FOOD SAFETY-NUTRITION AND FOOD SECURITY LINKAGES

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PRESENTATION LAYOUT

- FOOD SECURITY VERSUS FOOD SAFETY
- LINKAGES FOOD SECURITY-SAFETY –NUTRITION
- HAZARDS VERSUS RISK
- AFLATOXINS AS FOOD SAFETY and NUTRITION ISSUE
- CONCLUSION

FOOD SECURITY VERSUS FOOD SAFETY

- FOOD SECURITY:

- We consider that food security is achieved when all people, at all times, have physical, social, and economic access to sufficient safe and nutritious food that meets their dietary needs and food preferences for an active and health life (World Food Summit, 1996)

FOOD SECURITY VERSUS FOOD SAFETY

FOOD SAFETY:

A scientific discipline describing handling, preparation, and storage of food in ways that prevent foodborne illness

– do no harm concept

HAZARDS VERSUS RISK

- Food hazards are classified into:
- Biological hazards (Infectious bacteria, Toxin producing organisms, Moulds, Parasites, Virus, Prions)
- Chemical hazards (Food additives, Pesticide residues, Veterinary drug residues, Environmental contaminants, Chemical contaminants from packing, Allergens)
- Physical hazards (Metal, machine filings, Glass, Jewellery, Stones, Bone chips)

FOOD HAZARDS VERSUS RISK

- WE ARE DAILY EXPOSED TO FOOD HAZARDS
- RISK FOR A FOODBORNE DISEASE IS
- FUNCTION OF THE PROBABILITY OF AN ADVERSE HEALTH EVENT X SEVERITY OF THE CONSEQUENCE

RISK ASSESSMENT PROCESS

- STRUCTURED PROCESS (CODEX):
  - HAZARD IDENTIFICATION (Biological, chemical) hazard)
  - HAZARD CHARACTERIZATION (Qualitative/quantitative evaluation of health event – Dose-response assessment)
  - EXPOSURE ASSESSMENT (Qualitative/quantitative calculation of likely intake)
  - RISK CHARACTERIZATION: calculation of the probability of occurrence of health event

FOODBORNE DISEASES: CHALLENGES

- CHEMICAL/PESTICIDES RESIDUES:
  - CHRONIC LONG TERM EFFECTS
  - LACK OF INDEX DISEASES
- MICROBIAL HAZARDS:
  - AVERARE 3-5 DAYS
  - ONE LAB RESULT IS THE TIP OF ICEBERG
  - MATCHING FOOD ISOLATE/STOOL ISOLATE

FOODBORNE DISEASES: CHALLENGES

- NORTH AMERICA
  - 48 MILLIONS /YEAR =1/6 American
  - 128,000 hospitalized
  - 3,000 deaths
  - MICROBIAL HAZARDS: CAMPY –SALMONELLA
  - CONSUMER PERCEPTION: PESTICIDES/CHEMICAL
- CHINA: ADULTERATION (MELAMINE-OIL)
- AFRICA:
  - LACK OF DATA
  - INDICATIONS: PESTICIDES/CHEMICAL ISSUES

