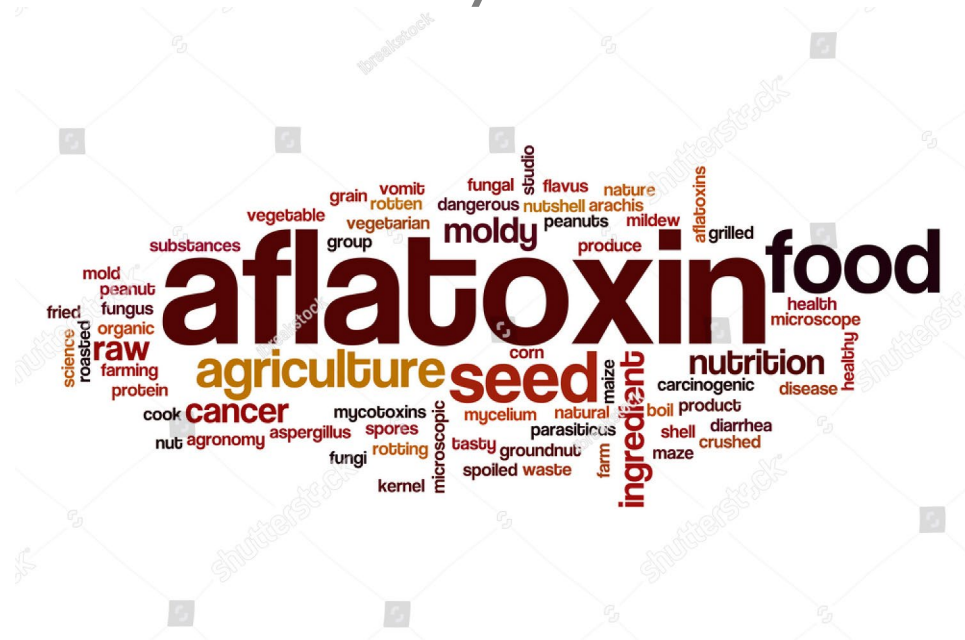




Setting the scene: what are aflatoxins and why do they matter



One Health Center of Excellence – University of Florida

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BACKGROUND

“The Poison in the Corn” “Eat and Die”?



New York Times, March 5, 1989.
<https://www.nytimes.com/1989/03/05/opinion/the-poison-in-the-corn.html>

- Maize, sorghum, groundnut are important staple crops around the world.1.

Aflatoxins:

- However, these staple crops can be highly toxic to humans and animals.1.
- Certain types of fungus that grow on them can produce aflatoxins—toxic compounds which can cause health problems in humans and animals.1.



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FOODS FREQUENTLY CONTAMINATED BY AFLATOXINS



From: Google Images. 2018



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HOW CAN AFLATOXIN CONTAMINATE STAPLE CROPS?

3. Minimizing mycotoxin contamination in food chain

SOURCES OF MYCOTOXIN EXPOSURE



From: Logrieco et al. in *The Mycotoxin Charter: Increasing Awareness of, and Concerted Action for, Minimizing Mycotoxin Exposure Worldwide*. 2018



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WHAT ARE THE POSSIBLE EFFECTS OF CONSUMING FOODS CONTAMINATED WITH AFLATOXIN?



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AFLATOXIN

AFLATOXIN IS POISONOUS

Aflatoxin, a byproduct of naturally-occurring fungi that infect many crops, is a Class I Human Carcinogen and leads to:

- IN ADULTS
 - Liver Cancer
 - Immunosuppression

10% OF ADULT DEATHS IN SOUTHEAST ASIA AND SUB-SAHARAN AFRICA ARE CAUSED BY LIVER CANCER

- IN CHILDREN
 - Stunting
 - Mental Impairment
 - Acute Poisoning

UP TO 35% OF CHILD STUNTING IS ASSOCIATED WITH AFLATOXIN

- IN LIVESTOCK
 - Contaminated Meat & Milk
 - Passed to Human Consumers

AFLATOXIN IS HARMFUL TO ECONOMIES

Higher medical costs, market losses and toxic effects in livestock can devastate economic systems and livelihoods.

