HOW TO HOW TO MEET FOOD GRADE LIMIT OF AFLATOXIN CONTAMINATION

PRESENTATION

By:

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INTRODUCTION

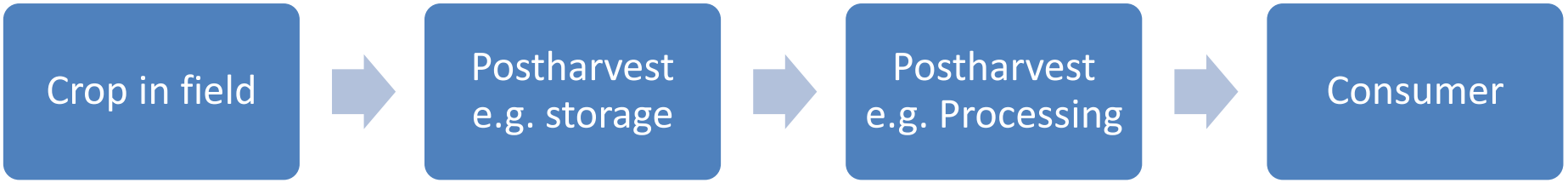
- Naturally occurring fungal metabolites
- Produced by *Aspergillus flavus* and *A. parasticus*.
- Major Aflatoxin groups are: B_1, B_2, G_1, G_2 & M_1
- Measured in ppb or µg/kg

Sources of aflatoxin contamination in food products

- Found in the soil
- Occur in crops in the field before harvest
- Postharvest contamination- especially with maize of high moisture levels
- Mechanical damage to kernels
- Presence of foreign matter
- Insect damaged kernels
- In processed foods

Why aflatoxin contamination in maize is of concern

- Aflatoxin contamination affects the entire food supply chain



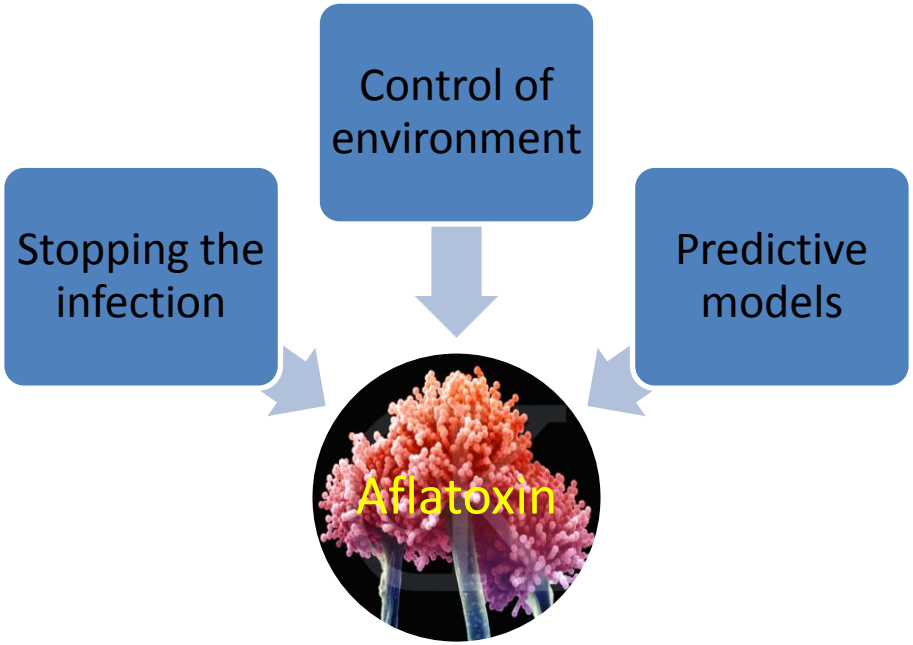
It impacts on the four pillars of food security:

- Availability of food,
- Access to food (by affecting income),
- Utilization of food (by affecting what we consume) and
- Stability (continuity of safe food).