FOODBORNE DISEASES CHALLENGES

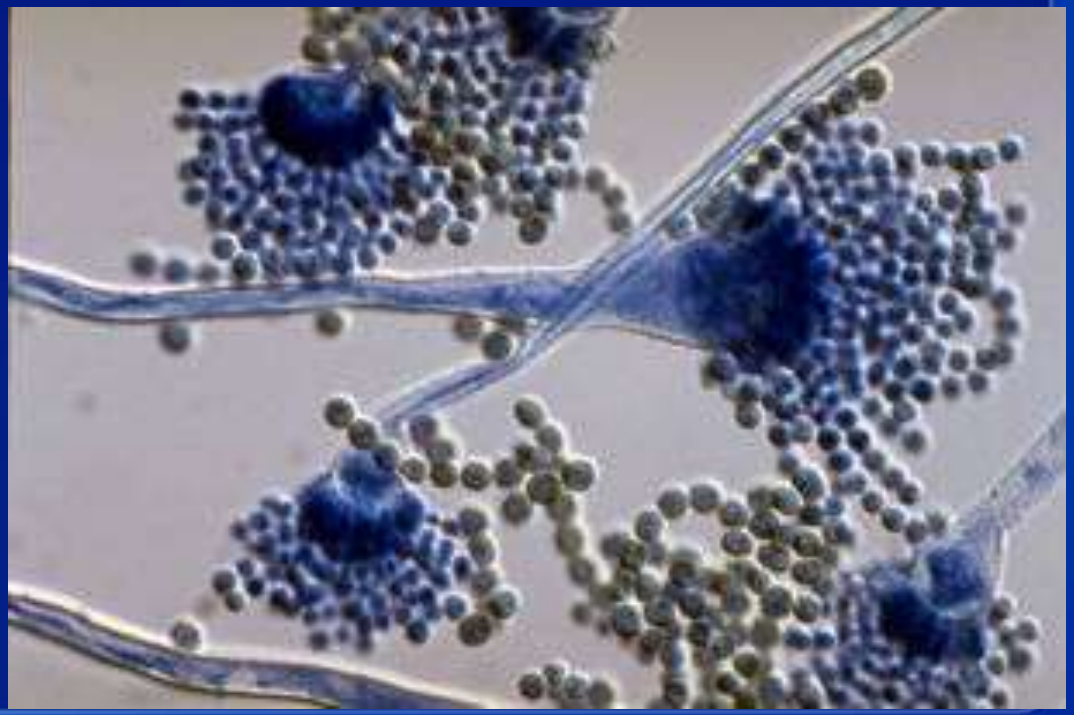
- BULAWAYO STUDY:
  - EMERGENCY PROGRAM
  - HIGH LEVEL OF PESTICIDES IN FRESH VEGETABLES AT RETAIL
- AFLATOXINS PROBLEM SEEMS TO BE MAJOR
- WHAT ARE AFLATOXINS ?

What is a “Toxin”

- A toxin (from Ancient Greek: *toxikon*) is a poisonous substance produced within living cells or organisms
- In simple terms it is a poison produced by biological agents.

Aflatoxins are naturally occurring toxins that are produced by species of a fungus called *Aspergillus*