IN 2001, AFRICA LOST OVER **\$600 MILLION** IN TRADE WITH THE E.U. DUE TO AFLATOXIN CONTAMINATION

\$1 BILLION USD PER YEAR ESTIMATED COST OF AFLATOXIN MANAGEMENT IN THE PHILIPPINES, THAILAND AND INDONESIA

25% OF THE WORLD'S CROPS ARE SUSCEPTIBLE TO AFLATOXIN

MAIZE, WHEAT, COUPOUS, SORGHUM, SPICES, RICE, CASSAVA

CAUSES	PREVENTION
PRE-HARVEST INFECTION 	*Aflasafe™ is a harmless fungus that competes with and prevents the growth of the aflatoxin-producing fungus in the field. *Plant breeding through traditional and biotech-driven methods can produce aflatoxin-resistant crops.
INSUFFICIENT GRAIN DRYING 	*Stove and solar powered grain dryers reduce moisture content before storage, which reduces the capacity for fungal growth.
POOR STORAGE 	*Low-cost hermetic storage bags last up to a full year and eliminate the need for pesticides, prevent infestation and stop mold growth.
CONTAMINATED MEAT/MILK/EGGS 	Adequate testing can ensure that animal feed is not contaminated at dangerous levels. Chemical binding agents and feed processing techniques are currently being studied to establish efficacy.

HOW DO WE ENSURE SMALLHOLDER ACCESS TO PREVENTION TECHNOLOGIES?

LEARN MORE AT AGRILINKS.ORG/AFLATOXIN



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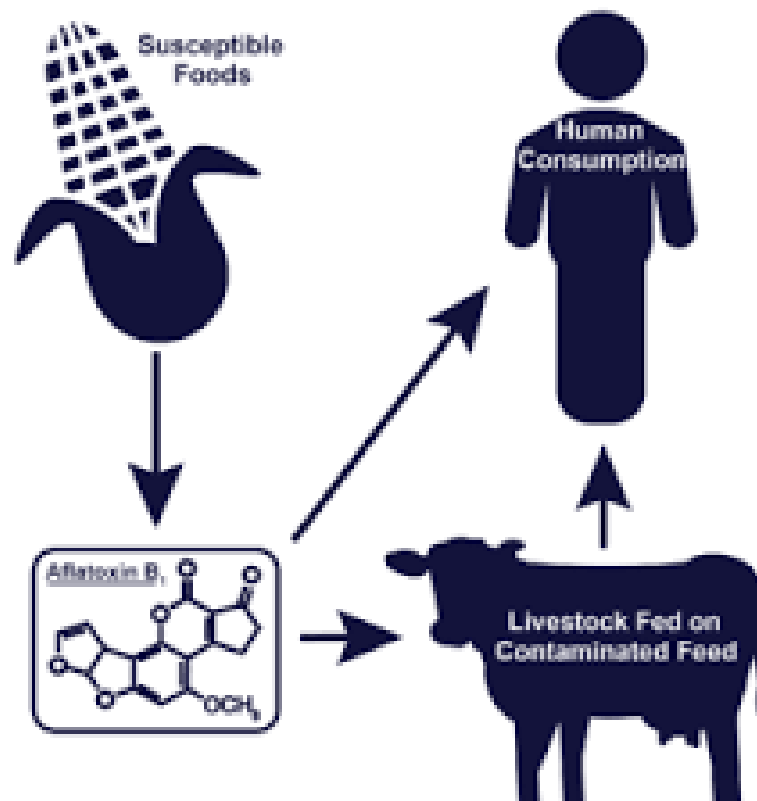
*Aflatoxin interventions supported by the U.S. Agency for International Development through Feed the Future.
Feed the Future is the U.S. Government's cornerstone global hunger and food security initiative, and supports broad-based economic growth through agricultural development with a focus on enabling smallholder farmers to increase productivity of better, more nutritious foods. Learn more: www.feedthefuture.gov



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WHAT IS THE PROBLEM THAT CONCERNS US THE MOST WITH AFLATOXINS?



