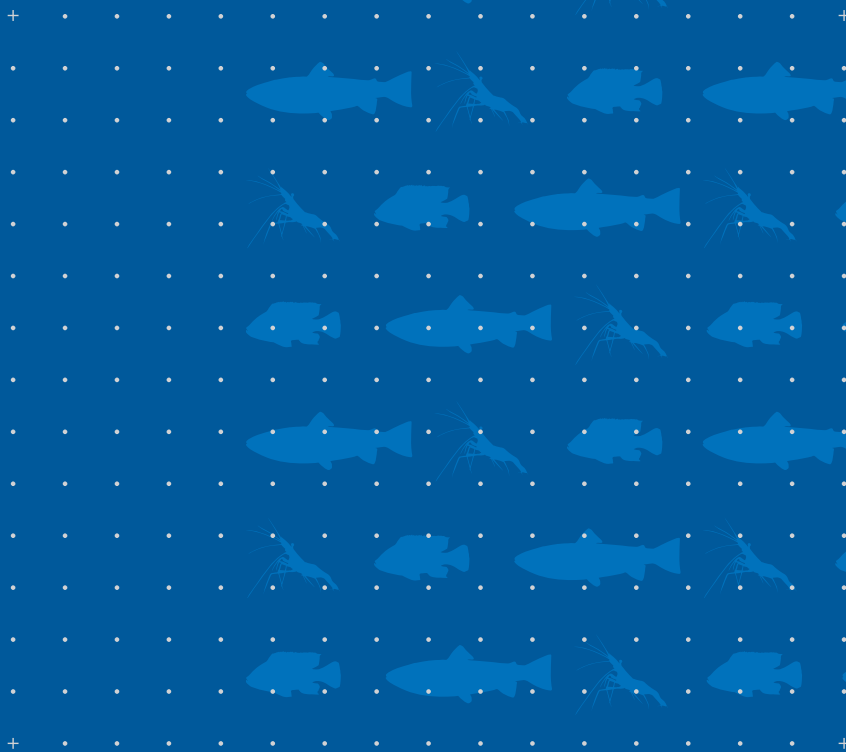


RONOZYME[®] P

Adding value to aquaculture feeds

a **DSM** Product



novozymes[®] 