Types
Aspergillus flavus and
Aspergillus parasiticus



The Fungus - Aspergillus

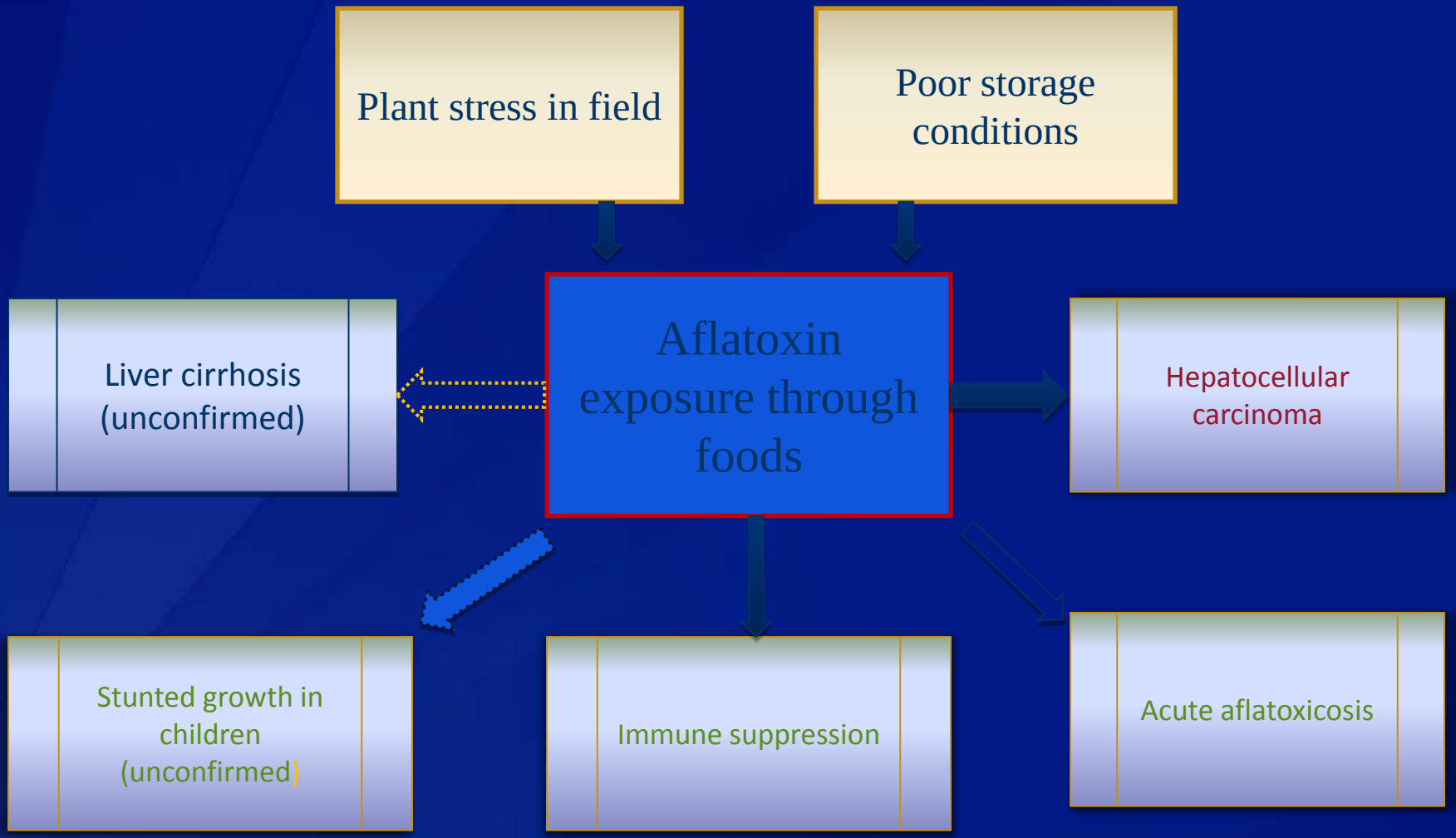
- Survives temperatures ranging from 12°C to 48°C
- Survives on almost any organic nutrient source.
- At latitudes between 40°N and 40°S of the equator
- Toxins produced when temperatures range between 24 and 35 C and moisture content exceeds 7%
- Contaminate 25% of crops worldwide

Aflatoxin Prone African Dietary Staples

- Maize
- Rice
- Corn
- Cassava
- Nuts
- Peanuts
- Chilies
- Spices

The toxin is also released in milk and dairy products

influence diagram: How aflatoxins get in our food, and its health effects



Acute Aflatoxicosis

- Acute poisoning is characterized by an acute hepatotoxic disease that manifests itself with
  - Depression
  - Anorexia
  - Jaundice
  - Hemorrhages
  - Edema of the lower extremities
  - Abdominal pain and vomiting