The effects of Aflatoxins on the Food Chain, 2017
<https://www.pocketdiagnostic.com/affects-aflatoxins-food-chain>



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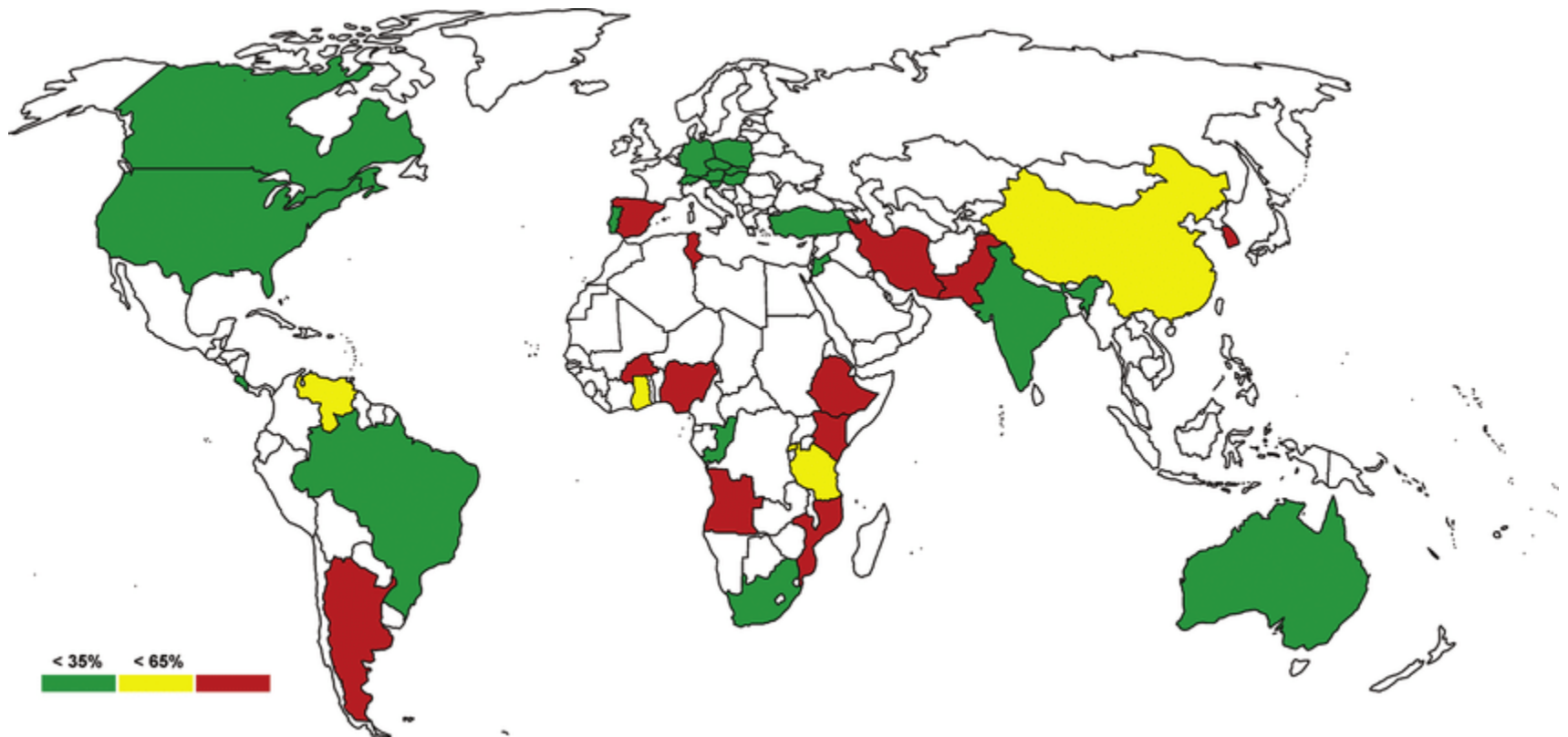


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WHERE HAVE AFLATOXINS BEEN REPORTED?

Worldwide prevalence for aflatoxin in feedstuffs, expressed as percentages. Based on scientific reports from each country.