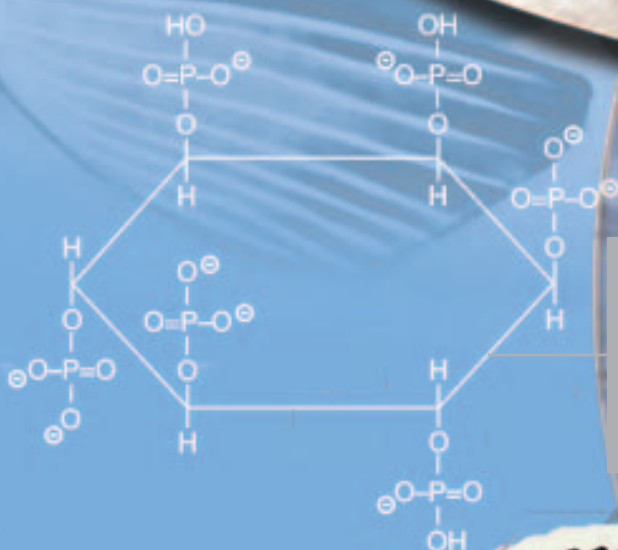
DSM Nutritional Products

Unlimited. **DSM**

RONOZYME® P

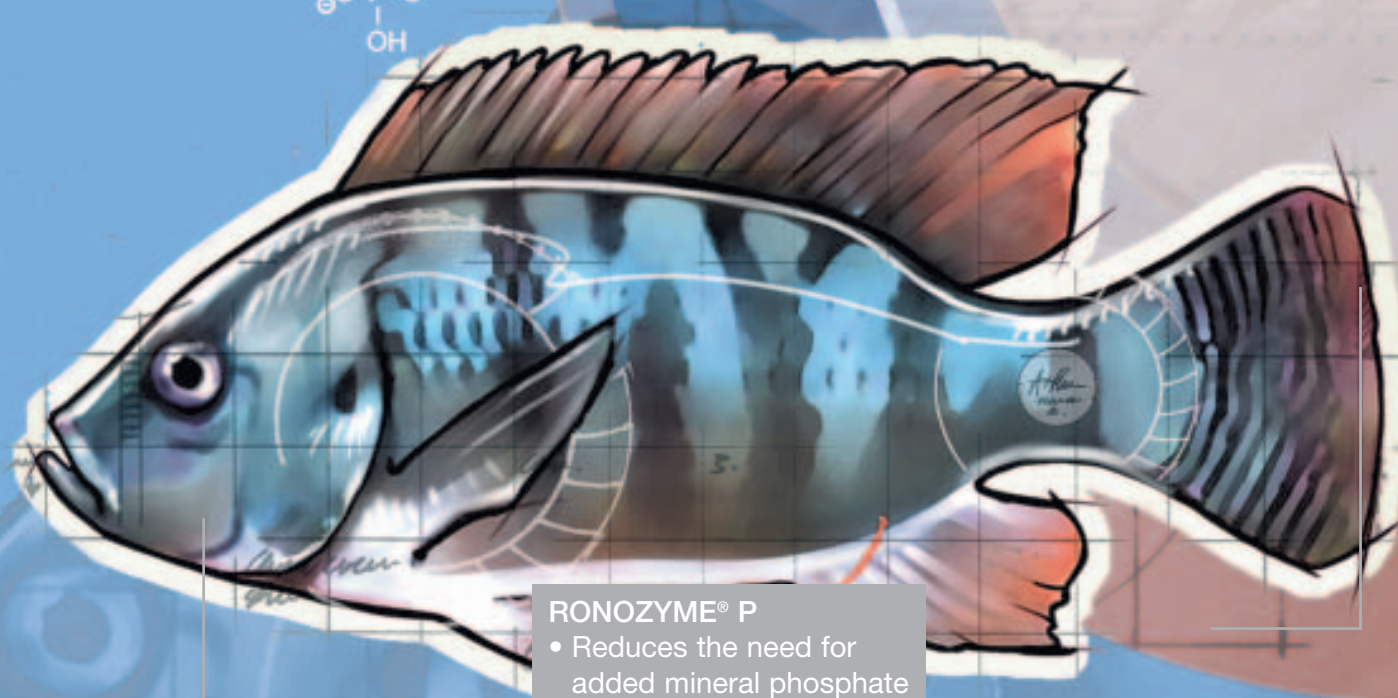
RONOZYME® P

- Heat-stable dietary phytase supplement
- Releases available phosphorus from phytic acid in feed ingredients of plant origin



Phytic acid

- A bound form of phosphorus found in feed ingredients of plant origin
- Considered to be an Anti-Nutritional Factor (ANF)



RONOZYME® P

- Reduces the need for added mineral phosphate in the diet
- Improves the utilisation of dietary proteins, amino acids, energy and trace minerals (cations)

Problems

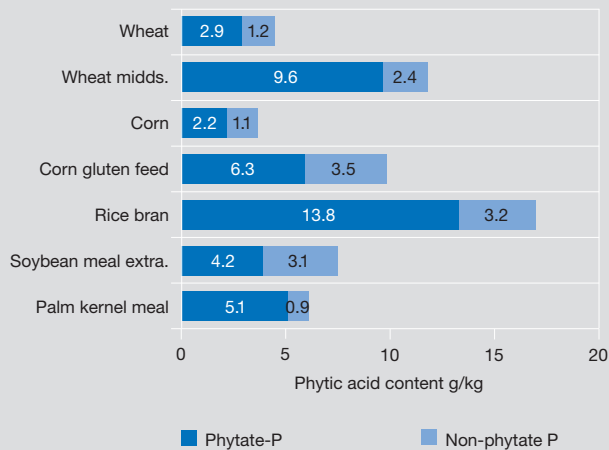
- Phytic acid phosphorus is indigestible by fish
- Phytic acid also binds amino acids and other minerals, reducing their digestibility
- Mineral phosphorus must be supplemented in the diet
- Undigested phosphorus and nitrogen are excreted, causing culture water pollution
- Replacement of fish meal with plant proteins leads to an increase in the amount of phytic acid in the diet

