The Risk of Aflatoxins in the region

Eastern and Central African Region

FSNWG
Food Security and Nutrition Working Group

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The current heavy short rains increase the risk of aflatoxins in the region

- The region is once again faced with the threat of aflatoxin poisoning in maize. The current heavy short rains across the region increases the risk of aflatoxin poisoning.

- Aflatoxin exposure can lead to rapid death - 125 people in Kenya died from aflatoxin poisoning in 2004.

- Some maize farmers do not dry the maize properly before storage. When the moisture content is higher than 16%, most cereals especially maize develops a mould or a fungus called *Aspergilus flavus* that produces *aflatoxin*.

There is an increased risk of aflatoxins in the region since much of the maize currently being harvested from the field could already be contaminated by the heavy rains.
What factors contribute to aflatoxin contamination?

**Soil:**
Grain may be contaminated through direct contact with the *Aspergillus* fungi spores present in soil or by windborne spores that can infect maize cobs still on the plant.

**Moisture:**
Moisture in the grain itself or from relative humidity is a very important factor in fungal growth and, thereby, aflatoxin formation. The relative humidity levels most favorable for fungal growth are between 65 and 80%; or moisture content in the grain is above 16%.

**Temperature:**
The rate of fungal growth depends on the temperature of the grain. Fungal growth is slow and minimal in cool-to-cold grains but fast and extensive in warm grains. The optimal temperature for *Aspergillus flavus* growth is 25°C–28°C.

**Oxygen:**
Most fungi will not grow in anaerobic conditions where the oxygen content is below 5%.

**Pests:**
Insect and pest damage to grain creates wounds through which fungal infection can occur and can lead to increased aflatoxin contamination.

Aflatoxin exposure occurs primarily through the diet

- Aflatoxins grow on whole grains such as maize, rice and wheat, as well as on groundnuts, almonds, walnuts, sunflower seeds, and spices such as black pepper and coriander.

- Aflatoxins can contaminate these food products during harvesting, processing, storage, or transport when conditions are favorable for mold growth.
Aflatoxins can cause rapid death when consumed

Chronic exposure to aflatoxins can damage the liver, which can produce: Liver inflammation (hepatitis). Other chronic disorders arising from aflatoxins exposure include: Immune deficiency, increased susceptibility to infections, cirrhosis of the liver and liver cancer.

Acute exposure to high levels of aflatoxins leads to aflatoxicosis, which can result in rapid death from liver failure. In 2004, during the worst known outbreak of aflatoxicosis in Kenya, 317 cases were reported and 125 people died. The minimum level of aflatoxin exposure required to cause aflatoxicosis is not known, but the disease mostly affects children.

Aflatoxin is colourless, so consumers cannot tell the difference between contaminated and healthy maize. Aflatoxin cannot be eliminated by washing, cooking, or even fermenting maize.
Using simple post-harvest techniques to reduce aflatoxin contamination

Although some farmers are aware of the aflatoxin problem, many still continue to thresh grain on bare ground and have poor storage facilities.

Farmers need to be educated on methods to reduce contamination such as:

- Better crop management to reduce the risks of plant infection.
- Timely harvesting.
- Using raised platforms to dry grains which allow for good ventilation and ensure proper drying.
- Using improved storage techniques-applying pesticides and using good silos.

There’s need for more research to better understand the causes of the aflatoxin contamination and to identify cost-effective techniques to reduce the risk.
Simple farm-level moisture testing technique

i. To test if maize is dry, mix a handful of grains with half a handful of dry salt in a dry soda bottle. Shake it for 2-3 minutes and allow it to settle.

ii. If salt sticks on the walls of the bottle, then the grain has moisture and needs more drying.

iii. Repeat the process until no salt sticks on the walls of the bottle.
Way forward in aflatoxins control

Key areas for future research, investment, and development for the reduction of aflatoxins in developing countries include:

• Development of maize varieties and hybrids with tolerance to infection by *Aspergillus* fungi and, subsequently, to aflatoxin accumulation;

• Increasing awareness among producers and consumers of the health and economic impacts of aflatoxin contamination;

• Creating market incentives to implement aflatoxin-mitigation techniques (e.g. through a market premium for aflatoxin-free food);

• Developing and promoting cost-effective technologies to reduce contamination along the entire maize value chain;

• Promoting alternative uses for grains infected with aflatoxin, instead of throwing away (e.g. used in biofuels);

• Developing low-cost sampling and testing technologies;

• Improving the intensity of testing to reduce the amount of contaminated maize entering the market place; and

• Strengthening institutions that are responsible for food-safety regulation.

The increasing risk of aflatoxins will render crop harvests unfit for human consumption thereby impacting on the food security situation in the region.
Thank You