PROGRAMMES AND ACTIVITIES FOR AFLATOXIN CONTROL IN AFRICA

THE IMPACT OF AFLATOXIN – KENYAN EXAMPLE

Mr. Ngetich Joseph

Ministry of Agriculture, Kenya

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INTRODUCTION

- Estimated 25% of world food crops affected by aflatoxin contamination (FAO) include maize, peanuts, cassava.
- These crops constitute the staple food for majority of African countries.
- Undermines overall development goals of Governments, for instance:
  - Attainment of Vision 2030 for Kenya
  - Attainment of MDGs (No. 1-Eradication of extreme poverty and hunger; No. 4- Reduction of child mortality; No. 5-Maternal health; No. 6-Combating HIV/AIDS and other diseases)

AFLATOXIN INCIDENCES IN KENYA

- To illustrate the impact of Aflatoxin in Kenya, the following brief history is necessary:
  - 265 people died between 2000 and 2008 out of which 123 died in 2004
  - No deaths recorded between 2009 and 2011
  - Presence of aflatoxin detected in huge quantities of maize in the Eastern Province of the country.

ADDRESSING THE PROBLEM

Aflatoxin is a multi-faceted transboundary problem that requires:

- Stakeholder involvement and participation, from both public and private sectors
- Sector-wide approach
- Regional, inter-Governmental and international collaboration

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- Mainstreaming in National policies and programs, for instance:
  - Agricultural Sector Development Strategy (ASDS)
  - CAADP in Kenya (Pillar 2, 3)
- Mobilization of resources and investment in projects with direct impact on food quality and access to markets.

ACTIVITIES FOR AFLATOXIN CONTAINMENT

- To effectively manage the levels of aflatoxin in food and livestock products, the following activities are necessary:
  - Policy formulation, development of standards and regulations
  - Awareness creation and training
  - Health impact analysis
  - Economic impact and analysis , research
  - Use of appropriate bio-control technologies
  - Pre and post harvest handling
  - Testing Development

Policy

- Policy formulation, development of standards and regulations
- A policy framework forms the basis for subsidiary legislation to enforce regulations
- Sets the standards and trading regulations
  - 10 ppb for Kenya ; 10 ppb EAS-2:2005
  - Harmonisation for EAC, COMESA, Africa in line with International standards
- Registration of traders and all grain dealers for ease of monitoring the movements of the produce in the country.
- Standards are needed to create markets for crops unsafe for human consumption. For instance, standards for: detoxification; blending; beef feedlot; feed producer; feed markets; human food/feed; corn flour mill; corn processor.

Awareness Creation and Training

- Farmers and the general public informed of the dangers associated with aflatoxin poisoning both in food and feed
  - On site training is the key with leaders identified at all levels.
  - Developing robust awareness and public education programs that involve all stakeholders.
  - Notifications on Aflatoxin in affected countries to inform and warn consumers
  - Strengthening the capacity of non-state actors to understand, advocate and push for safe foods and consumer health.
- Early detection of illness symptoms of such poisoning for immediate medical attention.
- A holistic approach to training of all stakeholders.

Health Impact Analysis

- Health impacts include:
  - Death due to acute poisoning
  - Chronic phase leads to loss of productivity (labour) and increased health expenses
  - Reduced immunity leading to increased attack from opportunistic diseases.
  - Stunted growth mainly of children leading to sickly and unproductive population.
- Need to understand effective interventions to minimize health impacts

Economic Impact Analysis

- Economic impacts include:
  - Loss to farmers, traders through contaminated produce, for instance 32000 bags of maize condemned in Kenya in 2009
  - Decreased production of animals
  - High cost of decontamination
  - Loss of trade, local regional and International
    - 135000 MT of maize cross border trade within EAC in 2010 (~43m USD)
    - 1.5 million MT maize, 781717 MT wheat imports to Kenya in 2009 (~84m USD)
    - 117 MT of maize rejected by the WFP in 2009 in Bura (~37k USD)
- How to evaluate losses due to, for instance:
  - Market failures – no testing, no premium, home consumption
  - Lack of alternatives in food insecure areas

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- Deaths could result in orphaned children creating a burden to society
- Reduced availability of both quantity and quality of food to the population
- Dilemma:
  - Market loss occurs when:
    - Food IS monitored for aflatoxin: Buyers pay lower prices or reject contaminated food (developed nations, local or international trade)
    - Animals become sick from aflatoxin consumption
  - Health loss occurs when:
    - Food IS NOT monitored for aflatoxin: Dangerous levels enter food supply

Use of Biocontrol Technologies

- Use of beneficial fungi successful in other parts of the world , for instance USA
- Trials on-going in Kenya involving the following collaborating institutions:
  - Kenya Agricultural Research Institute (KARI)
  - Kenya Plant Health Inspectorate Service (KEPHIS)
  - Maize and Wheat Improvement Centre (CIMMYT)
  - Agricultural Cooperative Development International/Volunteers in Overseas Cooperative Assistance. (ACDI/VOCA)
- Great potential to offer solutions to the Aflatoxin menace in Kenya and the rest of Africa

Resistant Cultivars

- Innovative breeding may be explored to produce cereal crops more tolerant to fungal infection.
- Challenge of tolerance versus high yields
- Different varieties of grain require different drying regimes.

Pre and Post Harvest Handling

Factors influencing fungal growth and toxin development:

- Growth cracks, mechanical injury and damage by pests to grains lead to infestation by fungi
- Toxins are produced under high temperatures, drought, high insect activity prior to harvest
- Wet conditions at harvest leading to longer duration for drying in the field after grain maturity

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- Value chain approach to pre- and post harvest handling including:
  - Proper drying as quickly as possible
  - Proper storage: control of humidity, temperature, ventilation
  - Manual or mechanical sorting/segregation by risk
  - Appropriate transport for food items including grains. (Closed or well covered vehicles to avoid rain or contact with external sources of moisture.)

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- Grains suspected to be contaminated should be impounded for analyses and confirmed cases of contamination should be destroyed or converted to non-food uses.

- Routine surveillance of all food and feed stores should be instituted.
  - Use of simple moisture meters.
  - Salt and bottle method

Testing Development

- Sampling protocols and procedures
- Sample preparation
- Analysis using rapid field-based test kits
- Reporting of results
- Quality assurance
- Laboratory capacity for elaborate confirmatory tests

CONCLUSION

- Integrated approach, from farm to fork
  - Limit the risks of aflatoxin contamination at each step along the food chain
- Concerted effort of all actors along the food production chain
  - Government authorities, Private sector (farmers, industries…), Research institutes, NGOs, …
- Multidisciplinary approach
  - Integrate technical and socio-economical aspects to develop a sustainable aflatoxin management system
- Coordinate other projects/activities, create a platform for complementary actions