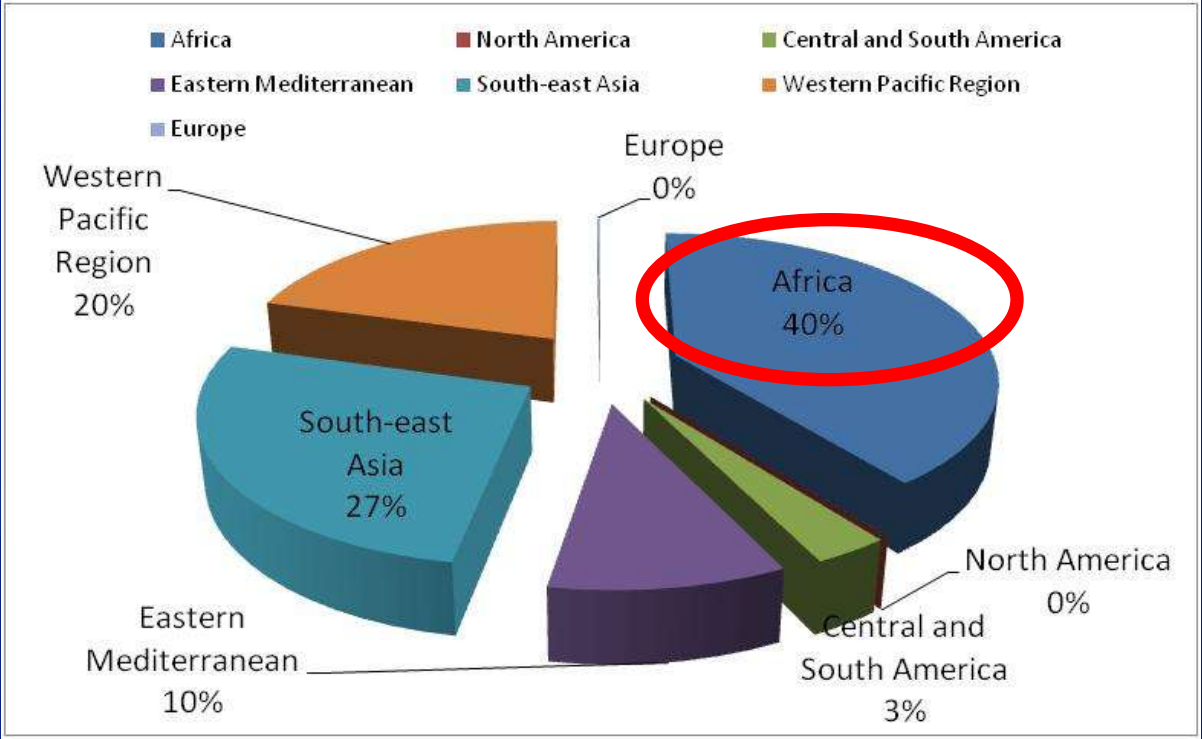
Chronic Exposure

- **5 billion people in developing countries worldwide are at risk**
  - Liver cancer: causative role in 5 – 40% of liver cancer cases
  - Synergy with Hepatitis B virus
  - Impaired immune function
  - Childhood stunting
  - Possible neural tube defects

25,200-155,000 global aflatoxin-induced liver cancer cases/yr

~5-30% of all liver cancer cases

Where does aflatoxin-induced liver cancer occur?



