail, the results showed that the weight gain and FCR had no different between PC and Microtech. The phosphorus digestibility was significantly increased ($P < 0.05$) by Microtech 5000. Our results indicated that Microtech 5000 could maintain broilers growth performance and nutrient digestibility even decreasing the dietary 0.1% of available P.



Compared with the NC group, Microtech 5000 significantly increased ($P < 0.05$) the tibial ash, calcium and phosphorus (P) contents. Broilers in PC group consumed higher ($P < 0.05$) amount of P than other two groups, and the P excretion was higher ($P < 0.05$) than NC and Microtech groups. The Microtech 5000 significantly decreased ($P < 0.05$) 26.67% of P excretion. These results suggested that Microtech 5000 excellent improved the P utilization efficiency.

Product classification

- Microtech 5000 enzyme activity $\geq 5000\text{U/g}$
- Microtech 10000 enzyme activity $\geq 10000\text{U/g}$
- The product packaging is 20kg/barrel or 25 kg/bag

Dosage Recommendation

Product	Normal	Excess
Microtech 5000	100g/t	100-500g/t
Microtech 10000	50g/t	50-250g/t

Note:

- Storage: keep in seal; store in dark, dry and cool place.
- Shelf life is 12 months.

Notice:

- Do not direct contact with skin.
- Do not mix, transport and storage with poisonous and harmful materials.
- Mixed uniformity



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Microtech 5000/10000



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Introduction of Microtech 5000/10000

The commercial application of phytase as feed additive was confirmed and accepted in animal feed industry. It was used to increase the efficiency of phosphorus in plant feed, decrease the environmental pollution, and reduce the anti-nutritional effects of phytic acid and its chelate. The Microtech 5000/10000 is the high-tech product which designed through bioinformatics, DNA shuffling, high-throughput screening, liquid fermentation and dosage preparation technologies.

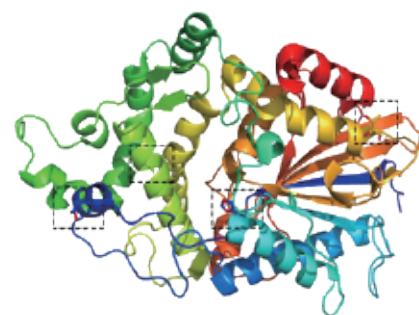
The high temperature resistant performance, acid resistance performance and pH adaptability were greatly improved in Microtech 5000/10000. In the feed industry, the bioavailability of phytate phosphorus was greatly increased by its excellent and stable catalysis.

Definition of phytase activity

One unit of phytase activity is defined as the amount of enzyme that releases 1 μmol phosphorus per minute from sodium phytate at 37°C and pH 5.5.

Research and development Random mutation and selection

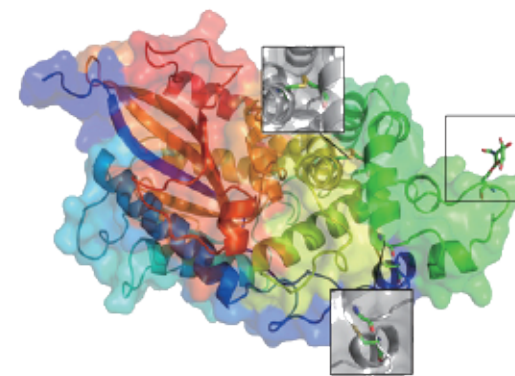
Heat-stable phytase mutant libraries was established through error prone PCR (EP-PCR), direct evolution and DNA shuffling. Heat resistance mutant was selected by high throughput screening.



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Reasonable design

On gene level, the 3D structure of heat-stable phytase was modeled by the software of Discovery Studio, Gromacs and Pymol. The potential active and high temperature resistance center were analyzed and predicted by molecular dynamics. After confirmed the mutagenized genes and the modified amino acid sequences by protein domain structures analysis, molecules in weak intermolecular interactions and unstable areas were replaced by heat-stable mutations. The phytase optimization was maintained through the enhanced compactness of external surface and the stability of spatial structure on protein level. Trough high temperature resistance screening test and high throughput screening, highly catalysis phytase at high-temperature environment was obtained.



Characteristics

Heat-stability test

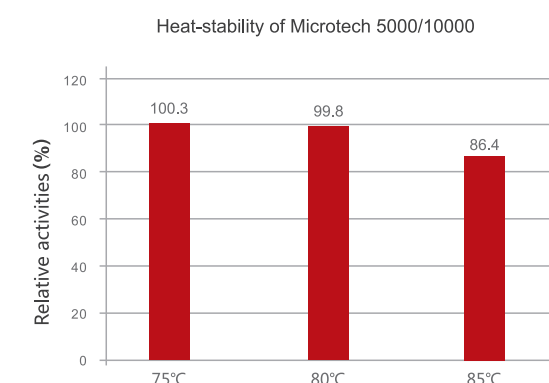
Depending on the excellent heat-stability performance and advanced dosage forms of the 4th generation phytase, there was no loss of Microtech 5000/10000 relative activity after 5min water bath at 75°C-80°C. The enzyme relative activity was more than 85% even in 85°C of water bath for 5min.

Heat-stability after pelleting

After feed conditioning and pelleting, the Microtech 5000/10000 enzyme activity retention rate were maintained between 82% to 98%.

