

مكافحة السموم الفطرية

Prevention and control of  
mycotoxins



# PREVENTIVE MEASURES


- Application of *Good Agricultural Practices (GAP)*, *Good Manufacturing Practices (GMP)*, *Good Hygienic Practices (GHP)* and *Hazard Analysis and Critical Control Points (HACCP)*.
- Crop Rotation
- Inhibit mold growth by appropriate drying and storage of grains/feeds.
- Efficient detoxification strategies.

# PREVENTION AND CONTROL OF MYCOTOXINS

The presence of mycotoxins is unavoidable as they are environmentally induced. However, the economic importance and health implication of mycotoxins has made its control inevitable. Control is very important to the feed manufacturer and livestock producer



# CONTROL MEASURES

- Detoxification and Physical treatment
  - Chemical Agents
  - Dietary Manipulations
  - Use of Adsorbents/binders
  - Bio-control measure ( Use of AFLASAFE)
  - Regulations
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# Detoxification and Physical treatment

- Exposure to sunlight for about 12-14 hours degrades aflatoxin up to 70-90%
- Drying at 120°C for 2-3 hours resulting in reduction by 60-90%
- Autoclaving, pelleting to inhibit mould growth.
- Cleaning, mechanical sorting and separation
- Density segregation (floatation).



# Chemical Agents

- ▶ Alkali

- ▶ Calcium Hydroxide

- ▶ Sodium Hydroxide

- ▶ Ammonia

- ▶ Acids

- ▶ Benzoic acid

- ▶ Copper Sulphate at  
0.04 - 0.05%



# Dietary Manipulations

- Mycotoxins affects nutrient value of feed, increasing the dietary level can minimize this effect.
- Aflatoxin negative effect is lower in birds consuming higher protein and higher methionine

# Use of Adsorbents/binders

- ▶ Inorganic toxin binders (Silica based)
  - ▶ Zeolites, Bentonites, Aluminosilicates
  - ▶ Activated charcoal, Clay and Yeast
  - ▶ Hydrated Sodium Calcium Aluminosilicate (HSCAS) at 1%
- ▶ Organic toxin binders (Carbon based)
  - ▶ Oat hulls, Wheat bran, Alfalfa fiber, Extracts of yeast cell wall, Cellulose, Hemicellulose and Pectin



# Bio-control measure ( Use of AFLASAFE)

- This is a biological control strategy which employs the mechanism of "competitive exclusion."

This method is used at agronomic level during planting. Aflasafe™ is tossed on field soil by hand 2-3 weeks prior to flowering of crop at 10-20 kg per hectare. Protection by *Aflasafe* carries over from field to store thus protecting maize/groundnut along the entire value chain (from field to fork).

# Regulations

Regulation be based on evaluation of risk assessment, establishment of tolerance level (or  $LD_{50}$ ) and enforcement of compliance with this level for raw materials and finished feed.

Thus the enforcement of the NIAS recommended minimum aflatoxin level in feed ingredients and finished feed is very essential

# Future Fight Against Mycotoxins

- ➤ Have farmers select strains resistant to contamination.
- ➤ Scientists hope to genetically engineer plants resistant to fungal infection.
- ➤ Use feed additives that sequester the toxins and prevent absorption from the gastrointestinal tract.



Considering the importance of mycotoxin in food safety, international trade, public health and the performance of poultry and livestock, the need to have a regulatory framework that addresses mycotoxin cannot not be over emphasized. Mycotoxin must be addressed at the policy level. This is not an option but a must.