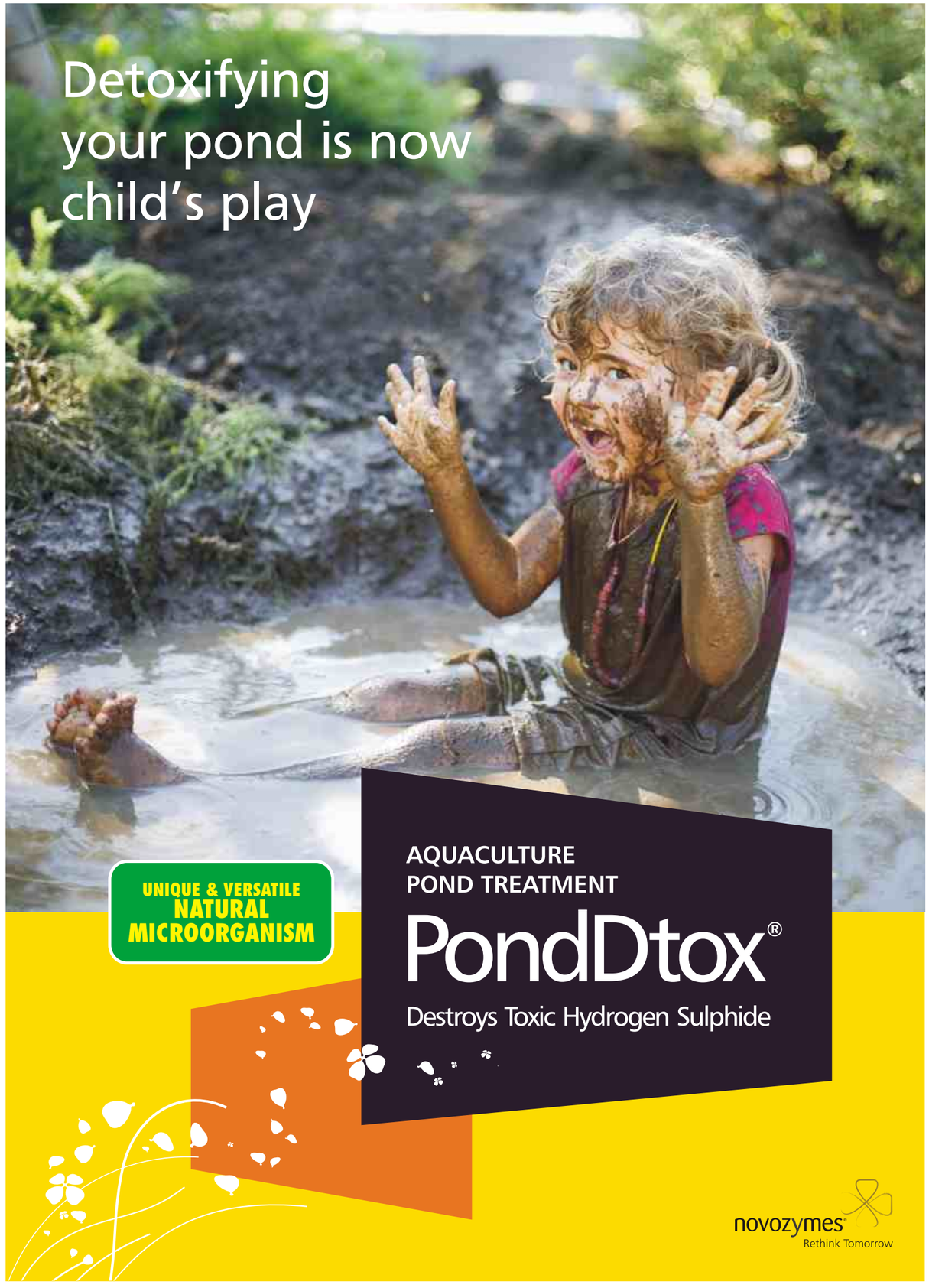

Detoxifying
your pond is now
child's play
UNIQUE & VERSATILE
NATURAL
MICROORGANISM
AQUACULTURE
POND TREATMENT
PondDtox®
Destroys Toxic Hydrogen Sulphide
novozymes®
Rethink Tomorrow

DO YOU KNOW JUST 0.01 PPM OF HYDROGEN SULFIDE CAN BE DANGEROUS?

Hydrogen Sulfide (H_2S) is highly toxic to shrimp and fish, and can cause rapid and massive mortalities in aquaculture ponds. Studies have confirmed that as low as 0.051 ppm H_2S concentration in sea water can lead to mortality of 50% or more of the shrimp (*Penaeus monodon*) population in just 4 days. H_2S concentrations of only 0.01 ppm causes chronic toxicity to bluegill fish, *Lepomis macrochirus*, and is considered the danger limit of organisms such as shrimp and mollusks living in contact with the sediment.