Product Solutions

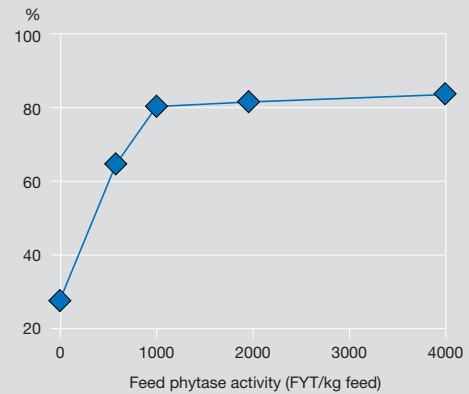
- RONOZYME® P releases increasing available phosphorus and amino acids
- Supplemental dietary phosphorus is eliminated
- Fecal excretion of nutrients is reduced
- Culture water quality is improved
- RONOZYME® P enables



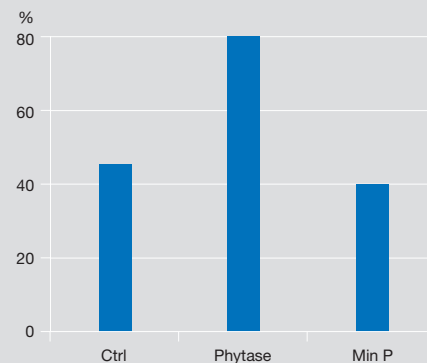
Phytic acid content of some common fish feed ingredients



Apparent digestibility of phosphorus in soybean meal (rainbow trout)



Phosphorus retention in trout fed practical diets



phosphate from phytic acid, phosphorus as well as other minerals and

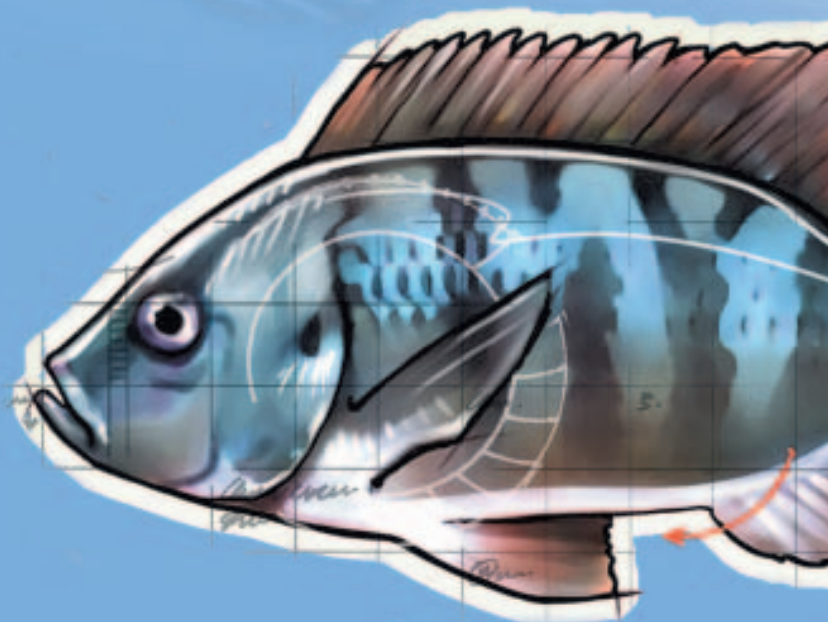
phosphorus may be reduced or

phosphorus is reduced

improved

greater use of plant raw materials

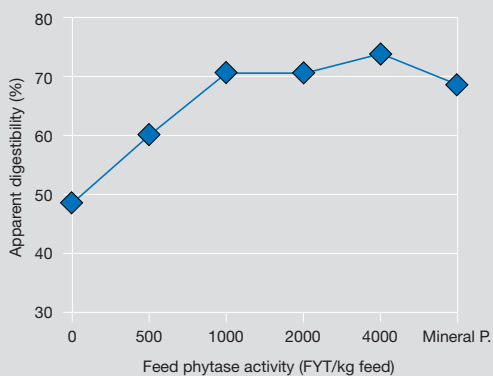
Scientific studies show that dietary phytase releases phosphorus from phytic acid in many aquatic species:



