

# Novozymes PondDtox®

The only safeguard against toxic  
hydrogen sulfide

Hydrogen sulfide is a common, but toxic metabolite formed in aquaculture ponds. When aerobic bacteria break down excess feed and accumulated organic waste, oxygen is depleted, and the result is anaerobic zones where sulfatereducing bacteria will thrive. This results in the buildup of hydrogen sulfide. Continued exposure to hydrogen sulfide will kill aquatic animals, and even levels as low as 0.002 ppm have shown to negatively affect aquatic life. Common signs of a pond with hydrogen sulfide problems are patches of black bottom sludge, reduced feeding, and increased mortality after 35–45 days of stocking or during the later stages of culture.

PondDtox® is the world's only microbial solution that can both prevent and remedy a hydrogen sulfide-infected pond. When applied, the bacterium *Paracoccus spp* oxidizes the hydrogen sulfide into harmless compounds.

#### Benefits of using PondDtox®

- Effectively removes existing hydrogen sulfide and prevents buildup
- Protects aquatic life; prevents and reduces mortality
- Improves size of aquatic animal and yield of crop

#### Technical results

The effectiveness of PondDtox® for controlling hydrogen sulfide has been proven in laboratory and shrimp pond trials.



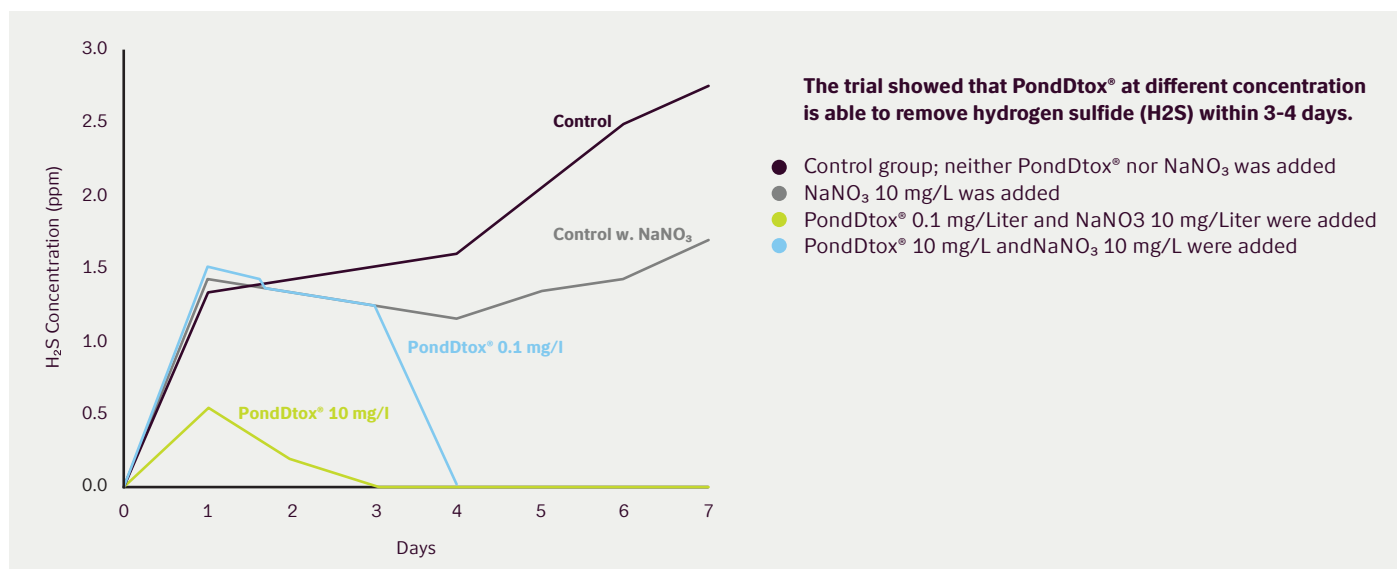
Fig. 1. On the left is a bottom soil sample from a pond suffering from the effects of hydrogen sulfide. Note the black color. On the right is a sample from a healthy pond. Note the normal soil color.



## Laboratory trial

Laboratory trial proves the ability of PondDtox® to remove hydrogen sulfide from sludge.

Methodology: Hydrogen sulfide was prepared by mixing sludge from the shrimp pond with shrimp feed. The sample was divided into four groups with three replicates, and PondDtox® and NaNO<sub>3</sub> were added. The trial showed that PondDtox® at different concentration is able to remove hydrogen sulfide (H<sub>2</sub>S) within 3-4 days. All PondDtox® treatments include 10 ppm nitrate; typical minimum pond nitrate levels.

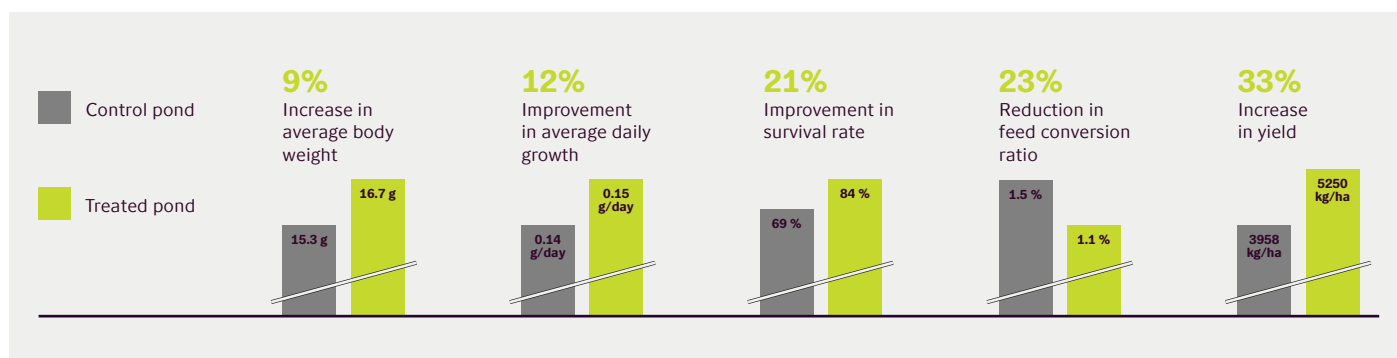


## Pond trials

PondDtox® has been proven to increase the yield and improve the feed conversion in pond trials.

Methodology: PondDtox® positively affects critical aquaculture parameters in pond trials.

Pond trials were conducted in 6 white shrimp ponds: 3 control ponds (without PondDtox®) and 3 treated ponds. PondDtox® was applied directly into pond water from stocking date at 0.1 ppm then applied at the same dosage every 7 days until harvest in treated ponds.



Source: "Effects of *Paracoccus pantotrophus* on Water Quality and Production of Pacific White Shrimp (*Litopenaeus vannamei*) Cultured in Low Salinity Water," L. Panichakornkul et al., Kasetsart University, Thailand, 2008.

At the forefront of sustainable agriculture, Novozymes works with partners, farmers and producers to feed and fuel a growing world.

### About Novozymes

Novozymes is the world leader in biological solutions. Together with customers, partners and the global community, we improve industrial performance while preserving the planet's resources and helping build better lives. As the world's largest provider of enzyme and microbial technologies, our bioinnovation enables higher agricultural yields, low-temperature washing, energy-efficient production, renewable fuel and many other benefits that we rely on today and in the future. We call it Rethink Tomorrow.

### Novozymes A/S

Krogshoejvej 36  
DK-2880 Bagsvaerd  
Denmark

Tel. +45 4446 0000