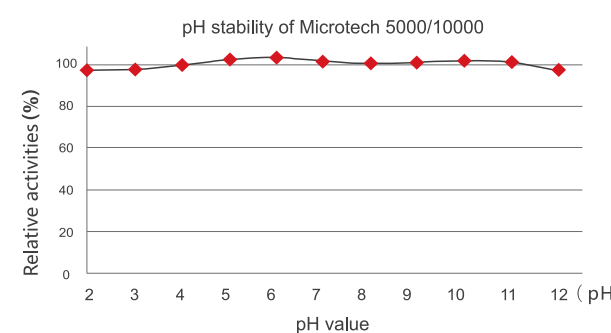
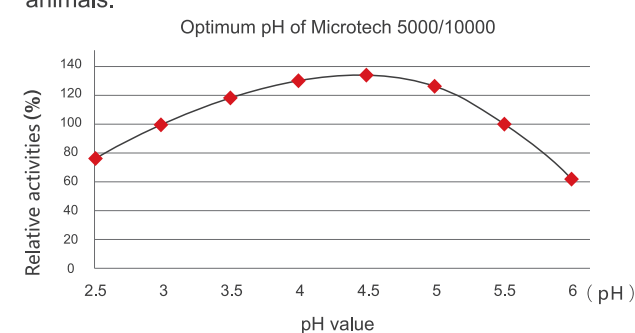
Wide range of pH adaptability and stability

The Microtech 5000/10000 has wide range of pH adaptability from pH 2 to 12, and insure its enzymolysis in monogastric animals.



Note: The phytase activity is defined with National standard method of China which detected enzyme activity after 5 min of water bath at 75°C, 80°C and 85°C, respectively.

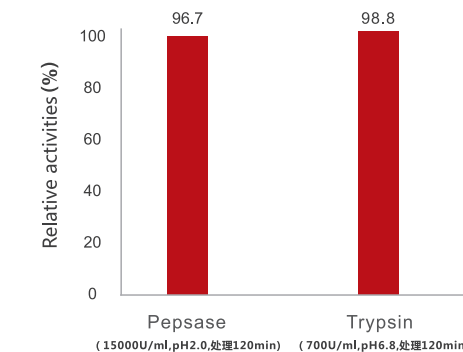
The optimum pH for reaction is pH 3 to 5.5.



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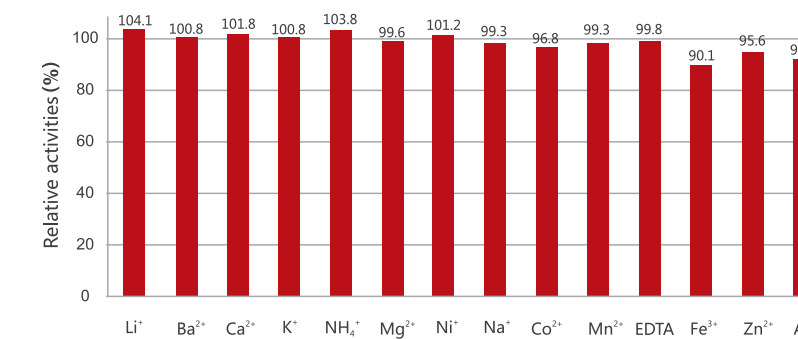
The tolerance to protease and metal ion

Resistance of Microtech 5000/10000 to different protease



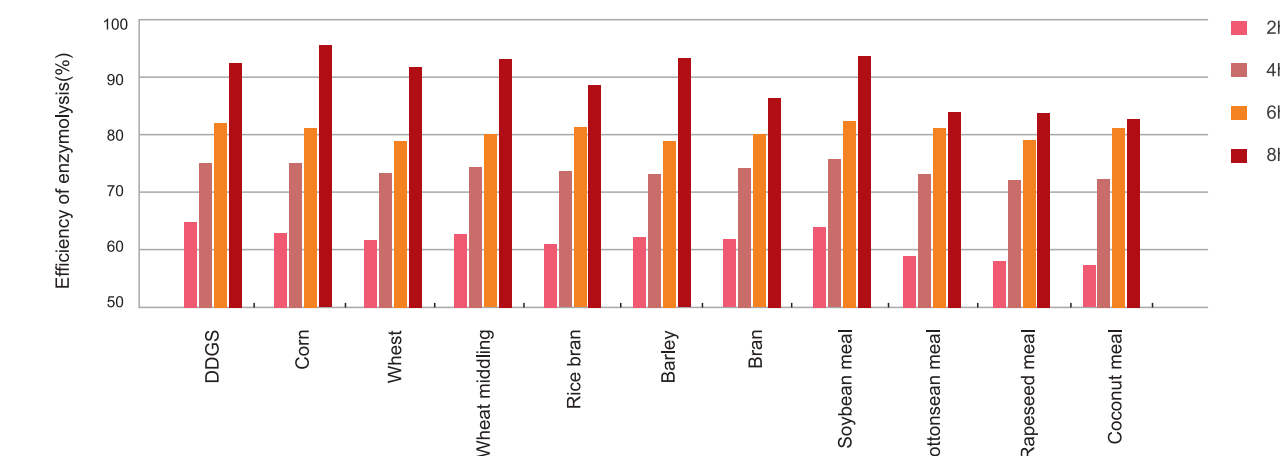
The enzyme retention rate were 96.7% and 98.8% when Microtech 5000/10000 were treated with pepsase and trypsin for 120 min, respectively. Highly anti-protease ability was shown in the tolerance test.

Effect of metal ion on activity of Microtech 5000/10000



Microtech 5000/10000 showed high tolerance to 14 kinds of metal ion solutions.

High enzymolysis efficiency to different substrate



The efficiency of phytate phosphorus which released from DDGS, corn, wheat and soybean meal were up to 70% when treating with Microtech 5000/10000 for 4 hours at 37°C and pH 5.5.

