

Food Safety Hazard: Mycotoxins



Characteristics/description

Mycotoxins can be regarded as toxic metabolites produced by a wide variety of fungi. Aflatoxin, for example, is a fungal toxin contaminating maize, peanuts and other types of crops during production, harvest, storage or processing. Plant stress (insect damage, heat, drought) and insufficient drying of harvested crops contribute to mold growth and toxin production. Exposure to aflatoxin is known to cause both chronic and acute severe disease. In Kenya, acute aflatoxin poisoning resulted in death in up to 40 percent of cases. An estimated 4.5 billion people living in developing countries may be chronically exposed to aflatoxin through their diet (FAO).

Source

The greatest poisoning risks for humans come from mycotoxins that commonly contaminate basic staples, even in the absence of any visible mold growth, and are normally detectable only by chemical methods. However, homegrown staple crops are not routinely tested for the presence of aflatoxin.

Effects on humans

Health effects linked to mycotoxins range from acute toxicosis and death to stunting in children and multiple system (gastrointestinal, neurological, immunologic) damage due to chronic exposure. The toxins are considered carcinogenic, with the liver being the primary organ affected.

Treatment for patients

Management consisting of supportive care for multiple system failure, including antibiotics and antifungal therapy for secondary infections.

Key links

"Selected Mycotoxins: Ochratoxins, Trichothecenes, Ergot," published under the joint sponsorship of the United Nations Environment Program, the International Labor Organization, and the World Health Organization: http://apps.who.int/iris/bitstream/10665/39552/1/9241571055_eng.pdf

U.S. Department of Agriculture: "Aflatoxins," a resources page: <https://fsrio.nal.usda.gov/pathogen-biology/natural-toxins/aflatoxins>

Aflatoxins and growth impairment: A review: <http://www.tandfonline.com/doi/abs/10.3109/10408444.2011.575766>

FAO-Mycotoxins in Grain: <http://www.fao.org/Wairdocs/X5008E/X5008e01.htm>

Mycotoxins: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC164220/>

Toxic effects of mycotoxins in humans - World Health Organization: [http://www.who.int/bulletin/archives/77\(9\)754.pdf](http://www.who.int/bulletin/archives/77(9)754.pdf)

Risk reduction strategies

- Aflatoxins are considered unavoidable contaminants of food and feed, even where good manufacturing practices have been followed. In the US, the action level for most human food is 20 parts per billion (ppb) total aflatoxins. Studies of maize in Africa have found aflatoxin at more than 60 times that level.
- Strategies to improve crop plant health, harvesting, storage and transport are needed to reduce the risk of chronic exposure. Inexpensive detection assays would support surveillance and reduce the amount of contaminated food entering markets.