From: Molina et al. in *A Focus on Aflatoxins in Feedstuffs: Levels of Contamination, Prevalence, Control Strategies, and Impacts on Animal Health*. 2017



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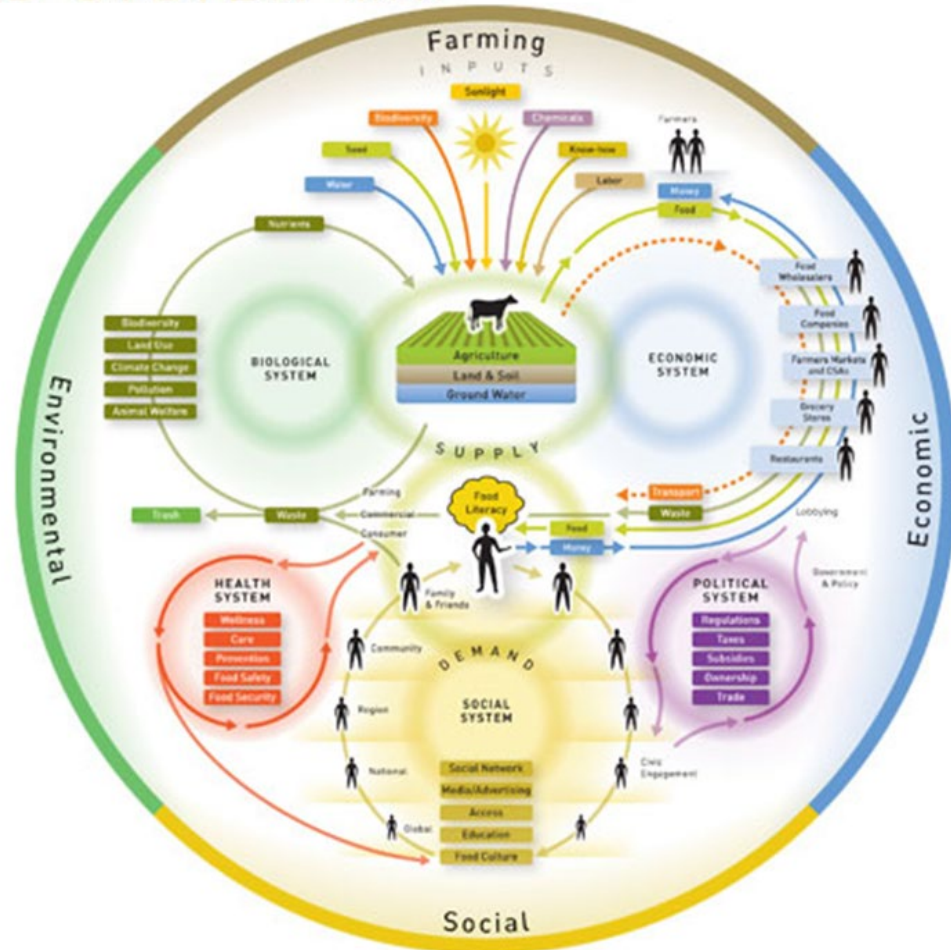


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AFLATOXINS AFFECT THE ENTIRE FOOD SYSTEM

FOOD SYSTEM MAP



From: Center for Environmental Transformation. Camden, New Jersey 2015. <http://www.goodfoodworld.com/wp-content/uploads/2012/05/Food-System.jpg>



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2. Natural occurrence of aflatoxins in groundnut (*Arachis hypogaea*) from eastern Ethiopia. Chala *et al.*, 2010.
3. Natural Occurrence of Toxigenic Fungi Species and Aflatoxin in Freshly Harvested Groundnut Kernels in Tigray, Northern Ethiopia. Assefa *et al.*, 2012.
4. Stakeholders' perception about aflatoxin contamination in groundnut (*Arachis hypogaea*) along the value chain actors in eastern Ethiopia. Guchi, 2014.
5. Natural occurrence of aflatoxins in groundnut (*Arachis hypogaea*) from eastern Ethiopia. Chala *et al.*, 2010.
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9. Aflatoxin contamination of milk and dairy feeds in the Greater Addis Ababa milk shed, Ethiopia. Gizachew *et al.*, 2015.
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