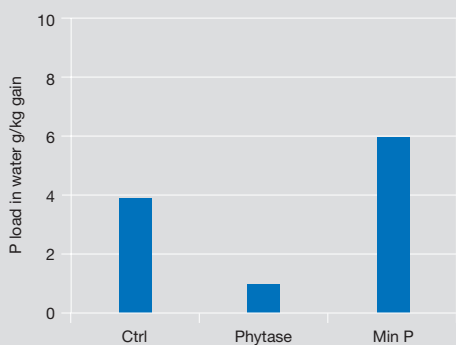
- Rainbow trout
- Atlantic salmon
- Carp
- Nile tilapia
- Red tilapia
- Channel catfish
- Basa catfish
- African catfish
- European sea bass
- Striped bass
- White shrimp



Apparent digestibility of phosphorus in Nile tilapia fed practical diets



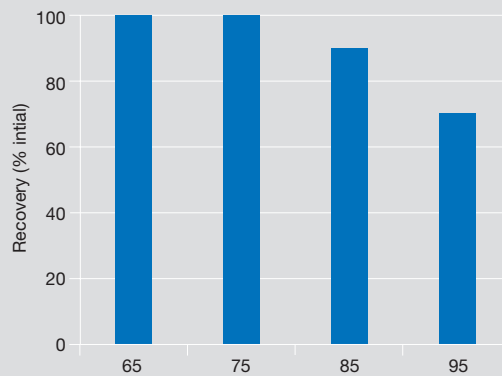
Phytase effect on phosphorus loading in trout culture water



Application of **RONOZYME® P** in Aquaculture feeds

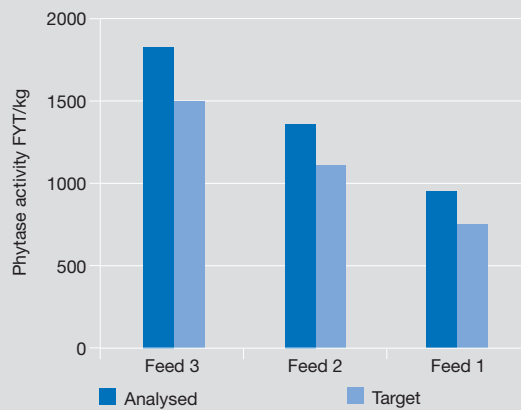
RONOZYME® P (CT) is a dry granulated and coated product, the most stable phytase on the market, and may be used in pelleted feeds.

Recovery of RONOZYME® P (CT) following pelleting at temperatures up to 95° C (%)



RONOZYME® P (L) liquid is needed for more aggressive feedmilling processes such as extrusion followed by extended conditioning and drying.

Recovery of RONOZYME® P following post-pelleting application in heated oil (FYT/kg feed)



RONOZYME® P is stable in treated feeds during storage.

Storage stability of RONOZYME® P applied post extrusion to fish feed (FYT/kg feed)



Benefits of RONOZYME® P in aquaculture

- Increases phosphorus, zinc, protein and other nutrient availability to fish
- Reduces or eliminates the need for dietary mineral phosphorus addition
- Maintains water quality through reduced phosphorus and nitrogen excretion

RONOZYME® P adds value to the feed

RONOZYME® P (L)

Description

RONOZYME® P (L) is a liquid phytase preparation (IUB No. 3.1.3.26) from *Peniophora lycii*

Specification

Appearance: brown aqueous liquid

Phytase activity*: min. 5000 FYT/g

*Declared activity

Stability and storage

RONOZYME® P (L) maintains its declared activity for at least 12 months from the date of manufacture when stored in the unopened original container and at a temperature below 25° C. Prolonged storage at temperatures above 30° C should be avoided. The 'best used before' date is printed on the label.

Usage recommendations

RONOZYME® P (L)

- Phytase activity: 5000 FYT/g
- 750 FYT/kg releases at least 0.12% available phosphorus
- 150 g RONOZYME® P (L)/MT FEED

Monocalcium phosphate mixture (MDCP)

- Total P content: 21%
- P available: 85%
- Availability phosphorus: 17.8%
- 7kg MDCP/MT feed

0.12% available Phosphorus

DSM Nutritional Products

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