

## Product Description

Phytase 5000 is a highly concentrated special enzyme in powder form for the treatment of raw materials containing phytic acid, for instance, in baking industry, in breweries and distilleries. Phytase 5000 is tested by specialized laboratories for purity and quality. When employed in breweries and distilleries the laws and regulations currently in force in the respective countries have to be adhered to.

## Aim of Treatment

Phytase 5000 is employed in food industry in all kinds of processes in which raw material containing phytic acid (wheat, barley, rye, rice, corn or soybean) is processed, as for instance in baking industry, breweries and distilleries. Depending on the respective case of application the employment of Phytase 5000 provides the following advantages:

### Baking industry:

- Saving of time in sour dough preparation by promoting the metabolic activity of the micro-organisms by releasing the organically bound phosphate groups in phytic acid.
- Promotion of yeast activity by provision of the metabolically effective myo-inositol.
- Improvement of the nutritional value of bakery products by releasing minerals valuable for health, bound in complexes (calcium, magnesium) and trace elements (iron, selenium, zinc).
- Increase of enzyme activities relevant for baking (amylases, proteases etc.) by abolishing the enzyme inhibiting effect of phytic acid.
- Improvement of baking properties of corn, rice and soybean.

### Brewery and distillery

- Increase of technically relevant enzyme activities (amylases, glucanases, proteases etc.) by abolishing the enzyme inhibiting effect of phytic acid in malting barley and other starch containing raw fruits (wheat, rye, rice, corn).
- Increase of the effect of thermostable bacterial amylases by release of calcium.
- Increase of fermentation capacity of brewery and distillery yeast by provision of yeast-utilizable phosphate and myo-inositol from phytic acid at the same time, as well as by liberation of metabolically active trace elements as for instance iron, selenium and zinc.
- Improved utilization of the raw fruits rice and corn.

## Product and Effect

Phytase 5000 performs a gradual cleavage of all phosphate groups in phytic acid, from IP6 over IP5, IP4, IP3, IP2, IP1 to finally the free myo-inositol. The phytase is particularly active in the temperature range between 35°C and 65°C, with an optimum at 50°C. The best temperature stability of the enzyme is at temperatures of up to 40°C. The pH-activity covers a broad range between pH 1.5 and pH 6.5, with an optimum at pH 5.5. The highest pH-stability is between pH 3 and pH 6. Phytase 5000 tolerates up to 12% alcohol by vol. Important and valuable side activities support the saccharification of starch and advance the aroma formation in bakery products, respectively enhance the aromas in distillates.

## Dosage

The following standard dosages are recommended:

- 50-150 g Phytase 5000/ton flour in dough making processes in baking industry
- 30- 50 g Phytase 5000/ton raw fruit (wheat, rye, rice, corn) in starch digestion in distilleries and breweries
- 20- 30 g Phytase 5000/ton raw fruit (wheat, rye, rice, corn) during alcoholic fermentation in distilleries and breweries

In case of a deviation from standard conditions a higher or lower dosage might be required.

**Highly  
concentrated  
special powder  
enzyme for  
splitting off  
organically  
bound phosphate  
groups in phytic  
acid**

## Application

### Baking industry:

When Phytase 5000 is added as dry powder to baking preparations/mixes the enzyme powder is well mixed in the preparation. In case of an addition to dough, liquid mashes and extracts the enzyme powder is mixed with a small amount of water and this paste is then further dissolved by adding a little more water, subsequently it is added to the product and stirred in. Please take care of an even distribution. In the dough making process Phytase 5000 is active at temperatures between 25°C and 35°C, depending on the respective case of application (sour dough) up to 24 hours.

### Brewery and distillery:

Phytase 5000 is employed for starch digestion in all methods in which a liquefaction or saccharification is carried through at temperatures between 50°C and 60°C. Here the pH-value of the distilling mash can be in the high pH-range around pH 6 of the activity of the bacterial enzymes as well as in the low pH-range around 4 of the activity of fungal enzymes. In case of starch digestion reaction times of 0.5 to 2 hours are usually kept, in case of fermentation Phytase 5000 is active during the entire fermentation process of usually 72 hours.

## Storage

Phytase 5000 keeps its declared activity up to 36 months if stored optimally (0-10°C). Higher storage temperatures result in a shorter shelf life. Temperatures above 25°C are to be avoided. Reseal open packagings tightly and use up as soon as possible.

## General Characteristics

Enzyme characteristics: the activity range of Phytase 5000 is between pH 2.0 and 6.0, the optimum is at pH 5.0. The temperature range of the enzyme is between 25°C and 65°C, the temperature optimum is at 50°C. The diagrammes 1 and 2 show the influence of temperature and pH-value on the enzyme activity of Phytase 5000.

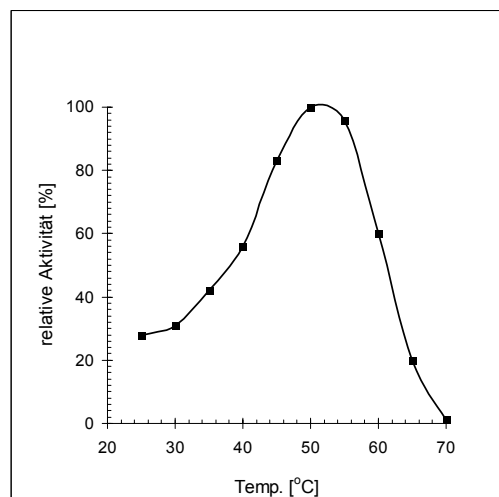


Fig 1: Influence of temperature on activity (phytic acid solution, pH 5.0).

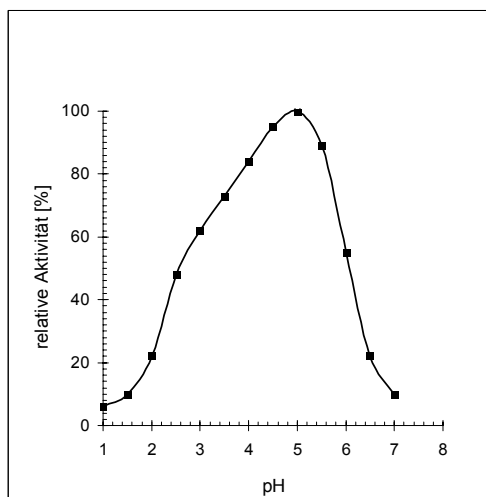


Fig 2: Influence of pH-value on activity (phytic acid solution, 50 °C).