Mycofix® product line



Naturally ahead in mycotoxin risk managment



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Mycotoxins ...

... are toxic products produced by fungi that colonize crops before, during and after harvest and pose a potential threat to human and animal health. Mycotoxins are chemically very stable, heat resistant and difficult to eliminate during extrusion or pelletizing.

How do mycotoxins affect fish and shrimps?

Several major mycotoxins have substantial negative effects on health and productivity of aquatic species. They are known to be carcinogenic (aflatoxin $B_{1^{\prime}}$ ochratoxin A, fumonisin $B_{1^{\prime}}$), dermatotoxic (trichothecenes), nephrotoxic (ochratoxin A) and immunosuppressive (aflatoxin $B_{1^{\prime}}$ ochratoxin A and trichothecenes).

All mycotoxins

- Poor growth
- Immunosuppression
- Increased mortality

Zearalenone

- White Shrimp reduced growth
- Deposit in meat

Trichothecenes (DON, T-2)

- Reduced body weight
- Inhomogeneous growth
- Physiological disorders
- Lower hematocrit value

Aflatoxin B,

- Low digestibility
- Negative effect on digestive enzymes
- Physiological disorders and histo logical changes
- Hepato-pancreatic damage
- Lower hematocrit value
- Reduced growth
- Increased mortality

Aflatoxin B₁

- Highly carcinogenic
- Liver tumors, liver lesions
- Severe hepatic necrosis
- Pale gills
- Impaired blood clotting
- Anemia
- Pale yellow kidney lesions

All mycotoxins

- Reduced growth
- Higher mortality
- Lower weight gain

Trichothecenes (DON, T-2)

- Reduced feed consumption
- Decreased hemoglobin concentration, lower hematocrit value
- Poorer feed conversion rate

Fumonisins

- Lower hematocrit value
- Histopathological lesions
- Lesions in the exocrine and endocrine pancreas
- Lesions in inter-renal tissue

Ochratoxin A

- Poorer feed conversion rate
- Severe histopathological lesions of liver and posterior kidneys
- liver and posterior klane
- Liver necrosis
- Pale, swollen kidneys



Effect of aflatoxins on catfish growth Source: Dr. J. Khjarern



Effect of aflatoxins on tilapia performance Source: Dr. J. Khjarern



Healthy liver Liver affected by AfB, Source:T.D. Cardona, S.G. Llangantileke & Noomhorm (2004)



Susceptibility to mycotoxins depends on:

Age

Fry and juveniles are more susceptible to mycotoxins than adults.

Fish species

Marine cold water species are very sensitive.

Mycotoxin Contamination Levels and Dose Recommendations for Mycofix[®] Product line

Unspecific symptoms like poor fish performance and/or disease syndromes, reported in commercial operations, may be due to additive and synergistic interactions between multiple mycotoxins, even at a very low contamination level.



-- Mycofix[®] Product line 2 - 3 kg/tonne Mycofix[®] Product line 1 – 2 kg/tonne -- Mycofix[®] Product line 0.5 - 1.0 kg/tonne

Chart 1. Mycotoxin Contamination Levels and Dose Recommendations for Mycofix® Product line

Mycofix[®] Product line

- Dosage: 0.5 - 3.0 kg/t depending on contamination level of mycotoxins and depending on the product used in the feed
- Stability: 18 months from production date
- Packing: 25 kg plastic bag in corrugated cartons
- Storage: Store in a dry place and avoid direct sunlight

* Approved and registered in the EU according to the regulation No 1060/2013.

Trial-proven benefits of Mycofix® Product line*

Application of Mycofix[®] in AFB1 (100 ppb) contaminated diets has revealed economical benefits. Mycofix[®] at 1.5 kg/ton improved weight gain and feed conversion rate of Pangasius catfish fed a diet contaminated with 100 ppb AFB1.

Encarnação et al, 2009., Aquaculture Center of Applied Nutrition (ACAN), Bangkok, Thailand

Results of a trial carried out in Tilapia showed that inclusion of 94 ppb aflatoxin reduced Tilapia growth performance. The application of Mycofix^{*} to aflatoxin contaminated diets reduced these negative effects of aflatoxins. Mycofix^{*} also improved the feed conversion rate of Tilapia.

Encarnação et al, 2009, Aquaculture Center of Applied Nutrition (ACAN), Bangkok, Thailand

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