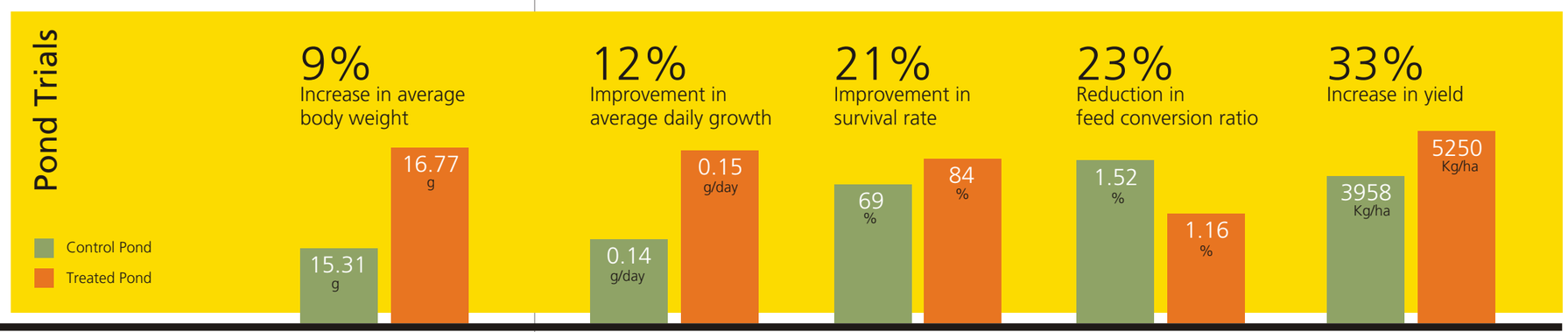
DETRIMENTAL EFFECTS OF HYDROGEN SULFIDE

Continued H_2S exposure causes mortality in the animal. Long before death due to H_2S exposure, shrimp will often feed much less, or stop feeding altogether. They tend to swim higher in the water column, missing out on their normal feeding, or come close to pond side where they are exposed and stressed. They are also more susceptible to disease. The problem occurs frequently in acidic soils. It generally hits between 35-45 DOC or during later stages of culture.

Almost 1 out of 3 ponds are hit by this problem, without a proper solution at hand.

PERFORMANCE RESULTS

The effectiveness of PondDtox for controlling H_2S has been proven in laboratory and pond trials across Asia. The results shown here are for pond trials conducted in 6 shrimp ponds with high stocking density: 3 control ponds (without PondDtox) and 3 treated ponds (using PondDtox at 0.1 ppm, every 7 days till harvest).



THERE IS AN EFFECTIVE BIOLOGICAL SOLUTION NOW FROM NOVOZYMES

Novozymes Biologicals' PondDtox contains unique and versatile natural microorganism *Paracoccus pantotrophus* - an effective solution for oxidizing H_2S.

PondDtox is a stable, dry formulation that can be applied both during pond bottom preparation as well as during the shrimp grow-out period.

The Paracoccus strain in PondDtox has the strong ability to grow both in aerobic and anaerobic conditions.

Under aerobic conditions, this strain grows using waste food and simple carbon materials for energy. Paracoccus grows and multiplies upon pond addition, and eventually becomes part of the natural pond bottom material.

When conditions in the pond begin to get anaerobic, the Paracoccus switches to its anaerobic metabolism and oxidizes H_2S as per the reaction shown below.

PondDtox uses:

- Hydrogen Sulfide for cellular energy
- Nitrate, produced during the natural nitrification cycle, for electron acceptor instead of oxygen
- Carbon Dioxide/organic carbon material (CHO) from uneaten food for cell mass

PondDtox rapidly oxidizes the H_2S and prevents it from bubbling into the lower pond water zone which stresses the animal and affects growth.

H_2S production in anaerobic conditions by native SRB (Natural SRB Strains)

SO_4 + CHO (Uneaten food) ⟶ SRB Cell Mass + H_2S

Action of PondDtox to stop the H_2S build-up PondDtox (*Paracoccus pantotrophus*)

CO_2/CHO+ H_2S+ NO_3 ⟶ Paracoccus Cell Mass + SO_4 + N_2 +Energy

PondDtox BENEFIT 01
Effective in aerobic and anaerobic pond conditions

PondDtox BENEFIT 02
Weight Increase

PondDtox BENEFIT 03
Growth Increase

PondDtox BENEFIT 04
Survival Increase

PondDtox BENEFIT 05
FCR Decrease

PondDtox BENEFIT 06
Yield Increase

AQUACULTURE
POND TREATMENT

PondDtox®

Destroys Toxic Hydrogen Sulphide

PRODUCT SPECIFICATIONS

Bacteria Species	*Paracoccus pantotrophus* *- removes H2S in pond sludge* *Bacillus megaterium* *- accelerates breakdown of excess organic waste in pond water*
Bacterial Count	3.0 billion cfu/g (3.0 x 10^9 cfu/g)
Appearance	Tan, free flowing powder
Odour	Yeast-like
Optimum pH	7.5-8.3
Optimum Pond Temperature Range	23°-40°C

Can be Applied at three stages of the culture period

- During Pond Preparation
- During the early stage of culture
- During the later stage of culture (> 90 Days)

Aeration is recommended with application of all microbial products.

APPLICATION DETAILS

**DOC = Days Of Culture*

	Application Period	Dosage	*Notes*
	During soil/pond preparation	2 kg/10,000 m^2	*Spread over wet pond soil*
Prevention	At 35 - 45 DOC* From 90 DOC* till harvest	1 kg/10,000 m^2 every 7-10 days	*H_2S is commonly produced during these periods of culture cycle*
Treatment	When pond soil turns black and develops bad odor	1st application 2 kg/10,000 m^2 2nd application 1 kg/10,000 m^2 after 3-4 days	*Maintain alkalinity above 100 ppm*

novozymes®
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