Three sectors are also adversely affected: **Agriculture, trade and health.**

Control and management of aflatoxin

- Though unavoidable aflatoxin can be controlled
- Regulations governing aflatoxins in food is based on: maximum permitted, or recommended levels for specific commodities
- The EU sets limits for maize is 5µg/kg for B_1 and 10µg/kg TA
- The strategies used in aflatoxin control can be grouped as:



Mitigation measures for aflatoxin contamination

For primary producers

Pre-harvest control- best achieved through general Good Agricultural Practice (GAP):

- Land preparation: crop waste removal, fertilizer application and crop rotation
- Use of fungus- and pest-resistant crop varieties
- Control of fungal infection and insect pests e.g. atoxigenics
- Prevention of drought stress by irrigation
- Timely harvest
- Maintaining high hygiene in the storage structures

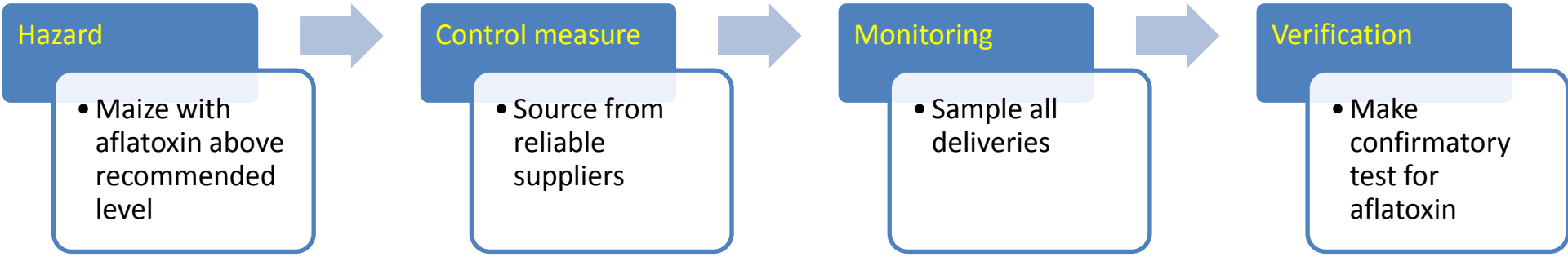
For food processors

- Physical separation and hygiene – sorting manually or electronically
- Rapid effective drying and safe storage
- Monitoring temperature and RH in storage structures
- Monitor products for ‘hotspots’
- Use of insect control methods
- Avoid moisture ingression in the storage structures
- Monitoring at reception during deliveries
- Continuous monitoring by sampling and testing

  preparation of representative sample is very critical- bulk lots
- Adopt a First In First Out (FIFO) policy- to reduce storage period

For food processors cont.

- Processes such as dehulling before milling very effective
- Adoption of processes such as: ammoniation, commercial processing technologies for reducing aflatoxin contamination
- Blending- less and more contaminated to reduce risk
- Disinfection methods- Fumagation
- Adoption of food processing hygiene such as Hazard Analysis Critical Control Point (HACCP)



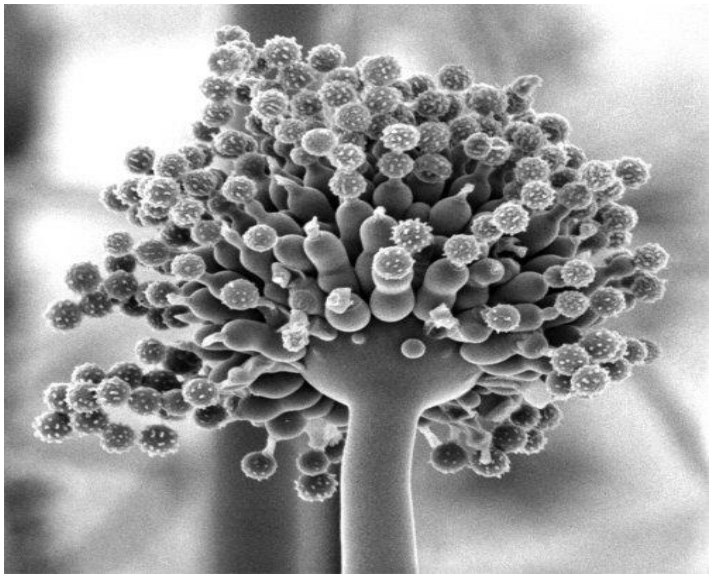
Potential use of super absorbent polymers in aflatoxin alleviation in food

- Reduction of moisture in grains is very important.
- There are a number of technologies that could be used to dry maize fast.
- An example of such technologies is the use of super absorbent polymers (SAPS) in hermetic drying of maize.
- These SAPS have a potential to rapidly and properly dry maize to moisture level of 13% or below. This helps in arresting growth of fungi in the product

Research done on polymers

❖Moisture sorption in seed maize (*Zea mays* L.) during hermetic drying using super absorbent hydrogel

❖The effect of superabsorbent polymers on aflatoxin contamination in maize



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Thank You!