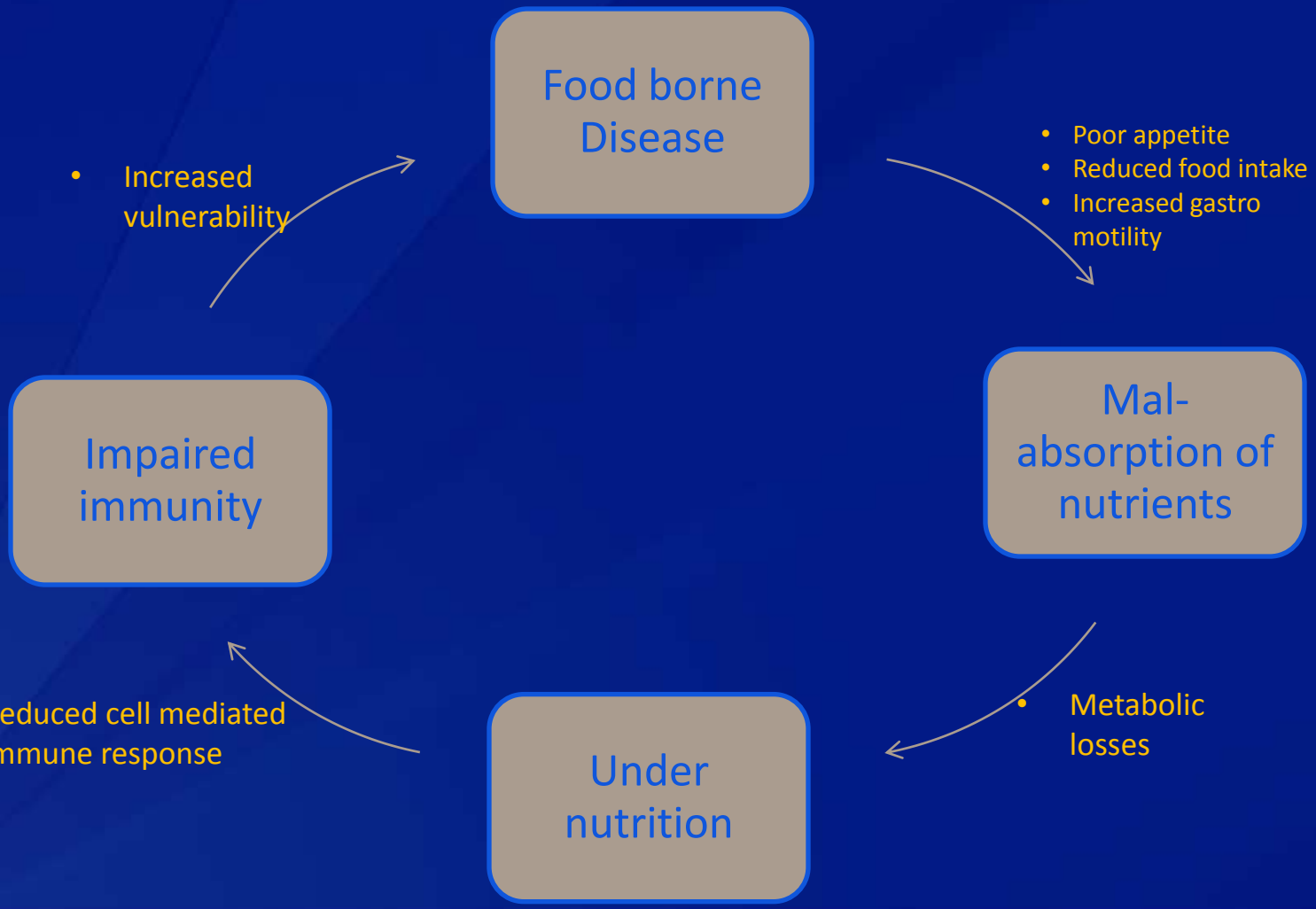
Liu Y, Wu F. (2010). "Global Burden of Aflatoxin-Induced Hepatocellular Carcinoma: A Risk Assessment." *Environmental Health Perspectives* 118:818-824.

PREVENTION AND CONTROL: Value chain approach – "farm to fork"

1. Pre-harvest
    - Bio Control
    - Improved Plant Varieties
    - Integrated Pest Management
2. Post-harvest
    - Post-Harvest Handling
    - Improved Storage
    - Quality Assurance of the Food Chain

- THREE
- TAKE AWAY
- MESSAGES

The Vicious Cycle of Under nutrition and Poor Food safety



Food Safety – A pre-requisite for Food Security

- Food security exists when all people, at all times, have physical and economic access to **sufficient**, **safe** and **nutritious** food that meets their **dietary needs** and food preferences for an active and **healthy** life. (World Food Summit, 1996)

- FOOD SAFETY CONTROLS:
- REQUIRE
- A VALUE CHAIN APPROACH
- SHARED RESPONSIBILITY

THANKS/MERCI/OBLIGADO